



NUCLEAR ENERGY INSTITUTE

WHITE PAPER

IMPLEMENTING A 24-MONTH FREQUENCY FOR
EMERGENCY PREPAREDNESS PROGRAM REVIEWS

REV. D

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¹ The Nuclear Energy Institute (NEI) is the organization responsible for establishing unified industry policy on matters affecting the nuclear energy industry, 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, nuclear materials licensees, and other organizations and entities involved in the nuclear energy industry.

Purpose

This white paper provides guidance that may be used by a licensee to adopt the voluntary option of conducting periodic emergency preparedness (EP) program reviews at a 24-month frequency as allowed by 10 CFR 50.54(t)(1)(ii). The guidance addresses only the criteria and monitoring necessary to meet the regulatory requirements permitting a 24-month review period; it is not intended to provide methods or instructions for conducting an EP program review.

The use of the guidance in this white paper is voluntary, and other approaches to meeting the 24-month review requirements of 10 CFR 50.54(t) may also be acceptable.

Background

Section 50.54(t) of Title 10 of the Code of Federal Regulations (CFR) requires that each nuclear power reactor licensee provide for a periodic independent review of their EP program. The entire section is presented below.

(t)(1) The licensee shall provide for the development, revision, implementation, and maintenance of its emergency preparedness program. The licensee shall ensure that all program elements are reviewed by persons who have no direct responsibility for the implementation of the emergency preparedness program either:

(i) At intervals not to exceed 12 months or,

(ii) As necessary, based on an assessment by the licensee against performance indicators, and as soon as reasonably practicable after a change occurs in personnel, procedures, equipment, or facilities that potentially could adversely affect emergency preparedness, but no longer than 12 months after the change. In any case, all elements of the emergency preparedness program must be reviewed at least once every 24 months.

(2) The review must include an evaluation for adequacy of interfaces with State and local governments and of licensee drills, exercises, capabilities, and procedures. The results of the review, along with recommendations for improvements, must be documented, reported to the licensee's corporate and plant management, and retained for a period of 5 years. The part of the review involving the evaluation for adequacy of interface with State and local governments must be available to the appropriate State and local governments.

This section was revised into its current form by Final Rule RIN 3150-AF63, "Frequency of Reviews and Audits for Emergency Preparedness Programs, Safeguards Contingency Plans, and Security Programs for Nuclear Power Reactors."² The rule amended U.S. Nuclear Regulatory Commission (NRC) regulations to give licensees the option to change the frequency of independent reviews and audits of their EP programs, safeguards contingency plans, and security programs. The amendment allows licensees to elect to conduct program reviews and audits either at intervals not to exceed 12 months, or as necessary, based on an assessment by the licensee

² Refer to 64 Fed. Reg. 14,814 (March 29, 1999) and a subsequently revised Final Rule in 64 Fed. Reg. 17,947 (April 13, 1999) that corrected erroneous citations. Additional background information is available in the Proposed Rule, 62 Fed. Reg. 40,978 (July 31, 1997).

against performance indicators, and as soon as reasonably practicable after a change occurs in personnel, procedures, equipment, or facilities that potentially could adversely affect the EP program, the safeguards contingency plan, and security program, but no longer than 12 months after the change. In all cases, each element of the EP program, the safeguards contingency plan, and the security program must be reviewed at least every 24 months.

The guidance in this paper was developed to support a licensee decision to implement the 24-month review period option allowed by 10 CFR 50.54(t) and is thus applicable to EP programs only.

General Approach

Implementation of the following activities will achieve compliance with the requirements of 10 CFR 50.54(t)(ii).

1. Monitoring of performance indicators, and
2. Assessing the adequacy of interfaces with State and local governments, and
3. Identifying a change in personnel, procedures, equipment, or facilities that potentially could adversely affect emergency preparedness.

To promote efficient use of resources, these activities are focused on the risk-significant aspects of interfaces with State and local governments and of licensee drills, exercises, capabilities, and procedures. They were designed to require an early review (i.e., less than 24 months) if there is a significant reduction in program performance or interface effectiveness, or loss of response capability. Further, the performance indicator threshold criteria do not represent boundaries between adequate and inadequate levels of program performance; that is not the purpose of the indicators. Rather, the trigger threshold criteria were selected to identify levels of performance that are degraded sufficiently to warrant an accelerated independent review of the affected area.

Performance Indicators

As stated in the “Comment Resolution” section of Final Rule RIN 3150-AF63, performance indicators are “numerical parameters generally derived from quantitative data to monitor the performance and gain insight to the effectiveness of the emergency preparedness and security programs” and provide a “measurement of success in a summary fashion.” If indicated performance falls below a prescribed level, then a review of the affected EP program area would be required. The Final Rule also states:

“Because of the licensees’ experience in implementing and performing self-assessments of their programs, the NRC has decided that at this time it will be the responsibility of the individual utilities to define their own performance indicators. Industry development of performance indicators is to be encouraged.”

For historical context, it should be noted that Final Rule RIN 3150-AF63 was published approximately one year prior to the implementation of the three EP performance indicators found in the NRC’s Reactor Oversight Process (ROP). This means that subsequent to the NRC’s decision cited above, the industry and the NRC collaboratively developed performance indicators that use objective data to monitor performance within the EP “cornerstone” area. Each EP performance indicator is measured against established thresholds which are related

to their effect on safety. In line with the NRC position that the industry should develop performance indicators to meet the requirements of 10 CFR 50.54(t)(1)(ii), the following three indicators should be used:

1. The ROP Drill/Exercise Performance (DEP) indicator,
2. The ROP Emergency Response Organization (ERO) performance indicator, and
3. The Emergency Response Facility and Equipment Readiness (ERFER) performance indicator defined in this document.

Collectively, these three indicators provide an effective periodic evaluation of licensee performance in drills and exercises, and the effectiveness of emergency response capabilities and procedures. The DEP indicator measures the ability of key emergency response decision-makers to assess off-normal plant conditions, determine the appropriate emergency classification level and protective action recommendation, and direct communication of this information to an Offsite Response Organization (ORO). It therefore reflects the status of EP program elements that underpin performance of risk-significant response actions, including training, qualifications, equipment, procedures, and the correction of weaknesses. The ERO performance indicator measures the ability to provide performance enhancing opportunities to personnel staffing key ERO positions. It therefore reflects on ERO readiness through experience gained by participation in drills, exercises and other performance enhancing experiences. Broad participation also supports the identification and correction of weaknesses in important EP program elements, including damage control, worker protection, accident assessment, procedure quality, training program, and facility readiness. Finally, the ERFER indicator measures licensee performance in the maintenance of EP-related facilities and equipment. It reflects the ability of the licensee to perform the surveillance, testing, inventory, and preventative and corrective maintenance activities that contribute to the availability of emergency assessment and offsite communications capabilities.

To ensure consistent implementation and promote inspection predictability, each performance indicator is described in Attachment 1. Should the actual level of an indicator meet or exceed a specified “EP Review Trigger Threshold,” then a review of the affected EP program area is required. This review should be completed within 6 months, either as a stand-alone review or as part of scheduled program review.

Review of State and Local Interface

The use of a performance indicator for evaluating the adequacy of interfaces with State and local governments was assessed and determined to not be the optimum approach. A quantitative measure is not the most effective way to evaluate a qualitative property like interface adequacy. In lieu of a performance indicator, the interim monitoring of the adequacy of interfaces with State and local governments should be performed by assessing the interactions between the licensee and appropriate governmental response agencies during a drill or exercise.³ These agencies are the Offsite Response Organizations (OROs) described in site emergency plan as responsible for the development of protective actions for the public.

³ As noted above, this activity is focused on assessing the risk-significant aspects of interfaces with State and local governments.

The drill or exercise to be observed to meet the “review of State and local interface” requirement should be identified (designated) in advance. The assessment should review the effectiveness of the communications and coordination observed during a drill or exercise that includes a General Emergency declaration and an ORO protective action decision. The interface should be determined as inadequate if:

1. The licensee fails to provide timely and accurate information concerning;
 - plant conditions, or
 - the emergency classification level, or
 - an offsite consequence analysis (a dose projection), or
 - a protective action recommendation; AND
2. The untimely or inaccurate information leads the ORO to issue a protective action decision that is not aligned with the actual plant and radiological release conditions at the time of the decision.⁴ For example, inaccurate information on plant conditions results in a decision to evacuate a sector/area when this action was not warranted based the actual plant conditions.

The observed drill or exercise should be conducted within 9 months to 15 months after completion of the previous 24-month program review (or, for initial implementation, the last 12-month review). This 6-month window should be considered during the scheduling of drills and exercises, and discussions with ORO agencies on anticipated drill support. The assessment should be documented and the documentation retained for inspection (e.g., in a drill report, the corrective action program, a stand-alone report, etc.).

A site served by an Emergency Operations Facility (EOF) that also serves one or more other sites (AKA a common EOF) may take credit for assessment observations made for another site. Credit may be extended only for the OROs in common between the sites.

As an alternative to a drill or exercise, a licensee may elect to assess the adequacy of interfaces with State and local governments in a manner similar to that used during the 24-month review of this area. This review should be conducted within 11 months to 13 months after completion of the previous 24-month program review (or, for initial implementation, the last 12-month review).

Change Adversely Affecting the EP Program

The following criterion should be used when determining whether a change has occurred in personnel, procedures, equipment, or facilities that potentially could adversely affect emergency preparedness.

A change was implemented that would preclude the performance of a function associated with one or more of the following planning standards if an actual emergency were declared.

⁴ A protective action decision made by an ORO that is intentionally different than the protective action recommendation provided by the licensee does not constitute inadequate interface.

- 10 CFR 50.47(b)(2) - Responsibilities, staffing and interfaces
- 10 CFR 50.47(b)(4) - Emergency classification system
- 10 CFR 50.47(b)(5) - Emergency notifications
- 10 CFR 50.47(b)(8) - Facilities and equipment
- 10 CFR 50.47(b)(9) - Emergency assessment capability
- 10 CFR 50.47(b)(10) - Emergency protective actions for the public⁵

The assessment of the impact from a change should also consider the sections of Appendix E to 10 CFR Part 50 that support the planning standards listed above.⁶ To meet the above criterion, there should be a conclusion that the change would prevent the function in question from being performed if an actual emergency were declared. The scope and depth of a subsequent review, if required, is expected to vary with the nature of the change (i.e., judgment will need to be exercised in making the decisions). Also, “reasonably practical” is a function of the significance of the change and needs to be factored into the scope and depth of review. The assessment should be documented and the documentation retained for inspection (e.g., in the corrective action program, a stand-alone report, etc.).

Implementation

The site-specific implementation of the guidance in this white paper should be described in, and controlled by, a procedure. The procedure should address the three provisions permitting the 24-month review frequency – 1) monitoring of performance indicators, 2) assessment of the adequacy of interfaces with State and local governments, and 3) identifying a change in personnel, procedures, equipment, or facilities that potentially could adversely affect emergency preparedness.

⁵ For the purposes of this white paper, the functions implementing protective actions for licensee emergency workers are not treated as risk-significant.

⁶ It is recommended that a change impact assessment also be informed by the guidance in Regulatory Guide 1.219, “Guidance on Making Changes to Emergency Plans for Nuclear Power Reactors,” and the examples in NRC Manual Chapter 609, Appendix B, “Emergency Preparedness Significance Determination Process.”

Attachment 1

EP Program Performance Indicator #1

INDICATOR NAME	ROP DRILL/EXERCISE PERFORMANCE (DEP) INDICATOR
PURPOSE:	This indicator measures the ability of key emergency response decision-makers to assess off-normal plant conditions, determine the appropriate emergency classification level and protective action recommendation, and direct communication of this information to an Offsite Response Organization (ORO). It therefore reflects the status of EP program elements that underpin risk-significant response actions, including training, qualifications, equipment, procedures, and the correction of weaknesses.
ASSESSMENT FREQUENCY:	Quarterly
INDICATOR DEFINITION:	Per current NRC-endorsed revision of NEI 99-02, “Regulatory Assessment Performance Indicator Guideline.”
DATA REPORTING ELEMENTS:	Per current NRC-endorsed revision of NEI 99-02, “Regulatory Assessment Performance Indicator Guideline.”
CALCULATION:	Per current NRC-endorsed revision of NEI 99-02, “Regulatory Assessment Performance Indicator Guideline.”
EP REVIEW TRIGGER THRESHOLD:	<94%
CLARIFYING NOTES:	<p>Per current NRC-endorsed revision of NEI 99-02, “Regulatory Assessment Performance Indicator Guideline.”</p> <p>The EP Review Trigger Threshold was set at the value for the DEP indicator’s White Threshold (< 90%) plus 40% of the difference to 100%, i.e., $90\% + (0.4 \times 10\%) = 94\%$. This value provides a reasonable margin to the White Threshold of 90% where performance is outside of the nominal, expected range.</p>

Attachment 1

EP Program Performance Indicator #2

INDICATOR NAME	ROP EMERGENCY RESPONSE ORGANIZATION (ERO) PERFORMANCE INDICATOR
PURPOSE:	This indicator measures the ability to provide performance enhancing opportunities to personnel staffing key Emergency Response Organization (ERO) positions. It therefore reflects on ERO readiness through experience gained by participation in drills, exercises and other performance enhancing experiences. Broad participation also supports the identification and correction of weaknesses in important EP program elements, including damage control, worker protection, accident assessment, procedure quality, training program, and facility readiness.
ASSESSMENT FREQUENCY:	Quarterly
INDICATOR DEFINITION:	Per current NRC-endorsed revision of NEI 99-02, “Regulatory Assessment Performance Indicator Guideline.”
DATA REPORTING ELEMENTS:	Per current NRC-endorsed revision of NEI 99-02, “Regulatory Assessment Performance Indicator Guideline.”
CALCULATION:	Per current NRC-endorsed revision of NEI 99-02, “Regulatory Assessment Performance Indicator Guideline.”
EP REVIEW TRIGGER THRESHOLD:	<90%
CLARIFYING NOTES:	<p>Per current NRC-endorsed revision of NEI 99-02, “Regulatory Assessment Performance Indicator Guideline.”</p> <p>The EP Review Trigger Threshold was set at the value for the ERO indicator’s White Threshold (< 80%) plus 50% of the difference to 100%, i.e., $80\% + (0.5 \times 20\%) = 90\%$. This value provides a reasonable margin to the White Threshold of 80% where performance is outside of the nominal, expected range.</p>

Attachment 1

EP Program Performance Indicator #3

INDICATOR NAME **EMERGENCY RESPONSE FACILITY AND EQUIPMENT READINESS (ERFER) INDICATOR**

PURPOSE:	This indicator measures licensee performance in the maintenance of EP-related facilities and equipment. It reflects the ability of the licensee to perform the surveillance, testing, inventory, and preventative and corrective maintenance activities that contribute to the availability of emergency assessment and offsite communications capabilities.
ASSESSMENT FREQUENCY:	Quarterly
INDICATOR DEFINITION:	The number of reports made pursuant to the requirements of 10 CFR 50.72(b)(3)(xiii) during the quarter for an unplanned loss of emergency assessment or offsite communications capability.
DATA REPORTING ELEMENTS:	<p>The following data are required to calculate this indicator:</p> <ul style="list-style-type: none"> • The number of reports made pursuant to the requirements of 10 CFR 50.72(b)(3)(xiii) during the quarter for an unplanned loss of emergency assessment or offsite communications capability.
CALCULATION:	Count the number of reports made pursuant to the requirements of 10 CFR 50.72(b)(3)(xiii) during the quarter for an unplanned loss of emergency assessment or offsite communications capability.
EP REVIEW TRIGGER THRESHOLD:	≥ 2 reports made in one quarter
CLARIFYING NOTES:	<p>NUREG-1022, Revision 3, "Event Reporting Guidelines: 10 CFR 50.72 and 50.73," contains guidelines that the NRC staff considers acceptable for use in meeting the requirements of 10 CFR 50.72, "Immediate Notification Requirements for Operating Nuclear Power Reactors." Section 3.2.13, "Loss of Emergency Preparedness Capabilities," of NUREG-1022, Revision 3, contains guidance for reporting under 10 CFR 50.72(b)(3)(xiii). Supplement 1 to NUREG-1022, Revision 3, endorses Nuclear Energy Institute (NEI) 13-01, "Reportable Action Levels for Loss of Emergency Preparedness Capabilities," dated July 2014. NEI 13-01 provides specific guidance for reporting under 10 CFR 50.72(b)(3)(xiii). Guidance found in NEI 13-01 provides for an acceptable alternative to guidance found in Section 3.2.13 of NUREG-1022, Revision 3.</p> <p>A planned loss is one that results from a scheduled work activity such as component maintenance, testing, modification or replacement. An unplanned loss would typically involve the failure of a structure or piece of equipment.</p> <p><i>(Continued on next page.)</i></p>

Attachment 1

A report made pursuant to the requirements of 10 CFR 50.72(b)(3)(xiii) and subsequently retracted does not count towards this indicator.

The EP Review Trigger Threshold was set based on a review of industry event reports made for a loss of emergency assessment or offsite communications capability between July 2016 and July 2019. During this 3-year period, the highest total in any quarter was approximately 10 event reports and there were approximately 60 sites in operation (some having shutdown during the period). Therefore, the highest average number of reports per site in a quarter was $10/60 = 0.17$. Also during this period, there were only three occurrences of a site making more than one event report during a quarter. From this review, it was determined that permitting a site to make one report per quarter without triggering an early review is a reasonable standard.