TECHNICAL ANALYSIS IN SUPPORT OF THE GUIDANCE IN NUREG-0654/FEMA-REP-1, SECTION II.B, "EMERGENCY RESPONSE ORGANIZATION," PROPOSED REVISION 2

1. PURPOSE OF PROPOSED REVISION

1.1. Background

Section 50.47, "Emergency Plans," of Title 10 of the *Code of Federal Regulations* (10 CFR) sets forth the U.S. Nuclear Regulatory Commission's (NRC) emergency plan requirements for nuclear power plant facilities. The regulation in 10 CFR 50.47(a)(1)(i) states, in part,

> …no initial operating license for a nuclear power reactor will be issued unless a finding is made by the NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.

Section 50.47(b) establishes the standards that the onsite and offsite emergency response plans must meet for NRC staff to make a positive finding that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. Planning Standard (2) of this section requires that:

> 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.

Section IV.A of Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50, states:

> The organization for coping with radiological emergencies shall be described, including definition of authorities, responsibilities, and duties of individuals assigned to the licensee's emergency organization and the means for notification of such individuals in the event of an emergency. Specifically, the following shall be included:
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> 1. A description of the normal plant operating organization.
>
> 2. A description of the onsite emergency response organization (ERO) with a detailed discussion of:
>
>   a. Authorities, responsibilities, and duties of the individual(s) who will take charge during an emergency;
>
>   b. Plant staff emergency assignments;

c. Authorities, responsibilities, and duties of an onsite emergency coordinator who shall be in charge of the exchange of information with offsite authorities responsible for coordinating and implementing offsite emergency measures.

3. A description, by position and function to be performed, of the licensee's headquarters personnel who will be sent to the plant site to augment the onsite emergency organization.

4. Identification, by position and function to be performed, of persons within the licensee organization who will be responsible for making offsite dose projections, and a description of how these projections will be made and the results transmitted to State and local authorities, NRC, and other appropriate governmental entities.

5. Identification, by position and function to be performed, of other employees of the licensee with special qualifications for coping with emergency conditions that may arise. Other persons with special qualifications, such as consultants, who are not employees of the licensee and who may be called upon for assistance for emergencies shall also be identified. The special qualifications of these persons shall be described.

6. A description of the local offsite services to be provided in support of the licensee's emergency organization.

7. By June 23, 2014, identification of, and a description of the assistance expected from, appropriate State, local, and Federal agencies with responsibilities for coping with emergencies, including hostile action at the site. For purposes of this appendix, "hostile action" is defined as an act directed toward a nuclear power plant or its personnel that includes the use of violent force to destroy equipment, take hostages, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, projectiles, vehicles, or other devices used to deliver destructive force.

8. Identification of the State and/or local officials responsible for planning for, ordering, and controlling appropriate protective actions, including evacuations when necessary.

9. By December 24, 2012, for nuclear power reactor licensees, a detailed analysis demonstrating that on-shift personnel assigned emergency plan implementation functions are not assigned responsibilities that would prevent the timely performance of their assigned functions as specified in the emergency plan.

Revision 1 to NUREG-0654/FEMA-REP-1, “Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants,” dated November 1980, was intended to aid licensees, applicants for licenses, or State and local emergency response organizations in the development of their Radiological Emergency Response Plans. The NRC endorsed this document for use in this effort via Revision 2 to Regulatory Guide (RG) 1.101, “Emergency Planning and Preparedness for Nuclear Power Reactors,” dated October 1981. RG 1.101 allowed for licensees to submit alternatives to the guidance provided in NUREG-0654/FEMA-REP-1 for staff review and approval if necessary.

Section II.B of NUREG-0654/FEMA-REP-1, Revision 1, states, in part:

> 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.

Evaluation Criteria 5 of Section II.B of NUREG-0654/FEMA-REP-1, Revision 1, states, in part:

> Each licensee shall specify the positions or title and major tasks to be performed by the persons to be assigned to the functional areas of emergency activity. For emergency situations, specific assignments shall be made for all shifts and for plant staff members, both onsite and away from the site. These assignments shall cover the emergency functions in Table B-1 entitled, "Minimum Staffing Requirements for Nuclear Power Plant Emergencies." The minimum on-shift staffing levels shall be as indicated in Table B-1. The licensee must be able to augment on-shift capabilities within a short period after declaration of an emergency. This capability shall be as indicated in Table B-1.

Following the terrorist attacks of September 11, 2001, the NRC staff reviewed the emergency preparedness (EP) planning basis and concluded that the EP planning basis remains valid. However, the staff recognized that the guidance contained in NUREG-0654/FEMA-REP-1, Revision 1, could be enhanced to better reflect lessons learned, to better document enhanced strategies for the development of licensee emergency plans, and to remove ambiguous or outdated information.

1.2. Need for Further Guidance

On December 14, 2004, the EP staff briefed the Commission on EP program initiatives and informed the Commission of its intent to conduct a comprehensive review of EP regulations and guidance. In staff requirements memorandum (SRM) M04121B dated December 20, 2004, the Commission directed the staff to conduct a review of EP regulations and guidance to assess the need for regulatory enhancements. In SECY-06-0200, "Results of the Review of Emergency Preparedness Regulations and Guidance," dated September 20, 2006, the staff provided the Commission with the results of its review of the NRC's EP program and its recommendations for proposed enhancements to the EP regulations and guidance. Specifically, SECY-06-0200 states:

> Shift Staffing and Augmentation: The staff has had a continuing challenge in evaluating the adequacy of licensee shift staffing because of lack of clarity regarding the functional requirements for emergency response. The staff is proposing a revision to 10 CFR Part 50.47(b)(2) and Appendix E, to address the emergency response functional requirements. The revision to the regulation would establish functional requirements for the emergency responders instead of focusing on specific emergency responder positions.

In the January 8, 2007, SRM to SECY-06-0200, the Commission approved the staff's recommendation to develop a rulemaking plan to enhance EP regulations and guidance. On April 17, 2007, the staff provided the Commission with a rulemaking plan, which described the content and schedule for completion of the enhancements to the EP regulations and guidance and incorporated the Commission's comments and clarifications consistent with the SRM. The

rulemaking plan addressed the 12 issues assigned a high priority by the staff in SECY-06-0200. Of these 12, issue #7, "Shift staffing and augmentation," is the primary focus of this analysis, which is intended to clarify the staff's position on an acceptable, effective on-shift staffing and ERO staffing plan as well as update the guidance related to the ERO, all while maintaining licensee and offsite response organization (ORO) flexibility in determining how best to meet the regulations.

While the guidance provided in NUREG-0654/FEMA-REP-1, Revision 1, is an acceptable method for licensees to develop their emergency plans, the NRC and licensees have experienced many improvements and lessons learned since 1980. Likewise, the NRC and licensees have had many difficulties in consistently interpreting the technical basis for many of the staffing guidelines provided in Section II.B of NUREG-0654/FEMA-REP-1, Revision 1. The intent of Revision 2 of NUREG-0654/FEMA-REP-1, Section II.B (hereafter referred to as Section II.B (proposed)), is to enhance the guidance with the accumulated knowledge and experience obtained since 1980, and to provide a technical basis for why the ERO positions and/or functions are beneficial and why the timing associated with the ERO response is adequate.

1.3. Regulations Versus Guidance

The guidance provided in NUREG-0654/FEMA-REP-1 is not considered by the NRC to be regulation, and as such, licensees may choose to submit alternatives to the guidance for staff review and approval. As stated, in part, in NUREG-0654/FEMA-REP-1, Revision 2, Section I.B, "Scope":

> This guidance describes, and makes available to the public, methods that the NRC and FEMA staff consider acceptable for use in implementing specific parts of each of the agencies' regulations. The guidance is not a substitute for regulations, and compliance with it is recommended but not required.

This position has been confirmed many times:

- The criteria described in NUREG-0654 regarding emergency plans, referenced in NRC regulations, were intended to serve solely as regulatory guidance, not regulatory requirements. *(Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), LBP-83-22, 17 NRC 608, 616 (1983), citing Metropolitan Edison Co. (Three Mile Island Nuclear Station, Unit 1), ALAB-698, 16 NRC 1290, 1298-99 (1982), rev'd in part on other grounds, CLI-83-22, 18 NRC 299 (1983). See Philadelphia Electric Co. (Limerick Generating Station, Units 1 & 2), ALAB-819, 22 NRC 681, 710 (1985); Carolina Power and Light Co. (Shearon Harris Nuclear Power Plant), LBP-86-11, 23 NRC 294, 367-68 (1986); Philadelphia Electric Co. (Limerick Generating Station, Units 1 & 2), ALAB-836, 23 NRC 479, 487 (1986); Philadelphia Electric Co. (Limerick Generating Station, Units 1 & 2), ALAB-845, 24 NRC 220, 238 (1986); Carolina Power & Light Co. (Shearon Harris Nuclear Power Plant), ALAB-852, 24 NRC 532, 544-45 (1986); Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), ALAB-900, 28 NRC 275, 290-91 (1988)).*

- In the absence of other evidence, adherence to NUREG-0654 may be sufficient to demonstrate compliance with the regulatory requirements of 10 CFR 50.47(b). However, such adherence is not required, because regulatory guides are not intended to serve as substitutes for regulations. *(Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), LBP-83-22, 17 NRC 608, 616 (1983),*

citing Metropolitan Edison Co. (Three Mile Island Nuclear Station, Unit 1), ALAB-698, 16 NRC 1290, 1298-99 (1982), rev'd in part on other grounds, CLI-83-22, 18 NRC 299 (1983)).

- Methods and solutions different from those set out in the guides will be acceptable if they provide a basis for the findings requisite to the issuance or continuance of a permit or license by the Commission. *(Shoreham Nuclear Power Station, Unit 1), LBP-83-22, 17 NRC 608, 616 (1983), citing Metropolitan Edison Co. (Three Mile Island Nuclear Station, Unit 1), ALAB-698, 16 NRC 1290, 1299 (1982), rev'd in part on other grounds, CLI-83-22, 18 NRC 299 (1983); Long Island Lighting Co. (Shoreham Nuclear Power Station, Unit 1), ALAB-788, 20 NRC 1102, 1161 (1984)).*

1.4. Objective

The objective of this analysis is to provide a technical basis for the development of Section II.B (proposed). Given the complexity and probable site-specific implementation of this guidance, a technical analysis to support the revision to this section was deemed to be prudent and reasonable.

1.5. Planning Basis

The planning basis for radiological emergency response plans was documented in NUREG-0654/FEMA-Rep-1, Revision 1, Section 1.D, was verified after the events of September 11, 2001, and would be maintained in the proposed Revision 2 of NUREG-0654/FEMA-REP-1, which states in Section I.C, in part:

> The overall objective of emergency response planning is to provide dose savings for a spectrum of incidents that have the potential to produce offsite doses in excess of the current Federal protective action guides (PAGs). Plans should not be limited to a single specific accident sequence or incident, as each incident could have different consequences, both in nature and degree. Further, the range of options for a planning basis is very large, starting with the requirement for no planning when significant offsite radiological consequences are unlikely to occur, to planning for the worst possible incident, **regardless of its extremely low likelihood** *{emphasis added}*.
>
> The range of times between the onset of incident conditions and the start of a radiological release could be on the order of less than an hour to several hours.

As discussed in Section 1.1 of this analysis, the NRC must make a finding of reasonable assurance, in accordance with 10 CFR 50.47(a)(1)(i), in order to issue an operating license to a licensee. Since 1980, the EP community has learned many lessons related to ERO staffing and augmentation and benefitted from significant advancements in technology. The NRC developed Section II.B (proposed) to provide licensees an updated staff position of ERO staffing and augmentation, including the timing of the ERO augmented response. While licensees are not required to adopt this revised ERO staffing and augmentation plan, Section II.B (proposed) is a significant improvement over that provided in 1980 and represents the accumulation of a significant amount of experience with ERO staffing and augmentation.

1.6. Process

The NRC's review of licensee ERO staffing and augmentation plans (hereafter to be called the ERO staffing plan) identified many areas where the current guidance could be enhanced. In addition, a review of industry inspection findings related to development of an effective ERO staffing plan, as well as implementing the plan, identified recurring issues related to timing and ambiguity. Lessons learned from industry events also were considered in the development of Section II.B (proposed).

The staff decided to re-baseline what an acceptable ERO staffing plan is, using all the information available, rather than limit itself to how the previous revision of NUREG-0654 was developed and organized, and how individual licensees may have developed their ERO staffing plans. This does not imply that existing ERO staffing plans are inadequate.

2. IDENTIFICATION AND PRELIMINARY ANALYSIS OF ALTERNATIVES

The alternatives to be considered are: (1) take no action (i.e., maintain the status quo); and (2) revise Section II.B (proposed) to update and enhance the guidance.

Alternative 1 would continue the difficulty associated with maintaining regulatory and industry consistency when interpreting guidance from 1980 as it applies to new technologies and methods for emergency response organization implementation.

Alternative 2 would serve to bring the guidance to current guidelines as well as clarify how timing and staffing needs are developed and implemented by a licensee, as well as provide more detailed guidance for how staff can review ERO staffing and timing criteria. The NRC expects that adoption of Alternative 2 would provide licensees a more stable and predictable regulatory environment for developing and implementing an effective ERO staffing plan, as well as provide a more consistent regulatory approach to the review of license amendments submitted for staff review.

3. TECHNICAL BASIS FOR SECTION II.B (PROPOSED)

3.1. Section II.B (proposed) continues to be based upon a method the staff considers to be acceptable for developing an ERO staffing plan in accordance with 10 CFR 50.47(b)(2) and Appendix E to 10 CFR Part 50, Section IV.A.

3.2. Analysis of Evaluation Criteria (Criteria numbering is as reflected in Section II.B (proposed):

B.1 As stated earlier, the overall intent of this guidance is to provide an acceptable method for meeting the regulations. This criteria reinforces that requirement.

B.1.a This criterion is intended to clarify an issue that resulted from Revision 1 of NUREG-0654/FEMA-REP-1. The inclusion of operations staffing, security force staffing, and the fire brigade, led to the idea that licensee emergency plans must describe, in detail, how these groups are staffed. While it is challenging to fully understand the intent of the original guidance, as no technical basis was developed, the current staff position is that only when an EP function is assigned to a licensee staff member from another group do the requirements of these regulations, and therefore this guidance, become applicable. For on-shift staff, the assignment of EP functions requires the licensee to perform an on-shift staffing analysis via 10 CFR Part 50, Appendix E, Section IV.A.9. Operations

and security force staffing, as well as the composition of the licensee's fire brigade, are controlled and evaluated by other regulations and programs.

B.2 This criterion reinforces the importance of an effective command and control strategy by ensuring that the emergency coordinator position is available on-site at all times.

B.2.a This criterion should ensure that applicable non-delegable functions are assigned to the emergency coordinator, up to and including responsibility for protective action recommendations. Pre-identifying command and control functions, as well as procedurally limiting certain functions from being delegated to some other position, is consistent with national emergency response policy and has been demonstrated to be effective.

B.3 This criterion recommends that licensees develop a table, such as the example provided in Table B-1 of NUREG-0654, to describe the licensee's ERO staffing plan. The analysis of Table B-1 is provided in Section 3.3. A table, as provided, is very effective in capturing the licensee's ERO staffing plan.

B.4 This criterion suggests the development of a block diagram to highlight the interfaces between the licensee, local emergency services/support, and state/local/tribal government response organizations. A block diagram is an effective method of capturing these interfaces.

B.5 This criterion advises that outside organizations considered to be the licensee's staff, including contractors, be specified in the emergency plan if they would be called upon to support EP. [Note that many licensees consider contractors to be external organizations while some consider them to be internal. Regardless, the use of contractors in support of EP should be documented in the site's emergency plan.]

3.3. Analysis of Table B-1

3.3.1. Table B-1 Preface Notes (Preface note numbering is as reflected in Section II.B of NUREG-0654/FEMA-REP-1, Revision 2):

i The intent of this note is to emphasize that the minimum number of personnel assigned EP functions is as approved by the NRC. This reinforces the fact that guidance is not regulation, and that licensees may consider alternatives to that provided in this NUREG. This note also reinforces the fact that augmentation has two separate functions: relieve the on-shift staff of assigned EP functions so that they may return their focus to their assigned, non-EP, responsibilities; and provide support staff for effective emergency response.

ii The intent of this note is to reinforce the position that this table is guidance and that the actual ERO staffing plan developed, approved, and implemented by the licensee should be described. While it may appear to be redundant, this issue has been brought to the staff's attention numerous times thus necessitating extra effort to ensure clarity of intent.

iii The intent of this note is to emphasize the distinction between ERO minimum staffing and the ERO as a whole. The licensee's emergency plan should describe, using the guidance provided in this revision of the NUREG, the ERO staffing plan that is the absolute minimum the licensee needs to implement their emergency plan (i.e., if any position or function is not staffed then the emergency plan cannot be effectively implemented). Licensees may have additional ERO staff trained, qualified, and available to ensure all available licensee resources are used when a radiological emergency occurs and to provide for staff relief on a 24 hour / 7 days a week extended basis. However, this additional ERO staff need not be reflected in the site-specific ERO staffing plan, if the emergency plan could effectively be implemented without them. Lower level emergency procedures should be used to effectively describe this tier of ERO staffing and augmentation.

In addition, this note also emphasizes that the augmentation times provided in the NUREG are a model for consideration, not a requirement for implementation. Licensees may consider alternatives for staff review and approval if they choose to; however, the licensee must provide a basis justifying why it is different.

iv The intent of this note is to ensure that licensees understand that the exact position titles depicted in Table B-1 are the ones that are defined in the licensee's emergency plan and are not necessarily the same as those listed in the NUREG. Licensees may consider alternatives for staff review and approval if they choose to, however, the licensee must provide a basis justifying why it is different.

v The intent of this note is to ensure that licensees understand that the exact location in an emergency response facility (ERF) for the positions depicted in Table B-1, and the emergency classification level (ECL), when the positions are mobilized, are the ones that are defined in the licensee's emergency plan and not necessarily the same as those listed in the NUREG. Licensees may consider alternatives for staff review and approval if they choose to; however, the licensee must provide a basis justifying why it is different.

vi The intent of this note is to highlight that, for the assignment of collateral duties to someone assigned an EP function, 10 CFR Part 50, Appendix E, Section IV.A.9 requires a detailed evaluation to ensure that the individual will be able to perform the assigned EP function(s) when needed, and that competing priorities will not preclude effective performance. This is for on-shift staff as well as augmented staff (minimum staffing).

vii The intent of this note is to emphasize that a performance-based approach to ERO staffing plan development should be used as practicable. Additionally, once developed and approved, the licensee's ERO staffing plan is maintained in accordance with 10 CFR 50.54(q).

This note also reiterates Note iii as it relates to this 'additional' ERO staff not considered to be minimum staff. This staff need not be reflected in the emergency plan, but may be reflected in applicable emergency plan implementing procedures, and therefore may not need to be maintained in accordance with 10 CFR 50.54(q).

viii The intent of this note is to emphasize that on-shift operations staff are controlled by other non-EP processes. It is only when EP functions are assigned to operations staff that the requirements of 10 CFR Part 50, Appendix E, Section IV.A.9 apply, thus requiring an on-shift staffing analysis be performed.

ix The intent of this note is to emphasize that the fire brigade is controlled by other non-EP processes. It is only when EP functions are assigned to fire brigade members on-shift that the requirements of 10 CFR Part 50, Appendix E, Section IV.A.9 apply, thus requiring an on-shift staffing analysis be performed.

3.3.2. Table B-1 Timing and ERF Activation

One of the ambiguous issues with Revision 1 of the NUREG is that it did not address other ERFs in any significant detail, and it did not provide a model that clearly demonstrated the staggered ERO response based upon an escalation of the ECL. In addition, Revision 1 of the NUREG did not provide clear guidance as to the critical functions for which each ERO position is to be responsible. This has led to numerous inconsistent ERO staffing plan issues and constant interpretation, and re-interpretation, of what the NUREG authors intended.

An important consideration in the development of this revision to Table B-1 is the timing of the response. Revision 1 of the NUREG had two distinct stages of response: those within 30 minutes of the ECL classification, and those within 60 minutes of ECL classification, where the actual ECL was not clearly described.

The NRC's review of approved licensee emergency plans, as well as an effort to re-evaluate the purpose of a 30/60 minute response, yielded the decision to have the first stage of response be within 60 minutes of an Alert ECL or greater, with the next stage to occur within 90 minutes of an Alert ECL or greater, for positions in the Technical Support Center (TSC) and Operations Support Center (OSC). In addition, the table describes the staggered ERF activation based upon ECL level for the Emergency Operations Facility (EOF) and the Joint Information Center/System (JIC/JIS), which should be staffed within 60 minutes of a Site Area Emergency (SAE) ECL or greater. This approach is considered to be an effective method for meeting the applicable regulations, but licensees are not required to change their emergency plans based upon this revised guidance. However, if a licensee submits a request for prior approval, then they must adequately address why the ERO positions and timing are different than what is described in this section of the NUREG, if necessary.

3.3.3. Table B-1 Functions/Positions

The functions/positions listed in Table B-1 are discussed below. This technical analysis is be broken down by EP functional title, then by the applicable EP position title(s), and finally the timing and staffing levels analyzed.

1. Command & Control

    a. This function is critical to effective emergency response and is consistent with the National Incident Management System (NIMS), dated December 2008. It should be staffed and maintained at all times. This function is typically assigned to the Operations Shift Manager (OSM).

i. The augmentation (relief) of this position is intended to relieve the OSM of EP functions so that the OSM can focus on the event response from an operations perspective. This should occur within 60-minutes of an Alert ECL declaration, or greater, and is typically a position staffed within the TSC.

b. For a SAE ECL, or greater, these functions (or a subset of them), typically those associated with protective action recommendations (PARs), should be assigned to an Emergency Director located in the EOF within 60-minutes of the SAE ECL, or greater, being declared.

2. Communications

a. This function is critical to effective emergency response and is consistent with NIMS. The ability to staff this position should be maintained at all times. This function is typically assigned to a pre-existing on-shift staff member as a collateral duty thus necessitating an on-shift staffing analysis, via 10 CFR Part 50, Appendix E, Section IV.A.9, to ensure that this EP function can be performed when needed without any additional competing priorities.

i. The augmentation (relief) of this position should occur within 60-minutes of an Alert ECL, or greater, and is intended to relieve the on-shift staff of this EP function. This function should consist of 2 staff members to fulfill the communication needs, at a minimum: 1 for the NRC and 1 for ORO notification and status updates. Additional communicators may be called upon as needed, and at the discretion of the licensee. These are typically located in the TSC.

b. For an SAE ECL, or greater, at least 1 additional communicator should be staffed in the EOF.

3. Radiation Protection (RP)

a. This function is critical to effective emergency response and is consistent with NIMS. The ability to provide radiological expertise when the plant is experiencing an event with serious radiological consequences is crucial, due to the unknown radiological environment faced by emergency workers, particularly at the onset of the event. This function should be staffed by 2 qualified RP staff members on-shift (or 1 per unit for multi-unit sites). These staff members should not have any collateral duties during emergency response. While not all Alert ECLs (or lower) have radiological consequences, licensees should develop their ERO staffing plans for a reasonable worst-case scenario from a radiological risk perspective.

i. The augmentation (support) of this position should occur in two stages: within 60 minutes of an Alert ECL or greater, 3 additional qualified RP staff should be available, and within 90 minutes of an

Alert ECL, or greater, an additional 3 additional qualified RP staff should be available, and both are typically staffed in the OSC.

ii. The total number of qualified RP staff recommended for the ERO is 8 for a single unit site, or 6 plus 1 for each unit.

b. While Table B-1 in Revision 1 to the NUREG is somewhat ambiguous for RP functions, as well as to how limited RP functions can be added to non-HP on-shift staff assigned other functions, it has been interpreted by the staff that the guidance calls for 3 RP qualified people on-shift, with 6 people arriving in 30 minutes and 6 more in 60 minutes, for a total of 12 RP qualified people in an ERO shift, of which 3 were initially on-site as part of the on-shift staff. Based upon staff review and approval of ERO staffing plans, and the evaluation of licensee exercises, the staff has determined that expecting 2 qualified RP staff on-shift is reasonable for the increased time period (30 minutes to 60 minutes), whereby additional RP resources would become available, and that 3 additional RP staff in 60 minutes and 3 additional RP staff in 90 minutes is acceptable to ensure the staff can maintain its reasonable assurance finding (10 CFR 50.47(a)).

In addition, the staff has determined that field monitoring teams (FMTs) (onsite and offsite) can function with limited RP expertise while under the direct supervision of senior RP staff in the TSC or EOF (refer to #11).

The Chemistry/Rad Chemistry function listed in Table B-1 to Revision 1 of the NUREG is no longer needed as the need for immediate reactor coolant sampling has been reduced due to the variety of plant indications of fuel damage available to licensees.

Overall, these reductions streamline the ERO functions assigned to qualified RP staff and reduce the overall staffing levels for qualified RPs. Licensees may consider alternatives to this guidance for staff approval if desired.

4. Supervision of RP Staff and Site Radiation Protection

a. This function is critical to effective emergency response to a radiological event, since the management of RP resources, and the assistance this position provides the Emergency Coordinator, is crucial for response to radiological events. In addition, with the relaxation of the qualification requirements for FMTs, this position is responsible for the direction and protection of FMTs.

i. The augmentation (relief) of this function should occur within 60-minutes of an Alert ECL, or greater, and is typically staffed in the TSC.

b. For an SAE ECL, or greater, an RP Manager position should be staffed in the EOF.

5. Dose Assessments/Projections

    a. This function is important to effective emergency response to a radiological event. The ability to perform timely dose assessments/projections is important to ensure accurate and timely PARs can be developed, when necessary. The ability to staff this position should be maintained at all times. This function is typically assigned to a pre-existing on-shift staff member as a collateral duty, thus necessitating an on-shift staffing analysis under 10 CFR Part 50, Appendix E, Section IV.A.9 to ensure that this EP function can be performed when needed without any additional competing priorities.

        i. The augmentation (relief) of this function should occur within 60-minutes of an Alert ECL, or greater, and is typically staffed in the TSC.

    b. For an SAE ECL, or greater, this position should be staffed in the EOF.

6. Emergency Classification

    a. This function is important to ensure a prompt and effective emergency response. Because the impetus for implementing the emergency plan is the determination of an emergency action level (EAL) at the correct ECL, having this ability maintained at all times is essential. This function is typically assigned to a pre-existing on-shift staff member as a collateral duty, thus necessitating an on-shift staffing analysis under 10 CFR Part 50, Appendix E, Section IV.A.9 to ensure that this EP function can be performed when needed without any additional competing priorities.

        i. The augmentation (relief) of this function should occur within 60-minutes of an Alert ECL, or greater, and is typically staffed in the TSC.

7. Engineering

    a. An engineer to monitor and evaluate changing core/thermal hydraulic issues is important to effective emergency response. This function is typically assigned to a pre-existing on-shift staff member as a collateral duty thus necessitating an on-shift staffing analysis under 10 CFR Part 50, Appendix E, Section IV.A.9 to ensure that this EP function can be performed when needed without any additional competing priorities.

        i. The augmentation (relief) of this function should occur within 60-minutes of an Alert ECL, or greater, and is typically staffed in the TSC.

    b. An engineer to provide expertise in electrical/instrumentation and control (I&C) systems and equipment supports the evaluation of these systems/equipment and supports the development of repair plans if necessary.

i. The augmentation (support) of this function should occur within 60-minutes of an Alert ECL, or greater, and is typically staffed in the TSC.

c. An engineer to provide expertise in mechanical systems and equipment supports the evaluation of these systems/equipment and supports the development of repair plans if necessary.

i. The augmentation (support) of this function should occur within 60-minutes of an Alert ECL, or greater, and is typically staffed in the TSC.

8. Security

a. The licensee's on-shift Security Force is controlled and maintained by the licensee's approved physical security plan and does not need to be reflected in the Emergency Plan and typically has no EP functions assigned as a collateral duty while on-shift.. However, a liaison to the Security Force is reasonable to provide support to the ERO.

i. The augmentation (support) of this function should occur within 60-minutes of an Alert ECL, or greater, and is typically staffed by a Security Liaison in the TSC to coordinate security-related activities with that of the ERO.

9. Repair Team Activities

a. Revision 1 of the NUREG did not elaborate on why maintenance personnel were expected to be on-shift. This has led to numerous issues related to consistency in interpretation and the expected qualification of these personnel, primarily on-shift.

i. The staff has determined that the ability to get emergency core cooling system (ECCS) equipment operational is the primary basis for necessitating maintenance expertise while on-shift, from an EP perspective. Maintenance staff expertise may be advantageous for licensees to consider for other reasons, and at their discretion; however, for the purposes of NUREG-0654/FEMA-REP-1, the only area where maintenance availability should typically be necessary on-shift is for ECCS designs that have a likelihood of common equipment failures such that the reliability of the system is in question. If licensees can demonstrate that the availability of ECCS is not subject to common equipment failures (i.e., ECCS equipment is diverse and redundant), then consideration for not needing limited maintenance expertise on-shift can be given. The issue of work planning or implementation of lockout/tag out control is not relevant to this guidance as administrative controls needed to manipulate/repair plant equipment/instrumentation are controlled via other plant procedures.

ii. The augmentation (support) of the electrician and mechanic positions should occur within 60-minutes of an Alert ECL, (or greater), and is typically staffed in the OSC.

iii. The augmentation (support) of the I&C position should occur within 90-minutes of an Alert ECL, or greater, and is typically staffed in the TSC.

10. Supervision of Repair Team Activities

a. The ability to effectively supervise repair team personnel during emergency response is important. If maintenance personnel are assigned on-shift, and are responding to an emergency event (emergency plan implementation), then the OSM typically assumes the supervisor role until relieved, but it could be assigned as a collateral duty to some other on-shift position thus necessitating an on-shift staffing analysis under 10 CFR Part 50, Appendix E, Section IV.A.9 to ensure that this EP function can be performed when needed without any additional competing priorities.

b. The augmentation (support) of these functions is as follows:

i. A Lead OSC Supervisor should be staffed within 60-minutes of an Alert ECL, (or greater), and is typically staffed in the OSC.

ii. An Electrical Supervisor, a Mechanical Supervisor, an I&C Supervisor, and an RP Supervisor should be staffed within 90-minutes of an SAE ECL, or greater, and is typically staffed in the OSC.

11. Field Monitoring Teams (FMTs)

a. The ability to locate, monitor, and track a radioactive plume is important to ensure appropriate protective measures are taken in response to a radiological event. The ability to staff these teams before they may be needed (i.e., before a radiological release) greatly enhances the ability of the licensee to provide timely and accurate PARs.

b. The augmentation (support) for these teams are as follows:

i. An onsite FMT should be staffed, consisting of a monitor and a driver. This onsite FMT is responsible for radiological monitoring of the site's Protected Area. This team should be staffed within 60-minutes of an Alert ECL, or greater.

1. The monitor should be qualified to assess radiation and contamination levels, but need not be an ANSI qualified RP Technician as long as the FMT is under the direct supervision of senior staff in the TSC or EOF.

2. The onsite FMT should not be staffed if the radiological conditions jeopardize the safety of the FMT.

ii. An offsite FMT should be staffed, consisting of a monitor and a driver. This offsite FMT is responsible for locating, monitoring, and tracking a radioactive plume, as well as obtaining environmental samples as necessary (air, water, vegetation, etc.). This team should be staffed within 60-minutes of an Alert ECL, or greater.

1. The monitor should be qualified to assess radiation and contamination levels, but need not be an ANSI qualified RP Technician as long as the FMT is under the direct supervision of senior staff in the TSC or EOF.

iii. Another offsite FMT should be staffed, consisting of a monitor and a driver. This offsite FMT is also responsible for locating, monitoring, and tracking a radioactive plume, as well as obtaining environmental samples (air, water, vegetation, etc.). This team should be staffed within 90-minutes of an Alert ECL, or greater.

1. The monitor should be qualified to assess radiation and contamination levels, but need not be an ANSI qualified RP Technician as long as the FMT is under the direct supervision of senior staff in the TSC or EOF.

12. Media Information (Joint Information Center/Joint Information System (JIC/JIS)

a. Revision 1 of the NUREG did not adequately address the importance of media relations as an aspect of emergency planning. While the exact staffing composition is left to the licensee to determine, with significant input from applicable OROs, and from the Federal Emergency Management Agency, media relations is an important part of effective emergency response and is consistent with the National Incident Management System (NIMS), dated December 2008.

b. The augmentation (support) of this function should, at a minimum, be whatever is absolutely needed to support this function, i.e., without those positions this function could not occur. This should be staffed within 60-min of an Alert ECL, or greater, to address media inquiries; and within 60-minutes of an SAE ECL, or greater, to support media related tasks.

13. Information Technology (IT)

a. The ever-increasing advances in technology have led to significant enhancements in many areas of emergency response, such as communications, monitoring, displays, digital procedures, etc. Licensees should consider the use of this technology whenever it enhances their ability to protect the health and safety of the public.

b. However, if the implementation of the emergency plan is so reliant on this technology that without it, the emergency plan could not be implemented, then an IT Lead should augment (support) the response within 60-minutes of an Alert ECL, or greater, if the TSC/OSC has this technology; and within 60-minutes of an SAE ECL, or greater, if the EOF or JIC/JIS has this technology.

    i. If the licensee has capable backup plans for if/when this technology fails, then this function is not necessary.

3.3.4. Table B-1 End Notes

There are several notes at the end of Table B-1. All of them are intended to reinforce certain aspects of the guidance as it relates to an ERO staffing plan.

1. This note is intended to reemphasize that the assignment of collateral duties to an individual must be evaluated to ensure that the EP function(s) can occur without any competing priorities.

2. This note is intended to clarify a historical issue with the previous guidance, i.e., does the 'clock' stop when the TSC/OSC is minimally staffed or when the staff is performing the stated EP function.

3. This note is intended to clarify a historical issue with the previous guidance, i.e., does the 'clock' stop when the EOF/JIC/JIS is minimally staffed or when the staff is performing the stated EP function.

4. This note supports the RP functional criteria of 2 qualified RP staff on-shift for single unit sites, and 1 per unit for multi-unit sites.

5. This note supports the issue of what maintenance capability should be on-shift, and what they are to be responsible for.

6. This note supports the fact that the JIC/JIS function need not be located in the TSC/OSC for an Alert ECL, or greater.

7. This note supports the rationale for determining if IT support is necessary.

4. Conclusion

Section II.B (proposed), represents a significant change from Revision 1 of the NUREG. However, Revision 1 was endorsed in 1980 and is therefore significantly out of date. All licensees have emergency plans that are different from Revision 1 in some areas, particularly Section II.B. This was acceptable as licensees are not required to implement guidance and sought staff approval for alternate approaches to meeting the regulations. The intent of Section II.B (proposed) is to bring the staff position up to date, and to provide licensees a consistent model upon which they could consider revisions to their ERO staffing plan. This revision also enhances regulatory stability as the ambiguity of previous guidance, as well as the lack of guidance related to other ERFs, has been clarified and updated.

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