

NEI 12-01 [Revision 0]

**Guideline for Assessing
Beyond Design Basis
Accident Response
Staffing and
Communications
Capabilities**

April 2012

[THIS PAGE IS LEFT BLANK INTENTIONALLY]

NEI 12-01 [Revision 0]

Nuclear Energy Institute

**Guideline for Assessing
Beyond Design Basis
Accident Response
Staffing and
Communications
Capabilities**

April 2012

ACKNOWLEDGEMENTS

This document was developed by the Nuclear Energy Institute (NEI) Beyond Design Basis Event Response Staffing Study Task Force and the Communications during an Extended Loss of AC Power Task Force.

NEI Beyond Design Basis Event Response Staffing Study Task Force

NEI Chairperson: David Young

Industry Lead: Robert Svaleson, Exelon Nuclear/Corporate

Industry Members:

Paul Driehaus – Exelon Nuclear/Corporate

Monica Ray – APS/Palo Verde Nuclear Generating Station

William Renz – Entergy Nuclear/Corporate

John Stephenson – Progress Energy/Corporate

NEI Communications during an Extended Loss of AC Power Task Force

NEI Chairperson: David Young

Industry Lead: Robert Svaleson, Exelon Nuclear/Corporate

Industry Members:

Michael Austin – Duke Energy/Corporate

David Draghi – Exelon Nuclear/Corporate

Steve Sawtschenko – APS/Palo Verde Nuclear Generating Station

Soren Thomassen - PSEG/Salem and Hope Creek Generating Stations

NOTICE

Neither NEI, nor any of its employees, members, supporting organizations, contractors, or consultants make any warranty, expressed or implied, or assume any legal responsibility for the accuracy or completeness of, or assume any liability for damages resulting from any use of, any information apparatus, methods, or process disclosed in this report or that such may not infringe privately owned rights.

EXECUTIVE SUMMARY

This technical report provides recommended criteria to assist with the preparation of assessments that will determine the required staff necessary for responding to a beyond design basis external event that affects multiple units at a site, and the identification of enhancements that could provide a means to power equipment needed to communicate on-site and offsite during an extended loss of AC power event. These assessments are necessary for responding to certain information requests contained in US Nuclear Regulatory Commission (NRC) letter, *Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident*, dated March 12, 2012¹ [the Letter]. As discussed in SECY-11-0137, *Prioritization of Recommended Actions to be taken in Response to Fukushima Lessons Learned*², dated October 3, 2011, responses to the information requests will be used to inform possible future regulatory actions.

The information requests related to Emergency Preparedness (EP) are contained in Enclosure 5 of the Letter. Within this enclosure are two Requested Actions; both involve performance of an assessment. These actions are summarized below.

- Assess current communications systems and equipment used during an emergency event given a set of standard assumptions. Consider enhancements that may be appropriate for the emergency plan with respect to communications requirements of 10 CFR 50.47, Appendix E to 10 CFR 50, and the guidance in NUREG-0696 in light the set of standard assumptions. Also consider the means necessary to power the new and existing communications equipment during a multi-unit event, with a loss of all AC power.
- Assess current staffing levels and determine the appropriate staff to fill all necessary positions for responding to a multi-unit event during a beyond design basis external event, and determine if any enhancements are appropriate given the considerations of Fukushima Near-Term Task Force (NTTF) Recommendation 9.3³.

An associated listing of Requested Information is provided below each Requested Action.

A licensee should be able to provide the staffing necessary for responding to a beyond design basis external event affecting all units on a site. The number and composition of the response staff should be sufficient to implement mitigation strategies and repair actions intended to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities for all affected units. The assessment criteria presented in this technical report will assist with identification of this required staffing and related enhancements.

In addition to adequate staffing, a licensee should also maintain the capability to perform critical communications during and following an event that results in an extended loss of AC power. This document provides criteria for assessing the availability of communications systems and equipment necessary for implementation of emergency planning standard requirements.

¹ Refer to ADAMS ML12053A340

² Refer to ADAMS ML11272A111

³ For background information, refer to NRC staff report entitled, *Recommendations for Enhancing Reactor Safety in the 21st Century*, dated July 12, 2011; ADAMS ML111861807

Communications capabilities that support implementation of mitigation strategies and repair actions intended to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities will also be assessed.

The criteria and related actions presented in this document mirror the industry's multi-phase approach for performing the requested assessments and providing the requested information. The industry's phased approach was developed with recognition of 1) the higher priority placed upon the completion of licensee actions necessary to comply with the EP Rule promulgated in Federal Register Volume 76, Number 226; dated November 23, 2011; Pages 72560-72600; and 2) the dependency of certain assessment elements upon future definition of new response requirements associated with Fukushima NTTF Recommendation 4.2, as subsequently modified by the staff and issued as NRC Order EA-12-049. The phased approach and related high-level licensee actions are described more fully in Section 1.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	i
1 INTRODUCTION.....	1
1.1 RESPONSE STAFFING ASSESSMENT.....	1
1.2 COMMUNICATIONS DURING AN EXTENDED LOSS OF AC POWER ASSESSMENT	1
1.3 APPROACH TO INFORMATION REQUEST RESPONSES.....	2
1.4 TRACKING OF ASSESSMENT RESULTS	5
2 ASSESSMENT ASSUMPTIONS	9
2.1 PURPOSE	9
2.2 ASSUMPTIONS COMMON TO BOTH ASSESSMENTS	9
2.3 ASSUMPTIONS FOR STAFFING ASSESSMENT	10
2.4 ASSUMPTIONS FOR COMMUNICATIONS ASSESSMENT	10
3 RESPONSE STAFFING STUDY	12
3.1 OVERVIEW OF A BEYOND DESIGN BASIS EXTERNAL EVENT RESPONSE.....	12
3.2 ASSESSMENT OF ON-SHIFT STAFFING FOR A BEYOND DESIGN BASIS EXTERNAL EVENT AFFECTING MULTIPLE UNITS.....	13
3.3 EXISTING AUGMENTED STAFFING FOR RESPONDING TO A MULTI-UNIT EVENT	14
3.4 EXPANDED RESPONSE CAPABILITY FOR RESPONDING TO A MULTI-UNIT EVENT	15
3.5 POSITION-SPECIFIC ASSESSMENT GUIDANCE	16
3.6 STAFFING FOR EXPANDED RESPONSE FUNCTIONS.....	17
3.7 WORK AREAS FOR PERSONNEL PERFORMING EXPANDED RESPONSE FUNCTIONS ...	18
3.8 ACTIVATING AN EXPANDED RESPONSE CAPABILITY.....	18
3.9 MOBILIZATION OF EXPANDED RESPONSE CAPABILITY STAFFING	18
3.10 CONSIDERATIONS FOR PROGRAM DOCUMENTS.....	19
4 COMMUNICATIONS DURING AN EXTENDED LOSS OF AC POWER.....	24
4.1 REQUIRED EMERGENCY COMMUNICATIONS CAPABILITIES	24
4.2 PLANT PAGING (ANNOUNCEMENT) SYSTEM	27
4.3 COMMUNICATIONS EQUIPMENT AT ORO FACILITIES.....	28
4.4 NOTIFICATION OF THE EMERGENCY RESPONSE ORGANIZATION (ERO).....	28
4.5 EQUIPMENT LOCATION REQUIREMENTS.....	28
4.6 PERFORMANCE CHARACTERISTICS	29

4.7	OTHER ASSESSMENT CONSIDERATIONS	29
4.8	QUALITY AND MAINTENANCE-RELATED REQUIREMENTS	30
4.9	NATIONAL COMMUNICATIONS SYSTEM (NCS) SERVICES.....	30
4.10	COMMUNICATIONS PROVIDER EMERGENCY SERVICES.....	30
4.11	PERSONNEL TRAINING	31
5	REFERENCES.....	32
5.1	US Nuclear Regulatory Commission (NRC) letter, Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident, dated March 12, 2012	32
5.2	SECY-11-0137, Prioritization of Recommended Actions to be taken in Response to Fukushima Lessons Learned , dated October 3, 2011	32
5.3	10 CFR § 50.47 Emergency plans – Section (b).....	32
5.4	10 CFR § 50, Appendix B – Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants	32
5.5	10 CFR § 50, Appendix E – Emergency Planning and Preparedness for Production and Utilization Facilities.....	32
5.6	NUREG 0696, Functional Criteria for Emergency Response Facilities.....	32
5.7	Federal Register Volume 76, Number 226; dated November 23, 2011; Pages 72560-72600	32
5.8	NEI 10-05, Assessment of On-Shift Emergency Response Organization Staffing and Capabilities.....	32
5.9	NSIR/DPR-ISG-01, Interim Staff Guidance – Emergency Planning for Nuclear Power Plants	32
5.10	NUREG-0654, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants	32
5.11	INPO 10-007, Equipment Important to Emergency Response	32

GUIDELINE FOR ASSESSING BEYOND DESIGN BASIS ACCIDENT RESPONSE STAFFING AND COMMUNICATIONS CAPABILITIES

1 INTRODUCTION

1.1 RESPONSE STAFFING ASSESSMENT

Each licensee currently maintains an on-shift and augmented Emergency Response Organization (ERO) in accordance with existing regulations and guidance. An ERO is capable of responding to any accident within the scope of the plant design basis. The criteria presented in this technical report are intended to assist a licensee with the identification of additional organizational capabilities that will facilitate simultaneous performance of accident mitigation and repair actions at all on-site units following a beyond design basis external event.

It is recognized that licensees employ many different response organization structures to meet emergency planning standards and requirements. Consequently, there is a wide variation in the number, type, and location of emergency response positions, as well as the assignment of requisite authorities and responsibilities. This variation precluded development of a standard response staffing study template.

In lieu of a standard template, this technical report provides recommended criteria for use in performing an assessment to identify the staff that should be available to respond to a beyond design basis external event affecting multiple units at a site. These criteria can be readily applied to a variety of assessment methodologies. This approach will allow a licensee the flexibility to perform a response staffing assessment that accommodates their specific needs while, at the same time, ensuring consistency with industry-developed standards, and NRC regulations and guidance.

1.2 COMMUNICATIONS DURING AN EXTENDED LOSS OF AC POWER ASSESSMENT

Licensees also employ diverse methods to meet emergency communications requirements and, as a result, there are significant differences in communications systems, configurations and capabilities from site to site. As with the response staffing assessment, these differences precluded development of a standard communications assessment template.

In lieu of a standard template, this technical report provides recommended criteria for use in identifying enhancements that will ensure the availability of critical communications capabilities during an extended loss of AC power, including evaluation of power sources to onsite and off-site communications equipment. These criteria can be readily applied to a variety of assessment methodologies. This approach will allow a licensee the flexibility to perform a communications capability assessment that accommodates their specific needs while, at the same time, ensuring consistency with industry-developed standards, and NRC regulations and guidance.

1.3 APPROACH TO INFORMATION REQUEST RESPONSES

As presented in Table 1.1, Summary of Licensee Actions for Responding to NRC Information Requests Related to EP, a phased approach will be used to respond to the information requests contained in the Letter. The table provides recommended completion and submittal dates for each information request; the identified request numbers correspond to the request numbering used in Enclosure 5 of the Letter for each assessment area – Communications and Staffing. Some information requests are applicable to all sites while others apply to multi-unit sites only; the applicability of each request to a site type is also provided.

The basis for the approach presented in Table 1.1 is discussed below.

1.3.1 Staffing

A 2-phase approach will be used to respond to the information requests associated with Staffing. The table below summarizes this approach.

Plant Type	Phase 1 Staffing Assessment (for functions except those related to NTTF Recommendation 4.2)	Phase 2 Staffing Assessment (for functions related to NTTF Recommendation 4.2)
Single-unit plants	Perform staffing assessment and implement actions as required by recent EP Rule using ISG and NEI 10-05	Perform staffing assessment as requested by 50.54(f) letter using NEI 12-01; provide results per alternative course of action described in 60-day letter
Multi-unit plants	<ul style="list-style-type: none"> • Perform staffing assessment and implement actions as required by recent EP Rule using ISG and NEI 10-05 • Perform staffing assessment as requested by 50.54(f) letter using NEI 12-01 and material from NEI 10-05; provide results per alternative course of action described in 60-day letter 	Perform staffing assessment as requested by 50.54(f) letter using NEI 12-01; provide results per alternative course of action described in 60-day letter

The basis for this approach is discussed below.

1.3.1.1 Phase 1 Staffing Assessment

For multi-unit plants, the Phase 1 staffing assessment performed in response to the Letter will be performed by March 29, 2013, and provided by April 30, 2013. This assessment will consider all requested functions except those related to Fukushima Near-Term Task Force (NTTF) Recommendation 4.2. An assessment considering these functions will be performed in Phase 2.

The timing of the Phase 1 staffing assessment reflects the higher priority placed by the staff, and approved by the Commission is SRM-SECY-12-0025, upon the completion of licensee actions necessary to comply with the Final EP Rule issued on November 23, 2011 (Fed. Reg. 72,560). In particular, Section IV.A.9 of 10 CFR 50, Appendix E, requires that licensees complete 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. As stated in the EP Rule, this analysis must be completed by December 24, 2012.

Following completion of EP Rule staffing analysis, the staffing assessment associated with the Letter may be performed. Based on staffing analysis experience to date, it is anticipated that a staffing analysis for a multi-unit event will require 3 months to complete and validate. One additional month is allotted for processing of an assessment submittal package.

As requested, an implementation schedule for any modifications that are determined to be appropriate should be included with the Phase 1 staffing assessment.

Single-unit plants do not need to provide a Phase 1 staffing assessment in response to the Letter as performance of this activity is governed by the recent EP Rule and existing license requirements.

1.3.1.2 Phase 2 Staffing Assessment

Each licensee should determine a date for completing the Phase 2 staffing assessment; the assessment will be provided no later than 4 months prior to beginning of second refueling outage (as used within the context of NRC Order EA-12-049). This assessment will consider the requested functions related to Fukushima Near-Term Task Force (NTTF) Recommendation 4.2.

The industry will be responding to multiple regulatory actions resulting from the recommendations contained in the Fukushima NTTF Report, as modified in related Commission Papers (SECY's) and Staff Requirements Memoranda (SRM). One of these actions, in particular, has the potential to impact emergency response staffing levels. This action is NRC Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events EA-12-049 [the Order] which addresses Fukushima NTTF Recommendation 4.2. A summary of the Order is provided below.

This Order requires a three-phase approach for mitigating beyond-design-basis external events. The initial phase requires the use of installed equipment and resources to maintain or restore core cooling, containment and spent fuel pool (SFP) cooling. The transition phase requires providing sufficient, portable, onsite equipment and consumables to maintain or restore these functions until they can be accomplished with resources brought from off site. The final phase requires obtaining sufficient offsite resources to sustain those functions indefinitely.

Additional details on an acceptable approach for complying with this Order will be contained in final Interim Staff Guidance (ISG) scheduled to be issued by the NRC in August 2012.

In accordance with the Order, each licensee must develop new strategies for mitigating the effects of beyond-design-basis external events. To ensure accurate results, the staffing assessment for response functions related to NTF Recommendation 4.2 must be based on the actions delineated in the procedures and guidelines developed in response to the Order. Once the site-specific actions associated with the new response strategies are defined (e.g., down to the procedure or guideline step level), the staffing needed to perform these actions can be assessed with the necessary level of accuracy.

Based on a review of the planned actions necessary to comply with the Order, an assessment of the staffing for the functions related to NTF Recommendation 4.2 can be provided by 4 months prior to beginning of the second refueling outage (as used within the context of NRC Order EA-12-049). Licensees of single-unit sites should adhere to this submittal milestone. Licensees of multi-unit sites have two options for providing the Phase 2 staffing assessment.

- Provide one phase 2 staffing assessment applicable to all on-site units. This assessment should be provided 4 months prior to the first occurrence of a second refueling outage at the site (i.e., the first “second refueling outage”). This option may be used by sites that will employ essentially identical mitigation strategies for all on-site units.
- Provide two or more phase 2 staffing assessments as applicable to the different on-site units. Each assessment should be provided 4 months prior to the occurrence of the second refueling outage of the unit to which the assessment is applicable. This option may be used by sites that will employ different mitigation strategies for on-site units.

As requested, an implementation schedule for any modifications that are determined to be appropriate should be included with the Phase 2 staffing assessment.

1.3.2 Communications

There are two separate responses to the information requests related to communications. The alternative timing of the responses to requests #1 and #3 reflects the higher priority placed by the staff, and approved by the Commission is SRM-SECY-12-0025, upon the completion of licensee actions necessary to comply with the Final EP Rule issued on November 23, 2011 (Fed. Reg. 72,560). The proposed alternative timing is warranted as many of the licensee staff resources necessary for performing the communications assessment are the same resources involved in implementing new EP Rule requirements, responding to Institute of Nuclear Power Operations (INPO) initiatives related to enhancing communications capabilities (e.g., IER 11-4), and maintaining existing EP communications equipment.

In addition, the estimated completion date assigned to information request #3 will promote alignment between the out-year budgeting/funding of future enhancements, and the development of an accurate and complete enhancement implementation schedule.

1.4 TRACKING OF ASSESSMENT RESULTS

It is expected that the results of each completed assessment will be verified and validated to ensure adequacy and accuracy. Once these actions are completed, a licensee should determine what method(s) will be employed to track implementation of corrective actions and enhancements identified by an assessment. Each corrective action and enhancement should have an estimated completion date; some may be sufficiently complex to require development of project or change management plans, and associated schedules.

In accordance with the requirements of 10 CFR 50, Appendix B, a Condition Adverse to Quality identified during an assessment must be entered into a corrective action program.

Table 1.1
Summary of Licensee Actions for Responding to NRC Information Requests Related to EP

Action #	Action	EP Rule	Phase 1	Phase 2
1	Assess staffing for responding to events defined in EP Rule Interim Staff Guidance (ISG) (<i>see Note 2</i>); assessment performed in accordance with NEI 10-05. [<i>Applicable to all sites.</i>]	<ul style="list-style-type: none"> ▪ Due December 24, 2012 ▪ Provide per EP Rule ISG (<i>see Note 1</i>) 		
2	Provide an alternative course of action for responding to the Letter. Consider use of standard response template from NEI. [<i>Applicable to all sites.</i>]		Provide within 60 days of letter date.	
3	Communications - provide information on interim actions; respond to Information Request #2. [<i>Applicable to all sites.</i>]		Provide within 90 days of letter date.	
4	Staffing - provide information on augmented staff notifications, methods of site access and interim actions; respond to Information Requests #3, #4 and #5. [<i>Applicable to all sites.</i>]		Provide within 90 days of letter date.	
Note 1 - NSIR/DPR-ISG-01, Interim Staff Guidance, Emergency Planning for Nuclear Power Plants				

Action #	Action	EP Rule	Phase 1	Phase 2
5	<p>Communications – perform and provide an assessment to identify enhancements that may be needed to ensure communications are maintained during a large-scale external event meeting the conditions described in the standard assumptions. Refer to Section 4 of this document for assessment guidance. Develop an implementation schedule. Respond to Requests #1 and #3. <i>[Applicable to all sites.]</i></p>		<ul style="list-style-type: none"> ▪ Complete by September 28, 2012 ▪ Provide by October 31, 2012 	
6	<p>Staffing (<i>phase 1</i>) – perform and provide an assessment of the onsite and augmented staff needed to respond to a large-scale external event meeting the conditions described in the standard assumptions, NOT including staffing needed to implement actions that address NRC Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (EA-12-049). Refer to Section 3 of this document for guidance. Develop an implementation schedule for staffing changes, and identify changes to the emergency plan. Respond to Requests #1, #2 and #6. <i>[Applicable to multi-unit sites. See Note 2.]</i></p>		<ul style="list-style-type: none"> ▪ Complete by March 29, 2013 ▪ Provide by April 30, 2013 	
<p>Note 2 - Single-unit plants do not need to provide a phase 1 staffing assessment in response to the 50.54(f) letter as performance of this activity is governed by the recent EP Rule and existing license requirements.</p>				

Action #	Action	EP Rule	Phase 1	Phase 2
7	<p>Staffing (<i>phase 2</i>) – perform and provide an assessment of the staffing necessary to implement actions that address NRC Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (EA-12-049). Perform assessment in conjunction with the development of procedures or guidelines that address the Order. Refer to Section 3 of this document for guidance.</p> <p>Develop an implementation schedule for staffing changes, and identify changes to the emergency plan. Respond to Requests #1, #2 and #6.</p> <p><i>[Applicable to all sites.]</i></p>			<ul style="list-style-type: none"> ▪ Completion date at discretion of licensee ▪ Provide no later than four (4) months prior to the beginning of the second refueling outage [as used within the context of NRC Order EA-12-049]

2 ASSESSMENT ASSUMPTIONS

2.1 PURPOSE

Assessments pursuant to Enclosure 5 of the Letter should be performed using the assumptions contained in this section. The use of these assumptions will help ensure that the requested information, including the identification of future enhancements, is developed consistent with industry standards, and NRC regulations and guidance.

2.2 ASSUMPTIONS COMMON TO BOTH ASSESSMENTS

1. A large-scale external event occurs that results in:
 - all on-site units affected
 - extended loss of AC power
 - impeded access to the units
2. Initially, all on-site reactors are operating at full power and are successfully shut down.
3. A Hostile Action directed at the affected site does not occur during the period that the site is responding to the event.
4. The event impedes site access as follows:
 - A. Post event time: 0 to 6 hours – No site access. This duration reflects the time necessary to clear roadway obstructions, use different travel routes, mobilize alternate transportation capabilities (e.g., private resource providers or public sector support), etc.
 - B. Post event time: 6 to 24 hours – Limited site access. Individuals may access the site by walking, personal vehicle or via alternate transportation capabilities (e.g., private resource providers or public sector support).
 - C. Post event time: 24+ hours – Improved site access. Site access is restored to a near-normal status and/or augmented transportation resources are available to deliver equipment, supplies and large numbers of personnel.

A staffing assessment may utilize a “no site access” end time of less than 6 hours if supported by a documented basis. This basis should include a discussion of the transportation-related resources and capabilities, and related supporting arrangements, which provide assurance that augmented staff would be available on the site starting at the time used in the assessment. Such resources and capabilities could be provided by Company-internal, private or public sources; licensees are strongly encouraged to document all arrangements with the appropriate service providers (e.g., Letter of Agreement, contract, etc.).

2.3 ASSUMPTIONS FOR STAFFING ASSESSMENT

1. On-shift personnel are limited to the minimum complement allowed by the site emergency plan (i.e., the minimum required number for each required position). This would typically be the on-shift complement present during a backshift, weekend or holiday.
2. The phase 1 staffing assessment (for licensee Action #6 of Table 1.1) should consider the applicable actions from the Station Blackout (SBO) coping strategies in place at the time of the assessment. Such actions may include the shedding of non-essential battery loads, use of portable generators or batteries, opening room and cabinet doors, water/coolant conservation or makeup using portable equipment, etc. These actions do not include those associated with cross-tying AC power sources or electrical distribution busses between units since, as stated in assumption number 2.2.1, all on-site units are experiencing an extended loss of AC power.

Sites with existing strategies for responding to an extended loss of AC power affecting all on-site units should consider those actions in their phase 1 staffing assessment.

2.4 ASSUMPTIONS FOR COMMUNICATIONS ASSESSMENT

1. Installed sources of AC power, including alternate AC power sources, are not available. These power sources are typically classified as safety-related or governed by augmented quality requirements.
2. Nonessential loads from DC battery buses are stripped in accordance with plant emergency or abnormal operating procedures, or other response guidelines to extend battery life.
3. Installed inverters and battery chargers remain available provided they are protected from internal and external flooding events consistent with the current station design.
4. Diesel fuel oil stored in seismic structures and protected from flooding and wind remains available.
5. Portable equipment staged for implementation of accident management strategies (e.g., SAMG and EDMG) may be used provided it is stored on-site; is reasonably protected from seismic, wind, and flooding events⁴; is maintained through programmatic controls; and has implementing actions specified in existing procedures or guidelines. This includes use of portable AC and DC power sources.

⁴ Consider protection criteria presented in regulatory and industry guidance applicable to equipment associated with NRC Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events.

6. Offsite infrastructure supporting communications systems is inoperable in the area surrounding the site (e.g., cellular telephone or microwave towers, telephone central office buildings, telephone lines, etc.). A licensee has two options for determining the affected area.
- Apply a default distance value, in all directions, of approximately 25 miles from the plant site, OR
 - Develop a site-specific distance assumption and document the basis.

Communications infrastructure in locations beyond the area defined above is not significantly impacted by the event.

7. Communications equipment located at an offsite response facility, and supplied from a backup power source, is assumed to be functional. The availability of this equipment must be determined in conjunction with Assumption #6, above. For example, a diesel generator-powered satellite telephone system at an Emergency Operations Center (EOC) located 4 miles from the plant would be available since the system does not rely upon ground-based communications infrastructure within the affected area. A land-line telephone in the same EOC would not be available due to local infrastructure impacts consistent with Assumption #6.

3 RESPONSE STAFFING STUDY

3.1 OVERVIEW OF A BEYOND DESIGN BASIS EXTERNAL EVENT RESPONSE

Following the occurrence of a significant off-normal event, on-shift personnel will declare an emergency and respond in accordance with the site emergency plan. At an Alert or higher emergency classification level, plan implementation will include notification of some or all of the augmenting Emergency Response Organization (ERO). In accordance with existing regulations and guidance, an augmented ERO is capable of responding to any design basis event affecting the site.

To promote a common understanding of the terminology used in this document, and the associated assessment concepts developed therein, a simplified framework for responding to a beyond design basis external event causing an extended loss of AC power is presented in Figure 3.1. From this Figure, the following observations are drawn.

Conditions at All Units	A beyond design basis external event has occurred which causes an extended loss of AC power affecting all on-site units.
Response Phases	<p>For purposes of a staffing assessment, the response to the stipulated conditions may be divided into 3 phases.</p> <ul style="list-style-type: none"> • Initial Phase⁵ - Implementation of strategies that generally rely upon installed plant equipment. • Transition Phase⁶ – Implementation of strategies that involve the use of on-site portable equipment and consumables to extend the coping period, and prevent a loss of functions needed for core cooling, containment, and spent fuel pool cooling. • Contingency Phase – In the event that coping actions are not successful, implementation of strategies intended to arrest incipient or ongoing fuel damage, protect containment and minimize radiological releases.
Operating Procedures	<p>As appropriate to the 3 Response Phases discussed above, plant operators and ERO members would employ mitigation strategies and equipment in accordance with the following procedure sets.</p> <ul style="list-style-type: none"> • Emergency Operating Procedures (EOPs)⁷ – Procedures developed in accordance with existing regulatory and industry guidance. • [Procedure Type TBD by Owners Groups] – These are procedures that will be developed to implement Transition Phase coping strategies using on-site portable equipment and consumables. • Severe Accident Management Guidelines (SAMGs) – Guidelines developed

⁵ INPO documents may refer to this phase as Primary coping.

⁶ This phase includes implementation of strategies that address NRC Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events. INPO documents may refer to this phase as Secondary coping.

⁷ This includes site-specific Abnormal Operating Procedures if applicable.

Mitigation Equipment	<p>in accordance with existing regulatory and industry guidance.</p> <p>The mitigation equipment used for responding to the stipulated unit conditions may be divided into 2 categories.</p> <ul style="list-style-type: none"> • Installed Systems, Structures and Components (SSCs). • On-site portable equipment and consumables that augment plant SSCs. Equipment of this type would be used in accordance with procedures or guidelines developed to implement Transition Phase coping or Severe Accident Management (SAM) strategies⁸. Examples within this category include stored portable equipment such as pumps, generators, batteries, air bottles, hoses, cables, etc.
Fuel Status	<p>The status of irradiated fuel during the stipulated unit conditions may be divided into 2 states.</p> <ul style="list-style-type: none"> • During the Initial Phase and Transition Phase coping, irradiated fuel will be adequately cooled such that no damage occurs. • If coping actions cannot be effectively implemented, then decay heat will cause damage to irradiated fuel.
Emergency Response Staffing	<p>The on-shift staff should be capable of implementing:</p> <ul style="list-style-type: none"> • Any and all Initial Phase coping strategies, and • Any site-specific Transition Phase coping strategies that cannot be affected by the augmented staff within the necessary timeframes. <p>Consistent with expected reporting times, the augmented staff should be capable of implementing Transition Phase coping strategies, and SAM strategies in the event that coping actions are unsuccessful in preventing fuel damage.</p>

It is recognized that, following successful implementation of Transition Phase coping strategies, there is a third phase characterized by the ability to cope indefinitely; this is referred to as the Final Phase. The Final Phase would involve the use of equipment and consumables transported to the site from offsite locations, including ongoing replacement and replenishment as needed. The demands placed upon the ERO during this phase are not significantly different than those associated with Transition Phase coping; therefore, this phase is not included in a staffing assessment.

3.2 ASSESSMENT OF ON-SHIFT STAFFING FOR A BEYOND DESIGN BASIS EXTERNAL EVENT AFFECTING MULTIPLE UNITS

Section IV.A.9 of 10 CFR 50, Appendix E, states that nuclear power reactor licensees shall perform “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.” The methodology described in NEI 10-05, *Assessment of On-Shift Emergency Response Organization Staffing and Capabilities*, provides a structured approach for meeting this requirement. The use of NEI 10-05 to perform an on-shift staffing analysis is endorsed in NSIR/DPR-ISG-01, *Interim Staff Guidance Emergency Planning for Nuclear Power Plants*.

⁸ May include equipment used to implement EDMG/B.5.b strategies.

While NSIR/DPR-ISG-01 and NEI 10-05 address a Station Blackout (SBO) affecting a single-unit site, and one unit on a multi-unit site, they do not consider the scenario of an extended loss of AC power affecting all units on a multi-unit site. Licensees of multi-unit sites should perform an assessment of this scenario using the assumptions listed in Section 2 and the methodology provided in NEI 10-05 (i.e., the phase 1 staffing assessment). In particular, the assessment should determine the ability of the on-shift staff to implement Initial Phase coping actions and, consistent with the site access assumption presented in Section 2.2, any Transition Phase actions that must be performed prior to the end of the “no site access” time period.

The phase 1 staffing assessment should consider the applicable actions from the Station Blackout (SBO) coping strategies in place at the time of the assessment. Such actions may include the shedding of non-essential battery loads, use of portable generators or batteries, opening room and cabinet doors, water/coolant conservation or makeup using portable equipment, etc. These actions do not include those associated with cross-tying AC power sources or electrical distribution busses between units since, as stated in assumption number 2.2.1, all on-site units are experiencing an extended loss of AC power.

Sites with existing strategies for responding to an extended loss of AC power affecting all on-site units should consider those actions in their phase 1 staffing assessment.

The results from this assessment should be included in the licensee response described in Action #6 of Table 1.1.

3.3 EXISTING AUGMENTED STAFFING FOR RESPONDING TO A MULTI-UNIT EVENT

Emergency plans are developed to meet the planning standards presented in 10 CFR 50.47(b). Some of these planning standards are related to *emergency preparedness* activities (i.e., program planning and maintenance) while others refer to *emergency response* actions (i.e., those performed during and following an event). The augmented staffing needed to perform the *emergency response* functions associated with several of these planning standards is not affected by whether or not the initiating event is within the plant design basis. In other words, the augmented staffing required to perform these functions following a within or beyond design basis external event would not be significantly different.

A detailed review of the event timeline and lessons learned from the accident at Fukushima Daiichi was performed to identify those response functions that can be adequately performed by the augmented ERO staffing which addresses current regulations and guidance. This staffing is described in existing site emergency plans and implementing procedures. The review determined that existing augmented EROs are capable of performing the following response functions following a beyond design basis external event.

- Command and control (i.e., the senior manager) in all emergency response facilities
- On-site radiological assessments and direction of protective measures (e.g., respirators, dosimetry, KI, etc.)

- Offsite radiological assessment (i.e., dose projections)
- Formulation of Protective Action Recommendations (PARs)
- Offsite monitoring and environmental sampling
- Environmental sample analysis
- Emergency Notifications System (ENS) and Health Physics Network (HPN) communications
- Support functions including logistics, licensing, industry coordination, purchasing and inventory/materials
- Emergency public information

Based on this review, the response functions listed above do not need to be included in the assessment of augmented staffing.

3.4 EXPANDED RESPONSE CAPABILITY FOR RESPONDING TO A MULTI-UNIT EVENT

As discussed above, a licensee maintains provisions for mobilizing qualified personnel to assist the on-shift staff in responding to more serious events and accidents. These personnel, typically referred to as the augmented ERO, are capable of performing a wide range of functions necessary for responding to a radiological emergency, up to and including a severe accident involving fuel damage. This capability notwithstanding, the on-site ERO at a multi-unit site is designed to respond to a design basis accident affecting a single unit.

A typical augmented ERO for a multi-unit site would be challenged to effectively respond to a beyond design basis external event that resulted in an extended loss of AC power affecting more than one unit. In an event of this magnitude, it would be necessary to “expand” the capability of the augmented ERO in order to facilitate timely and effective performance of critical emergency response functions. Based on a detailed review of the event timeline and lessons learned from the accident at Fukushima Daiichi, it was determined that the focus of this “expanded response capability” should be enabling the performance of unit-specific accident assessment and mitigation functions.

To be effective, an expanded response capability should encompass those functions necessary for preventing damage to irradiated fuel, or if such damage occurs, minimizing radiological releases. The selected functions must directly support the assessment and implementation of a range of mitigation strategies intended to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities. Tables 3.1 and 3.2 list the emergency response functions identified by the NEI Beyond Design Basis Event Response Staffing Study Task Force as meeting these requirements.

Tables 3.1 and 3.2 also provide recommended staffing considerations for each listed function. This staffing will promote timely evaluation of accident conditions and mitigation strategies, and facilitate subsequent performance of mitigation actions, for each affected unit. Using the recommended staffing approach will also obviate issues

associated with the assignment of collateral duties⁹. If necessary, a licensee may develop a site-specific alternative approach to the recommended staffing; however, a basis for the alternative approach should be provided.

The staffing required for implementation of SAM strategies will vary from site to site depending upon several factors. As noted in Table 3.1, a licensee should review the range of strategies applicable to each unit (e.g., depressurizing steam generators or injecting into the Reactor Pressure Vessel using a specific water source), and identify the two strategies for each unit that require the greatest number of staff to implement within time periods compatible with successful performance. The number and composition of the individuals identified by this review comprise the minimum staffing for this function.

For purposes of assessing augmented staffing, it is assumed that the on-shift staff successfully performs all Initial Phase, and any required Transition Phase, coping actions. Consistent with the site access assumption presented in Section 2.2, the assessment should determine the ability of the augmenting staff to implement Transition Phase coping strategies performed after the end of the “no site access” time period.

The staffing required for implementation of Transition Phase coping strategies will vary from site to site depending upon several factors. As noted in Table 3.2, a licensee should review the range of strategies applicable to each unit (e.g., depressurizing steam generators or injecting into the Reactor Pressure Vessel using a specific water source), and identify the two strategies for each unit that require the greatest number of staff to implement within time periods compatible with successful performance. The number and composition of the individuals identified by this review comprise the minimum staffing for this function.

Table 3.1 also specifies the staffing necessary to support the simultaneous deployment of emergency repair and corrective action teams to each affected unit. The availability of this staffing will promote timelier restoration of installed plant safety systems to service and facilitate implementation of component modifications necessary to utilize equipment brought-in from offsite locations.

3.5 POSITION-SPECIFIC ASSESSMENT GUIDANCE

3.5.1 On-Site Radiation Protection Technicians

Following a beyond design basis external event, on-site Radiation Protection (RP) Technicians should be available in sufficient numbers to support performance of assigned emergency plan functions and the expanded response capability. The equation below should be used to determine the required number of on-site RP Technicians:

$$RPT_T = RPT_{COP} + RPT_{RCA} + RPT_{NC}$$

Where:

$$RPT_T = \text{Total required number of on-site RP Technicians}$$

⁹ Refer to NRC Letter, Enclosure 5, staffing information request #1.

RPT_{COP} = Number needed to support implementation of any 2 extended loss of AC power coping strategies per unit. Determine this number by reviewing strategies for each unit.

RPT_{RCA} = Number needed for repair and corrective action
= 2 x the number of units

RPT_{NC} = Number of on-site RP Technicians performing other emergency plan functions that would preclude them from performing job coverage for extended loss of AC power coping, repair or corrective action teams.

In the event of fuel damage, prevailing dose rates would likely require that the site's RP Technician complement be augmented with technicians from outside sources. A licensee should verify that provisions exist for obtaining additional RP Technicians (e.g., from other fleet or alliance sites, INPO emergency resources manual, contracted service providers, etc.).

3.5.2 Administrative Support Personnel

A licensee should determine if current assignments and locations of administrative support personnel are adequate for implementation of the expanded response capability, and identify necessary changes.

3.6 STAFFING FOR EXPANDED RESPONSE FUNCTIONS

A licensee should ensure the availability of a sufficient number of personnel to perform expanded response functions. This may be done in several ways, including:

- Assign responsibilities to existing ERO positions. Per NRC Letter staffing information request #1, the potential impacts from the assignment of new collateral duties should be assessed.
- Establish provisions for calling out additional individuals from the existing augmented ERO staff (e.g., calling out 2 engineering teams at a 2-unit site).
- Select and qualify additional personnel. Sources of additional staffing include site, corporate or contracted personnel. Site Security Department resources may also be considered.
- Consider the application of remote data access, meeting and other communications technologies to support the availability of required staffing.

Personnel identified by the staffing assessment as necessary for performing a planned or expected response action (e.g., an action described in a procedure or guideline) should be provided with appropriate training. Licensees should consider the applicability of the training requirements specified in 10 CFR 50, Appendix E, and related guidance.

3.7 WORK AREAS FOR PERSONNEL PERFORMING EXPANDED RESPONSE FUNCTIONS

A licensee should identify additional work areas necessary for the performance of expanded response functions. The use of alternate emergency response facilities should be considered.

3.8 ACTIVATING AN EXPANDED RESPONSE CAPABILITY

In accordance with the assumptions stated in Section 2, an expanded response capability will be needed following a beyond design basis external event that results in an extended loss of AC power affecting multiple units on a site. A licensee should develop an implementing strategy to integrate the expanded response capability into the existing augmented ERO (i.e., put in place the ability to transition to unit-specific performance of the functions listed in Tables 3.1 and 3.2). Such a strategy would include decision-making criteria for initiating the actions necessary to ensure timely performance of expanded response functions.

Suggested criteria for requiring activation of an expanded response capability would include:

- Loss of ALL offsite and ALL onsite power sources to AC emergency busses at more than 1 unit, OR
- Plant parameters or conditions require implementation of SAM strategies for more than 1 unit.

3.9 MOBILIZATION OF EXPANDED RESPONSE CAPABILITY STAFFING

Personnel performing expanded response functions should report to the site as soon as possible and within a timeframe sufficient to support implementation of those Transition Phase coping strategies which are not assigned to the on-shift staff. This will ensure that functions supporting core cooling, containment, and spent fuel pool cooling are continuously maintained. Staff mobilization strategies should be developed that support this goal.

Licensees should identify appropriate transportation resources that could be used to facilitate timely staff augmentation should an event impede normal site access. Resources of this type would vary depending upon the location of the site, and may include helicopters, all-terrain vehicles or boats. A listing of resource providers should be developed and made available to appropriate ERO personnel (e.g., in an emergency response telephone directory). Some arrangements may require a written agreement (e.g., Letter of Agreement, Memorandum of Understanding, contract, etc.).

3.10 CONSIDERATIONS FOR PROGRAM DOCUMENTS

The capability for responding to a beyond design basis external event does not need to be described in the emergency plan.

A licensee may choose to incorporate implementing instructions for expanded response functions into emergency plan implementing procedures, and/or extended loss of AC power, SAM or other program documents.

Development of, and changes to, procedures or guidelines that implement extended loss of AC power and SAM strategies should be assessed to determine if emergency response staffing levels are impacted. The establishment of appropriate administrative controls should be considered.

A licensee should determine if any changes are necessary to documents describing the emergency response drill and exercise program. In particular, standard objectives and extent-of-play may need to be revised to clarify the expected demonstration of functions that are dependent upon the type of scenario event or accident (i.e., within or beyond design basis, and number of affected units). For example, functions associated with an expanded response capability would not be demonstrated during a drill or exercise that involved a design basis accident affecting only one unit.

Table 3.1
Expanded Response Functions for Phase 1 Staffing Assessment

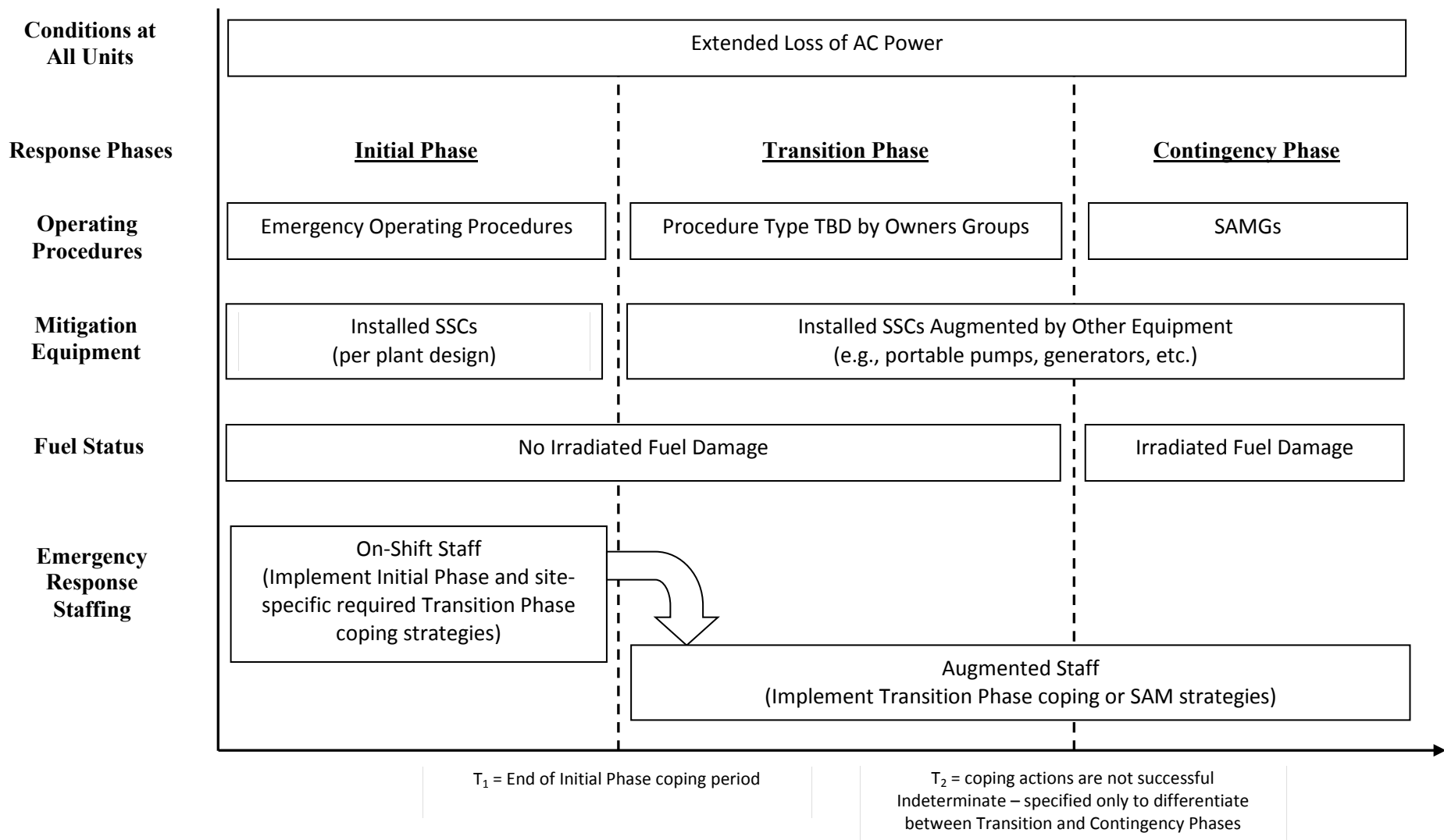
Expanded Response Function	Typical Location	Key Roles and Staffing Considerations
Unit Response Coordination	TSC	<ul style="list-style-type: none"> • Overall cognizance of the activities related to implementation of repair and corrective actions, and implementation of Transition Phase coping and Severe Accident Management (SAM) strategies for an assigned unit • One individual per unit; individuals should not be assigned other functions
Operations Coordination	TSC	<ul style="list-style-type: none"> • Provides coordination of Operations staff and support for an assigned unit • One individual per unit; individuals should not be assigned other functions
Maintenance Coordination	TSC or OSC	<ul style="list-style-type: none"> • Provides coordination of Maintenance staff and support for an assigned unit • One individual per unit; individuals should not be assigned other functions
Engineering Coordination	TSC or EOF	<ul style="list-style-type: none"> • Provides coordination of Engineering staff and support for an assigned unit • One individual per unit; individuals should not be assigned other functions
Engineering Assessments	TSC or EOF	<ul style="list-style-type: none"> • One team for each unit to perform engineering assessments in support repair and corrective actions • Team composition (i.e., number and represented disciplines) as described in the emergency plan • Team may include personnel responsible for performing other functions for the same assigned unit

Expanded Response Function	Typical Location	Key Roles and Staffing Considerations
Evaluation of Severe Accident Management (SAM) Strategies	TSC or EOF	<ul style="list-style-type: none"> • One team for each unit to evaluate selection of SAM strategies; team performs evaluations not done by Control Room personnel • Team composition (i.e., number and represented disciplines) as described in governing site programs, procedures and guidelines • Team may include personnel responsible for performing other functions for the same assigned unit
Unit In-Plant Team Coordination	OSC	<ul style="list-style-type: none"> • Overall cognizance of on-site and in-plant teams performing or supporting repair and corrective actions for an assigned unit • One individual per unit; individuals should not be assigned other functions
Non-Licensed Operators	OSC	<ul style="list-style-type: none"> • Two individuals per unit to assist with implementation of repair and corrective actions • Should not include members of the on-shift staff
Mechanical Maintenance Repair and Corrective Action	OSC	<ul style="list-style-type: none"> • Two individuals per unit to implement repair and corrective actions • Staffing may include an on-shift individual (i.e., 2 individuals for a unit composed of 1 on-shift and 1 augmented)
Electrical Maintenance Repair and Corrective Action	OSC	<ul style="list-style-type: none"> • Two individuals per unit to implement repair and corrective actions • Staffing may include an on-shift individual (i.e., 2 individuals for a unit composed of 1 on-shift and 1 augmented)
I&C Repair and Corrective Action	OSC	<ul style="list-style-type: none"> • Two individuals per unit to implement repair and corrective actions • Staffing may include an on-shift individual (i.e., 2 individuals for a unit composed of 1 on-shift and 1 augmented)
Implementation of SAM Strategies	OSC	<ul style="list-style-type: none"> • Number and composition of personnel capable of simultaneous implementation of any 2 SAM strategies at each unit • Should not include personnel assigned to other functions (e.g., emergency repair and corrective actions); however, may include members of the on-shift staff and personnel responsible for implementation of Transition Phase coping strategies

Table 3.2
Expanded Response Functions for Phase 2 Staffing Assessment

Expanded Response Function	Typical Location	Key Roles and Considerations
Evaluation of Transition Phase Coping Strategies	TSC or EOF	<ul style="list-style-type: none"> • One team for each unit to evaluate selection of Transition Coping strategies; team performs evaluations not done by Control Room personnel • Team composition (i.e., number and represented disciplines) as described in governing site programs, procedures and guidelines • Team may include personnel responsible for performing other functions for the same assigned unit
Implementation of Transition Phase Coping Strategies	OSC	<ul style="list-style-type: none"> • Number and composition of personnel capable of simultaneous implementation of any 2 Transition Phase coping strategies at each unit • Should not include personnel assigned to other functions (e.g., emergency repair and corrective actions); however, may include members of the on-shift staff and personnel responsible for implementation of SAM strategies

Figure 3.1
Simplified Framework for Responding to an Extended Loss of AC Power Event



4 COMMUNICATIONS DURING AN EXTENDED LOSS OF AC POWER

4.1 REQUIRED EMERGENCY COMMUNICATIONS CAPABILITIES

Consistent with emergency planning standard requirements, communications systems and equipment associated with the following emergency response functions should be available during an extended loss of AC power. Availability should be determined after a review of existing capabilities and consistent with the assumptions listed in Section 2. In particular, it is important that the primary and backup (if applicable) power source for each communications system or piece of equipment be identified.

End-point equipment identified for a communications link listed below should be used solely for the purpose indicated. For example, a satellite telephone assigned to the Control Room should not be credited for performing both Offsite Response Organization (ORO) and NRC notifications.

When performing this assessment, consideration should be given to the desirability of providing some communications capabilities in alternate facilities at offsite locations instead of their normal locations in on-site facilities.

4.1.1 Notifications to, and communications with, OROs [*per 10 CFR 50 Appendix E.IV.D and E.9.a*]

Emergency Response Facility	Minimum Communications Links
Control Room	1 per Control Room for Shift Communicator
Technical Support Center ¹⁰ (TSC)	1 for Key TSC Communicator
Emergency Operations Facility (EOF)	1 for Key EOF Communicator

4.1.2 Notifications to, and communications with, the Nuclear Regulatory Commission (NRC) Headquarters Incident Response Center and the appropriate NRC Regional Office Operations Center [*per 10 CFR 50 Appendix E.IV.D and E.9.d*]

Emergency Response Facility	Minimum Communications Links
Control Room	1 per Control Room for ENS Communicator
Technical Support Center (TSC)	1 for ENS Communicator
Location(s) where HPN communications are performed	1 for HPN Communicator

4.1.3 Communications between licensee emergency response facilities [*per 10 CFR 50 Appendix E.9.c. Additional links that support performance of critical response functions are also specified.*] The minimum communications links to support this function are listed below by facility. For example, if the normally used telephone system cannot be restored to service, these links could rely upon some combination of radio, sound-

¹⁰ If applicable per the site Emergency Plan.

powered and satellite-based communications systems.

Emergency Response Facility	Minimum Communications Links
Control Room	1 per unit
Technical Support Center (TSC)	1 each for: <ul style="list-style-type: none"> • Senior/Lead TSC Manager • Operations Coordination • Maintenance Coordination • Engineering Coordination • Radiological Support Additional response coordination links for multi-unit sites: <ul style="list-style-type: none"> • 1 for each position providing Unit Response Coordination.
Operational Support Center (OSC)	1 each for: <ul style="list-style-type: none"> • Senior/Lead OSC Manager • Radiological Support Additional response coordination links for multi-unit sites: <ul style="list-style-type: none"> • 1 for each position providing Unit In-Plant Team Coordination.
Emergency Operations Facility (EOF)	1 each for: <ul style="list-style-type: none"> • Senior/Lead Manager • Key Protective Measures • Operations or Technical Support (as needed to support performance of dose projections, formulation of PARs and plant status updates to ORO authorities).
Joint Information Center (JIC)	1 for Senior Manager

4.1.4 Communications with field/offsite monitoring teams [*per 10 CFR 50 Appendix E.9.c*]

Emergency Response Facility	Minimum Communications Links
Primary location where field/offsite monitoring team coordination is performed	Field/offsite monitoring team coordination
Primary location from which field/offsite monitoring teams are deployed	1 for each field/offsite monitoring team

4.1.5 Communications with other Federal agencies as described in the site emergency plan (e.g., the US Coast Guard) [*per 10 CFR 50 Appendix E.9.b*]

Emergency Response Facility	Minimum Communications Links
Primary location where communication with Federal agencies is performed	Coordination with Federal agencies

4.1.6 Coordination and direction of on-site and in-plant response teams. This includes teams necessary to affect emergency repairs, firefighting, search and rescue, radiological monitoring, and implementation of Transition Phase coping and severe accident management strategies. To accommodate the timeline associated with NRC Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (as discussed in Section 1), this element should be assessed in 2 phases.

4.1.6.1 Phase 1 Assessment

Emergency Response Facility	Minimum Communications Links
On-shift staff	Number necessary for the on-shift staff to perform Initial Phase coping actions
Operational Support Center (OSC) and other site-specific locations as necessary	1 each for: <ul style="list-style-type: none"> • On-site radiological monitoring 2 each for: <ul style="list-style-type: none"> • Firefighting (1 for brigade leader and 1 for the brigade) 2 each per unit for: <ul style="list-style-type: none"> • In-plant radiological monitoring • Search and Rescue • Emergency repairs Site-specific number needed to implement any 2 severe accident mitigation strategies

The results from this assessment should be included in the licensee response described in Action #5 of Table 1.1.

4.1.6.2 Phase 2 Assessment

Emergency Response Facility	Minimum Communications Links
Operational Support Center (OSC) and other site-specific locations as necessary	Site-specific number needed to implement any 2 strategies developed in response to NRC Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events

4.1.7 Other communications links based on site-specific needs identified during the assessment

4.2 PLANT PAGING (ANNOUNCEMENT) SYSTEM

NOTE

Perform this assessment if the plant paging (announcement) system is described in the site emergency plan as a method to communicate initial response instructions to the plant staff.

Because the assumed event would result in an initial declaration of a Site Area Emergency (at a minimum), all plant personnel would be directed to report to their assigned emergency response facilities or an assembly area, or exit the site. Once at an emergency response facility or assembly area, further communications to these individuals may be passed over the inter-facility communications links and provided via facility announcements. After the initial directions to plant personnel have been provided, the plant-paging system may be removed from service at any time as a means to extend battery life.

4.2.1 The following assessment actions should be performed.

- 4.2.1.1 Determine if the plant-paging system (e.g., Gai-Tronics) is powered from a battery-backed source and would remain available to provide the initial emergency declaration and direction announcement to the plant staff.
- 4.2.1.2 If the plant-paging system is powered from a battery-backed source, then no further action is required in this area.
- 4.2.1.3 If portions of the plant-paging system are not powered from a battery-backed source, then reasonable alternate methods should exist to provide emergency notification to the plant staff in the areas that would not receive an announcement. These methods should be capable of notifying essentially 100% of the plant staff within approximately 30 minutes.
- 4.2.1.4 If the plant-paging system is not powered from a battery-backed source, then perform some combination of the following actions.

1. Provide a battery-backed power source for all or portions of the plant-paging system.
2. Establish reasonable alternate methods as needed to provide emergency notification to the plant staff. These methods should be capable of notifying essentially 100% of the plant staff within approximately 30 minutes.

4.3 COMMUNICATIONS EQUIPMENT AT ORO FACILITIES

Some communications capability should be available at the ORO facilities that normally receive licensee notifications of an emergency declaration or a Protective Action Recommendation (as described in the site emergency plan). Through discussions with ORO and other appropriate personnel, identify the communications equipment that would remain operable during an extended loss-of-grid event. This determination should be made consistent with the assumptions listed in Section 2.

4.4 NOTIFICATION OF THE EMERGENCY RESPONSE ORGANIZATION (ERO)

To promote timely staff augmentation by the ERO, licensees should verify the following:

- ERO members can be notified of the emergency using a method that would be operable under the assumed event conditions (e.g., satellite pagers), AND/OR
- ERO members are trained to automatically respond to their assigned facilities or a designated staging area when made aware of an area wide loss-of-grid (e.g., by direct observation, media reports, word-of-mouth, etc.).

The information developed from this section should be included in the licensee response described in Action #4 of Table 1.1.

4.5 EQUIPMENT LOCATION REQUIREMENTS

To be assumed operable, a piece of on-site communications equipment should be in a location, and maintained in a manner, that maximizes survivability following a beyond design basis external event. In particular, the location or manner should reasonably preclude wetting from flooding or impact damage from a seismic event. The equipment itself does not need to be seismically qualified.

Equipment should be stored, or otherwise available, in locations that can be readily accessed when needed. To the degree practical, consider potential constraints to equipment access or movement when selecting a storage location.

When selecting storage locations, consider criteria presented in regulatory and industry guidance applicable to equipment associated with NRC Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (e.g., FLEX equipment).

The above guidance applies to equipment at the point of use (e.g., a radio) as well as any supporting infrastructure components. Such components may include portable power

sources, and radio system repeaters and antennas.

4.6 PERFORMANCE CHARACTERISTICS

The assessment should confirm that the systems and equipment identified for usage will support communications among and between:

- Licensee emergency response facilities, including Security
- Field/offsite monitoring teams and the location controlling deployment of the teams (e.g., the EOF)
- The Shift Communicator, Key TSC and EOF Communicators, and the ORO contact points.
- ENS and HPN communicators and the NRC staff.
- On-site and in-plant teams and the location controlling deployment of the teams (e.g., the OSC)

The assessment should also verify that a radio system(s) used by ERO personnel possesses the necessary design and operating characteristics to adequately support emergency communications.

Expected reliance upon “multi-use” equipment should be minimized. This means that communications equipment used to implement emergency response functions should not be relied upon to simultaneously support other functions (e.g., Security). In cases where multiple-usage is unavoidable, the assessment should consider the capability of the equipment to effectively perform under the expected conditions and the need for specific multi-use protocols.

4.7 OTHER ASSESSMENT CONSIDERATIONS

A portable backup AC power source for communications systems and components may be credited as operable provided that it is consistent with the assumptions and requirements discussed above, including location requirements. The assessment should consider the amount of power source fuel available on-site (e.g., available fuel will support the expected run time).

For battery-operated equipment, there should be a sufficient number of on-site and charged batteries to support operation of required equipment. This number should be determined with consideration given to the following items.

- A sufficient number of charged batteries should be available at the start of an event to support performance of the required emergency response functions listed in Section 4.1, Required Emergency Communications Capabilities.
- Use the vendor’s stated minimum reliable operability period for a fully-charged battery. This information may be modified if supported by a documented basis.
- The availability of on-site battery charging capability. Credit may be given to power source(s) and battery charging equipment consistent with the assumptions and

- requirements discussed above, including location requirements.
- Delivery of replacement batteries may be assumed to occur any time after T + 24 hours. The assessment should consider whether the batteries are delivered in a charged or uncharged state, and if uncharged, the time required for on-site charging.

Manual actions taken by emergency responders to facilitate the use of a particular means of communication may be credited provided that these actions are described in a response procedure or guideline. For example, radio communication relay zones may be employed if a procedure or guideline provides direction on where personnel need to be located and their equipment. The personnel necessary to implement these manual methods should be considered when determining required response staffing.

A licensee should coordinate with the Institute of Nuclear Power Operations (INPO) to identify communications equipment that may be obtained from industry sources and consider methods for making this information readily available to emergency managers.

4.8 QUALITY AND MAINTENANCE-RELATED REQUIREMENTS

Communications equipment, and related power sources and infrastructure, may be purchased and installed under the site requirements normally applied to other EP equipment. It is desirable that the equipment to be commonly available (e.g. commercial equipment) such that parts and replacements can be readily obtained.

Programmatic controls should be applied to all communications-related equipment to ensure availability and reliability, including the performance of periodic inventory checks and operability testing.

Supporting contracts with vendors should be periodically verified.

The guidance contained in INPO 10-007, *Equipment Important to Emergency Response*, should be reviewed for applicability.

4.9 NATIONAL COMMUNICATIONS SYSTEM (NCS) SERVICES

To enhance overall communications capabilities, each licensee should verify that they have arrangements in place to utilize the services offered by the NCS to the degree possible. These services include access to the Government Emergency Telecommunications Service (GETS), the Telecommunications Service Priority (TSP) program and the Wireless Priority Service (WPS). Information concerning these services may be obtained from their web site - <http://www.ncs.gov/>

4.10 COMMUNICATIONS PROVIDER EMERGENCY SERVICES

To enhance overall communications capabilities, each licensee should verify that they have arrangements in place to utilize the emergency services offered by their communications service provider(s) to the degree possible. As one example, see services offered by Verizon - <http://www.verizonbusiness.com/Products/communications/emergency/>

4.11 PERSONNEL TRAINING

Response personnel should receive periodic training on the location and use of communications systems and equipment.

5 REFERENCES

- 5.1** US Nuclear Regulatory Commission (NRC) letter, Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-Ichi Accident, dated March 12, 2012
- 5.2** SECY-11-0137, Prioritization of Recommended Actions to be taken in Response to Fukushima Lessons Learned , dated October 3, 2011
- 5.3** 10 CFR § 50.47 Emergency plans – Section (b)
- 5.4** 10 CFR § 50, Appendix B – Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants
- 5.5** 10 CFR § 50, Appendix E – Emergency Planning and Preparedness for Production and Utilization Facilities
- 5.6** NUREG 0696, Functional Criteria for Emergency Response Facilities
- 5.7** Federal Register Volume 76, Number 226; dated November 23, 2011; Pages 72560-72600
- 5.8** NEI 10-05, Assessment of On-Shift Emergency Response Organization Staffing and Capabilities
- 5.9** NSIR/DPR-ISG-01, Interim Staff Guidance – Emergency Planning for Nuclear Power Plants
- 5.10** NUREG-0654, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants
- 5.11** INPO 10-007, Equipment Important to Emergency Response