DUKE ENERGY.

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ONS-2015-077

June 17, 2015

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U.S. Nuclear Regulatory Commission
Washington, DC 20555

10 CFR 50.54(f)

Duke Energy Carolinas, LLC (Duke Energy)
Oconee Nuclear Station, Units 1, 2 and 3
Docket Numbers 50-269, 50-270, 50-287
Renewed License Numbers DPR-38, DPR-47, and DPR-55

Subject: Response to March 12, 2012, Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendation of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, Enclosure 5, Recommendation 9.3, Emergency Preparedness - Staffing, Requested Information Items 1, 2 and 6 -Phase 2 Staffing Assessment

References:

1. 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 (ADAMS Accession No. ML12053A340)
2. Duke Energy's 60 day response to March 12, 2012 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 May 9, 2012 (ADAMS Accession No. ML12132A377)
3. NEI 12-01, "Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities," Revision 0, dated May 2012
4. Duke Energy's Response to March 12, 2012, Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations Recommendation 9.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, Emergency Preparedness – Staffing, Requested Information Items 1, 2, and 6 - Staffing Assessment, dated April 30, 2013 (ADAMS Accession No. ML13127A192
5. NRC Letter, Response regarding Licensee Phase 1 staffing submittals associated with Near-Term Task Force Recommendation 9.3 related to the Fukushima Dai-ichi Nuclear Power Plant accident (ADAMS Accession No. ML13233A183), dated October 23, 2013

AX45
NRR

Ladies and Gentlemen,

On March 12, 2012, the NRC staff issued a Request for Information pursuant to 10 CFR 50.54(f) Regarding Recommendations 9.3 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident (Reference 1). Enclosure 5 of Reference 1 contains the

specific Requested Actions, Requested Information, and Required Response associated with Recommendation 9.3 for Emergency Preparedness - Staffing. Reference 1 also made provisions to provide an alternative course of action and establish different response dates.

Accordingly, Duke Energy submitted an alternative course of action by letter dated May 9, 2012 (Reference 2) and provided a schedule for responding to the requested Information related to Emergency Preparedness staffing. By letter dated April 30, 2013 (Reference 4) the Phase 1 staffing assessment was provided for Oconee Nuclear Station (ONS).

The NRC staff provided their review of the ONS Phase 1 staffing assessment in letter dated October 23, 2013 (Reference 5). The NRC review confirmed that the onsite minimum staff is sufficient to support required plant actions and emergency plan functions, without the assignment of collateral duties that would impact the performance of assigned emergency plan functions. As a result, the NRC staff concluded that the ONS Phase 1 staffing submittal adequately addresses the response strategies needed to respond to an event that results in a multi-unit Station Blackout.

The Attachment to this letter provides the Phase 2 Staffing Assessment Report for ONS in accordance with Nuclear Energy Institute (NEI 12-01) "Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities," (Reference 3).

There are no new or revised regulatory commitments associated with this letter.

If any further information is needed please contact David Haile at (864) 873-4742,

I declare under penalty of perjury that the foregoing is true and correct. Executed on June 17, 2015.

Sincerely,

Scott L. Batson

Vice President

Oconee Nuclear Station

Attachment:
Oconee Nuclear Station, NEI 12-01 Phase 2 Staffing Assessment Report

cc (with enclosure):

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Attachment to ONS-2015-077

Oconee Nuclear Station
Units 1, 2, and 3

Oconee Nuclear Station, NEI 12-01 Phase 2 Staffing Assessment Report

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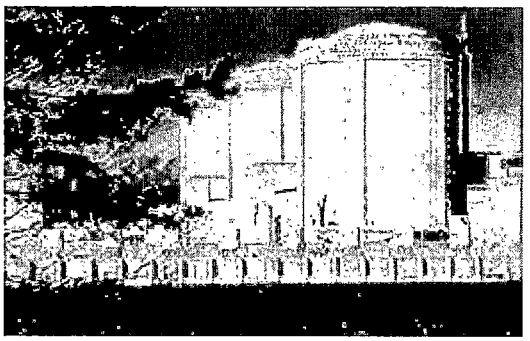

Oconee Nuclear Station (ONS)

NEI 12-01, Phase 2 - Staffing Assessment Report

Revision 0

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1. EXECUTIVE SUMMARY

Using the methodology of (Nuclear Energy Institute) NEI 12-01 Revision 0, Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities, this report presents the results of an assessment of the capability of the Oconee Nuclear Station (ONS) on-shift staff and augmented Emergency Response Organization (ERO) to respond to a beyond design basis external event (BDBEE). The assumptions for the NEI 12-01 Phase 2 scenario postulate that the BDBEE involves a large-scale external event that results in:

A. An extended loss of all AC power (ELAP)

B. An extended loss of ultimate heat sink (UHS)

C. Impact on all units (all three units are in operation at the time of the event)

D. Impeded access to the station by off-site responders as follows:

- 0 to 6 Hours Post Event – 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.
- 6 to 24 Hours Post Event – 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).
- 24+ Hours Post Event – 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 team of subject matter experts from Operations, Maintenance, Security, Radiation Protection, Chemistry, Emergency Preparedness and industry consultants performed tabletop exercises in March and April 2015 for the on-shift portion of the assessment. The participants reviewed the assumptions and applied existing procedural guidance, including applicable draft FLEX Guidelines (FGs) for coping with a BDBEE using minimum on-shift staffing. Particular attention was given to the sequence and timing of each procedural step, its duration, and the on-shift individual performing the step to account for both the task and time motion analyses of NEI 10-05, Assessment of On-Shift Emergency Response Organization Staffing and Capabilities.

Analysis result items are listed in Section 3.4 and have been entered into the corrective action program.

1.1 On-shift ERO Analysis

The on-shift ERO analysis concluded that the current ONS on-shift staffing present for the "no site access" 6-hour time period is sufficient to perform the EOP, FG and emergency response tasks. However, shift personnel are not yet trained to perform the FG tasks.

Note – the Acronym SPOC is used in this report to refer to a team of Maintenance support personnel assigned to 24 hr coverage, 7 days a week. Recent merger changes also use a synonymous term of FIN 24 for the same team.

1.2 Expanded ERO Analysis

The expanded ERO analysis concluded that the current ONS augmenting ERO is sufficient to fill positions for the expanded ERO functions. Thus, the ERO resources and capabilities necessary to implement Transition Phase coping strategies performed after the end of the "no site access" 6-hour time period do exist in the current program.

2 INTRODUCTION

In March 2012, the Nuclear Regulatory Commission (NRC) issued a §50.54(f) request for information regarding recommendations from the near-term task force review of insights from the Fukushima Dai-Ichi accident (see Reference 5). Enclosure 5 of the §50.54(f) letter related to Emergency Preparedness and contained requests involving performance of staffing assessments. The actions for the staffing assessment are summarized as follows:

> *It is requested that addressees assess their 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 natural event and determine if any enhancements are appropriate given the considerations of Near-Term Task Force (NTTF) Recommendation 9.3*[1].

A two-phased approach was established by the industry to respond to the information requests contained in the §50.54(f) letter associated with staffing. Additionally, NEI developed a technical report (NEI 12-01, Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities) that includes the recommended criteria for use in performing the staffing assessment for a beyond design basis external event. The criteria presented in the NEI 12-01 technical report provide for documenting the organizational capabilities that will facilitate simultaneous performance of accident mitigation and repair actions following a beyond design basis external event.

Note – Use of the term ELAP throughout this report also assumes a loss of the ultimate heat sink as part of the event.

2.1 Phase 1 Staffing Assessment

The objective of the Phase 1 staffing assessment was to evaluate the *on-site and augmented staff* needed to respond to a large-scale external event at a multi-unit site meeting the conditions described in the NEI 12-01 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). That is, the Phase 1 staffing assessment considered the requested functions except those related to Fukushima NTTF Recommendation 4.2.

The ONS Phase 1 staffing assessment was submitted to the NRC on 4/30/13. NRC letter, "Response Regarding Licensee Phase 1 Staffing Submittals Associated with Near-Term Task Force Recommendation 9.3 Related to the Fukushima Dai-Ichi Nuclear Power Plant Accident," dated 10/23/13, provided regulatory approval of the Phase 1 staffing report.

[1] For background information, refer to NRC staff report SECY-11-0093, entitled, Recommendations for Enhancing Reactor Safety in the 21st Century, dated July 12, 2011 [ADAMS ML111861807 - NTTF report]

2.2 Phase 2 Staffing Assessment

Sites with one or more operating units are required to perform a Phase 2 staffing assessment no later than four months prior to beginning of the second refueling outage (as used within the context of NRC Order EA-12-049) or 12/31/16, whichever comes first. In contrast to the Phase 1 staffing assessment, the Phase 2 staffing assessment considers the response functions related to Order EA-12-049.

The Phase 2 staffing assessment for response functions related to Order EA-12-049 must be based on the actions delineated in the procedures and guidelines developed in response to the Order to ensure accurate results. Once the site-specific actions associated with the new response strategies are defined (i.e., down to the procedure or guideline step level), the staffing needed to perform these actions can be assessed with the necessary level of accuracy.

The results of the Phase 2 assessment have been verified and validated to ensure adequacy and accuracy. In accordance with the requirements of 10 CFR 50, Appendix B, corrective actions and enhancements identified during the assessment are entered into the corrective action program. With regard to this assessment, analysis result items related to ERO staffing that constitute an unsatisfactory result in accordance with the specifications of NEI 10-05 or NEI 12-01 are entered into the corrective action program.

Draft Emergency Operating Procedure (EP) and FLEX Guidelines (FG) documents were used during the conduct of the staffing assessments. Prior to the ONS implementation date associated with Order EA-12-049 per the current refueling outage schedule, a review of this report will be performed based on the final validated FGs and any applicable new procedures not available when the staffing table tops were performed. This report will be updated if the staffing assessment results change.

3 PHASE 2 STAFFING ANALYSIS SUMMARY

The on-shift ERO analysis concluded that current ONS on-shift staffing present for the "no site access" 6-hour time period is sufficient to perform the EP, FG and emergency response tasks. However, shift personnel are not yet trained to perform the FG tasks.

The expanded ERO analysis concluded that the current ONS augmenting ERO is sufficient to fill positions for the expanded ERO functions. Thus, the ERO resources and capabilities necessary to implement Transition Phase coping strategies performed after the end of the "no site access" 6-hour time period do exist in the current program.

3.1 On-Shift Staffing Task Analysis Results

Refer to Section 6.2, On-Shift Staffing Analysis Results Tables, for documentation of the on-shift staffing task analysis results.

3.1.1 Unassigned Tasks

The task analysis did not identify any unassigned tasks.

3.1.2 Performance Validation

Note – Per NEI 10-05, a validated task is one that has a controlling method (i.e., a program or process) by which the capability to perform the task has been analyzed, such as within the Operations Training Program or the EP Drill Program.

The task analysis did not identify any EP or Emergency Plan tasks performed by the on-shift positions that were not validated.

The task analysis did identify that the performance of FG tasks is currently not incorporated into the operator or other applicable training program.

3.1.3 Potential Overlap

The task analysis identified two potential task overlaps that were performed by the on-shift personnel in response to the ELAP event.

- The Communicator performed the tasks of State/Local notification (5/9) and NRC notifications (5/13) using the satellite phone. Per NEI 10-05 Table 3-1, personnel that perform continuous NRC communications and other tasks must be evaluated by time motion analysis.
- The Fire Brigade Leader performed the tasks of Contact with the National SAFER Resource Center (NSRC) (2/20) and State/Local notification (5/9) using the satellite phone. Per NEI 10-05 Table 3-1, personnel that perform State/Local notification (5/9) and other operations related tasks must be evaluated by time motion analysis. *(Note: The parenthetical references equates to (Table#/line#) in Section 6.2)*

The Security Shift Supervisor performs security contingency plan and Emergency Plan tasks (personnel accountability) during the ELAP event. A representative of the ONS Security Department analyzed the Emergency Plan task assigned to SSS. It was concluded that performance of the Emergency Plan task did not cause an overlap with the Security Plan tasks. Tasks related to the Security Plan are not specifically documented in this analysis due to their security-sensitive nature. No security personnel credited in the Security Plan were assigned tasks associated with the implementation of mitigating strategies during the ELAP event.

3.2 On-Shift Staffing Time Motion Study (TMS) Results

Note – Time motion analysis data was developed during the task analysis using draft FGs and the informed judgment of the FLEX subject matter experts. In accordance with the methodology provided in NEI 10-05 informed judgment can be used for tasks where directly applicable operating experience is not available and actual timed performance is not practical.

Refer to Attachment 3, NEI 10-05 Appendix D and E On-Shift Staffing Analysis Results Tables, for additional documentation of the on-shift staffing time motion study results.

3.2.1 Unassigned Tasks

The time motion analysis did not identify any unassigned tasks.

3.2.2 Overlap Resulting in Overburden

The time motion analysis did not identify any task overlap that resulted in overburden of the position.

- The Communicator performed the tasks of State/Local notification (5/9) and NRC notifications (5/13) using the satellite phone. The State/local notification task was performed for the initial SAE notification from T=30 to T=60. NRC continuous communications began at T=75 following the attempt to activate ERDS (5/11). Responsibility for follow-up State/local notification was then assigned to the Fire Brigade Leader. Communicator task performance was sequential and thus not an overlap.
- The Fire Brigade Leader performed the tasks of Contact NSRC (2/20) and State/Local notification (5/9) using the satellite phone. Follow-up State/local notifications were performed from T=90 to T=120, T=150 to T=180, T=210 to T=240, T=270 to T=300 and T=330 to T=360. Contact NSRC was performed from T=128 to T=138. Fire Brigade Leader task performance was sequential and thus not an overlap.

3.3 Augmented and Expanded ERO Assessment Results

Refer to Section 7 for details of the expanded ERO functional staffing resources.

NEI 12-01 Table 3.1, less SAMG implementation, assumes a specified staffing consideration for one unit is multiplied by the number of units, then doubled in order to support expanded ERO staffing for two 12-hour shifts.

(Note: While ONS has three units, it only has two control rooms due to a shared control room for Units 1 and 2. A shared TSC and OSC supports all three units)

Based on the NEI 12-01 assumption that the expanded ERO needs 2 Operations Superintendents per unit for 24/7 shift coverage, the analysis identified that augmented ERO personnel had only 5 of the 6 qualified Operations Coordinators assumed for ELAP.

Additionally, the expanded ERO analysis determined that agreements and company resources, and their logistics, have been implemented to allow the transportation of the expanded ERO and equipment to the station.

3.4 List of Analysis Results

The following items are the analysis results from this assessment that were documented in the corrective action program to ensure they don't potentially hinder station personnel from performing response tasks in a timely manner:

Analysis Result Item Description
#1: Prior to the ONS implementation date associated with Order EA-12-049 per the current refueling outage schedule, a review of this report will be performed based on the final validated FGs and any applicable new procedures not available when the staffing tabletop reviews were performed. This report will be updated if the staffing assessment results change.
#2: ONS has 5 Operations Superintendents credited in the ERO. The NEI 12-01 methodology assumes that 6 are needed in order to support 24/7 staffing of a three unit event.
#3 ONS Drill and Exercise procedures do not currently include evaluation objectives or demonstration criteria for FLEX.
#4 The position specific ERO response assessment confirmed that there were an adequate number of qualified personnel for the 2 most manpower intensive strategies, but it was unclear if all personnel had a method to be called in or were trained to self-report.

4 SCOPE OF THE ELAP ERO STAFFING ASSESSMENT

1. Evaluate the ability of the on-shift staff to implement Initial Phase coping actions and, consistent with the site access assumption, evaluate Transition Phase actions that must be performed prior to the end of the "no site access" 6-hour time period.
   - Initial Phase – Implementation of strategies that generally rely upon installed plant equipment.
   - Transition Phase – 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. Setup for these strategies may be performed prior to the end of the Initial Phase as determined by procedure.
2. Evaluate the applicable EOP actions and FG strategies for the ELAP event in place at the time of the assessment.
   - Such actions 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 for multi-unit sites (since all units are assumed affected).
3. Evaluate the existing EOPs and draft FGs for responding to an extended loss of AC power affecting all units.
4. Evaluate whether the ability of the on-shift staff to perform any required emergency response functions would be degraded or lost prior to the arrival of the augmented ERO.
5. Consistent with the site access assumption, evaluate the ability of the augmented staff to implement Transition Phase coping strategies performed after the end of the "no site access" 6-hour time period.

5 ASSUMPTIONS OF THE ELAP ERO STAFFING ASSESSMENT

1. The ELAP event occurs during off-normal work hours at a time when augmented ERO responders are not at the site (e.g., during a backshift, weekend or holiday). This analysis uses 6 hours as the time period to conduct the on-shift ERO response actions. See assumption 13.A below.
2. Only personnel required to be on-shift are credited in the staffing analysis. Interim minimum on-shift staffing reductions allowed by Technical Specifications and/or Technical Requirements Manual are not invoked for the study.

   The on-shift personnel complement for this event includes the minimum required number and composition as described in the ONS Emergency Plan.

Functional Area	Major Tasks	Emergency Positions	Analysis Shift Staffing
1. Plant Operations and Assessment of Operational Aspects (a)	Control Room Staff	CR Supervisor (SRO) Control Room Operator (RO) Non-Licensed Operator (NLO)	3 6 3
2. Emergency Direction and Control	Command and Control	Ops Shift Manager (SM)	1
3. Notification & Communication	Licensee	Operator (SRO/RO/NLO)	1[b]
	Local/ State	SRO	1
	Federal	Operator (SRO/RO/NLO)	1[b]
4. Radiological Assessment	Dose Assessment	RP Qualified Individual	1
	In-plant Surveys	RP Qualified Individual	1
	Onsite Surveys	RP Qualified Individual	1
	Chemistry	Chemistry Technician	1
5. Plant System Engineering, Repair, and Corrective Actions	Tech Support – OPs	Shift Technical Advisor	1
	– Core Damage	Shift Technical Advisor	1[a]
	Repair and Corrective Actions	Mechanical Maintenance IAE Maintenance	2 2
6. In-Plant PAs	Radiation Protection	RP Qualified Individual	2[a]
7. Fire Fighting (c)	--	Fire Brigade Lead (SRO/NLO) Fire Brigade Member (NLO) Fire Brigade Member	1 4 5[b, c]
8. 1st Aid and Rescue	--	MERT (d)	2
9. Site Access Control and Accountability	Security & Accountability	Security Shift Supervisor Security Personnel	1 (e)
		Minimum # of Personnel:	**31**

(a) The control Room staff complement is reflective of 3 units in operation.

(b) May be filled by an individual filling another position provided they are qualified to do the collateral functional.

(c) The Fire Brigade requirement of ten members is met by using five personnel from Operations (including the Fire Brigade Leader) and five personnel from either SPOC, Radiation Protection, Chemistry or Security (SLC 16.13.1).

(d) The Medical Emergency Response Team (MERT) can be filled by any qualified technician.

(e) Per Duke Energy ONS Security Plan.

3. On-shift personnel can report to their assigned response locations within timeframes sufficient to allow for performance of assigned actions. The following are the assumed locations of the on shift personnel:
   - Operations Shift Manager (SM) ..... SM Office
   - Shift Technical Advisor (STA) ..... Work Control Center
   - U1 Control Room Supervisor (CRS1) ..... Control Room
   - U2 Control Room Supervisor (CRS2) ..... Control Room
   - U3 Control Room Supervisor (CRS3) ..... Control Room
   - Communicator (COM) ..... Work Control Center
   - U1 At the Controls RO (OATC1) ..... Control Room
   - U1 Balance of Plant RO (BOP1) ..... Control Room
   - U2 At the Controls RO (OATC2) ..... Control Room
   - U2 Balance of Plant RO (BOP2) ..... Control Room
   - U3 At the Controls RO (OATC3) ..... Control Room
   - U3 Balance of Plant RO (BOP3) ..... Control Room
   - U1 Nuclear Equipment Operator #1 (AO1) ..... Control Room
   - U1 Nuclear Equipment Operator #2 (AO4) ..... Turbine Building
   - U2 Nuclear Equipment Operator #1 (AO2) ..... Control Room
   - U2 Nuclear Equipment Operator #2 (AO5) ..... Turbine Building
   - U3 Nuclear Equipment Operator #1 (AO3) ..... Control Room
   - U3 Nuclear Equipment Operator #2 (AO6) ..... Turbine Building
   - Nuclear Equipment Operator – Outside (AO7) ..... Turbine Building
   - Fire Brigade Lead (FBL) ..... Work Control Center
   - Mechanical Technician #1 (Mech1) ..... Turbine Building
   - Mechanical Technician #2 (Mech2) ..... Turbine Building
   - I&E Technician #1 (IAE1) ..... Turbine Building
   - I&E Technician #2 (IAE2) ..... Turbine Building
   - RP Technician #1 (RP1) ..... Turbine Building
   - RP Technician #2 (RP2) ..... Auxiliary Building
   - RP Technician #3 (RP3) ..... Auxiliary Building
   - Chemistry Technician (Chem) ..... Warehouse #3
   - Security Shift Supervisor (SAS) ..... SAS
   - MERT #1 (MERT1) ..... PAP
   - MERT #2 (MERT2) ..... PAP

   Note: Auxiliary Operator (AO) is equivalent to Non-Licensed Operator (NLO)
4. Equipment credited in current coping strategies remains available for use including the FLEX equipment connections and system interfaces.

5. The total loss of AC power affecting all three units assumes the following:
   - Appendix "R" emergency lighting is available during the period of power loss and operators can carry flashlights.
   - If a security emergency diesel generator (EDG) exists, consider it unavailable..
   - The Public Address System is not powered.
   - Plant operations radios are available throughout the event (using installed and spare batteries).
   - Satellite phones are available throughout the event.
   - ERDS and ERFIS communications capabilities are lost as a result of the 25 mile telecommunications blackout range.
   - Power operated door locks can be overridden by key or other mechanism.
6. The Standby Shutdown Facility (SSF) will be activated, as it is robust per the guidance of NEI 12-06.
7. A Hostile Action directed at the affected site does not occur during the period that the site is responding to the event.
8. The on-shift staff possesses the necessary Radiation Worker qualifications to obtain normal dosimetry and to enter Radiological Controlled Areas (but not high, locked high or very high radiation areas) without the aid of a RP Technician.
9. The on-site security organization is able to satisfactorily perform tasks related to Site and Protected Area Access Controls. Performance of this function is regularly analyzed through other station programs and will not be evaluated here, unless a role or function from another major response area is assigned as a collateral duty.

   The use of Security personnel for any mitigation actions must be in accordance with NEI guidance. (Refer to Attachment 1 Reference #4)
10. Individuals holding the position of RP Technician or Chemistry Technician are qualified to perform the range of tasks expected of their position.
11. The task of making a simple and brief communication has minimal impact on the ability to perform other assigned functions/tasks, and is therefore an acceptable collateral duty for all positions. Examples include making a plant page announcement or placing a call for assistance to an offsite resource such as local law enforcement. This assumption does not apply to emergency notification to an Offsite Response Organization or the NRC.
12. The task of performing a peer check has minimal impact on the ability to perform other assigned functions/tasks, and is therefore an acceptable collateral duty for all positions. Examples include performing a peer check on a recommended emergency classification or notification form for transmittal to offsite authorities.
13. 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. Thus, adequate core cooling is maintained throughout the 6 six hour duration. No core damage occurs and no entry into Severe Accident Management Guidelines (SAMGs) is required.

14. The event impedes site access as follows:
    A. Post event time: 6 hours – No site access. It is assumed that those Emergency Plan functions performed by the augmented ERO will be delayed for the 6-hour period (e.g., offsite field monitoring).
    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.
15. All offsite facilities and staging areas are available including those located within the 25 mile telecommunications blackout range.

6 ON-SHIFT ERO RESPONSE CAPABILITY

This section of the assessment documents the ability of the on-shift ERO to implement emergency procedures and coping strategies performed prior to the end of the "no site access" 6 hour time period.

6.1 ELAP Event Description and Initial Conditions

A large-scale external event occurs that results in a loss of off-site power combined with a failure of the emergency and SBO diesel generators to load. The scope of the event includes the following conditions:

- an extended loss of AC power (ELAP) event occurs
- an extended loss of ultimate heat sink (LUHS) occurs
- all three units are impacted (all units are in operation at the time of the event)
- station access is impeded

Initially, all three reactors are operating at full power. Upon the loss of AC power, all reactors are successfully shut down.

This event results in a Site Area Emergency (SAE) Emergency Classification Level (ECL) based on Emergency Action Level (EAL) [4.5.S.1], Loss of all AC. The scenario is designed such that restoration of any AC power source is not possible before the arrival of ERO personnel (6 hours).

Initial Conditions

All three units are at 100% power at equilibrium, middle of core life.

Scenario Events

An offsite electrical transient occurs resulting in a loss of all offsite power.

No Emergency Diesel Generators (EDGs) can be synchronized to any unit AC bus, resulting in a multi-unit Loss of all AC power. For ONS this equates to a loss of power to the Emergency busses from any power source (e.g., loss of Keowee Hydro, Lee Combustion turbine, etc.).

Adequate core cooling is maintained throughout the 6-hour duration. No core damage occurs and no entry into SAMG is required.

No abnormal radiological conditions exist during this event.

Note – refer to Attachment 1 for a list of procedures used to assess the tasks performed during the ELAP scenario.

The Standby Shutdown Facility (SSF) is operable during the time period under analysis.

6.2 On-Shift Staffing Analysis Results Tables

TABLE 1 – On-Shift Positions **Extended Loss of All Power (ELAP)**

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	Time Motion Study (TMS) Required?
1.	Operations Shift Manager (SM)	Figure B-8a	360	2 / 1 5 / 1 5 / 3 5 / 5 5 / 8	No	No
2.	Shift Technical Advisor (STA)	Figure B-8a	360	2 / 2	No	No
3.	U1 Control Room Supervisor (CRS1)	Figure B-8a	360	2 / 3 EOP 2 / 3 FG	No Yes	Yes
4.	U2 Control Room Supervisor (CRS2)	Figure B-8a	360	2 / 4 EOP 2 / 4 FG	No Yes	Yes
5.	U3 Control Room Supervisor (CRS3)	Figure B-8a	360	2 / 5 EOP 2 / 5 FG	No Yes	Yes
6.	Communicator (COM)	Figure B-8a	360	5 / 9 5 / 11 5 / 13	No	Yes
7.	U1 ATC RO (OATC1)	Figure B-8a	360	2 / 7 EOP 2 / 7 FG	No Yes	Yes
8.	U1 BOP (BOP1)	Figure B-8a	360	2 / 8 EOP 2 / 8 FG	No Yes	Yes
9.	U2 ATC RO (OATC2)	Figure B-8a	360	2 / 9 EOP 2 / 9 FG	No Yes	Yes
10.	U2 BOP (BOP2)	Figure B-8a	360	2 / 10	No	No
11.	U3 ATC RO (OATC3)	Figure B-8a	360	2 / 11 EOP 2 / 11 FG	No Yes	Yes
12.	U3 BOP (BOP3)	Figure B-8a	360	2 / 12	No	No
13.	U1 Nuclear Eq. Operator #1 (AO1)	Figure B-8a	360	2 / 13 EOP 2 / 13 FG	No Yes	Yes
14.	U1 Nuclear Eq. Operator #2 (AO4)	Figure B-8a	360	2 / 14	No	No
15.	U2 Nuclear Eq. Operator #1 (AO2)	Figure B-8a	360	2 / 15 EOP 2 / 15 FG	No Yes	Yes
16.	U2 Nuclear Eq. Operator #2 (AO5)	Figure B-8a	360	2 / 16	No	No
17.	U3 Nuclear Eq. Operator #1 (AO3)	Figure B-8a	360	2 / 17 EOP 2 / 17 FG	No Yes	Yes
18.	U3 Nuclear Eq. Operator #2 (AO6)	Figure B-8a	360	2 / 18	No	No

Line	On-shift Position	Emergency Plan Reference	Augmentation Elapsed Time (min)	Role in Table#/Line#	Unanalyzed Task?	Time Motion Study (TMS) Required?
19.	Outside Nuclear Eq. Operator (AO7)	Figure B-8a	360	2 / 19	No	No
20.	Fire Brigade Leader (FBL)	Figure B-8a	360	2 / 20 FG 5 / 9 EP	Yes No	Yes
21.	IAE Technician #1 (IAE1)	Figure B-8a	360	2 / 21	Yes	Yes
22.	IAE Technician #2 (IAE2)	Figure B-8a	360	2 / 22	Yes	Yes
23.	Mechanical Technician #1 (Mech1)	Figure B-8a	360	2 / 23	Yes	Yes
24.	Mechanical Technician #2 (Mech2)	Figure B-8a	360	2 / 24	Yes	Yes
25.	RP Technician #1 (RP1)	Figure B-8a	360	N/A	N/A	N/A
26.	RP Technician #2 (RP2)	Figure B-8a	360	N/A	N/A	N/A
27.	RP Technician #3 (RP3)	Figure B-8a	360	4 / 6	No	No
28.	Chemistry Technician (Chem)	Figure B-8a	360	N/A	N/A	N/A
29.	Security Shift Supervisor (SAS)	Figure B-8a	360	5 / 15	No	No
30.	MERT #1 (MERT1)	Figure B-8a	360	N/A	N/A	N/A
31.	MERT #2 (MERT2)	Figure B-8a	360	N/A	N/A	N/A

Note: NEI 10-05 requirements for Time Motion Study analysis following the identification of potential task overlap are satisfied by evaluating the timing and duration of the activities by subject matter experts during the task analysis table top. See Section 3.2.

TABLE 2 – Plant Operations & Safe Shutdown **Extended Loss of All Power (ELAP)**

Minimum Operations Crew (Three Units – Two Control Rooms)

Line	On-Shift Position	Task Description	Controlling Method
1.	Operations Shift Manager (SM)	Plant and crew oversight (AD-OP-ALL-1000)	Ops Training
2.	Shift Technical Advisor (STA)	STA tasks (AD-OP-ALL-1000)	Ops Training
3.	U1 Control Room Supervisor (CRS1)	Direct OATC1 to perform immediate actions (EP/1/A/1800/001, Steps 3.1–3.5) Transfer to the Blackout Tab and verify AP/25 in progress (AP/25) Perform steps 1-6 and direct OATC1 to perform step 7, Enclosure 5.32, Load Shed of Inverters (EP/1/1800/001, Blackout tab, Steps 1-7) Read EP/1/A/1800/001 Blackout Tab Steps 8-41 Direct step 34, Enclosure 5.44, Parallel Actions for SBO (EP/01 Blackout tab Step 34) Direct AO5 to emergency purge generator H_2 (EP/001, Blackout tab, Step 28) Direct BOP1 to cooldown RCS to 240-250° F (EP/001, Blackout tab, Steps 192-194) Initiate initial assessment and FLEX equipment staging per FG/0/A/1900/005 (EP/001, Blackout tab, Step 35, IAAT)	Ops Training
		Dispatch FBL to contact NSRC (FG/005, Step 4.1-4.2) Direct Mech1&2, IAE1&2 to perform debris removal and perform FG/005 Enclosures 5.5, SPOC Supervisor Actions for ELAP, and 5.7, staging FLEX mitigation strategies pump at intake Direct OATC1 to perform in plant U1 damage assessment (FG/005, Enclosure 5.1) Verify all units in MODE 1-4 (FG/005, Step 4.7) Direct AO1 to perform U1 external damage assessment (FG/005, Enclosure 5.1) Direct staging FLEX equipment for ELAP (FG/005, Section 4A)	N/V (None In Place)
4.	U2 Control Room Supervisor (CRS2)	Direct OATC2 to perform immediate actions (EP/2/A/1800/001, Steps 3.1–3.5) Transfer to the Blackout Tab and verify AP/25 in progress (AP/25) Power PSW - Step 1 RNO 7 realizes no power to PSW (U2 Encl 5.42) Perform steps 1-6 and direct OATC2 to perform Enclosure 5.32, Load Shed of Inverters (EP/2/1800/001, Blackout tab, Steps 1-7) Read EP/2/A/1800/001 Blackout Tab Steps 8-41 Direct step 34, Enclosure 5.44, Parallel Actions for SBO (EP/01 Blackout tab Step 34) Direct BOP2 to cooldown RCS to 240-250° F (EP/001, Blackout tab, Steps 192-194)	Ops Training
		Direct OATC2 to perform in plant U2 damage assessment (FG/005, Encl 5.2) Direct AO2 to perform U2 external damage assessment (FG/005, Encl 5.2) Direct Section 4B Unit 2, staging FLEX equipment for flood events (FG/005, Section 4B Unit 2) Direct AO1, AO2 and RP1 to initiate and align Alternate Spent Fuel Cooling to Boggs Box (FG/005, Section 4A, Step 20)	N/V (None In Place)

Line	On-Shift Position	Task Description	Controlling Method
5.	U3 Control Room Supervisor (CRS3)	Direct OATC3 to perform immediate actions (EP/3/A/1800/001, Steps 3.1–3.5) Transfer to the Blackout Tab and verify AP/25 in progress (AP/25) Perform steps 1-6 and direct OATC to perform Enclosure 5.32, Load Shed of Inverters (EP/3/1800/001, Blackout tab, Steps 1-7) Read EP/3/A/1800/001 Blackout Tab Steps 8-41 Direct Enclosure 5.44, Parallel Actions for SBO (EP/01 Blackout tab Step 34) Direct BOP3 to C/D RCS to 240-250° F (EP/001, Blackout tab, Steps 192-194)	Ops Training
		Direct OATC3 to perform in plant U3 damage assessment (FG/005, Encl 5.3) Direct AO3 to perform U3 external damage assessment (FG/005, Encl 5.3) Direct section 4a, staging phase 2 FLEX equipment for ELAP events (FG/005, Section 4A)	N/V (None In Place)
6.	Communicator (COM)	N/A	N/A
7.	U1 ATC RO (OATC1)	Perform manual actions (EP/001, Steps 3.1–3.5) Dispatch AO1 to manually start U1 TDEFDWP (EP/001, Rule 3, Steps 1–17) Verify cross-tie with alternate unit is desired and dispatch AO4 to cross tie EFW for U1 (EP/001, Rule 3, Step 18) Read step to establish SG feed from PSW (EP/001, Rule 3, Step 22) Direct AO1 to load shed inverters (EP/001, Step 7) Determine SSF Status (EP/001 Blackout tab Step 27) Perform restoration of power (EP/01 Blackout tab Encl 5.38) Direct AO4/5 to open atmospheric dump bypass valves (EP/001, Encl 5.24, Step 1) Perform step 34, parallel actions for SBO (EP/001, Encl 5.44)	Ops Training
		Perform U1 in plant damage assessment (FG/005, Encl 5.1)	N/V (None In Place)
8.	U1 BOP (BOP1)	Initiate SSF EOP AP/0/A/1700/025 (EP/001, Step 3.5 RNO) Verify an RO is staged to perform AP/25 at SSF (AP/25, through Step 4.3) Feed SG with ASW and seals with RC makeup pump from SSF (AP/25) Direct AO4 to isolate PDW (AP/25, Step 4.24) Cooldown RCS to 240-250° F (EP/001, Blackout tab, Steps 192-194)	Ops Training
		Direct IAE1 and MECH1 to prepare the Dedicated Submersible Pump for installation in Unit 2 CCW piping per AM/0/A/1300/059 (AP/25, Step 4.23)	N/V (None In Place)
9.	U2 ATC RO (OATC2)	Perform manual actions (EP/001, Steps 3.1–3.5) Dispatch AO2 to manually start U2 TDEFDWP (EP/001, Rule 3, Steps 1–17) Verify cross-tie with alternate unit is desired and dispatch AO5 to cross tie EFW for U2 (EP/001, Rule 3, Step 18) Read step to establish SG feed from PSW (EP/001, Rule 3, Step 22) Direct AO2 to load shed inverters (EP/001, Step 7) Direct AO6/7 to open atmos dump bypass valves (EP/001, Encl 5.24, Step 1) Determine SSF Status (EP/001 Blackout tab Step 27) Perform restoration of power (EP/01 Blackout tab Encl 5.38) Perform step 34, parallel actions for SBO (EP/001, Encl 5.44)	Ops Training

Line	On-Shift Position	Task Description	Controlling Method
		Perform U2 in plant damage assessment (FG/005, Encl 5.2)	N/V (None In Place)
10.	U2 BOP (BOP2)	Initiate SSF EOP AP/0/A/1700/025 (EP/001, Step 3.5 RNO) Verify an RO is staged to perform AP/25 at SSF (AP/25, through Step 4.3) Feed SG with ASW and seals with RC makeup pump from SSF (AP/25) Cooldown RCS to 240-250° F (EP/001, Blackout tab, Steps 192-194)	Ops Training
11.	U3 ATC RO (OATC3)	Perform manual actions (EP/001, Steps 3.1–3.5) Dispatch AO3 to manually start U3 TDEFDWP (EP/001, Rule 3, Steps 1–17) Verify cross-tie with alternate unit is desired and dispatch AO6 to cross tie EFW for U3 (EP/001, Rule 3, Step 18) Read step to establish SG feed from PSW (EP/001, Rule 3, Step 22) Direct AO3 to load shed inverters (EP/001, Step 7) Direct AO1 to open atmos dump bypass valves (EP/001, Encl 5.24, Step 1) Determine SSF Status (EP/001 Blackout tab Step 27) Perform restoration of power (EP/01 Blackout tab Encl 5.38) Perform step 34, parallel actions for SBO (EP/001, Encl 5.44)	Ops Training
		Perform U3 in plant damage assessment (FG/005, Encl 5.3)	N/V (None In Place)
12.	U3 BOP (BOP3)	Initiate SSF EOP AP/0/A/1700/025 (EP/001, Step 3.5 RNO) Verify an RO is staged to perform AP/25 at SSF (AP/25, through Step 4.3) Feed SG with ASW and seals with RC makeup pump from SSF (AP/25) Cooldown RCS to 240-250° F (EP/001, Blackout tab, Steps 192-194)	Ops Training
13.	U1 Nuclear Eq. Operator #1 (AO1)	Perform manual start U1 TDEFDWP (EP/001 Encl 5.26) Load shed inverters (EP/001, Encl 5.32) Open U3 atmospheric dump block bypass valves (EP/001, Encl 5.24, Step 1) Perform SSF plant actions for U1 (AP/25, Encl 5.3 A)	Ops Training
		Perform U1 external damage assessment (FG/005, Encl 5.1) Initiate and align Alternate Spent Fuel Cooling to Boggs Box (FG/1-2/A/1900/011)	N/V (None In Place)
14.	U1 Nuclear Eq. Operator #2 (AO4)	Cross tie EFW for U2 (EP/001, Rule 3, Step 18) Open atmospheric dump block bypass valves (EP/001, Encl 5.24 Step 1) Isolate PDW (AP/25, Step 4.24) Divert SSF diesel service water discharge to yard drain (AP/25, Step 4.34)	Ops Training
15.	U2 Nuclear Eq. Operator #1 (AO2)	Perform manual start U2 TDEFDWP (EP/001, Encl 5.26) Load shed inverters (EP/001, Encl 5.32) Perform SSF plant actions for U2 (AP/25, Encl 5.3 B)	Ops Training
		Perform U2 external damage assessment (FG/005, Encl 5.2) Initiate and align Alternate Spent Fuel Cooling to Boggs Box (FG/1-2/A/1900/011)	N/V (None In Place)

Line	On-Shift Position	Task Description	Controlling Method
16.	U2 Nuclear Eq. Operator #2 (AO5)	Cross tie EFW for U2 (EP/001, Rule 3, Step 18) Open atmospheric dump block bypass valves (EP/001, Encl 5.24 Step 1) Check Service Air Diesel Compressor (EP/001, Enclosure 5.44, step 2) Emergency purge generator hydrogen (EP/001, Encl 5.17) Lower SG pressure with ADVs (EP/001, Blackout tab, Step 196)	Ops Training
17.	U3 Nuclear Eq. Operator #1 (AO3)	Perform manual start U3 TDEFDWP (EP/001, Encl 5.26) Load shed inverters (EP/001, Encl 5.32) Perform SSF plant actions for U3 (AP/25, Encl 5.3 C)	Ops Training
		Perform U3 external damage assessment (FG/005, Encl 5.3)	N/V (None In Place)
18.	U3 Nuclear Eq. Operator #2 (AO6)	Cross tie EFW for U3 (EP/001, Rule 3, Step 18) Open atmospheric dump block bypass valves (EP/001, Encl 5.24 Step 1) Perform Pump - Submersible - Emergency SSF Water Supply - Installation And Removal (AM/0/A/1300/059) Lower SG pressure with ADVs (EP/001, Blackout tab, Step 196)	Ops Training
19.	Outside Nuclear Eq. Operator (AO7)	Open U2 atmospheric dump block bypass valves (EP/001, Encl 5.24, Step 1) Check U1/2/3 turbine shafts are stopped ((EP/001, Enclosure 5.44, step 5)) Refill EWST - IAAT EWST <60k ((EP/001, Enclosure 5.44, step 12)) Lower SG pressure with ADVs (EP/001, Blackout tab, Step 196)	Ops Training
20.	Fire Brigade Leader (FBL)	Contact NSRC with satellite phone (FG/005, Step 4.2)	N/V (None In Place)

Other (non-Operations) Personnel

Line	On-Shift Position	Task Description	Controlling Method
21.	IAE Technician #1 (IAE1)	Prepare the Dedicated Submersible Pump for installation in U2 CCW piping (AM/0/A/1300/059) Perform debris removal and Enclosure 5.5, SPOC supervisor actions for ELAP, and Enclosure 5.7, staging FLEX mitigation strategies at intake (FG/005 Steps 4.5 and Encl 5.5 and Encl 5.7)	N/V (None In Place)
22.	IAE Technician #2 (IAE2)	Prepare the Dedicated Submersible Pump for installation in U2 CCW piping (AM/0/A/1300/059) Perform debris removal and Enclosure 5.5, SPOC supervisor actions for ELAP, and Enclosure 5.7, staging FLEX mitigation strategies at intake (FG/005 Steps 4.5 and Encl 5.5 and Encl 5.7)	N/V (None In Place)
23.	Mechanical Technician #1 (Mech1)	Prepare the Dedicated Submersible Pump for installation in U2 CCW piping (AM/0/A/1300/059) Perform debris removal and Enclosure 5.5, SPOC supervisor actions for ELAP, and Enclosure 5.7, staging FLEX mitigation strategies at intake (FG/005 Steps 4.5 and Encl 5.5 and Encl 5.7)	N/V (None In Place)

Line	On-Shift Position	Task Description	Controlling Method
24.	Mechanical Technician #2 (Mech2)	Prepare the Dedicated Submersible Pump for installation in U2 CCW piping (AM/0/A/1300/059) Perform debris removal and Enclosure 5.5, SPOC supervisor actions for ELAP, and Enclosure 5.7, staging FLEX mitigation strategies at intake (FG/005 Steps 4.5 and Encl 5.5 and Encl 5.7)	N/V (None In Place)
25.	RP Technician #1 (RP1)	Initiate and align Alternate Spent Fuel Cooling to Boggs Box (FG/1-2/A/1900/011)	N/V (None In Place)
26.	RP Technician #2 (RP2)	N/A	N/A
27.	RP Technician #3 (RP3)	N/A	N/A
28.	Chemistry Technician (CT)	N/A	N/A
29.	Security Shift Supervisor (SSS)	N/A	N/A
30.	MERT #1 (MERT1)	N/A	N/A
31.	MERT #2 (MERT2)	N/A	N/A

TABLE 3 – Firefighting **Extended Loss of All Power (ELAP)**

Line	Performed By	Task Description	Controlling Method
1.	Fire Brigade Leader (FBL)	N/A	N/A
2.	Fire Brigade Member #1 (AO4)	N/A	N/A
3.	Fire Brigade Member #2 (AO5)	N/A	N/A
4.	Fire Brigade Member #3 (AO6)	N/A	N/A
5.	Fire Brigade Member #4 (AO7)	N/A	N/A
6.	Fire Brigade Member #5 (MECH1)	N/A	N/A
7.	Fire Brigade Member #6 (MECH2)	N/A	N/A
8.	Fire Brigade Member #7 (IAE1)	N/A	N/A
9.	Fire Brigade Member #8 (IAE2)	N/A	N/A
10.	Fire Brigade Member #9 (RP2)	N/A	N/A

TABLE 4 – Radiation Protection and Chemistry **Extended Loss of All Power (ELAP)**

#	Position Performing Function/Task	Performance Time Period After Emergency Declaration (minutes)										
		0-30	30-60	60-90	90-120	120-150	150-180	180-210	210-240	240-300	300-330	330-360
1.	In-Plant Survey On-Shift Position:											
2.	On-Site Radiological Survey On-Shift Position:											
3.	Personnel Monitoring On-Shift Position:											
4.	Job Coverage On-Shift Position:											
5.	Offsite Radiological Assessment On-Shift Position:											
6.	Other RP: Obtain Back-up Met Data On-Shift Position: **RP3**			X		X		X		X	X	
7.	Sampling On-Shift Position:											
8.	Other Chem – Describe On-Shift Position:											

Note: Line 6 RP3 tasks to obtain back-up met data each took 10 minutes to perform. See timeline for specific time intervals.

TABLE 5 – Emergency Plan Implementation **Extended Loss of All Power (ELAP)**

Line	Function/Task	On-Shift Position	Controlling Method
1.	Declare the Emergency Classification Level (ECL)	SM	JPM#: SRO-001, 002, 003, 006A, 007A, 008, 013, 014, 015, 017, 018, 019, 020 D.1.2 The correct Event Classification Level was formally declared within 15 minutes.
2.	Approve Offsite Protective Action Recommendations	N/A	N/A – GE not declared for EPAP event at ONS in first 6 hours
3.	Approve content of State/local notifications	SM	E.2.2 The ENF was approved prior to transmittal.
4.	Approve extension to allowable dose limits	N/A	N/A – Not applicable to ELAP event
5.	Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)	SM	B.1 Demonstrate the ability of the normal staff complement to perform the functions of the onshift ERO. [includes 8 demonstration criteria]
6.	ERO notification	N/A, ERO self-activation credited	E.1.2 The ERO group page(s) was (were) initiated within 15 minutes of event declaration. E.1.3 The Nuclear ERO Call-out System was initiated within 15 minutes of the event declaration.
7.	Abbreviated NRC notification for Design Basis Threat event	N/A	N/A – Not applicable to ELAP event
8.	Complete State/local notification form	SM	E.2.1 The ENF was completed accurately.
9.	Perform State/local notifications	COM FBL	E.2.3 State / local notifications were performed within 15 minutes of the declaration or change in conditions requiring notification.
10.	Complete NRC event notification form	N/A	E.4.2 The NRC form was completed accurately.
11.	Activate ERDS	COM	F.3.2 ERDS initiated within one hour of an Alert or higher declaration.
12.	Offsite radiological assessment	N/A	N/A – Not applicable to ELAP event for ONS
13.	Perform NRC notifications	COM	E.4.1 The NRC was notified via Event Notification System (ENS) immediately after completing State / local notification and within one hour of event classification. E.4.2 A communicator was assigned to maintain an open line over the ENS circuit when requested by the NRC.
14.	Perform other site-specific event notifications (e.g., INPO, ANI, etc.)	N/A	N/A – Not applicable to ELAP event for ONS
15.	Personnel accountability	SAS	SC-1402, CAS/SAS Operator J.2.2 All unaccounted-for individuals were identified by name within 30 minutes of announcing Site Assembly.

Note: Line #3, #8 and #9 includes initial and follow-up State/local notifications.

6.3 ELAP On-Shift Staffing Task Timetable

Time (T+mins)	Position(s)	Action	Duration (min)
0		**Complete loss of station AC power event occurs**	
0	CRS1 CRS2 CRS3	Direct OATC1/2/3 to perform manual actions (P/*/A/1800/001, Steps 3.1–3.5)	1
0	OATC1 OATC2 OATC3	Perform manual actions (EP/001, Steps 3.1–3.5)	2
1	BOP1 BOP2 BOP3	Initiate SSF EOP AP/0/A/1700/025 (EP/001, Step 3.5 RNO)	1
2	BOP1 BOP2 BOP3	Verify an RO is staged to perform AP/25 at SSF (AP/25, through Step 4.3)	6
2	CRS1 CRS2 CRS3	Transfer to the Blackout Tab and verify AP/25 in progress (AP/25)	1
3	CRS2	Power PSW - Step 1 RNO 7 realizes no power to PSW (U2 Encl 5.42)	3
3	OATC1 OATC2 OATC3	Dispatch AO1/2/3 to manually start U1/2/3 TDEFDWP (EP/001, Rule 3, Steps 1–17)	2
5	AO1 AO2 AO3	Perform manual start U1/2/3 TDEFDWP (EP/001, Encl 5.26)	8
5	OATC1 OATC2 OATC3	Verify cross-tie with alternate unit is desired and dispatch AO4/5/6 to cross tie EFW for U1/2/3 (EP/001, Rule 3, Step 18)	1
6	AO4 AO5 AO6	Attempt to perform cross-tie with alternate unit (EP/001, Rule 3, Step 18 Note – Recalled to CR when TDEFDWP is determined to not start.	20
6	CRS1 CRS2 CRS3	Perform/read steps 1-6 and direct OATC1/2/3 to perform load shed of inverters during SBO (EP/*/1800/001, Blackout tab, Steps 1-7)	3
6	OATC1 OATC2 OATC3	Read step to establish SG feed from PSW per Encl 5.45. (EP/001, Rule 3, Step 22, No feed available, rule 3 no help at this point)	1
8	BOP1 BOP2 BOP3	Feed SG with ASW and seals with RC makeup pump from SSF (AP/25)	Duration
12	CRS1 CRS2 CRS3	Read EP/*/A/1800/001 Blackout Tab Steps 8-41	21
13	AO1 AO2 AO3	Return to Control Room	
13	OATC1 OATC2 OATC3	Direct AO1/2/3 to load shed inverters (EP/001, Step 7)	1
13	AO1 AO2 AO3	Load shed inverters (EP/001, Encl 5.32)	8
14	OATC2	Direct AO7 to open atmospheric dump block bypass valves (EP/001, Encl 5.24, Step 1)	1

Time (T+mins)	Position(s)	Action	Duration (min)
15	AO7	Open U2 atmospheric dump block bypass valves (U2 EP/001, Encl 5.24, Step 1)	10
15	SM	Declare SAE based on 4.5.S.1 (RP/0/B/1000/001)	-
15	SM	Provide notification and direction to on-shift staff (RP/0/B/1000/002)	Duration
21	AO1 AO2 AO3	Return to Control Room	
21	OATC3	Direct AO1 to open U3 atmospheric dump block bypass valves (U3 EP/001, Encl 5.24, Step 1)	1
21	AO1	Open U3 atmospheric dump block bypass valves (U3 EP/001, Encl 5.24, Step 1)	10
21	OATC1 OATC2 OATC3	Determine SSF Status (EP/001 Blackout tab Step 27)	1
25	AO7	Return to Control Room	
25	OATC1 OATC2 OATC3	Read IAAT step for restoration of power, Enclosure 5.38 (EP/01 Blackout tab, step 26, Encl 5.38)	5
26	AO4 AO5 AO6	Return to Control Room	
26	OATC1	Direct AO4 and AO5 to open U1 atmospheric dump block bypass valves (U1 EP/001, Encl 5.24, Step 1)	1
26	OATC2	Direct AO6 to open U2 atmospheric dump block bypass valves (U2 EP/001, Encl 5.24, Step 1)	1
26	AO4 AO5 AO6	Open atmospheric dump block bypass valves (EP/001, Encl 5.24, Step 1)	10
27	SM	Complete and approve content of ENF for initial SAE (RP/0/B/1000/015A)	2
27	BOP1	Direct IAE1 and MECH1 to prepare the Dedicated Submersible Pump for installation in Unit 2 CCW piping per AM/0/A/1300/059 (AP/25, Step 4.23)	2
29	IAE2 MECH2	Prepare the Dedicated Submersible Pump for installation in Unit 2 CCW piping (AM/0/A/1300/059)	120
29	SM	Direct COM to perform initial SAE State/local notifications (RP/0/B/1000/015A)	1
30	COM	Perform initial SAE State/local notifications (RP/0/B/1000/015A)	30
30	AO2 AO3	SSF - Perform Unit 2 /3 plant actions (AP/25, Encl 5.3 B/C)	180
30	SM	Direct SAS to commence Assembly/Accountability (RP/0/B/1000/009)	1
31	AO1	Return to Control Room	
31	AO1	SSF - Perform Unit 1 plant actions (AP/25, Encl 5.3 A)	180
31	SSS	Perform Site Assembly/Site Accountability (RP/0/B/1000/009)	30
33	CRS1 CRS2 CRS3	Direct step 34, Enclosure 5.44, Parallel Actions for SBO (EP/01 Blackout tab Step 34)	1
34	OATC1 OATC2 OATC3	Perform step 34, parallel actions for SBO (EP/001, Encl 5.44) (Encl performed in parallel with continued progress in BO tab)	30
36	AO4 AO5 AO6	Return to Control Room	
36	BOP1	Direct AO4 to isolate PDW (AP/25, Step 4.24)	1

Time (T+mins)	Position(s)	Action	Duration (min)
36	AO4	Isolate PDW (AP/25, Step 4.24)	Duration
36	AO5	Check Service Air Diesel Compressor (EP/001, Enclosure 5.44, Step 2)	15
36	AO6	Perform Pump - Submersible - Emergency SSF Water Supply - Installation And Removal (AM/0/A/1300/059)	120
39	AO7	Check U1/2/3 turbine shafts are stopped (EP/001, Enclosure 5.44, Step 5)	20
51	AO5	Return to Control Room	
59	AO7	Return to Control Room	
59	AO7	Refill EWST - IAAT EWST <60k (EP/001, Enclosure 5.44, step 12)	60
70	COM	Activate ERDS (RP/005)	5
75	COM	Perform NRC notifications (RP/0/B/1000/015A)	Duration
77	RP3	Obtain Met data using backup method (sat phone call to NWS) and report Met data to SM (AD-EP-ALL-0202)	10
87	SM	Complete and approve content of ENF for follow-up #1 SAE (RP/0/B/1000/02)	2
89	SM	Direct FBL to perform follow-up #1 SAE State/local notifications (RP/0/B/1000/015A)	1
90	FBL	Perform follow-up #1 SAE State/local notifications (RP/0/B/1000/015A)	30
90	CRS1	Direct AO5 to emergency purge generator hydrogen per EP/*/A/1800/001, Encl 5.17 (EP/001, Blackout tab, Step 28)	1
91	AO5	Emergency purge generator hydrogen (EP/*/A/1800/001, Encl 5.17)	60
114	AO4	Divert SSF diesel service water discharge to yard drain (AP/25, Step 4.34)	Duration
119	AO7	Return to Control Room	
121	CRS1 CRS2 CRS3	Direct BOP1/2/3 in SSF to cooldown RCS to 240-250° F (EP/001, Blackout tab, Steps 192-194)	5
126	BOP1 BOP2 BOP3	Cooldown RCS to 240-250° F (EP/001, Blackout tab, Steps 192-194)	Duration
126	CRS1	Initiate FG/0/A/1900/005 - go to Step 196 (EP/001, Blackout tab, Step 35, IAAT)	1
127	CRS1	Dispatch FBL to contact NSRC (FG/005, Step 4.1-4.2)	1
128	FBL	Contact NSRC with satellite phone (FG/005, Step 4.2)	10
137	RP3	Obtain Met Data using backup method (satellite phone call to NWS) and report Met data to SM (AD-EP-ALL-0202)	10
147	SM	Complete and approve content of SAE ENF for follow-up #2 SAE (RP/0/B/1000/02)	2
149	SM	Direct FBL to perform follow-up #2 SAE State/local notifications (RP/0/B/1000/015A)	1
149	IAE1 MECH1	Return to Control Room	
149	CRS1	Direct MECH1, MECH2, IAE1, and IAE2 to perform debris removal and perform Enclosure 5.5, SPOC supervisor actions for ELAP, and Enclosure 5.7, staging FLEX mitigation strategies at intake (FG/005 Steps 4.5 and Encl 5.5 and Encl 5.7)	1
150	IAE1 IAE2 MECH1 MECH2	Perform debris removal and perform Enclosure 5.5, SPOC supervisor actions for ELAP, and Enclosure 5.7, staging FLEX mitigation strategies at intake (FG/005 Steps 4.5 and Encl 5.5 and Encl 5.7)	Duration
150	CRS1 CRS2 CRS3	Direct OATC1/2/3 to perform in plant U1/2/3 damage assessment (FG/005, Encl 5.1/2/3)	1

Time (T+mins)	Position(s)	Action	Duration (min)
151	OATC1 OATC2 OATC3	Perform U1/2/3 in plant damage assessment (FG/005, Encl 5.1/2/3)	30
151	AO5	Return to Control Room	
151	AO5 AO7	Lower SG pressure with ADVs (EP/001, Blackout tab, Step 196)	Duration
151	CRS1	Verify all units in MODE 1-4 (FG/005, Step 4.7)	1
156	AO6	Return to Control Room	
156	AO6	Lower SG pressure with ADVs (EP/001, Blackout tab, Step 196)	Duration
197	RP3	Obtain Met Data using backup method (satellite phone call to NWS) and report Met data to SM (AD-EP-ALL-0202)	10
207	SM	Complete and approve content of SAE ENF for follow-up #3 SAE (RP/0/B/1000/002)	2
209	SM	Direct FBL to perform follow-up #3 SAE State/local notifications (RP/0/B/1000/015A)	1
210	FBL	Perform follow-up #3 SAE State/local notifications (RP/0/B/1000/015A)	30
210	AO2 AO3	Return to Control Room	
211	AO1	Return to Control Room	
211	CRS1 CRS2 CRS3	Direct AO1/2/3 to perform U1/2/3 external damage assessment (FG/005, Encl 5.1/2/3)	1
211	AO1 AO2 AO3	Perform U1/2/3 external damage assessment (FG/005, Encl 5.1/2/3)	60
257	RP3	Obtain Met Data using backup method (satellite phone call to NWS) and report Met data to SM (AD-EP-ALL-0202)	10
267	SM	Complete and approve content of SAE ENF for follow-up #4 SAE (RP/0/B/1000/002)	2
269	SM	Direct FBL to perform follow-up #4 SAE State/local notifications (RP/0/B/1000/015A)	1
268	CRS1 CRS2 CRS3	Perform staging Phase 2FLEX equipment for ELAP events (FG/005, Section 4A)	10
270	FBL	Perform follow-up #4 SAE State/local notifications (RP/0/B/1000/015A)	30
271	AO1 AO2 AO3	Return to Control Room	
278	CRS2	Direct AO1, AO2 and RP1 to initiate and align Alternate Spent Fuel Cooling to Boggs Box per FG/1-2/A/1900/011 (FG/005, Section 4A, Step 20)	1
279	AO1 AO2 RP1	Initiate and align Alternate Spent Fuel Cooling to Boggs Box (FG/1-2/A/1900/011)	Duration
317	RP3	Obtain Met Data using backup method (satellite phone call to NWS) and report Met data to SM (AD-EP-ALL-0202)	10
327	SM	Complete and approve content of SAE ENF for follow-up #5 SAE (RP/0/B/1000/002)	2
329	SM	Direct FBL to perform follow-up #5 SAE State/local notifications (RP/0/B/1000/015A)	1
330	FBL	Perform follow-up #5 SAE State/local notifications (RP/0/B/1000/015A)	30

7 AUGMENTED AND EXPANDED ERO RESPONSE ANALYSIS

This section of the assessment documents the ability of the augmented and expanded ERO to implement Transition Phase coping strategies performed after the end of the "no site access" 6 hour time period. The expanded ERO is defined as the required augmented ERO for a multi-unit event.

7.1 ERO Notification and Response during an ELAP

Revision 2014-02 of the Oconee Nuclear Station Emergency Plan, dated October 2014, is established as the licensing basis for the augmented ERO staffing complement.

The minimum augmented ERO personnel complement is described in Figure B-8b of the Oconee Nuclear Station Emergency Plan and is provided in Table 7-1 below.

Major Functional Area	Major Task	Position, Title or Expertise	Capability for Additions*	
			45 min	75 min
Emergency Direction and Control**		Station Manager		1
Notification/ Communication	Notify Company Personnel, state, County, federal Agencies and maintain communication	State Communicators		2
EOF/Radiological Accident Assessment and Support and Off Site Agency Support	EOF Director (Emergency Classification, Protective Action Recommendation, Offsite Agency Interface, ENF Approval)	DPC Senior Manager		1
Emergency Classification	EOF Plant Assessment	Accident Assessment Manager		1
Dose Assessment and Protective Action Recommendations	EOF Offsite Dose Assessment/Protective Action Recommendations	Radiological Assessment Manager		1
Offsite Notifications	Offsite Agency Notifications	Offsite Agency Communicator		1
	EOF Access Control			#
	TSC Dose Assessment/Protective Action Recommendations	Radiological Assessment		1
	OffSite Surveys Onsite Surveys	Field Monitoring Teams (2)	1	4*** 1
	In-Plant Surveys	RP Qualified Individual	1	1
	Chemistry/Radio Chemistry	Rad/Chem Technician		1
Plant System Engineering, Repair and Corrective Action	Technical Support	Core/Thermal Hydraulics Electrical Mechanical		1 1 1
	Repair and Corrective Actions	Mechanical Maintenance Rad/Waste Operator I&E Technician		1 1 2
Protective Actions (In Plant)	Radiation Protection A. Access Control B. RP Coverage for Repair, Corrective Actions, Search and rescue, First Aid and Firefighting C. Personnel Monitoring D. Dosimetry E. On-Shift Dose Assessment	RP Qualified Individual		4
Firefighting		Fire Brigade		Local Support
Rescue Operations and First-Aid		MERT Team		Local Support

* *Consideration is given to the fact that many of the Oconee Nuclear Site Emergency Response Organization personnel do not live within a radius of the station which will allow a response time of 30 minutes or less under ideal conditions. factors such as weather conditions, road capacity and traffic density, and the distance to travel from residence to the emergency response facility, indicate a realistic response time from a few minutes to 1 hour and 15 minutes for most employees. Consideration is also given to personnel on shift who are qualified and sufficient in number to handle any emergency condition until response personnel begin to arrive on site.*

** *Management of Offsite Emergency response will be assumed by the EOF Director when the Emergency Operations Facility is activated. Management of the Onsite Emergency Response is assumed by the Station manager/Alternate acting as the Emergency Coordinator when the Technical Support Center and Operational Support Centers are activated.*

*** *The Field Monitoring Teams will initially report to the Body Burden Analysis (BBA) Room. If needed, the Field Monitoring Teams will dispatch from the Body Burden Analysis (BBA) Room. Once the Emergency operations Facility (EOF) Field Monitoring Coordinator is ready he/she will assume control of the Field Monitoring teams. A FMT consists of one RP qualified individual and one vehicle driver.*

\# *An electronic card reader in conjunction with a posted building security officer fulfills the function for controlling access to the EOF during emergencies.*

7.1.1 General ERO Response

1. Implementing Strategy for the Expanded ERO

The ERO augmentation process consists of an "all call/all come" expectation. When the ERO notification system is operable, all qualified ERO members are contacted and expected to report if fit for duty. In the absence of the call out system, all ERO members are trained to respond automatically per NSD-117, "Emergency Response Organization Staffing," Section 4.4.11, which states:

> *Following a large scale natural disaster on site, all ERO personnel should respond to their Emergency Response Facility or their designated alternate site, if their Emergency Response Facility is inaccessible, as soon as safely possible. This is not dependent upon receiving an initial ERO activation page or call.*

NSD-117 Section 4.4 responsibilities were initially provided to the ERO members as electronic read training for the Duke Energy fleet that was sent to all ONS ERO members.

Review of the ONS ERO roster confirmed that sufficient numbers of qualified individuals are available to fill the positions in Table 7.2 with adequate depth to staff at least two 12-hour shifts, except for the Operations Coordination function.

Table 7.2 considers that 1 Operations Superintendent per unit, per shift, is needed, but ONS only has 5 Operations Superintendent on the ERO roster at the time of the assessment.

2. Response Timeliness for the Expanded ERO

   The ONS ERO augmentation process consists of an "all call/all come" expectation. Callout of an expanded ERO is subsumed within the callout of the augmented ERO.

   In the absence of the call out system, ERO members are trained to respond automatically per NSD-117, as described in the implementing strategy above.

3. Work Location for the Expanded ERO

   If access to the primary emergency response facilities is not possible, ERO members are trained to report to the alternate location. ONS has identified the alternate OSC and alternate TSC as the facilities to be utilized to support the expanded response capabilities. In addition, the Outage Control Center (OCC) and the Issaqueena Trail Facility (legacy ONS EOF) could be utilized as additional work areas should additional space be necessary for the performance of expanded response functions.

4. Transportation for the Expanded ERO

   The ONS §50.54(f) response stated that the following methods of access to the site are available:

   - Roadway – There are several roadways into the Oconee region. If one path becomes impassable, detours using other roadways are viable. Major routes include:
     - From the East or West using East Pickens Highway (SC Route 183)
     - From the South using the Rochester Highway (SC Route 130)
   - Water – ONS can be accessed from the water via Keowee Lake. Access to the Keowee Lake for personal watercraft or watercraft arranged for by Duke Energy can be made through any of six public access boat ramps. Access to the site from the Lake can be made from two docks located on site.
   - Air – Access to ONS can be provided from staging areas and three designated onsite landing zones via helicopters arranged for by Duke Energy.

   The ONS Emergency Plan contains specific Letters of Agreement for services and support from resource providers such as local counties, fire departments, law enforcement, and health care facilities to assist in Emergency Plan implementation.

5. ERO Drill & Exercise Program

   NEI 12-01 states that 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.

   Current ONS drill and exercise procedures do not include evaluation objectives and demonstration criteria for beyond design basis events and expanded ERO activities. As future guidance is expected from the NRC in this area, no further changes are necessary to the drill and exercise procedures at this time.

7.1.2 Position Specific ERO Response

1. Radiation Protection Technicians (RPTs)

Following a beyond design basis external event, the on-site Radiation Protection (RP) Qualified Individuals will be available in sufficient numbers to support performance of assigned emergency plan functions and the expanded response capability.

The equation below was used to determine the required number of on-site RP Qualified Individuals for a BDBEE. This number consists of both on-shift and augmented ERO RP Qualified Individuals that perform on-site response functions for ONS.

The equation in NEI 12-01, section 3.5.1, is as follows:

$RPT_T = RPT_{COP} + RPT_{RCA} + RPT_{NC}$, where:

RPT_T = Total required number of on-site RP Technicians.

RPT_{COP} = Number needed to support implementation of the 2 most limiting ELAP FLEX strategies. This is determined by reviewing the FG strategies for each unit.

RPT_{RCA} = Number needed for repair and corrective action, equals two x 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

For ONS, the resulting number of RPTs is:

RPT Category	Number Required	Comments
RPT_{COP}	5	RCS Inventory Stategy requires 3 RPTs SFP Makeup & Cooling requires 2 RPTs.
RPT_{RCA}	6	2 times number of units (2x3).
RPT_{NC}	3	Minimum # of RPTs required for ERO augmentation response for radiological assessment function.

Thus, the total number of on-site RPTs required for the expanded ERO is 23, which is based on the staffing needed to:

1) Support the two most limiting RP resource intense FG strategies, which do not require rotating shifts

   = 5 RPT_{COP}

2) Support operating on 12-hour shifts for other RP tasks

   =2 shifts of RPT_{RCA} and RPT_{NC}

   = 2 (6+3)

   = 18 $RPT_{RCA\ and\ NC}$

3) RPT_T = 5 RPT_{COP} + 18 $RPT_{RCA\ and\ NC}$

   = 23 RPT_T

43 RPTs are available to support performance of assigned emergency plan functions and the expanded response capability (refer to Table 7-1).

Provisions exist for obtaining additional RPT resources from other stations within the Duke fleet and/ or through industry agreement with INPO as part of the INPO Emergency Resources Manual documented by letter of agreement dated September 2009.

2. Administrative Support Personnel

NEI 12-01 states that 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.

The administrative support personnel who assist the augmented ERO members are not assigned critical response tasks. Augmented ERO personnel are capable of performing their assigned tasks and responsibilities without requiring administrative support.

3. FG Implementers

The assessment considered the number of personnel required for simultaneous implementation of the two FG strategies for each unit that require the greatest number of staff to implement. There are five (5) FG strategies for the site:

1) Maintain Instrumentation
2) Decay Heat Removal
3) RCS Injection
4) Containment Integrity
5) Spent Fuel Pool (SFP) Makeup & Cooling

Based on the FG task analysis, the following two FLEX strategies have been selected:

Strategy #1 – Maintain Instrumentation

Implementation involves the following FG and personnel resources:

- FG/020, Unit 2 FLEX Electrical Distribution

Personnel (department)	Total #	Task Performed
SPOC	6	Move Generator and Cable from FLEX Building (Non-concurrent task)
		Deploy Cables (Non-concurrent task)
AO (2 per unit)	6	Make Connections, Breaker Alignment, Run Generator
Total	**12**	

Strategy #3 – RCS Inventory/Long-term Subcriticality

Implementation involves the following FG and personnel resources:

- FG/001, Long Term RCS Inventory Control

Personnel (department)	Total #	Task Performed
SPOC	6	Relocate Three Pumps and Hoses (Non-concurrent task)
		Layout Hoses (Non-concurrent task)
AO	3	Operate Pumps
AO	3	Valve Alignment
RP	3	Job Coverage
Total	**15**	

A total of 27 (12+15) personnel are required for the simultaneous implementation of these two FLEX strategies.

7.2 Expanded Response Functions for Phase 1 Staffing Assessment

Table 7-2a addresses NEI 12-01 Table 3.1, less SAMG implementation, and reflects a modeled staffing level to support the simultaneous deployment of emergency repair and corrective action teams to multiple affected units. The "Number Required" column basically assumes the staffing consideration for one unit, multiplied by the number of units, then doubled in order to support expanded ERO staffing for two 12-hour shifts. (Note: While ONS has three units, it only has two control rooms, due to a shared control room for Units 1 and 2. A shared TSC and OSC supports all three units) The "Number Available" column is the number of personnel qualified to the ERO position.

Table 7-2a Expanded vs. Augmented ERO Response Comparison

Function	Location	Key Roles and Staffing Considerations	ONS ERO Position	Number Required (3 Units)	Number Available
Unit Response Coordination	TSC	• 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.	Emergency Coordinator	6	7
Operations Coordination	TSC	• Provides coordination of Operations staff and support for an assigned unit. • One individual per unit; individuals should not be assigned other functions.	Operations Superintendent	6	5
Maintenance Coordination	OSC	• Provides coordination of Maintenance staff and support for an assigned unit. • One individual per unit; individuals should not be assigned other functions.	Maintenance Manager	6	9
Engineering Coordination	TSC	• Provides coordination of Engineering staff and support for an assigned unit. • One individual per unit; individuals should not be assigned other functions.	Engineering Manager	6	9

Function	Location	Key Roles and Staffing Considerations	ONS ERO Position	Number Required (3 Units)	Number Available
Engineering Assessments	TSC/ OSC	• One team for each unit to perform engineering assessments in support of 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.	Tech Assistant to the EC Elect Equipment Manager Nuclear Engineer	6 6 6	6 15 7
Unit In-Plant Team Coordination	OSC	• 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.	OSC Manager	6	11
Non-Licensed Operators	OSC	• Two individuals per unit to assist with implementation of repair and corrective actions. • Should not include members of the on-shift staff.	Non-Licensed Operators[(a)]	12	33
Mechanical Maintenance Repair and Corrective Action	OSC	• 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).	SPOC and Maintenance Craft[(b)]	12	24
Electrical Maintenance Repair and Corrective Action	OSC	• 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).	SPOC and Maintenance Craft [(c)]	12	24
I&C Repair and Corrective Action	OSC	• 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).	SPOC and Maintenance Craft [(c)]	12	

(a) ONS has 40 total qualified NLOs. 7 NLOs are accounted for as being on shift. (Multiple Assigned Job Status Report dated 4/20/2015)

(b) ONS has 26 total qualified Mechanical Maintenance. 2 MM is accounted for as being on shift. (Multiple Assigned Job Status Report dated 4/20/2015)

(c) ONS has 26 total qualified IAE Technicians. 2 IAE is accounted for as being on shift. (Multiple Assigned Job Status Report dated 4/20/2015)

Table 7-2b addresses NEI 12-01 Table 3.2, Expanded Response Functions for Phase 2 Staffing Assessment, (FG implementation). The number required column is the personnel resources for the implementation of the two most limiting FG tasks. The number available column is the number of personnel qualified to the position. These FG tasks do not require 24-hour coverage.

Table 7-2b Expanded ERO FLEX Resources

Function	Location	Key Roles and Staffing Considerations	ONS ERO Position	Number Required (3 Units)	Number Available
Evaluation of Transition Phase Coping Strategies	TSC or EOF	• 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	Tech Assistant to the EC Elect Equipment Manager Nuclear Engineer	6 6 6	6 15 7
Implementation of Transition Phase Coping Strategies	OSC	• Number and composition of personnel capable of simultaneous implementation of any two Transition Phase coping strategies at each unit (see Section 7.1.2.3) • 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	Reactor Operator Non Licensed Operator SPOC and Maintenance Craft RP Technician	2 12 6 3	33 71 26 44

Attachment 1: References

1. EA-12-049, NRC Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, 03/03/12
2. NEI 12-01, Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities, Revision 0
3. NEI 10-05, Assessment of On-Shift Emergency Response Organization Staffing and Capabilities, Revision 0
4. NEI document to industry peers, Generic Basis for Responses to Staffing Assessment Questions Related to Use of Security Personnel During a BDB Event Response, 12/23/13
5. 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 03/12/12
6. B. C. Waldrep letter to U.S. Nuclear Regulatory Commission (NRC), " Duke Energy 60-Day Response to 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," dated 05/09/12. (ML12132A377)
7. B. C. Waldrep letter to U.S. Nuclear Regulatory Commission (NRC), Duke Energy 90-Day Response "Emergency Preparedness Information Requested by 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," dated 06/08/12. (ML12164A389)
8. Letter from L. Skeen (NRR) to S. Perkins-Grew (NEI), "U.S. Nuclear Regulatory Commission Review of NEI 12-01, 'Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities," Revision 0, dated 05/15/12
9. NRC letter, "Response Regarding Licensee Phase 1 Staffing Submittals Associated with Near-Term Task Force Recommendation 9.3 Related to the Fukushima Dai-Ichi Nuclear Power Plant Accident," dated 10/23/13
10. NRC letter, "Oconee Nuclear Station, Units 1, 2, and 3 -Interim Staff Evaluation Regarding Overall Integrated Plan in Response to Order EA-12-049 (Mitigation Strategies) (TAC Nos. MF0782, MF0783 and MF0784)", dated 2/10/14
11. ONS Emergency Plan, Rev 14-02
12. NSD-117, Emergency Response Organization Staffing, Rev 16
13. ONS SLC 16.13.1, Minimum Station Staffing Requirements, dated 10/06/2014
14. AP/0/A/1700/025, Standby Shutdown Facility Emergency Operating Procedure, Rev 061
15. AP/0/A/1700/047, External Flood Mitigation, Rev 14
16. EP/1/A/1800/001, Emergency Operating Procedure, Rev 040
17. EP/1/A/1800/001 L, EOP Rules & Appendix, Rev 040
18. EP/2/A/1800/001, Blackout, Rev 041
19. FG/2/A/1900/001, Long term RCS Inventory Control, Rev 000

Attachment 1: References

20. FG/0/A/1900/003, Alternative Low Pressure Emergency Feedwater, Rev 000
21. FG/0/A/1900/005, Initial Assessment and FLEX Equipment Staging, Rev 000
22. FG/1/A/1900/007, Unit 1 Alternate Monitoring of Essential Instrumentation, Rev 000
23. FG/2/A/1900/007, Unit 2 Alternate Monitoring of Essential Instrumentation, Rev 000
24. FG/2/A/1900/008, Alternative RCS Boration, Rev 000
25. FG/2/A/1900/009, Low Decay Heat Temperature Control, Rev 000
26. FG/2/A/1900/010, CFT Isolation/Venting, Rev 000
27. FG/1&2/A/1900/011, Alternative Spent Fuel Pool Cooling, Rev 000
28. FG/2/A/1900/014, Unit 2 Shutdown RCS Makeup, Rev 000
29. FG/2/A/1900/015, Containment Isolation and Closure, Rev 000
30. FG/2/A/1900/020, Unit 2 FLEX Electrical Distribution, Rev 000
31. ONS Operator JPM Index, Rev [March/April 2015]
32. AD-EP-ALL-0202, Emergency response Offsite Dose Assessment, Rev 000
33. PD-EP-ALL-0800, Drills and Exercises Program, Rev 0000
34. AD-EP-ALL-0801, Design and Development of Drills and Exercises, Rev 000
35. AD-EP-ALL-0802, Conducting Drills and Exercises, Rev 000
36. AD-EP-ALL-0803, Evaluation and Critique of Drills and Exercises, Rev 000
37. RP/0/B/1000/001, Emergency Classification, Rev 003
38. RP/0/B/1000/002, Control Room Emergency Coordinator Procedure, Rev 008
39. RP0/B/1000/015A, Offsite Communications from the Control Room, Rev 003

Attachment 2: Waterfall Depiction of ERO Minimum Shift Staffing Tasks, time 0 -360 minutes

Time into the event (mins) Position	0-15	15-30	30-45	45-60	60-75	75-90	90-105	105-120	120-135	135-150	150-165	165-180	180-195	195-210	210-225	225-240	240-255	255-270	270-285	285-300	300-315	315-330	330-345	345-360
RP1																			FG/11, Align Boggs Box					
RP2																								
RP3						Obtain Met Data from NWS using Satellite phone				Obtain Met Data from NWS using Satellite phone				Obtain Met Data from NWS using Satellite phone				Obtain Met Data from NWS using Satellite phone				Obtain Met Data from NWS using Satellite phone		
Chem																								
SAS		Site Accountability																						
MERT																								
MERT																								

Attachment 2: Waterfall Depiction of ERO Minimum Shift Staffing Tasks, time 0 -360 minutes

Time into the event (mins) / Position	0-15	15-30	30-45	45-60	60-75	75-90	90-105	105-120	120-135	135-150	150-165	165-180	180-195	195-210	210-225	225-240	240-255	255-270	270-285	285-300	300-315	315-330	330-345	345-360
SM	Oversight																							
		Declare SAE	Approve ENF Direct Notifications Direct Accountability			Approve ENF Direct Notifications				Approve ENF Direct Notifications				Approve ENF Direct Notifications				Approve ENF Direct Notifications				Approve ENF Direct Notifications		
STA	Oversight																							
CRS1	Direct EP/001										Direct FG/005													
CRS2	Direct EP/001										Direct FG/005													
CRS3	Direct EP/001										Direct FG/005													
FBL							Notify State and Counties		Notify NSRC		Notify State and Counties				Notify State and Counties				Notify State and Counties				Notify State and Counties	
COM			Notify State and Counties		Activate ERDS	Notification of NRC																		
OATC1	EP/001										Perform FG/005, Unit 1 Damage Assessment													
OATC2	EP/001										Perform FG/005, Unit 2 Damage Assessment													
OATC3	EP/001										Perform FG/005, Unit 3 Damage Assessment													
BOP1	AP/25, SSF Operation																							
BOP2	AP/25, SSF Operation																							
BOP3	AP/25, SSF Operation																							
AO1	Manual Start of U1 TDEFWP (5-13)	Load Shed of Inverters (13-21)	Open ADV bypass valves (21 -31)	AP/25, SSF Operation											FG/005, Unit 1&2 Damage Assessment									
AO2	Manual Start of U2 TDEFWP (5-13)	Load Shed of Inverters (13-21)	Perform AP/25, SSF Operation																FG/11, Align Boggs Box					
AO3	Manual Start of U3 TDEFWP (5-13)	Load Shed of Inverters (13-21)	AP/25, SSF Operation														FG/005, Unit 3 Damage Assessment							
AO4	Attempt Cross Tie, recalled to CR (6-26)		Open ADV bypass valves (26 -36)	AP/25, SSF Operation																				
AO5	Attempt Cross Tie, recalled to CR (6-26)		Open ADV bypass valves (26 -36)	Check Service Air Diesel Compressor		Main Generators H2 Purge					Operate ADV													
AO6	Attempt Cross Tie, recalled to CR (6-26)		Open ADV bypass valves (26 -36)	AM/059, Install submersible pump(36-156)							Operate ADV													
AO7		Open ADV bypass valves		Check Turbine Shafts Stopped	Refill EWST						Operate ADV													
Mech1		AM/059, Install submersible pump									FG/005, Debris Removal													
Mech2		AM/059, Install submersible pump									FG/005, Debris Removal													
IAE1		AM/059, Install submersible pump									FG/005, Debris Removal													
IAE2		AM/059, Install submersible pump									FG/005, Debris Removal													