



June 16, 2015  
RC-15-0093

U.S. Nuclear Regulatory Commission  
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Dear Sir/Madam:

Subject: VIRGIL C. SUMMER NUCLEAR STATION (VCSNS) UNIT 1  
DOCKET NO. 50-395  
OPERATING LICENSE NO. NPF-12  
SOUTH CAROLINA ELECTRIC & GAS (SCE&G)  
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION  
REGARDING PHASE 2 STAFFING SUBMITTALS ASSOCIATED WITH  
NEAR-TERM TASK FORCE RECOMMENDATION 9.3 RELATED TO  
THE FUKUSHIMA DAI-ICHI NUCLEAR POWER PLANT ACCIDENT

- 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 (NTTF) Review of Insights from the Fukushima Dai-ichi Accident," dated March 12, 2012 [Agencywide Documents Access and Management System (ADAMS) Accession No. ML12053A340]
  2. South Carolina Electric & Gas (SCE&G), "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 May 9, 2012 [ADAMS Accession No. ML12135A089]
  3. Nuclear Energy Institute (NEI) 12-01, "Guideline for Assessing Beyond-Design-Basis Accident Response Staffing and Communications Capabilities," Revision 0, dated May 2012 [ADAMS Accession No. ML12125A412]

On March 12, 2012, the Nuclear Regulatory Commission issued a request for information (i.e., Reference 1). Enclosure 5 of Reference 1 contains specific requested actions and requested information associated with Recommendation 9.3 for Emergency Preparedness (EP) - Staffing.

In accordance with Enclosure 5 of Reference 1, South Carolina Electric & Gas Company acting for itself and as an agent for South Carolina Public Service Authority, submitted an alternate course of action for providing the requested information on May 9, 2012

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(i.e., Reference 2). The alternative course of action included a schedule for responding to Requested Information Items 1, 2, and 6 regarding EP- Staffing.

Accordingly, the Phase 2 Extended Loss of Alternating Current Power (ELAP) Emergency Response Organization (ERO) Staffing Analysis Report is provided as Enclosure 1. The Phase 2 staffing analysis follows the assessment process described in Reference 3. Regulatory Commitments identified within the staffing analysis, along with an implementation schedule, are provided in Enclosure 2.

Should you have questions concerning the content of this letter, please contact Bruce Thompson at (803) 931-5042.

I declare under penalty of perjury that the foregoing is true and correct.

6/16/2015  
Executed on

  
Thomas D. Gatlin

TS/TDG/wm

Enclosure 1: Phase 2 Extended Loss of Alternating Current Power (ELAP) Emergency Response Organization (ERO) Staffing Analysis Report

Enclosure 2: Regulatory Commitments

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**VIRGIL C. SUMMER NUCLEAR STATION UNIT 1  
DOCKET NO. 50-395  
OPERATING LICENSE NO. NPF-12**

**ENCLOSURE 1**

**PHASE 2 EXTENDED LOSS OF ALTERNATING CURRENT POWER (ELAP)  
EMERGENCY RESPONSE ORGANIZATION (ERO)  
STAFFING ANALYSIS REPORT**

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**VC Summer  
Nuclear Station  
Unit 1 (VCS U1)**

**NEI 12-01 Phase 2 Extended  
Loss of AC Power (ELAP)  
ERO Staffing Analysis Report**

Revision (0)

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**1 EXECUTIVE SUMMARY**

Using the methodology of (Nuclear Energy Institute) NEI 12-01, 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 VC Summer Nuclear Station Unit 1 (VCSNS U1) 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 AC power (ELAP)
- B. An extended loss of ultimate heat sink (UHS)
- C. Impact on all units (all units for multi-unit sites are in operation at the time of the event – not applicable to VCS U1)
- D. Impeded access to the unit 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, Radiation Protection, Chemistry, Emergency Preparedness and industry consultants performed tabletop evaluations in October 2014 and April 2015 for the on-shift portion of the assessment. The participants reviewed the assumptions and existing procedural guidance, including applicable draft Emergency Operating Procedure (EOP) and FLEX Support Procedures (FSPs) 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 VCS U1 on-shift staffing present for the “no site access” 6-hour time period is sufficient to perform the EOP, FSP and emergency response tasks with additional shift personnel and training committed to for the implementation of FLEX.

## 1.2 Expanded ERO Analysis

The expanded ERO analysis concluded that the current VCS U1 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 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. Information requests related to Emergency Preparedness were contained in Enclosure 5 of the §50.54(f) letter<sup>1</sup>. Enclosure 5 contained two requested actions; one involving performance of a staffing assessment and the other a communications assessment. 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<sup>2</sup>.*

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.

### **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.

VCS U1, being a single unit station, was not required to conduct the Phase 1 staffing assessment.

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<sup>1</sup> NRC 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 Daiichi Accident, dated March 12, 2012 [ADAMS ML12053A340]

<sup>2</sup> For background information, refer to NRC staff report entitled, Recommendations for Enhancing Reactor Safety in the 21<sup>st</sup> Century, dated July 12, 2011 [ADAMS ML111861807 - NTTF report]

### **Phase 2 Staffing Assessment**

Sites with one or more operating units are required to perform a Phase 2 staffing assessment no later than 4 months prior to beginning of the second refueling outage (as used within the context of NRC Order EA-12-049) or December 31, 2016, whichever comes first. In contrast to the Phase 1 staffing assessment, the Phase 2 staffing assessment considers the requested 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 EOP and FSP documents were used during the conduct of the staffing assessments. A review of this report will be performed based on the final validated FSPs and any applicable new procedures that were not available when the shift staffing study table tops were conducted. An action item for this review has been entered into the corrective action program. This report will be updated if the staffing assessment results change.



### 3 **PHASE 2 STAFFING ANALYSIS SUMMARY**

The on-shift ERO analysis concluded that the current VCS U1 on-shift staffing present for the “no site access” 6-hour time period is sufficient to perform the EOP and FSP tasks with additional shift personnel and training committed to for the implementation of FLEX per CR-12-01102.

The expanded ERO analysis concluded that the current VCS U1 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 exist in the current program.

#### 3.1 **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 EOP or Emergency Plan Implementing Procedure (EPIP) tasks performed by the on-shift positions that were not validated.

The task analysis did identify that the performance of FSP tasks is currently not incorporated into the operator or other appropriate training program (Refer to Section 3.4).

##### 3.1.3 **Potential Overlap**

The task analysis did not identify potential task overlaps that were performed by the on-shift personnel in response to the ELAP event.

The Security Force Supervisor performed security contingency plan and EP tasks (personnel accountability) during the ELAP event. A representative of the VCS U1 Security Department analyzed the EP task assigned to the SFS. It was concluded that performance of the EP task did not cause an overlap with their tasks related to the Security Plan. All security activities associated with opening doors or providing shift personnel area access are performed per the Security Plan. Other 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 Time Motion Study (TMS) Results**

**Note** – Time motion analysis data was developed during the task analysis using draft FSPs 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 Section 6.3, ELAP On-Shift Staffing Task Timetable, for documentation of the on-shift staffing task timing and sequence analysis 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.

**3.3 Augmented and Expanded ERO Assessment Results**

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

The expanded ERO analysis did not identify a shortage of qualified augmenting ERO personnel to fill the expanded ERO positions assigned to perform the ELAP functions.

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 analysis result items that potentially hinder station personnel from performing response tasks in a timely manner have been entered into the corrective action program to document the actions associated with this assessment report:

| Analysis Result Item Description   |
|--|
| #1: FSP task training/qualification has not yet been fully developed and incorporated in the applicable departmental training programs. This item is tracked by CR-12-01102. |

**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 FSP strategies in place at the time of the assessment for the ELAP event.
  - 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 – not applicable to VCSNS).
3. 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.
4. 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. The on-shift personnel complement for this event includes the minimum required number and composition as described in the EP-100 Table B-1a and additional shift personnel committed to for the implementation of FLEX per CR-12-01102 (3 Emergency Response Unit (ERU), 1 Electrical Maintenance (EM) and 1 I&C Maintenance (IM). Interim minimum on-shift staffing reductions allowed by Technical Specifications are not invoked for the study.

| Functional Area   | Major Tasks  | Emergency Positions   | Analysis Shift Staffing |
|---|--|---|-------------------------|
| 1. Plant Operations and Assessment of Operational Aspects   | --   | Shift Manager (SRO)<br>CR Supervisor (SRO)<br>Control Room Operator (RO)<br>Auxiliary Operator (AO) | 1<br>1<br>2<br>5        |
| 2. Emergency Direction and Control                          | Command and Control  | Shift Manager (SRO)   | 1 <sup>(a)</sup>        |
| 3. Notification & Communication                             | ERO  | State/County Communicator (STS)   | 1 <sup>(a)</sup>        |
|   | Local/ State   | State/County Communicator (STS)   | 1                       |
|   | Federal  | I&C Maintenance   | 1 <sup>(a)</sup>        |
| 4. Radiological Assessment                                  | Offsite Dose Assessment  | HP Specialist   | 1                       |
|   | Offsite Surveys  | HP Specialist   | 1 <sup>(a)</sup>        |
|   | In-plant Surveys   | HP Specialist   | 1                       |
|   | Onsite Surveys   | HP Specialist   | 1 <sup>(a)</sup>        |
|   | Chemistry  | Chemistry Specialist  | 1                       |
| 5. Plant System Engineering, Repair, and Corrective Actions | Tech Support   | Shift Engineer (STA)  | 1                       |
|   | Repair and Corrective Actions  | Mechanical Maintenance  | 2                       |
|   |  | Electrical Maintenance  | 2                       |
|   | I&C Maintenance  | 2   |                         |
| 6. In-Plant PAs   | Radiation Protection (such as access control, job coverage and personnel monitoring) | HP Specialist   | 2 <sup>(a)</sup>        |
| 7. Fire Fighting  |  | Fire Brigade  | 5 <sup>(a)(d)</sup>     |
| 8. Beyond Design Basis Emergency Response                   | FLEX Support   | ERU Supervisor  | 1                       |
|   | Debris Removal   | ERU Personnel   | 2                       |
|   |  | Shift Technical Specialist  | 1 <sup>(a)</sup>        |
|   |  | Chemistry Specialist  | 1 <sup>(a)</sup>        |
| 9. 1 <sup>st</sup> Aid and Rescue                           | --   | First Aid Team (b)  | 2 <sup>(a)</sup>        |
| 10. Site Access Control and Accountability                  | Security & Accountability  | Security Force Supervisor <sup>(c)</sup>  | 1                       |
|   |  | Security Personnel  | (c)                     |
| <b>Minimum # of Personnel:</b>                              |  |   | <b>24</b>               |

- (a) May be performed by an individual filling another position provided they are qualified to do the collateral function.
- (b) The First Aid Team can be filled by any qualified individual.
- (c) Per Security Plan.
- (d) Per station Fire Protection 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 who perform tasks reviewed as part of this assessment at the time the event is initiated:

- Shift Manager (SM) ..... Control Room
- Shift Engineer (STA) ..... Control Room
- Control Room Supervisor (CRS) ..... Control Room
- Control Room Operator #1 (NRO)..... Control Room
- Control Room Operator #2 (BOP) ..... Control Room
- Auxiliary Operator #1 (CBAO) ..... Control Building
- Auxiliary Operator #2 (TBAO)..... Control Building
- Auxiliary Operator #3 (IBAO)..... Control Building
- Auxiliary Operator #4 (ABUAO)..... Aux Building
- Auxiliary Operator #5 (ABLAO) ..... Aux Building
- Shift Technical Specialist (STS – ERU3)..... Control Room
- Mechanical Maint #1 (MM1) .....Shop
- Mechanical Maint #2 (MM2) .....Shop
- Electrical Maintenance #1 (EM1)..... Service Building (Shop)
- Electrical Maintenance #2 (EM2)..... Service Building (Shop)
- I&C Maintenance #1 (IM1) ..... Control Building (Shop)
- I&C Maintenance #2 (IM2) ..... Control Building (Shop)
- HP Lead (HP Lead) ..... Control Building
- HP Count Room (HP CR)..... Count Room
- Chemistry Specialist (CT – ERU4) ..... Chem Lab
- Security Force Supervisor (SFS)..... Central Alarm Station
- Emergency Response Supervisor (ERU Supv)..... ERB
- Emergency Response #1 (ERU1) ..... ERB
- Emergency Response #2 (ERU2) ..... ERB

4. Equipment credited in current coping strategies remains available for use including FLEX equipment connections and system interfaces (such as installed low leakage RCS seals).
5. The extended loss of AC power assumes the following:
  - Appendix "R" emergency lighting is available during the period of power loss.
  - Public Address System (Gaitronics) is powered by battery for the first two hours.
  - Plant operations and Security radios are available during the period of power loss using installed batteries.
  - Satellite phones are available when used in line of site of a satellite (e.g. outside) during the period of power loss using installed and additional batteries.
  - ERDS is lost as a result of the 25 mile telecommunications blackout range.
  - Power operated door locks can be overridden by key.
6. A hostile action directed at the affected site does not occur during the period that the site is responding to the event.
7. The on-shift staff possesses the necessary radiation worker qualifications to obtain normal dosimetry and to enter Radiologically Controlled Areas (but not high, locked high or very high radiation areas) without the aid of a HP Specialist.
8. 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)

9. Individuals holding the position of HP Specialist or Chemistry Specialist are qualified to perform the range of tasks expected of their position.
10. 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 off-site resource such as local law enforcement. This assumption does not apply to emergency notification to an Offsite Response Organization or the NRC.
11. 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 off-site authorities.
12. 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 hour duration. No core damage occurs and no entry into Severe Accident Management Guidelines (SAMGs) is required.

13. 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.
14. Off-site emergency response 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 diesel generators. The scope of the event includes the following:

- an extended loss of AC power (ELAP) event occurs
- an extended loss of UHS occurs
- station access is impeded

Initially, the reactor is operating at full power. Upon the loss of AC power all on-shift personnel either report to the Control Room or have a radio and the reactor is successfully shut down. Alternate Seal Injection (ASI) fails at beginning of event. The Condensate Storage Tank remains protected and available throughout the event.

This event results in a Site Area Emergency (SAE) classification level based on Emergency Action Level (EAL) SS1.1, which escalates to a General Emergency (GE) classification level based on EAL SG1.1 once it has been determined that power cannot be restored before the coping time will be exceeded (i.e., an ELAP). 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**

100% power at equilibrium, end of core life.

#### **Scenario Events**

An off-site electrical transient occurs resulting in a loss of all off-site power.

None of the Emergency Diesel Generators can be synchronized to any AC bus, resulting in a loss of all AC power. Alternate AC is not available.

Equipment credited in current coping strategies remains available for use including all FLEX equipment connections and system interfaces.

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.



6.2 On-Shift Staffing Analysis Results Tables

TABLE 1 – On-Shift Positions

Extended Loss of All AC Power (ELAP)

| Line | On-shift Position                      | Emergency Plan Reference | Augmentation Elapsed Time (min) | Role in Table # / Line#                            | Unanalyzed Task? | TMS Required? |
|------|--|--------------------------|---------------------------------|--|------------------|---------------|
| 1.   | Shift Manager (SM)                     | E-Plan Table B-1a        | N/A                             | 2 / 1<br>5 / 1<br>5 / 2<br>5 / 3<br>5 / 5<br>5 / 8 | No               | No            |
| 2.   | Shift Engineer (STA)                   | E-Plan Table B-1a        | N/A                             | 2 / 2  | No               | No            |
| 3.   | Control Room Supervisor (CRS)          | E-Plan Table B-1a        | N/A                             | 2 / 3 EOP<br>2 / 3 FSP                             | No<br>Yes        | Yes           |
| 4.   | CRO#1 (NRO)                            | E-Plan Table B-1a        | N/A                             | 2 / 4 EOP<br>2 / 4 FSP                             | No<br>Yes        | Yes           |
| 5.   | CRO#2 (BOP)                            | E-Plan Table B-1a        | N/A                             | 2 / 5 EOP<br>2 / 5 FSP                             | No<br>Yes        | Yes           |
| 6.   | Auxiliary Operator #1 (CBAO)           | E-Plan Table B-1a        | N/A                             | 2 / 6 EOP<br>2 / 6 FSP                             | No<br>Yes        | Yes           |
| 7.   | Auxiliary Operator #2 (TBAO)           | E-Plan Table B-1a        | N/A                             | 2 / 7  | No               | No            |
| 8.   | Auxiliary Operator #3 (IBAO)           | E-Plan Table B-1a        | N/A                             | 2 / 8 EOP<br>2 / 8 FSP                             | No<br>Yes        | Yes           |
| 9.   | Auxiliary Operator #4 (ABUAO)          | E-Plan Table B-1a        | N/A                             | 2 / 9 EOP<br>2 / 9 FSP                             | No<br>Yes        | Yes           |
| 10.  | Auxiliary Operator #5 (ABLAO)          | E-Plan Table B-1a        | N/A                             | 2 / 10   | No               | No            |
| 11.  | Shift Technical Specialist (STS)(ERU3) | E-Plan Table B-1a        | N/A                             | 5 / 6<br>5 / 9<br>5 / 16                           | No               | No            |
| 12.  | Mechanical Maint #1 (MM1)              | E-Plan Table B-1a        | N/A                             | 2 / 12 EOP<br>2 / 12 FSP                           | No<br>Yes        | Yes           |
| 13.  | Mechanical Maint #2 (MM2)              | E-Plan Table B-1a        | N/A                             | 2 / 13 EOP<br>2 / 13 FSP                           | No<br>Yes        | Yes           |
| 14.  | Electrical Maintenance #1 (EM1)        | E-Plan Table B-1a        | N/A                             | 2 / 14 EOP<br>2 / 14 FSP                           | No<br>Yes        | Yes           |
| 15.  | Electrical Maintenance #2 (EM2)        | E-Plan Table B-1a        | N/A                             | 2 / 15   | No               | No            |
| 16.  | I&C Maintenance #1 (IM1)               | E-Plan Table B-1a        | N/A                             | 2 / 16   | No               | No            |

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| Line | On-shift Position                  | Emergency Plan Reference | Augmentation Elapsed Time (min) | Role in Table # / Line#    | Unanalyzed Task? | TMS Required? |
|------|------------------------------------|--------------------------|---------------------------------|----------------------------|------------------|---------------|
| 17.  | I&C Maintenance #2 (IM2)           | E-Plan Table B-1a        | N/A                             | 5 / 11<br>5 / 13<br>5 / 15 | No               | No            |
| 18.  | HP Specialist #1 (HP Lead)         | E-Plan Table B-1a        | N/A                             | 4 / 1                      | No               | No            |
| 19.  | HP Specialist #2 (HP CR)           | E-Plan Table B-1a        | N/A                             | 4 / 5                      | No               | No            |
| 20.  | Chemistry Specialist (CT)(ERU4)    | E-Plan Table B-1a        | N/A                             | 3 / 5                      | Yes              | Yes           |
| 21.  | Security Force Supervisor (SFS)    | Security Plan            | N/A                             | 5 / 15                     | No               | No            |
| 22.  | Emergency Response Supv (ERU Supv) | OAP-100.6                | N/A                             | 3 / 1                      | Yes              | Yes           |
| 23.  | Emergency Response #1 (ERU1)       | OAP-100.6                | N/A                             | 3 / 2                      | Yes              | Yes           |
| 24.  | Emergency Response #2 (ERU2)       | OAP-100.6                | N/A                             | 3 / 3                      | Yes              | Yes           |

**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 AC Power (ELAP)**

**Minimum Crew (One Unit – Single Control Room)**

| Line # | Generic Title/Role | On-Shift Position             | Task Description  | Controlling Method   |
|--------|--------------------|-------------------------------|---|--|
| 1.     | Shift Manager      | Shift Manager (SM)            | Plant and crew oversight (EPP-01)   | Ops Training   |
| 2.     | STA                | Shift Engineer (STA)          | STA tasks (SAP-0421)<br>Contact system control (EOP-6 Step 11)  | Ops Training   |
| 3.     | Unit Supervisor    | Control Room Supervisor (CRS) | Direct immediate and subsequent actions (EOP-6)<br>Check AC restored w/i 2 hours (EOP-6 Step 14)<br>Verify power restored to at least 1 bus (EOP-6 Step 34 RNO)<br>Check instrumentation (EOP-6 Step 21-D)<br>Check SG PORV available in CR (EOP-6 Step 24-C RNO)<br>Check if ELAP is in progress (EOP-6 Step 21-C)<br>Check if FSP-5.0 initiated (EOP-6 Step 24-B RNO)<br>Check if FSP-5.0 initiated (EOP-6 Step 32 RNO)<br>Declare ELAP - implement FSP-5 (EOP-6 Step 14 RNO)<br>Direct initiation alt Security measures (FSP-05 Step 3)<br>Verify power to 1HA from battery chargers (FSP-5 Step 13)<br>Check power to station batteries (FSP-5 Step 23) | Ops Training<br><br><br><br><br><br><br><br><br><br>Ops Training |

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| Line # | Generic Title/Role    | On-Shift Position            | Task Description  | Controlling Method |
|--------|-----------------------|------------------------------|---|--------------------|
| 4.     | Reactor Operator #1   | CRO#1 (NRO)                  | Verify Reactor trip (EOP-6 Step 1)<br>Isolate the RCS (EOP-6 Step 3)<br>Verify valve closure (EOP-6 Step 5)<br>Ensure all RCPs are tripped (EOP-6 Step 7)<br>Place switches in PTL (EOP-06 Step 8)<br>Place component cooling booster pump in off (EOP-6 Step 15-A)<br>Verify alt seal injection in service (EOP-6 Step 15-C)<br>Check RCS inventory (EOP-6 Step 24-A)<br>Check SI actuation (EOP-6 Step 27)<br>Verify CETCs (EOP-6 Step 31)<br>Check RCS inventory (EOP-6 Step 24-A)<br>Monitor intermediate and source range instruments (EOP-6 Step 26)<br>Reset SI (EOP-6 Step 27)<br>Perform containment isolation verification (EOP-6 Step 28-31) | Ops Training       |
|        |                       |                              | Assess plant condition and equipment (FSP-5, Step 2)<br>Place switches in PTL (FSP-5 Step 6)  | Ops Training       |
| 5.     | Reactor Operator #2   | CRO#2 (BOP)                  | Verify TG trip (EOP-6 Step 2)<br>Verify EFW flow (EOP-6 Step 4)<br>Attempt to restore power to ESF (EOP-6 Step 6)<br>Ensure breakers open (EOP-6 Step 9)<br>Ensure FW/MS isolation valve are closed (EOP-6 Step 17)<br>Check for ruptured SG (EOP-6 Step 18-A)<br>Check for faulted SG (EOP-6 Step 19)<br>Verify NR level in intact SGs (EOP-6 Step 20-A)<br>Check bus voltage >108 VDC (EOP-6 Step 21-B)<br>Verify CST level (EOP-6 Step 22)<br>Check instrumentation (EOP-6 Step 21-D)<br>Check CST level (EOP-6 Step 22)<br>Initiate and perform cooldown (EOP-6 Step 25)  | Ops Training       |
|        |                       |                              | Isolate both DG buses (FSP-5 Step 5)<br>Put HVAC loads in PTL/off per Att 8 (FSP-5 Step 8)<br>Ensure XFMR feeder breaker closed (FSP-5 Steps 18 & 19)<br>Ensure XFMR feeder breaker closed (FSP-5 Steps 21 & 22)  | Ops Training       |
| 6.     | Auxiliary Operator #1 | Auxiliary Operator #1 (CBAO) | Verify APN4071 supplied from BU DG (EOP-6 Step 13)<br>Perform containment isolation verification (EOP-6 Step 28-31)   | Ops Training       |
|        |                       |                              | Energize batteries from EEB (FSP-05 Step 4)   | Ops Training       |
| 7.     | Auxiliary Operator #2 | Auxiliary Operator #2 (TBAO) | Establish instrument air to RB (EOP-6 Step 12)<br>Isolate condenser (EOP-6 Step 16)<br>De-energize non-essential loads per Att 2 (EOP-6 Step 21-A)<br>Initiate and perform cooldown (EOP-6 Step 25)   | Ops Training       |

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| Line # | Generic Title/Role | On-Shift Position                       | Task Description  | Controlling Method |
|--------|--------------------|---|---|--------------------|
| 8.     | Other              | Auxiliary Operator #3 (IBAO)            | Attempt to local start EDG (EOP-06 Att 1)   | Ops Training       |
|        |                    |   | Close CTG breaker (FSP-5 Step 11)<br>Open battery charger breakers (FSP-5 Step 14-1)<br>Reset lockout relays (FSP-5 Step 17)<br>Initiate and perform cooldown (EOP-6 Step 25)                                   | Ops Training       |
| 9.     | Other              | Auxiliary Operator #4 (ABUAO)           | Close locally operates isolation valves (EOP-6 Step 15-B)<br>Close locally operates isolation valves (EOP-6 Step 15-C RNO)<br>Dilute BAT (EOP-6 Step 34-D RNO)<br>Initiate and perform cooldown (EOP-6 Step 25) | Ops Training       |
|        |                    |   | Open battery charger breakers (FSP-5 Step 14-2)<br>Reset lockout relays (FSP-5 Step 20)   | Ops Training       |
| 10.    | Other              | Auxiliary Operator #5 (ABLAO)           | Locally control Turb Driven EF Pump (EOP-6 Step 20-B)   | Ops Training       |
| 11.    | Other              | Shift Technical Specialist (STS)(ERU 3) | N/A   | N/A                |

**Other (non-Operations) Personnel**

| Line # | Generic Title/Role | On-Shift Position               | Task Description   | Controlling Method |
|--------|--------------------|---------------------------------|--|--------------------|
| 12.    | Mechanic           | Mechanical Maint #1 (MM1)       | Troubleshoot EDG (Skill of Craft)  | Maint Training     |
|        |                    |                                 | Initiate building vent natural circ per FSP-20.1 - Security patrols supporting (FSP-5 Step 26) | Maint Training     |
| 13.    | Other              | Mechanical Maint #2 (MM2)       | Troubleshoot EDG (Skill of Craft)  | Maint Training     |
|        |                    |                                 | Initiate building vent natural circ per FSP-20.1 - Security patrols supporting (FSP-5 Step 26) | Maint Training     |
| 14.    | Electrician        | Electrical Maintenance #1 (EM1) | Troubleshoot EDG (Skill of Craft)  | Maint Training     |
|        |                    |                                 | Locally open breakers (FSP-5 Step 7)   | Maint Training     |
| 15.    | Other              | Electrical Maintenance #2 (EM2) | Troubleshoot EDG (Skill of Craft)  | Maint Training     |
| 16.    | I&C Technician     | I&C Maintenance #1 (IM1)        | Troubleshoot EDG (Skill of Craft)  | Maint Training     |
| 17.    | Other              | I&C Maintenance #2 (IM2)        | N/A  | N/A                |

**TABLE 3 – Emergency Response**

**Extended Loss of All AC Power (ELAP)**

| Line # | Performed By                             | Task Description  | Controlling Method |
|--------|--|---|--------------------|
| 1.     | Emergency Response Supervisor (ERU Supv) | Assess FLEX equipment deployment route (ERP-0111)<br>Contact SAFER (FSP-5 Step 1-A)<br>Review SAFER equipment list (FSP-5 Step 1-B)<br>Assess access routes (FSP-5, Step 1-C) | ERU Training       |
| 2.     | Emergency Response #1 (ERU1)             | Stage CTGs (FSP-20.7)<br>Start CTGs (FSP-5 Step 11)   | ERU Training       |
| 3.     | Emergency Response #2 (ERU2)             | Assess radio comm/setup tower (ERP-20)<br>Clear debris (ERP-0112)   | ERU Training       |
| 4.     | Shift Technical Specialist (ERU3)        | Assess radio comm/setup tower (ERP-20)<br>Clear debris (ERP-0112)   | ERU Training       |
| 5.     | Chemistry Specialist (CT)(ERU4)          | Stage CTGs (FSP-20.7)<br>Start CTGs (FSP-5 Step 11)   | ERU Training       |

| Analysis Result Item #1   |
|---|
| #1: FSP task training/qualification has not yet been fully developed and incorporated in the applicable departmental training programs. This item is tracked by CR-12-01102 |

TABLE 4 – Radiation Protection and Chemistry

Extended Loss of All AC 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<br>On-Shift Position:<br><b>HP Lead</b>                | X   | X     |       |        |         |         |         |         |         |         |         |
| 2. | On-Site Radiological Survey<br>On-Shift Position:                      |   |       |       |        |         |         |         |         |         |         |         |
| 3. | Personnel Monitoring<br>On-Shift Position:                             |   |       |       |        |         |         |         |         |         |         |         |
| 4. | Job Coverage<br>On-Shift Position:                                     |   |       |       |        |         |         |         |         |         |         |         |
| 5. | Off-site Radiological Assessment<br>On-Shift Position:<br><b>HP CR</b> |   |       |       |        | X       |         |         |         |         |         |         |
| 6. | Other HP – Describe:<br>On-Shift Position:                             |   |       |       |        |         |         |         |         |         |         |         |
| 7. | Sampling<br>On-Shift Position:   |   |       |       |        |         |         |         |         |         |         |         |
| 8. | Other Chem – Describe:<br>On-Shift Position:                           |   |       |       |        |         |         |         |         |         |         |         |

TABLE 5 – Emergency Plan Implementation

Extended Loss of All AC Power (ELAP)

| Line | Function/Task  | On-Shift Position | Controlling Method                                       |
|------|--|-------------------|--|
| 1.   | Declare the Emergency Classification Level (ECL)                                 | Shift Manager     | VCS-TQP-0802<br>EPP-105 - D.1, E.2<br>EPT-18             |
| 2.   | Approve Offsite Protective Action Recommendations                                | Shift Manager     | EPP-105 - E.2, J.4<br>EPP-106<br>EPT-18                  |
| 3.   | Approve content of State/local notifications                                     | Shift Manager     | VCS-TQP-0802<br>EPP-105 - E.2<br>EPP-106<br>EPT-18       |
| 4.   | Approve extension to allowable dose limits                                       | N/A               | N/A FLEX   |
| 5.   | Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.) | Shift Manager     | EPP-105 - B.1, E.1, J.1<br>EPT-18                        |
| 6.   | ERO notification   | STS               | EPP-105 - E.1  |
| 7.   | Abbreviated NRC notification for design basis threat (DBT) event                 | N/A               | N/A FLEX   |
| 8.   | Complete State/local notification form   | Shift Manager     | EPP-105 - E.2<br>EPP-106<br>EPT-18                       |
| 9.   | Perform State/local notifications  | STS               | EPP-105 - E.2<br>EPP-106<br>EPT-16                       |
| 10.  | Complete NRC event notification form   | N/A               | N/A – VCS Control Room utilizes ENF for NRC notification |
| 11.  | Activate Emergency Response Data System (ERDS)                                   | IM2               | EPP-105 - F.2<br>EPP-106<br>EPT-08<br>EPT-16             |
| 12.  | Offsite radiological assessment  | N/A – see table 4 | C-517-016-01-10 in Q-HP-MIDAS (required for EPT-42)      |
| 13.  | Perform NRC notifications  | IM2               | EPP-105 - B.2, F.2<br>EPP-106<br>EPT-08<br>EPT-16        |
| 14.  | Perform other site-specific event notifications (e. g., INPO, ANI, etc.)         | N/A               | N/A  |
| 15.  | Personnel accountability   | IM2<br>SFS        | EPP-105 - J.1, J.2                                       |
| 16.  | Activate sirens  | STS               | EPT-16   |

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

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**6.3 ELAP On-Shift Staffing Task Timetable**

| Time (T+mins) | Position(s)              | Action  | Duration (min) |
|---------------|--------------------------|---|----------------|
| 0             |                          | <b>Complete loss of station AC power event occurs</b>                 |                |
| 0             | CRS                      | Direct immediate and subsequent actions (EOP-6)                       | 360            |
| 0             | NRO                      | Verify Reactor trip (EOP-6 Step 1)                                    | 1              |
| 0             | BOP                      | Verify TG trip (EOP-6 Step 2)   | 1              |
| 1             | NRO                      | Isolate the RCS (EOP-6 Step 3)  | 2              |
| 1             | BOP                      | Verify EFW flow (EOP-6 Step 4)  | 1              |
| 2             | BOP                      | Attempt to restore power to ESF (EOP-6 Step 6)                        | 1              |
| 3             | NRO                      | Verify valve closure (EOP-6 Step 5)                                   | 1              |
| 3             | BOP                      | Ensure breakers open (EOP-6 Step 9)                                   | 1              |
| 4             | NRO                      | Ensure all RCPs are tripped (EOP-6 Step 7)                            | 1              |
| 4             | IBAO                     | Attempt to locally start EDG (EOP-06 Att 1)                           | 20             |
| 4             | MM1<br>MM2<br>EM1<br>EM2 | Troubleshoot EDG (Skill of Craft)                                     | 120            |
| 4             | IM1                      | Troubleshoot EDG (Skill of Craft)                                     | 50             |
| 5             | NRO                      | Place switches in PTL (EOP-06 Step 8)                                 | 2              |
| 5             | STA                      | Contact system control (EOP-6 Step 11)                                | 10             |
| 5             | TBAO                     | Establish instrument air to RB (EOP-6 Step 12)                        | 10             |
| 6             | CBAO                     | Verify APN4071 supplied from BU DG (EOP-6 Step 13)                    | 5              |
| 7             | ERU1<br>CT               | Stage CTGs (FSP-20.7)   | 108            |
| 8             | ERU2                     | Assess radio comm/setup tower (ERP-20)                                | 30             |
| 9             | ERU Supv                 | Assess FLEX equipment deployment route (ERP-0111)                     | 30             |
| 10            | CRS                      | Check AC restored within 2 hours (EOP-6 Step 14)                      | 110            |
| 12            | NRO                      | Place component cooling booster pump in off (EOP-6 Step 15-A)         | 1              |
| 12            | ABUNO                    | Close locally operated isolation valves (EOP-6 Step 15-B)             | 10             |
| 13            | NRO                      | Verify alt seal injection in service (EOP-6 Step 15-C)                | 1              |
| 14            | BOP                      | Ensure FW/MS isolation valve are closed (EOP-6 Step 17)               | 2              |
| 15            | SM                       | Declare SAE based on SS1.1 (EPP-001.3)                                |                |
| 15            | SM                       | Provide notification and direction to on-shift staff (EPP-001)        | 345            |
| 15            | SM                       | Complete and approve initial SAE ENF (EPP-002)                        | 10             |
| 15            | STS                      | Notify ERO (EPP-002)  | 5              |
| 16            | TBAO                     | Isolate condenser (EOP-6 Step 16)                                     | 10             |
| 16            | BOP                      | Check for ruptured SG (EOP-6 Step 18-A)                               | 1              |
| 17            | BOP                      | Check for faulted SG (EOP-6 Step 19)                                  | 1              |
| 17            | HP Lead                  | Perform Rad Survey at penetrations (EOP-6 Step 18-B)                  | 20             |
| 17            | IM2                      | Complete shift accountability list (EPP-012)                          | 5              |
| 17            | SFS                      | Initiate PA accountability report (EPP-012/SPP-114)                   | 2              |
| 18            | BOP                      | Verify NR level in intact SGs (EOP-6 Step 20-A)                       | 1              |
| 19            | ABLAO                    | Locally control Turb Driven EF Pump (EOP-6 Step 20-B)                 | Duration       |
| 20            | BOP                      | Check bus voltage >108 VDC (EOP-6 Step 21-B)                          | 1              |
| 21            | CRS                      | Check if ELAP is in progress (EOP-6 Step 21-C)                        | 1              |
| 22            | SFS                      | Complete accountability (EPP-012/SPP-114)                             | 3              |
| 22            | ABUAO                    | Close locally operated isolation valves (EOP-6 Step 15-C RNO)         | 10             |
| 23            | BOP                      | Verify CST level (EOP-6 Step 22)                                      | 1              |
| 24            | Security                 | Open CB doors during roving patrols (EOP-6 Step 23)                   | 5              |
| 25            | STS                      | Perform State/local initial SAE notifications - 5 locations (EPP-002) | 25             |
| 25            | NRO                      | Check RCS inventory (EOP-6 Step 24-A)                                 | 1              |
| 26            | IM2                      | Attempt to activate ERDS and perform NRC notification (EPP-002)       | Duration       |
| 26            | CRS                      | Check if FSP-5.0 initiated (EOP-6 Step 24-B RNO)                      | 1              |
| 27            | TBAO                     | Locally deenergize non-essential loads per Att 2 (EOP-6 Step 21-A)    | 50             |



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| Time (T+mins) | Position(s)                  | Action   | Duration (min) |
|---------------|------------------------------|--|----------------|
| 27            | NRO                          | Check SI actuation (EOP-6 Step 27)   | 1              |
| 28            | NRO                          | Verify CETCs (EOP-6 Step 31)   | 1              |
| 28            | CRS                          | Check if FSP-5.0 initiated (EOP-6 Step 32 RNO)   | 1              |
| 29            | CRS                          | Verify power restored to at least 1 bus (EOP-6 Step 34 RNO)                                    | 10             |
| 32            | ABUAO                        | Dilute BAT (EOP-6 Step 34-D RNO)   | 60             |
| 38            | ERU2                         | Clear debris (ERP-0112)  | 120            |
| 50            | STS                          | Activate sirens – unsuccessful (EPP-021)   | 3              |
| 75            | SM                           | Complete and approve follow-up SAE ENF (EPP-002)   | 10             |
| 85            | IM1                          | Perform State/local follow-up SAE - 5 locations (EPP-002)                                      | 25             |
| 120           | CRS                          | Declare ELAP - implement FSP-5 (EOP-6 Step 14 RNO)   | 1              |
| 120           | SM                           | Declare GE based on SG1.1 (EPP-001)  |                |
| 120           | SM                           | Determine PAR, complete and approve ENF for GE   | 10             |
| 120           | HP CR                        | Perform dose assessment (EPP-005 Att 3)  | 15             |
| 121           | ERU Supv                     | Contact SAFER (FSP-5 Step 1-A)   | 5              |
| 122           | NRO                          | Assess plant condition and equipment (FSP-5, Step 2)   | 2              |
| 124           | CRS                          | Contact Security to initiate alt Security measures (FSP-05 Step 3)                             | 2              |
| 126           | CBAO                         | Energize batteries from EEB (FSP-05 Step 4)  | 15             |
| 126           | ERU Supv                     | Review SAFER equipment list (FSP-5 Step 1-B)   | 10             |
| 127           | BOP                          | Isolate both DG buses (FSP-5 Step 5)   | 2              |
| 129           | NRO                          | Place switches in PTL (FSP-5 Step 6)   | 2              |
| 130           | IM1                          | Perform State/local initial GE notifications - 5 locations (EPP-002)                           | 25             |
| 131           | EM1                          | Locally open breakers (FSP-5 Step 7)   | 15             |
| 132           | BOP                          | Put HVAC loads in PTL/off per Att 8 (FSP-5 Step 8)   | 3              |
| 133           | ERU1<br>CT                   | Start CTGs (FSP-5 Step 11)   | 30             |
| 134           | MM1<br>MM2                   | Initiate building vent natural circ per FSP-20.1 - Security patrols supporting (FSP-5 Step 26) | 30             |
| 136           | ERU Supv                     | Assess access routes (FSP-5, Step 1-C)   | 5              |
| 163           | IBAO                         | Close CTG breaker (FSP-5 Step 11)  | 5              |
| 168           | CRS                          | Verify power to 1HA from battery chargers (FSP-5 Step 13)                                      | 1              |
| 169           | IBAO                         | Open battery charger breakers (FSP-5 Step 14-1)  | 2              |
| 169           | ABUAO                        | Open battery charger breakers (FSP-5 Step 14-2)  | 5              |
| 170           | ERU Supv<br>ERU1<br>ERU2     | Prepare for CST makeup (FSP-6)   | 120            |
| 170           | CRS                          | Verify power to 1HB from battery chargers (FSP-5 Step 15)                                      | 1              |
| 171           | IBAO                         | Open battery charger breakers (FSP-5 Step 16-1)  | 3              |
| 174           | ABUAO                        | Open battery charger breakers (FSP-5 Step 16-2)  | 5              |
| 174           | IBAO                         | Reset lockout relays (FSP-5 Step 17)   | 3              |
| 178           | BOP                          | Ensure XFMR feeder breaker closed (FSP-5 Steps 18 & 19)  | 1              |
| 179           | ABUAO                        | Reset lockout relays (FSP-5 Step 20)   | 1              |
| 180           | SM                           | Complete and approve ENF for follow-up GE (EPP-002)  | 10             |
| 180           | BOP                          | Ensure XFMR feeder breaker closed (FSP-5 Steps 21 & 22)  | 1              |
| 181           | CRS                          | Check power to station batteries (FSP-5 Step 23)   | 1              |
| 182           | CRS<br>BOP                   | Check instrumentation (EOP-6 Step 21-D)  | 3              |
| 185           | BOP                          | Check CST level (EOP-6 Step 22)  | 1              |
| 186           | NRO                          | Check RCS inventory (EOP-6 Step 24-A)  | 1              |
| 187           | CRS                          | Check SG PORV available in CR (EOP-6 Step 24-C RNO)  | 1              |
| 188           | BOP<br>TBAO<br>IBAO<br>ABUAO | Initiate and perform cooldown (EOP-6 Step 25)  | 120            |
| 190           | IM1                          | Perform State/local follow-up GE - 5 locations (EPP-002)                                       | 25             |

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| <b>Time (T+mins)</b> | <b>Position(s)</b>                                  | <b>Action</b>   | <b>Duration (min)</b> |
|----------------------|---|---|-----------------------|
| 198                  | RO  | Monitor int and source range instruments (EOP-6 Step 26)      | 1                     |
| 199                  | NRO   | Reset SI (EOP-6 Step 27)                                      | 1                     |
| 200                  | NRO<br>CBAO   | Perform containment isolation verification (EOP-6 Step 28-31) | 60                    |
| 240                  | SM  | Complete and approve ENF for follow-up GE (EPP-002)           | 10                    |
| 250                  | IM1   | Perform State/local follow-up GE - 5 locations (EPP-002)      | 25                    |
| 300                  | SM  | Complete and approve ENF for follow-up GE (EPP-002)           | 10                    |
| 308                  | <b>Initial Cooldown Complete</b>                    |   |                       |
| 310                  | IM1   | Perform State/local follow-up GE - 5 locations (EPP-002)      | 25                    |
| 360                  | <b>End of Shift Staffing Task Sequence Analysis</b> |   |                       |

**7 AUGMENTED AND EXPANDED ERO RESPONSE CAPABILITY**

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 for a single unit station is defined as the ERO complement needed to support EP response and FLEX implementation activities.

**7.1 ERO Notification and Response during an ELAP**

Assessment of staffing resources for the expanded ERO is provided by the depth of personnel filling the existing augmented ERO positions. Table 7-1 below documents the augmented ERO minimum and full staffing requirements from the VCS U1 Emergency Plan. A four team rotation is specified in SAP-127. The number qualified is based on the VCS U1 Emergency Planning Telephone Directory Rev. 121 dated March 2015.

**Table 7-1 Augmented ERO Response Resources - Minimum & Full Staffing**

|                     | ERO Title                                | # Required  | # Qualified |
|---------------------|--|-------------|-------------|
| EOF                 | Offsite Emergency Coordinator            | 1           | 7           |
|                     | State/County Communicator                | 1           | 11          |
|                     | EOF Logger                               | Non-minimum | 9           |
|                     | Technical Support Coordinator            | Non-minimum | 6           |
|                     | Offsite Rad Monitoring Coordinator       | 1           | 4           |
|                     | Dose Assessor/HP                         | 1           | 6           |
|                     | FMT (HP Specialist)                      | 2           | 53          |
|                     | FMT (Driver)                             | 2           | 10          |
|                     | Security Coordinator                     | Non-minimum | 4           |
|                     | General Services Coordinator             | Non-minimum | 5           |
| TSC                 | Emergency Director                       | 1           | 8           |
|                     | State/County Communicator                | 1           | 9           |
|                     | ENS Communicator                         | 1           | 9           |
|                     | Operations Supervisor                    | 1           | 6           |
|                     | Technical Support Supervisor             | 1           | 8           |
|                     | Core Thermal Engineer                    | 1           | 4           |
|                     | Mechanical Engineer                      | 1           | 15          |
|                     | Electrical Engineer                      | 1           | 9           |
|                     | Maintenance Supervisor                   | Non-minimum | 5           |
|                     | Radiological Assessment Supervisor       | Non-minimum | 5           |
|                     | Chemistry Supervisor                     | Non-minimum | 8           |
| OSC                 | OSC Supervisor                           | 1           | 7           |
|                     | Operations Staff (Interim ED)            | Non-minimum | 13          |
|                     | Operations Staff (Licensed Operator)     | Non-minimum | 39          |
|                     | Operations Staff (Non-Licensed Operator) | Non-minimum | 41          |
|                     | Mechanical Maintenance Mechanic          | 1           | 30          |
|                     | Electrical Maintenance Electrician       | 2           | 24          |
|                     | I&C Maintenance Mechanic                 | 2           | 19          |
|                     | Plant Rad Monitoring Director            | 1           | 4           |
|                     | HP Specialist (offsite dose assessment)  | 1           | 53          |
|                     | HP Specialist (onsite rad monitoring)    | 2           |             |
|                     | HP Specialist (in-plant rad surveys)     | 2           |             |
|                     | HP Specialist (rad protection)           | 4           |             |
|                     | HP Specialist (rad waste)                | 1           |             |
|                     | Chemistry Specialist                     | 1           | 11          |
| Security Supervisor | Non-minimum                              | 5           |             |

**VCS U1 NEI 12-01 Phase 2 ELAP ERO Staffing Analysis Report**

|     | ERO Title                                | # Required  | # Qualified |
|-----|--|-------------|-------------|
| JIC | Emergency Control Officer (Spokesperson) | 1           | 8           |
|     | JIC Coordinator                          | 1           | 6           |
|     | Lead Technical Briefer                   | 1           | 13          |
|     | Media Coordinator                        | Non-minimum | 6           |

**7.1.1 General ERO Response**

**1. Implementing Strategy for the Augmenting ERO**

The VCS U1 90-day §50.54(f) response letter identified how the augmented staff would be notified given degraded communications capabilities as follows:

*VCSNS Station Administrative procedure SAP-127 Revision 3, "Emergency Preparedness," Attachment VI, provides the expectation for Emergency Response Organization (ERO) personnel to respond to their assigned emergency response facilities when notified of an event. In the event of an area-wide loss-of-grid event prohibiting communications, the expectation is for ERO personnel to gain awareness of the event via direct observation, media reports, word of mouth, etc. This practice has been communicated to ERO responders, and will be included in the 2012 ERO annual requalification training.*

The ERO augmentation process consists of an "all respond" expectation. When the ERO notification system is operable, qualified ERO members are contacted and expected to report if fit for duty (a rotating duty team insures all ERO positions will be filled by personnel meeting FFD requirements). In the absence of the call out system, ERO members are trained to respond automatically per SAP-127 Attachment VI, which states the following.

*If you are made aware of an emergency, Alert or higher classification, but you have not received notification, respond to your assigned emergency facility, as soon as practical; do NOT wait on notifications.*

*For natural emergencies (major loss of electrical power) that may inhibit the ability to notify ERO members of an event, respond to your appropriate Emergency Response Facility. If no emergency exist or facilities are not being activated, you will be released.*

SAP-127 Attachment VI is reviewed by each person assigned and qualified on the Emergency Response Organization (ERO) annually.

Review of the VCS U1 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.

**2. Response Timeliness for the Augmenting ERO**

The VCS U1 ERO augmentation process consists of an all call/all come expectation. Callout of an expanded ERO is assumed within the callout of the augmented ERO.

In the absence of the call out system, ERO members are trained to respond automatically per SAP-127 as described in the implementing strategy above.

3. Work Location for the Augmenting ERO

If access to the primary on site emergency response facilities is not possible, ERO members are trained to report to their appropriate emergency response facility, which is the EOF for TSC and OSC personnel when the site is not accessible. The message is sent out site-wide each Thursday.

The EOF includes rooms and equipment for the remote TSC / OSC. Work areas for each ERO position have been designated that include the appropriate computer terminals and communications systems for the positions. Station documents are maintained locally on an updated server and can be printed (plant drawings can be printed on an engineering plotter). Power to the facility is provided by the grid or a dedicated diesel generator. The remote TSC / OSC has adequate space and resources to accommodate the expanded ERO.

4. Transportation for the Augmenting ERO

The VCS U1 90-day §50.54(f) response identified the following methods of access (e.g., roadways, navigable bodies of water and dockage, airlift, etc.) to the site that are expected to be available after a widespread large scale natural event:

*Various methods of transportation to VCSNS are applicable, including walking and use of personal vehicles. SCE&G currently has Memorandums of Understanding (MOU) and Letters of Agreement (LOA) with the South Carolina Emergency Management Division (SCEMD) and the counties of Fairfield, Lexington, Newberry, and Richland. These entities have agreed to provide support to VCSNS in the event of a large-scale natural disaster inhibiting site access. SCEMD is the central coordinating agency for mutual aid in South Carolina for all state and local resources.*

*In addition to the Memorandums of Understanding and Letters of Agreement with state agencies and local agencies, SCE&G is evaluating agreement(s) with private organizations to transport emergency responders to the site in the event of a large-scale natural disaster that inhibits site access. SCE&G is evaluating staging areas to be used by emergency responders. SCE&G anticipates completing the evaluations and establishing agreements by October 30, 2012.*

The LOAs with SCEMD, Fairfield County, Lexington County, Newberry County, and Richland County were verified to contain the following:

*Providing assistance for the transfer of staged equipment following an external event, such as hurricane, tornado, earthquake, or flooding, through the removal of large debris or roadway repairs which may restrict normal pathways for movement of personnel or equipment. This assistance will be provided within four to five and a half hours of the request to support the assumption of the initial coping strategy for VCSNC.*

The collective processes VCS U1 has in place as described above (e.g., roadway clearing, alternate site access should roadways be impassable, ERO transport, etc.) provide the ability of the augmented ERO to access the site and be available at six hours post event time.

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 could not be demonstrated during a drill or exercise that involved a design basis accident affecting only one unit.

EPP-105 includes evaluation objectives and demonstration criteria for beyond design basis events and expanded ERO activities.

7.1.2 Position Specific ERO Response

1. Radiation Protection Technicians (RPTs)

The equation below was used to determine the required number of on-site RP Technicians (on-shift plus augmented ERO RP Technicians that perform on-site response functions) for VCS U1:

$$RPT_{TOTAL} = RPT_{COP} + RPT_{SHIFT} + RPT_{RCA} + RPT_{NC}$$

Where:

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

$RPT_{COP}$  = Number needed to support implementation of the 2 most limiting ELAP coping strategies, including FLEX strategies.

$RPT_{SHIFT}$  = Number needed to fill on shift complement.

$RPT_{RCA}$  = Number needed for repair and corrective action – equivalent to the in-plant protective action Table B-1 function.

$RPT_{NC}$  = 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 – equivalent to the radiological assessment and support Table B-1 function.

For VCSNS, the resulting number of RPTs is:

| <u>RPT Category</u> | <u>Number Required</u> | <u>Comments</u>  |
|---------------------|------------------------|--|
| $RPT_{COP}$         | 1                      | Staffing assessment results indicate that 1 RPT is required to support implementation of the FSP strategies.                   |
| $RPT_{SHIFT}$       | 2                      | Minimum # of VCS U1 on-shift HPs.  |
| $RPT_{RCA}$         | 5                      | Minimum # of VCS U1 RPTs required for ERO augmentation response for the in-plant radiation protection and rad waste functions. |
| $RPT_{NC}$          | 5                      | Minimum # of VCS U1 RPTs required for ERO augmentation response for the radiological assessment function.                      |
| $RPT_T$             | 13                     |  |

Thus, the total number of on-site RPTs required for the expanded ERO is 25, which is based on the staffing needed to:

- 1) Support the two most limiting RP resource intense FSG strategies, which do not require rotating shifts (1 RPT<sub>COP</sub>)
- 2) Support operating on 12-hour shifts for other RP tasks (2 shifts of RPT<sub>RCA</sub>, RPT<sub>SHIFT</sub> and RPT<sub>NC</sub> = 24 total RPTs).

53 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 RP Technicians through industry agreement with INPO as part of the INPO Emergency Resources Manual documented by letter of agreement dated September 2009. No other arrangements have been made for additional RP Technicians.

## 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. However, since VCS U1 is a single unit site the administrative support personnel utilized for full ERO staffing as documented above are sufficient to support any expanded response resulting from implementation of FLEX strategies.

**3. FSG Implementers**

The assessment considered the number of personnel required for simultaneous implementation of the two FSG strategies that require the greatest number of staff to implement. There are five (5) FSG strategies for VCS U1:

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

Based on the FSP task analysis, the following FLEX strategies are limiting:

**Strategy #2 – Core Cooling/Decay Heat Removal**

Implementation involves the following FSPs and personnel resources:

- FSP-20.4.1, Staging the FX UHS Pumps
- FSP-20.4.2, FX UHS Pump Operation

| <b>Personnel (department)</b> | <b>Total #</b> | <b>Task Performed</b>  |
|-------------------------------|----------------|--|
| ERU                           | 2              | FSP-20.4.1 – Haul and stage UHS equipment from FLEX storage to deployed location (SW Pond) |
| Security                      | 2              | FSP-20.4.1 – Access to SW Pond (normal security function)                                  |
| ERU                           | 2              | FSP-20.4.1 – Run and connect hoses   |
| ERU (Same as above)           | 1              | FSP-20.4.1 – Run pump  |
| AO                            | 1              | FSP-20.4.2 – Valve manipulations and pump operation  |
| ERU (Same as above)           | 2              | FSP-20.4.2 – Start equipment   |
| <b>Total</b>                  | <b>7</b>       |  |

**Strategy #4 – Containment Integrity**

Implementation involves the following FSPs and personnel resources:

- FSP-20.4.1, Staging the FX UHS Pumps
- FSP-20.4.2, FX UHS Pump Operation
- FSP-12, Alternate Reactor Building Cooling

| <b>Personnel (department)</b> | <b>Total #</b> | <b>Task Performed</b>  |
|-------------------------------|----------------|--|
| ERU                           | 2              | FSP-20.4.1 – Haul and stage UHS equipment from FLEX storage to deployed location (SW Pond) |
| Security                      | 2              | FSP-20.4.1 – Access to SW Pond (normal security function)                                  |
| ERU                           | 2              | FSP-20.4.1 – Run and connect hoses   |
| ERU (Same as above)           | 1              | FSP-20.4.1 – Run pump  |
| AO                            | 1              | FSP-20.4.1 – Valve manipulations and pump operation  |
| ERU (Same as above)           | 2              | FSP-20.4.1 – Start equipment   |
| AO (Same as above)            | 1              | FSP-12 – Valve manipulations   |
| <b>Total</b>                  | <b>7</b>       |  |



**Strategy #5 – SFP Makeup & Cooling**

Implementation involves the following FSPs and personnel resources:

- FSP-20.4.1, Staging the FX UHS Pumps
- FSP-20.4.2, FX UHS Pump Operation
- FSP-11, Alternate Reactor Building Cooling

| <b>Personnel (department)</b> | <b>Total #</b> | <b>Task Performed</b>  |
|-------------------------------|----------------|--|
| ERU                           | 2              | FSP-20.4.1 – Haul and stage UHS equipment from FLEX storage to deployed location (SW Pond) |
| Security                      | 2              | FSP-20.4.1 – Access to SW Pond (normal security function)                                  |
| ERU                           | 2              | FSP-20.4.1 – Run and connect hoses   |
| ERU (Same as above)           | 1              | FSP-20.4.1 – Run pump  |
| AO                            | 1              | FSP-20.4.1 – Valve manipulations and pump operation  |
| ERU (Same as above)           | 2              | FSP-20.4.1 – Start equipment   |
| Security                      | 1              | FSP-11 – Open access panels FHB roof and RR access door (normal security function)         |
| MM                            | 2              | FSP-11 – Destructively open FHB siding (crane)   |
| MM                            | 2              | FSP-11 – Block FHB drains  |
| HP                            | 1              | FSP-11 – RP coverage for drain blockage  |
| <b>Total</b>                  | <b>13</b>      |  |

A total of 13 personnel are required to simultaneously implement the two most labor intensive FLEX strategies. The three security positions perform tasks governed by normal security procedures which are in support of FLEX activities, not actual FLEX tasks.

**7.2 Expanded Response Functions for Phase 2 Staffing Assessment**

Table 7-2 addresses NEI 12-01 Table 3.2, Expanded Response Functions for Phase 2 Staffing Assessment, (FSG implementation). The number required column is the personnel resources for the implementation of the two most limiting FSG strategies. The number available column is the number of personnel qualified to the position.

**Table 7-2 Expanded ERO FLEX Resources**

| Function   | Location   | Key Roles & Staffing Considerations   | VCS U1 ERO Position               | # Required | # Available        |
|--|------------|---|-----------------------------------|------------|--------------------|
| Evaluation of Transition Phase Coping Strategies     | TSC or EOF | <ul style="list-style-type: none"> <li>One team for each unit to evaluate selection of Transition Coping strategies; team performs evaluations not done by Control Room personnel.</li> <li>Team composition (i.e., number and represented disciplines) as described in governing site programs, procedures and guidelines.</li> <li>Team may include personnel responsible for performing other functions for the same assigned unit.</li> </ul> | TSC Shift Technical Advisor       | 2          | 13 <sup>(a)</sup>  |
|  |            |   | TSC Tech Support Supervisor       | 2          | 8                  |
|  |            |   | EOF Technical Support Coordinator | 2          | 6                  |
| Implementation of Transition Phase Coping Strategies | OSC        | <ul style="list-style-type: none"> <li>Number and composition of personnel capable of simultaneous implementation of any 2 Transition Phase coping strategies at each unit.</li> <li>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 FSG strategies.</li> </ul>                      | AO                                | 1          | 36 <sup>(b)</sup>  |
|  |            |   | ERU (ERO proper)                  | 4 total    | [9] <sup>(c)</sup> |
|  |            |   | ERU (STS)                         |            | 11 <sup>(d)</sup>  |
|  |            |   | ERU (Chem Specialist)             |            | 10 <sup>(e)</sup>  |
|  |            |   | MM                                | 4          | 28 <sup>(f)</sup>  |
| HP   | 1          | 51 <sup>(g)</sup>   |                                   |            |                    |

- (a) VCS U1 has 14 qualified STAs. 1 STA is accounted for as being on shift. (Watchstanding Authorization CGSS-15-0028, 04/20/15)
- (b) VCS U1 has 41 qualified AOs. 5 AOs are accounted for as being on shift. (EP Telephone Directory Rev 121)
- (c) VCS U1 has 12 qualified ERU personnel. 3 ERUs are accounted for as being on shift. (CR-12-01102)
- (d) VCS U1 has 12 qualified STSs. 1 STS is accounted for as being on shift. (EP Telephone Directory Rev 121)
- (e) VCS U1 has 11 qualified Chemistry Specialists. 1 Chemistry Specialist is accounted for as being on shift. (EP Telephone Directory Rev 121)
- (f) VCS U1 has 30 Mechanical Maintenance Mechanics. 2 MMs are accounted for as being on shift. (EP Telephone Directory Rev 121)
- (g) VCS U1 has 53 qualified HP Technicians. 2 HPTs are accounted for as being on shift. (EP Telephone Directory Rev 121)

**Attachment 1: References**

1. EA-12-049, NRC Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, 03/12/12
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. Letter from E. J. Leeds (NRC) and M. R. Johnson, (NRC) to All Power Reactor Licensees and Holders of Construction Permits in Active or Deferred Status, Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendation 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 (ML12053A340)
6. D. L. Skeen (NRR) letter 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, May 2012, dated 05/15/12
7. RC-12-0078, South Carolina Electric & Gas (SCE&G) 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
8. RC-12-0082, South Carolina Electric & Gas (SCE&G) 90-Day Response to Emergency Preparedness Information Requested by the NRC 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 06/08/12
9. EOP-6, Loss of all AC Power, Rev. 31 (04/18/15)
10. EP-100, Radiation Emergency Plan, Rev. 64
11. EPP-001, Activation and Implementation of the Emergency Plan, Rev. 30C
12. EPP-001.3, Site Area Emergency, Rev. 8
13. EPP-001.4, General Emergency, Rev. 9
14. EPP-002, Communication and Notification, Rev. 36
15. EPP-003, Plant Radiological Surveying, Rev. 14
16. EPP-005, Offsite Dose Calculation, Rev. 21
17. EPP-012, Onsite Personnel Accountability and Evacuation, Rev. 12

**Attachment 1: References**

18. EPP-021, Activation of the Early Warning System (EWSS), Rev. 22
19. EPP-105, Conduct of Drills and Exercises, Rev. 11
20. EPP-106, Emergency Preparedness Performance Indicator Procedure, Rev. 3C
21. EPT-08, ENS Communicator (shift), Rev. 1/27/15
22. EPT-16, State/County Communicator, Rev. 11/19/14
23. EPT-18, Licensed Operator, Rev. 11/17/14
24. SAP-0421, Shift Engineer Conduct of Operations, Rev. 7E
25. FSP-1.0, Long Term RCS Inventory Control, Revision 0 (03/31/15)
26. FSP-1.1, Establishing RCS Makeup During Reflux Cooling (03/24/15)
27. FSP-4.0, ELAP DC Bus Load Shed/Management (3/26/15)
28. FSP-4.1, Recovering the Vital DC and Instrument Busses when a 480V Source is Available (03/06/15)
29. FSP-5.0, Initial Assessment and Flex Equipment Staging (03/30/15)
30. FSP-6.0, Alternate CST Makeup (03/05/15)
31. FSP-7.0, Loss of Vital Instrumentation or Control Power (03/06/15)
32. FSP-7.1, Establishing Local Indication of Emergency Feed Flow (01/27/15)
33. FSP-8.0, Alternate RCS Boration (04/01/15)
34. FSP-9.0, Low Decay Heat Temperature Control (03/11/15)
35. FSP-10.0, Passive RCS Injection Isolation (04/06/15)
36. FSP-11.0, Alternate SFP Makeup and Cooling (04/06/15)
37. FSP-12.0, Alternate Reactor Building Cooling (03/10/15)
38. FSP-13.0, Transition from FLEX Equipment (04/6/15)
39. FSP-14.0, Shutdown RCS Makeup (03/19/15)
40. FSP-20.0, 5KW Portable Emergency Generator Operation (02/16/15)
41. FSP-20.1, Vital Area Emergency Ventilation (03/03/15)
42. FSP-20.3.1, Staging the FX SG Feed Pump Using the East Strategy (East Pen Flex Header) (02/24/15)

**Attachment 1: References**

43. FSP-20.3.2, Staging the FX SG Feed Pump Using the West Strategy (AB Roll-Up Door) (02/24/15)
44. FSP-20.3.3, FX SG Feed Pump Operation (02/23/15)
45. FSP-20.3.4, Staging the FX SG Feed Pump for RCS Makeup (03/24/15)
46. FSP-20.3.5, Operation of the FX SG Feed Pump for RCS Makeup (03/24/15)
47. FSP-20.4.1, Staging the FX UHS Pumps (03/05/15)
48. FSP-20.4.2, FX UHS Pump Operation (02/17/15)
49. FSP-20.5.1, Staging the FX RCS MU Pump (03/02/15)
50. FSP-20.5.2, FX RCS MU Pump Operation (02/23/15)
51. FSP-20.6.1, Staging the FX BSTR/XFER Pump (01/29/15)
52. FSP-20.6.2, FX BSTR/XFER Pump Operation (03/05/15)
53. FSP-20.7, FLEX Combustion Turbine Generator Operation (02/24/15)
54. FSP-20.8, RCS Makeup Using the Alternative Seal Injection Pump (03/03/15)
55. SAP-127, Emergency Preparedness, Rev 4
56. ERP- 0111, ERU BDB Haul Route Assessment (5/25/15)
57. ERP-0112, ERU BDB Debris Clearing (5/25/15)
58. OAP-100.6, Control Room Conduct and Control of Shift Activities Rev 4C

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**VIRGIL C. SUMMER NUCLEAR STATION UNIT 1  
DOCKET NO. 50-395  
OPERATING LICENSE NO. NPF-12**

**ENCLOSURE 2**

**REGULATORY COMMITMENTS**

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### Regulatory Commitments

The following table identifies those actions committed to by South Carolina Electric & Gas Company in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments.

| <b>Item</b> | <b>Commitment</b>  | <b>Scheduled Date</b>                   |
|-------------|--|---|
| 1           | Complete FSP task training/qualification and incorporate into the applicable departmental training programs.   | October 2, 2015                         |
| 2           | Increase on-shift staffing levels to support FLEX by revising Operations Administrative Procedure 100.6, "Control Room Conduct and Control of Shift Activities," Attachment VIIA." | Prior to entering mode 4 following RF22 |
| 3           | Review staffing analysis report with final validated FSPs and other applicable procedures. Revise and resubmit Phase 2 staffing analysis report, if required.                      | February 15, 2016                       |