

PSEG Nuclear LLC  
P.O. Box 236, Hancocks Bridge, NJ 08038-0236



10 CFR 50.54(f)

LR-N14-0248

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U.S. Nuclear Regulatory Commission  
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Hope Creek Generating Station  
Renewed Facility Operating License No. NPF-57  
NRC Docket No. 50-354

Subject: Hope Creek Generating Station's Response to March 12, 2012, Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 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
2. PSEG letter LR-N12-0143, "PSEG Nuclear LLC's 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 10, 2012
3. NEI 12-01, "Guideline for Assessing Beyond-Design-Basis Accident Response Staffing and Communications Capabilities," Revision 0, dated May 2012

4. NRC letter to 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 May 2012," dated May 15, 2012
5. PSEG letter LR-N13-0097, "Hope Creek Generating Station's Response to March 12, 2012, Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 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 1 Staffing Assessment," dated April 29, 2013
6. NRC Order Number EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated March 12, 2012
7. PSEG Letter LR-N14-0141, "Salem Generating Station's Response to March 12, 2012, Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 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," dated June 16, 2014

### Background

On March 12, 2012, the NRC staff issued a request for information pursuant to 10 CFR 50.54(f), regarding the Near-Term Task Force (NTTF) 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. In accordance with Reference 1, Enclosure 5, PSEG Nuclear LLC (PSEG) submitted a 60-day response letter (Reference 2) to describe its course of action for performing the requested actions and providing the requested information. Consistent with the actions described in Reference 2, Enclosure 1 provides the Phase 2 responses to the NTTF Recommendation 9.3: Emergency Preparedness – Staffing, Requested Information Items 1, 2, and 6, for the Hope Creek Generating Station (HCGS).

PSEG's staffing assessment follows a two-phased approach for evaluating a beyond-design-basis external event (BDBEE), consistent with the guidance of NEI 12-01 (Reference 3) as endorsed by the NRC in Reference 4. PSEG provided the results of Phase 1 of the assessment via Reference 5. Phase 1 addressed the staffing

levels that are needed to respond to a multi-unit BDBEE that results in an extended loss of alternating current (AC) power and impeded access to the site, not including the staffing needed to implement actions that address NRC Order EA-12-049 (Reference 6). The Phase 2 Staffing Assessment provided herein addresses staffing to implement diverse and flexible coping strategies (FLEX) in response to NRC Order EA-12-049.

Enclosure 1 to this letter provides the Phase 2 Staffing Assessment for HCGS. In accordance with Reference 2, Enclosure 1, this letter provides the response to the following information requests:

- Reference 1, Enclosure 5, Staffing, Requested Information Item 1
- Reference 1, Enclosure 5, Staffing, Requested Information Item 2
- Reference 1, Enclosure 5, Staffing, Requested Information Item 6

#### Requested Information Item 1

*It is requested that addressees provide an assessment of the onsite and augmented staff needed to respond to a large scale natural event meeting the conditions described in the Discussion section (Reference 1, Enclosure 5). This assessment should include a discussion of the onsite and augmented staff available to implement the strategies as discussed in the emergency plan and/or described in plant operating procedures. The following functions are requested to be assessed:*

- *How onsite staff will move back-up equipment (e.g., pumps, generators) from alternate onsite storage facilities to repair locations at each reactor as described in the Order regarding the NRC Near-Term Task Force (NTTF) Recommendation 4.2. It is requested that consideration be given to the major functional areas of NUREG-0654, Table B-1, such as plant operations and assessment of operational aspects, emergency direction and control, notification/communication, radiological accident assessment, and support of operational accident assessment, as appropriate.*
- *New staff or functions identified as a result of the assessment.*
- *Collateral duties (personnel not being prevented from timely performance of their assigned functions).*

#### Response to Requested Information Item 1

Enclosure 1 provides the requested Phase 2 Staffing Assessment. Response to the specific items included in Requested Information Item 1 is as follows:

- The Phase 2 Staffing Assessment concludes that the minimum complement of on-shift staff allowed by the current PSEG Emergency Plan, combined with two

additional on-shift personnel to support site-wide (i.e., HCGS and Salem Generating Station) equipment hauling and debris removal, are capable of responding to the Phase 2 scenario. The assessment considers the major functional areas associated with on-site implementation of the FLEX strategies, including the relocation of equipment from storage areas to deployment locations. The assessment also addresses the ability of the on-shift staff to perform any required emergency response functions prior to the delayed arrival of the augmented Emergency Response Organization (ERO).

- Based on the results of this assessment and the Salem Generating Station Phase 2 Staffing Assessment (Reference 7), PSEG is establishing administrative controls to ensure the availability of two on-shift individuals assigned to the functions of site-wide equipment hauling and debris removal in support of FLEX strategy implementation.
- The Phase 2 Staffing Assessment determined that personnel were not prevented from timely performance of their functions due to collateral duties. There are no conflicts or overlaps in functions or tasks required to be performed by on-shift operations and support personnel.

#### Requested Information Item 2

*Provide an implementation schedule of the time needed to conduct the onsite and augmented staffing assessment. If any modifications are determined to be appropriate, please include in the schedule the time to implement the changes.*

#### Response to Requested Information Item 2

PSEG has initiated the changes to administrative controls for shift staffing to ensure the availability of personnel to support equipment hauling and debris removal. These changes are tracked in PSEG's corrective action program and are planned to be completed no later than prior to restart from the HCGS spring 2015 refueling outage, concurrent with implementation of FLEX strategies to address NRC Order EA-12-049.

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Requested Information Item 6

*Identify changes that have been made or will be made to your emergency plan regarding the on-shift or augmented staffing changes necessary to respond to a loss of all ac power, multiunit event, including any new or revised agreements with offsite resource providers (e.g., staffing, equipment, transportation, etc.).*

Response to Requested Information Item 6

The Phase 2 Staffing Assessment provided in Enclosure 1 did not identify any changes to the Emergency Plan requirements for on-shift staffing, augmented staffing, or agreements with offsite resource providers.

There are no regulatory commitments contained in this letter.

If you have any questions or require additional information, please do not hesitate to contact Mr. Lee Marabella at 856-339-1208.

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

Executed on 12/09/2014  
(Date)

Sincerely,



Christopher J. Schwarz  
Vice President – Operations Support

Enclosure 1: Hope Creek Generating Station Fukushima Response  
NEI 12-01 Phase 2 Staffing Assessment Report

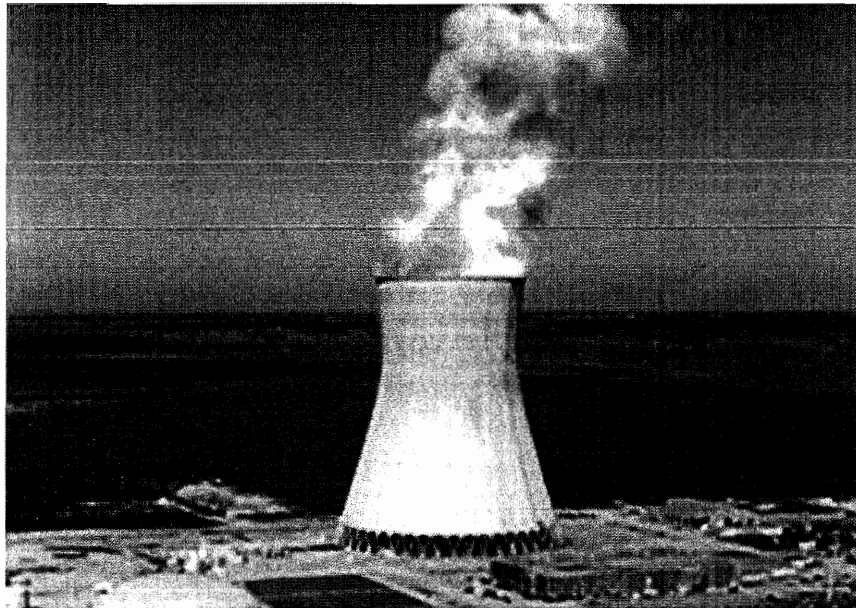
- cc: Director of Office of Nuclear Reactor Regulation  
Administrator, Region I, NRC  
Ms. C. Sanders-Parker, Project Manager, NRC  
Mr. J. Boska, Project Manager, NRC  
NRC Senior Resident Inspector, Hope Creek  
Mr. P. Mulligan, Manager IV, NJBNE  
Hope Creek Commitment Tracking Coordinator  
PSEG Corporate Commitment Coordinator

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**Enclosure 1**

**Hope Creek Generating Station Fukushima Response  
NEI 12-01 Phase 2 Staffing Assessment Report**

# **Hope Creek Generating Station Fukushima Response**



NEI 12-01 PHASE 2

STAFFING ASSESSMENT REPORT

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## **1 Executive Summary**

PSEG Nuclear LLC (PSEG) conducted an assessment of the capability of the on-shift organization as defined by the Emergency Plan, Fire Protection staffing procedures, and Operations shift staffing procedures to implement mitigation strategies in response to a beyond-design-basis extended loss of AC power (ELAP) event, based on lessons learned from the Fukushima Dai-ichi accident. The on-shift staffing analysis was conducted in accordance with the guidance in NEI 12-01, "Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities." This report describes the methods and results of the staffing assessment for Hope Creek Generating Station (HCGS). It takes into account actions that would be taken by common Hope Creek and Salem on-shift personnel who serve on the Fire Brigade/Emergency Medical Technician (EMT) response and personnel who provide support for heavy equipment hauling and debris removal.

This assessment concluded that sufficient on-shift resources are available at all times to implement the strategies developed to maintain or restore core cooling, containment and spent fuel pool cooling during a beyond-design-basis external event (BDBEE) that results in an ELAP affecting all on-site units simultaneously. The personnel that are assumed to be on site during the BDBEE are part of the minimum complement allowed by the PSEG Emergency Plan, except for two personnel resources that are assumed to be available on site for equipment hauling and debris removal. These two personnel will be subject to administrative controls for shift staffing to support the Salem Generating Station (SGS) and HCGS BDBEE mitigation strategies.

## **2 Introduction**

This report documents the analysis performed to meet the commitments for conducting a staffing assessment for a BDBEE affecting all units simultaneously at a multi-unit site. This report is in response to the Nuclear Regulatory Commission's (NRC's) March 12, 2012, request for information pursuant to 10 CFR 50.54(f) regarding the Near-Term Task Force (NTTF) review of insights from the Fukushima Dai-ichi accident (Reference 1). The assessment uses NEI 12-01, "Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communication Capabilities," (Reference 2) and NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," (Reference 3) to determine the response of on-shift and augmented resources to an ELAP incident impacting all units at a site. The assessment addresses Phase 2 of the analysis applicable to implementation of existing and FLEX strategies for prolonged loss of offsite power applicable to multi-unit sites during the initial and transition phases of the event utilizing the methodology of NEI 10-05, "Assessment of On-Shift Emergency Response Organization Staffing and Capabilities" (Reference 4). The assessment was performed to support the HCGS response.

The assessment was conducted using:

- Existing Hope Creek Abnormal Operating Procedures

- Hope Creek 300 series Emergency Operating Procedures
- Hope Creek draft 400 series (FLEX) Emergency Operating Procedures
- Hope Creek Severe Accident Management Guidelines
- SGS FLEX Support Guidelines (FSGs) to consider common resource needs

The assessment considers required actions performed during the initial and transition phases of an ELAP (first 24 hours). Consistent with NEI 12-01 and NEI 12-06, near-normal site access and the ability to receive and deploy offsite resources are considered to be established during the final phase (24+ hours following the ELAP).

### **3 Staffing Assessment Process Overview**

Draft strategies for responding to an ELAP affecting HCGS and draft 400 series EOPs were evaluated during the NEI 12-01 Phase 2 Staffing Assessment by a multi-disciplined team. Coordination of response actions with SGS was considered during this analysis. The staffing assessment addressed the ability of the on-shift staff to perform required emergency response functions prior to the delayed arrival of the augmented Emergency Response Organization (ERO).

The Phase 2 Staffing Assessment requires that the ELAP scenario be evaluated based on the minimum staffing in the Emergency Plan (Reference 6) (consistent with NEI 12-01) and the supplemental staff allowed by the minimum administrative staffing procedures (consistent with NEI 12-06). Table 1 summarizes the available personnel, including shared resources for a multi-unit event, used for performance of the Phase 2 Staffing Assessment. Table 1 is based on Emergency Plan, Figure 3-1, On Shift Staffing, and administrative controls in OP-HC-112-101-1001, Shift Turnover Responsibilities, Attachment 5, ERO Shift Duty Positions.

**Table 1 – HCGS On-Shift Staff**

| PSEG Nuclear LLC Emergency Plan, Rev 29<br>On Shift Staffing<br>Emergency Response Organization |          | Supplemental<br>Administrative<br>Staff <sup>Note 7</sup><br>(NEI 12-06<br>assumption) |
|---|----------|--|
| Position  | On-shift | On-shift   |
| Shift Manager (SM)  | 1        |  |
| Control Room Supervisor (SRO)   | 1        |  |
| Shift Technical Advisor (STA)   | 1        |  |
| Reactor Operator (RO)   | 1        |  |
| Plant Operator (RO)   | 1        |  |
| Control Room Communicator <sup>Note 1</sup>   | 2        |  |
| Equipment Operator (EO)   | 2        |  |
| Radwaste Operator   | 1        |  |
| Radiation Protection (RP) Technician <sup>Note 2</sup>  | 2        |  |
| Chemistry Technician <sup>Note 3</sup>  | 1        |  |
| Shift Maintenance Supervisor  | 1        |  |
| Shift I&C Technician <sup>Note 6</sup>  | 1        |  |
| Shift Electrician <sup>Note 6</sup>   | 1        |  |
| On-Shift Stock Handler  | 1        |  |
| Total:  | 17       |  |
| Fire Department <sup>Note 4</sup>   | 5        |  |
| Rescue Operations/First Aid <sup>Note 5</sup>   |          |  |
| Security  | Sec Plan |  |
| Debris Removal & Towing Operations <sup>Note 8</sup>  |          | 2  |
| Total:  |          | 2  |

Note 1 – Communicator positions can be filled by individuals filling another position (RO/PO, NEO, etc., provided this individual is not part of the Tech Spec minimum requirements

Note 2 – Two RP Technicians on shift per station. This assessment assumes the two HCGS technicians are available, and did not use SGS technicians to support HCGS.

Note 3 – One Chemistry Technician per station, for a total of two, provides chemistry sampling support. This assessment assumes the HCGS technician is available, and did not use the SGS technician to support HCGS.

Note 4 – Fire Department is a separate department. The Fire Department consists of one Fire Department Leader and five Fire Department Members (Reference 9).

Note 5 – Rescue Operations/First Aid is a collateral duty of the Fire Department. These personnel are included in the Fire Department number above.

Note 6 – One Instrumentation and Control (I&C) Technician and one Shift Electrician per station. This assessment assumes the HCGS I&C Technician and Shift Electrician are available, and did not use SGS personnel to support HCGS.

Note 7 - Will be included in either OP-SA-112-101-1001 or OP-HC-112-101-1001, Shift Turnover Responsibilities, Attachments 18 and 5, respectively, (References 7 and 8).

Note 8 – Debris Removal and Towing Operators can be filled with two SGS personnel or two Hope Creek Station personnel, or one from each station. A minimum of one Debris Removal Operator and one Towing Operator are required to support site FLEX strategies per NEI 12-06 site administrative minimum staffing.

#### **4 NEI 12-01 Phase 2 Assessment Results**

The minimum on-shift staff as shown in Table 1, HCGS On-Shift Staff, performed all actions required by operating and emergency plan procedures in the first hour period relying only on installed structures, systems and components remaining in the initial phase of the response. PSEG determined via table top exercise that the Hope Creek FLEX strategies when implemented will be capable of successfully responding to a BDBEE using on-shift resources during the first six hours and augmented responders from six to twenty-four hours.

No conflicts or overlaps in functions or tasks required to be performed by on-shift operations and support personnel were identified during this analysis. Resources that may be shared between HCGS and SGS such as RP and Chemistry Technicians were not used for the HCGS analysis, with the exception of debris removal and towing operators. Fire Department personnel had no assigned actions in the Hope Creek Phase 2 Staffing Assessment but are a common resource shared with the SGS. Fire Department personnel have assigned duties in responding to an extended loss of AC power event at SGS. A parallel assessment for SGS was conducted to ensure there was no conflict over resources shared with HCGS. The SGS Phase 2 Staffing Assessment was provided to the NRC via Reference 5.

An evaluation of each applicable Salem FLEX Support Guideline and each Hope Creek BDBEE EOP action was conducted in order to determine the resources needed and estimated duration of each task associated with the strategy. The total number of resources identified and task durations were then used to identify the two most resource limiting FLEX strategies. This analysis identified that the two most resource limiting FLEX strategies are:

- HC.OP-EO.ZZ-0401, FLEX Electrical – Phase II 480 VAC Power
- HC.OP-EO.ZZ-0403, Injection Via Service Water FLEX Pump To RPV, Spent Fuel Pool or Torus

Action to remove debris and tow heavy FLEX equipment into position requires two personnel to support both Salem and Hope Creek. These needs were previously identified in the Salem Phase 2 Staffing Assessment (Reference 5) and are tracked in the Salem and Hope Creek corrective action systems. No additional actions are required.

## 5 Phase 2 Staffing Assessment Details

The Phase 2 Staffing Assessment for HCGS was conducted on October 13-15, 2014, using the guidance of NEI 10-05, NEI12-01, and NEI 12-06.

The personnel who participated in the assessment are shown in Table 2.

**Table 2 – Hope Creek Staffing Analysis Team**

| Personnel (Position/Title)   | Number | Organization/Department |
|--|--------|-------------------------|
| Shift Manager (SRO)  | 1      | Operations              |
| Nuclear Control Operator (RO)  | 1      |                         |
| Equipment Operator (EO)  | 1      |                         |
| EP Analyst   | 1      | Emergency Planning      |
| Fukushima Response   | 3      | Fukushima Team          |
| EP Specialist  | 2      | EP Consulting, LLC      |
| An initial assessment was conducted in February 2014 that included RP, Chemistry, Security, Fire Protection and Maintenance. |        |                         |

### 5.1 Assumptions

The extended loss of AC power event was evaluated using the following assumptions, consistent with NEI 10-05, NEI 12-01, and NEI 12-06.

#### 5.1.1 NEI 12-01 Assumptions for Staffing Assessment

1. A large-scale external event occurs that results in:
  - all on-site units affected
  - extended loss of AC power
  - impeded access to the units
2. Initially, all on-site reactors are operating at full power and are successfully shut down.
3. No hostile action is directed at the affected site during the period that the site is responding to the event.
4. The event impedes site access as follows:
  - A. Post-event time: 6 hours – No site access. This duration reflects the time necessary to clear roadway obstructions, use different travel routes, mobilize alternate transportation capabilities (e.g., private resource providers or public sector support), etc.
  - B. Post-event time: 6 to 24 hours – Limited site access. Individuals may access the site by walking, personal vehicle or via alternate transportation capabilities (e.g., private resource providers or public sector support).

- C. Post-event time: 24+ hours – Improved site access. Site access is restored to a near-normal status and/or augmented transportation resources are available to deliver equipment, supplies and large numbers of personnel.
- 5. On-shift personnel are limited to the minimum complement allowed by the Emergency Plan (i.e., the minimum required number for each required position), supplemented with additional on-shift staff consistent with NEI 12-06 (Assumption #12 in Subsection 5.1.3, below).
- 6. Following the accident at Fukushima Dai-ichi, the Institute of Nuclear Power Operations (INPO) issued three Industry Event Reports (IERs) requiring the assessment and implementation of a range of actions intended to improve the capabilities for responding to a BDBEE and ELAP, including events that impact the cooling of spent fuel.
- 7. The Phase 2 Staffing Assessment includes the INPO IER improvement actions already implemented at the time of the assessment.

#### 5.1.2 NEI 10-05 Applicable Assumptions

- 1. On-shift personnel can report to their assigned response locations within timeframes sufficient to allow for performance of assigned actions.
- 2. 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 Radiation Protection Technician.
- 3. Personnel assigned to the major response area of plant operations and safe shutdown meet the requirements and guidance established by NRC regulations and are able to satisfactorily perform the functions and tasks necessary to achieve and maintain safe shutdown. Staff performance within this area is not evaluated as part of this assessment, unless a role/function/task from another major response area is assigned as a collateral duty.
- 4. On-site security organization: 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.
- 5. Individuals holding the position of Radiation Protection Technician or Chemistry Technician are qualified to perform the range of tasks expected of their position.
- 6. 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. This assumption does not apply to emergency notification to an Offsite Response Organization (ORO) or the NRC.

7. 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.
8. The analyzed events occur 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). For purposes of this analysis, and consistent with NEI 12-01 Assumption #4, 360 minutes (6 hours) will be used as the time period for the conduct of on-shift ERO response actions.

### 5.1.3 NEI 12-06 Assumptions

1. Prior to the event, both units have been operating at 100 percent rated thermal power for at least 100 days or have just been shut down from such a power history as required by plant procedures in advance of the impending event.
2. At the time of the postulated event, the reactor and supporting systems are within normal operating ranges for pressure, temperature, and water level for the appropriate plant condition. All plant equipment is either normally operating or available from the standby state as described in the plant design and licensing basis.
3. No specific initiating event is used. The initial condition is assumed to be a loss of off-site power (LOOP) at a plant site resulting from an external event that affects the off-site power system either throughout the grid or at the plant with no prospect for recovery of off-site power for an extended period. The LOOP is assumed to affect all units at a plant site.
4. All installed sources of emergency on-site ac power and Station Blackout (SBO) alternate ac power sources are assumed to be not available and not imminently recoverable.
5. Cooling and makeup water inventories contained in systems or structures with designs that are robust with respect to seismic events, floods, and high winds, and associated missiles are available.
6. Normal access to the ultimate heat sink is lost, but the water inventory in the Ultimate Heat Sink (UHS) remains available and robust piping connecting the UHS to plant systems remains intact. The motive force for UHS flow, i.e., pumps, is assumed to be lost with no prospect for recovery.
7. Fuel for FLEX equipment stored in structures with designs which are robust with respect to seismic events, floods and high winds and associated missiles, remains available.
8. Permanent plant equipment that is contained in structures with designs that are robust with respect to seismic events, floods, and high winds, and associated missiles, are available.
9. Other equipment, such as portable ac power sources, portable back up dc power supplies, spare batteries, and equipment for 50.54(hh)(2), may be

used provided it is reasonably protected from the applicable external hazards per Sections 5 through 9 and Section 11.3 of this guidance and has predetermined hookup strategies with appropriate procedures/guidance and the equipment is stored in a relatively close vicinity of the site.

10. Installed electrical distribution system, including inverters and battery chargers, remains available provided they are protected consistent with current station design.
11. No additional events or failures are assumed to occur immediately prior to or during the event, including security events.
12. On-site staff is at administrative minimum shift staffing levels per Section 2 of the NEI 12-06 guidance. All personnel on-site are available to support site response.
13. Reliance on the fire protection system ring header as a water source is acceptable only if the header meets the criteria to be considered robust with respect to seismic events, floods, and high winds, and associated missiles.

#### 5.1.4 Plant Specific Assumptions

1. The A&B Train 125 vDC batteries have a capacity of 5 hours after DC load shed.
2. The HPCI battery (250 vDC) has a capacity of 15.9 hours.
3. The RCIC battery (250 vDC) has a capacity of 9 hours.
4. Spent Fuel Pool time-to-boil is 60 hours from the time of the loss of Fuel Pool cooling based on 100 days of operation since the last refueling outage.

## 5.2 Methodology

An assessment of on-shift staffing was performed using NEI 12-01, NEI 12-06 and NEI 10-05. Subject matter experts and consultants were assembled to provide analysis support. The assessment was conducted via a tabletop procedural analysis using HCGS procedures to determine if tasks have been sufficiently analyzed for performance by the minimum on-shift staff as designated in the Emergency Plan and supplemental administrative staff as allowed by NEI 12-06. The following provides a summary of the process that was used.

Each on-shift position from Emergency Plan, Figure 3-1, On-Shift Staffing, and any additional administrative on-shift position in accordance with OP-HC-112-101-1001 (Reference 8) was entered in Appendix 1, NEI 10-05 Table 1. For position titles with more than one position holder, a unique sequential number was assigned to each position. The site emergency plan reference that describes the requirement for the position to be on-shift was then entered into column 3 of Appendix 1, NEI 10-05 Table 1. Using only the on-shift positions entered in the table, the following



Appendix 1 tables were completed by entering the shift position that fills a described role, or performs a specific function or tasks:

- NEI 10-05 Table 2 – Plant Operations and Safe Shutdown
- Table 2A – Procedure Task Timing
- NEI 10-05 Table 3 – Firefighting
- NEI 10-05 Table 4 – Radiation Protection & Chemistry
- NEI 10-05 Table 5 – Emergency Plan Implementation
- Table 5A – E-Plan Implementation Timeline

Following completion of each of the above tables, each on-shift position assigned to the associated table was located on Appendix 1, NEI 10-05 Table 1. For each position, the table number and associated line number was then entered in column 4, "Role in Table#/Line#". If the associated task required additional actions, a "Yes" was placed in the last column and the additional action recorded in the results section of this report.

The On-Shift Staffing Assessment (OSA) was conducted using the following process:

1. Selection of the multi-disciplined work group
2. Conduct of a pre-job briefing outlining the requirements of NEI 12-01, NEI 12-06 and NEI 10-05
3. Review of the event initial conditions and assumptions
4. Performance of the tabletop procedural analysis
5. Plant walk downs were conducted on the first day of the assessment to assist in establishing the activity durations for each responder.
6. Documentation of the results of the tabletop using the NEI 10-05 forms modified to extend to 24 hours.

This review provided the team with a basic understanding of the event and resulting emergency classifications. The SRO conducted a team briefing explaining the nature and order of use of the various abnormal and emergency operating procedures including the draft 400 series FLEX related EOPs. The team determined if and when other on-shift resources, such as the RP or Chemistry Technician, would be required and identified the time required to perform expected emergency plan functions. The actions and durations of the on-shift resources in response to the limiting conditions evaluated were documented in the tables in Appendix 1 of this report.

Existing coping and planned mitigation strategies do not require the use of Security Officers to perform duties unrelated to their assigned roles. Security Officers will perform functions within their current roles such as monitoring and controlling site access.

## **6 Strategy Resource Loading**

An evaluation of each draft 400 series EOP was conducted to determine the resources needed and estimated duration of each task associated with the strategy. This evaluation is not associated with any specific event. The results of this evaluation are included in Table 3. Some resources, e.g., Security Officers, Fire Protection / EMTs, and the debris and towing operators, are shared resources between Salem and Hope Creek. Table 4 shows the consolidated on-shift credited staff for all units at PSEG Nuclear.

**Table 3  
HCGS FLEX Strategy Resource Loading**

| Procedure         | Description   | Resources<br>(Required # in<br>parentheses, ERO<br>indicates<br>augmenting<br>personnel after 6<br>hours) | Approximate<br>Duration<br>(minutes) | Notes   |
|-------------------|---|---|--------------------------------------|---|
| HC.OP-AB.SBO-0001 | DC bus load shed  | EO (1)  | 10                                   | Extend DC Power<br>(time sensitive)   |
| HC.OP-EO.ZZ-0401  | FLEX electrical – Phase II<br>480 VAC Power   |   |                                      |   |
|                   | Debris removal and generator<br>transport IAW Salem FSG 5<br>[S1(2).OP-FLEX.FSG-0005]                 | DRO (1)<br>TO (1)<br>These resources<br>are shared with<br>Salem Station.<br>Resource Limiting<br>Task    | 150                                  | Power restoration<br>(time sensitive)   |
|                   | Electrical alignment for FLEX<br>generator – Aux Building IAW<br>HC.OP-AB.SBO-0001                    | EO (1)<br>Resource Limiting<br>Task   | 50                                   | Power restoration<br>(time sensitive)   |
|                   | Electrical alignment for FLEX<br>generator – Rx/Radwaste<br>Building IAW HC.OP-<br>AB.SBO-0001        | EO (1)<br>Resource Limiting<br>Task   | 25                                   | Power restoration<br>(time sensitive)   |
|                   | Connect and start FLEX<br>Remote Diesel generator   | EO(1)<br>EM (1)<br>Resource Limiting<br>Task  | 30                                   | Power restoration<br>(time sensitive)   |
| HC.OP-EO.ZZ-0402  | FLEX electrical – Phase III<br>4160 VAC Power   | N/A   | N/A                                  | Not required<br>during Initial and<br>Transition<br>Phases                          |
| HC.OP-EO.ZZ-0406  | FLEX Injection from Torus to<br>RPV or Spent Fuel Pool  |   |                                      |   |
|                   | FLEX Equipment set up<br>(Reactor Building) IAW<br>HC.OP-AB.SBO-0001                                  | EO (2)  | 35                                   | Core cooling<br>(time sensitive)  |
|                   | Align Torus suction to FLEX<br>pump injection   | EO (1)  | 15                                   | Core cooling<br>(time sensitive)  |
|                   | Commence injection with<br>Reactor Building FLEX pump   | EO (1)  | 15                                   | Core cooling<br>(dependent upon<br>re-energizing<br>FLEX loads)<br>(time sensitive) |
|                   | Air supply for SRVs via FLEX<br>air compressor IAW HC.OP-<br>EO.ZZ-0407                               | EO (1)  | 20                                   | Core cooling<br>(dependent upon<br>re-energizing<br>FLEX loads)                     |
|                   | Injection via Service Water<br>FLEX pump to RPV, spent<br>Fuel Pool, or Torus IAW<br>HC.OP-EO.ZZ-0403 | ERO (4)<br>Resource Limiting<br>Task  | 480                                  | Core cooling<br>(Torus makeup)<br>(time sensitive)                                  |

**Table 3  
HCGS FLEX Strategy Resource Loading (cont'd.)**

| Procedure                 | Description   | Resources        | Approximate Duration (minutes) | Notes   |
|---------------------------|---|------------------|--------------------------------|---|
| HC.OP-EO.ZZ-0318          | Containment Venting   |                  |                                |   |
|                           | Connect nitrogen to blowout rupture disk IAW HC.OP-AB.SBO-0001              | EO (1)           | 10                             | Required for HRV operation                              |
|                           | Blowout rupture disk  | EO (1)           | 10                             | Required for HRV operation                              |
|                           | Vent suppression pool   | RO (1)<br>EO (1) | 10                             | Containment integrity (time sensitive)                  |
| HC.OP-AB.HVAC-0001        | Ventilation   |                  |                                |   |
|                           | Establish temporary Control Room ventilation                                | ERO (1)          |                                | Control Room habitability                               |
|                           | Restore lower relay room IAW HC.OP-EO.ZZ-0401                               | ERO (2)          |                                | Equipment cooling                                       |
|                           | Restore FRVS vent fan IAW HC.OP-EO.ZZ-0401                                  | RO (1)<br>EO (1) | 30                             | Reactor Building habitability                           |
| HC.OP-EO.ZZ-0404          | Alternate RPV Makeup  |                  |                                |   |
|                           | FLEX injection from CST to RPV or Spent Fuel Pool                           | N/R              | N/R                            | RPV inventory (alternate suction)                       |
|                           | FLEX equipment setup (Reactor Building) IAW HC.OP-AB.SBO-0001               | EO (2)           | 35                             | RPV inventory   |
|                           | Align alternate injection through A Train RHR                               | EO (2)           | 45                             | RPV inventory (alternate injection)                     |
|                           | Align CST suction to FLEX pump injection                                    | EO (1)           | 15                             | RPV inventory (alternate injection)                     |
|                           | Commence injection with Reactor Building FLEX pump                          | EO (1)           | 15                             | RPV inventory (dependent upon re-energizing FLEX loads) |
| HC.OP-EO.ZZ-0408          | FLEX fuel oil supply  | ERO (2)          | Periodic                       | Refuel FLEX equipment                                   |
| HC.OP-EO.ZZ-0403          | Spent Fuel Pool makeup from Service Water                                   | ERO (4)          | 480                            | Not required during initial or transition phases        |
| Initial Damage Assessment | Security determines transportation haul path availability                   | SEC (1)          | 30                             | Support FLEX equipment transport                        |
|                           | Determine status of installed FLEX diesel generators (normal and alternate) | IC (1)           | 10                             | Power source availability                               |
| HC.OP-AM.TSC-0027         | Local Monitoring of key plant parameters                                    |                  |                                |   |
|                           | Local Monitoring of key plant parameters                                    | IC (1)<br>EO (1) | Periodic                       | Contingency action – total loss of DC power             |

**Table 4  
Consolidated Salem and Hope Creek On-Shift Credited Staff**

| <b>Position</b>                             | <b>Salem</b>                                  | <b>Hope Creek</b>                             | <b>Common</b>                                 | <b>Total</b>                                  | <b>Notes</b>  |
|---|---|---|---|---|---|
| Shift Manager                               | 1   | 1   | N/A   | 2   |   |
| Control Room Supervisor (SRO)               | 2   | 1   | N/A   | 3   |   |
| Field Supervisor / OSC – SRO                | 1   | N/A   | N/A   | 1   |   |
| Shift Technical Advisor (STA)               | 1   | 1   | N/A   | 2   |   |
| Reactor Operator                            | 2   | 1   | N/A   | 3   |   |
| Plant Operator                              | 2   | 1   | N/A   | 3   |   |
| Communicator (EO)                           | 2   | 2   | N/A   | 4   |   |
| Equipment Operator (EO)                     | 5   | 2   | N/A   | 7   |   |
| Rad Waste Operator                          | 1   | 1   | N/A   | 2   |   |
| Chemistry Technician                        | 1   | 1   | N/A   | 2   |   |
| Radiation Protection Technician             | 2   | 2   | N/A   | 4   |   |
| Maintenance Supervisor                      | 1   | 1   | N/A   | 2   |   |
| I&C Technician                              | 1   | 1   | N/A   | 2   |   |
| Electrical Technician                       | 1   | 1   | N/A   | 2   |   |
| Debris Removal – site (DRO)                 | N/A   | N/A   | 1   | 1   | Personnel assigned by Shift Manager – may be assigned to either Salem or Hope Creek |
| Towing Operator Heavy Equipment – site (TO) | N/A   | N/A   | 1   | 1   | Personnel assigned by Shift Manager – may be assigned to either Salem or Hope Creek |
| Fire Chief                                  | N/A   | N/A   | 1   | 1   |   |
| Fire / EMT Responders                       | N/A   | N/A   | 5   | 5   |   |
| Security                                    | In accordance with PSEG Nuclear Security Plan | In accordance with PSEG Nuclear Security Plan | In accordance with PSEG Nuclear Security Plan | In accordance with PSEG Nuclear Security Plan |   |
| <b>TOTAL</b>                                | <b>23</b>                                     | <b>16</b>                                     | <b>8</b>                                      | <b>47</b>                                     |   |

## **7 Conclusions**

The existing on-shift staff structure and size is described in the documents referenced in this report. Collectively these documents describe a staff structure and size that is sufficient to carry out the mitigating strategies for the most limiting BDBEE situations.

Two common (Hope Creek and Salem) resources are being added to on-shift staffing requirements to support both Hope Creek and Salem activities for debris removal and heavy equipment towing. The need for these resources, and the actions necessary to assign them to shift positions, are contained in Salem Phase 2 Staffing Assessment (Reference 5). In this analysis the team assumed that one resource capable of performing debris removal and equipment towing assigned to Salem and one assigned to Hope Creek would be available in accordance with administrative controls to be established as part of FLEX program implementation. However, any qualified personnel who are not already assigned to minimum shift staffing / emergency response / Fire Brigade roles may be so assigned.

## **8 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," March 12, 2012
2. NEI 12-01, "Guideline for Assessing Beyond Design Basis Accident Response Staffing and Communications Capabilities," Revision 0, May 2012
3. NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," Revision 0, August 2012
4. NEI 10-05, "Assessment of On-Shift Emergency Response Organization Staffing and Capabilities," Revision 0, June 2011
5. PSEG Letter LR-N14-0141, "Salem Generating Station's Response to March 12, 2012, Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendations 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," dated June 16, 2014
6. PSEG Nuclear LLC Emergency Plan Revision 29
7. OP-SA-112-101-1001 Revision 3, "Shift Turnover Responsibilities" (Attachment 18)
8. OP-HC-112-101-1001 Revision 18, "Shift Turnover Responsibilities " (Attachment 5)
9. FP-AA-012 Revision 2, "Fire Protection Organization, Duties and Staffing"

## Appendix 1 - Staffing Tables

**Hope Creek Generating Station  
On-Shift Personnel Assignments Used During  
Analysis**

| <b>Position</b>         | <b>Designation</b> | <b>Assignment</b>                |
|-------------------------|--------------------|----------------------------------|
| Shift Manager           | SM                 | Shift Manager/Emergency Director |
| Control Room Supervisor | SRO1               | Control Room Supervisor          |
| Shift Technical Advisor | STA                | Shift Technical Advisor          |
| Reactor Operator        | RO1                | Operator At Controls (OATC)      |
| Plant Operator          | RO2                | Balance of Plant (BOP)           |
| CR Communicator         | CM1                | Offsite Communications (EO)      |
| CR Communicator         | CM2                | Offsite Communications (EO)      |
| Equipment Operator      | EO1                | Reactor Building EO              |
| Equipment Operator      | EO2                | Turbine Building EO              |
| Equipment Operator      | EO3                | Radwaste Operator                |

**Other On-Shift Assignments Used During Analysis**

| <b>Position</b>              | <b>Designation</b> | <b>Assignment</b>              |
|------------------------------|--------------------|--------------------------------|
| RP Technician                | RP1                | Offsite Dose Assessment (SRPT) |
| RP Technician                | RP2                | RP Support (ORPT)              |
| Chemistry Technician         | CT1                | Chemistry Sampling/Count Room  |
| Shift Maintenance Supervisor | SMS                | OSC Coordinator                |
| Shift I&C Technician         | IC1                | I&C Maintenance Support        |
| Shift Electrician            | EM1                | Electrical Maintenance Support |
| On-Shift Stock Handler       | SH1                | Warehouse Support              |
| Site Protection              | SP1                | Fire Department Chief          |
| Site Protection              | SP2                | Fire Department Responder      |
| Site Protection              | SP3                | Fire Department Responder      |
| Site Protection              | SP4                | Fire Department Responder      |
| Site Protection              | SP5                | Fire Department Responder      |
| SAS/CAS Operator             | SEC1               | Accountability                 |
| Debris Removal Operator      | DRO                | Assigned shift personnel*      |
| Towing Operator              | TO                 | Assigned shift personnel*      |


 Administrative Shift Staffing

\*Debris Removal and Towing Operators can be filled with two SGS personnel or two Hope Creek Station personnel, or one from each station. A minimum of one Debris Removal Operator and one Towing Operator are required to support site FLEX strategies per NEI 12-06 site administrative minimum staffing.



**Extended Loss of all AC Power (ELAP)  
NEI 10-05 TABLE 1  
On-shift Positions Hope Creek Nuclear Generating Station**

| Line | On-shift Position                  | Emergency Plan Reference        | Role in Table#/Line#   | Action Required? (See Notes) |
|------|------------------------------------|---------------------------------|--|------------------------------|
| 1.   | Shift Manager (SM)                 | PSEG Nuclear LLC E-Plan, Rev 29 | T2/L1 T5/L1<br>T5/L2 T5/L3<br>T5/L5 T5/L6<br>T5/L7 T5/L9<br>T5/L13 | No<br>(Note 1)               |
| 2.   | Control Room Supervisor (SRO1)     | PSEG Nuclear LLC E-Plan, Rev 29 | T2/L2  | No                           |
| 3.   | Shift Technical Advisor (STA)      | PSEG Nuclear LLC E-Plan, Rev 29 | T2/L3  | No                           |
| 4.   | Reactor Operator – OATC (RO1)      | PSEG Nuclear LLC E-Plan, Rev 29 | T2/L4 T5/L5  | No                           |
| 5.   | Plant Operator –BOP (RO2)          | PSEG Nuclear LLC E-Plan, Rev 29 | T2/L5  | No                           |
| 6.   | CR Communicator (CM1)              | PSEG Nuclear LLC E-Plan, Rev 29 | T2/L6 T5/L8  | No                           |
| 7.   | CR Communicator (CM2)              | PSEG Nuclear LLC E-Plan, Rev 29 | T2/L7 T5/L8 T5/L12   | No                           |
| 8.   | Equipment Operator (EO1)           | PSEG Nuclear LLC E-Plan, Rev 29 | T2/L8  | No                           |
| 9.   | Equipment Operator (EO2)           | PSEG Nuclear LLC E-Plan, Rev 29 | T2/L9  | No                           |
| 10.  | Equipment Operator (EO3)           | PSEG Nuclear LLC E-Plan, Rev 29 | T2/L10   | No                           |
| 11.  | RP Technician (RP2)                | PSEG Nuclear LLC E-Plan, Rev 29 | T4/L3  | No                           |
| 12.  | Shift Maintenance Supervisor (SMS) | PSEG Nuclear LLC E-Plan, Rev 29 | T2/L11   | No                           |
| 13.  | Shift I&C Technician (IC1)         | PSEG Nuclear LLC E-Plan, Rev 29 | T2/L12   | No                           |
| 14.  | Shift Electrician (EM1)            | PSEG Nuclear LLC E-Plan, Rev 29 | T2/L13   | No                           |
| 15.  | Debris Removal Operator (DRO)      | N/A                             | T2/L14   | Yes<br>(Note 2)              |
| 16.  | Towing Operator (TO)               | N/A                             | T2/L15   | Yes<br>(Note 2)              |
| 17.  | Site Protection (SP1)              | PSEG Nuclear LLC E-Plan, Rev 29 | T2/L16   | No                           |
| 18.  | SAS/CAS Operator (SEC1)            | PSEG Nuclear LLC E-Plan, Rev 29 | T5/L14   | No                           |

 Supplemental Administrative On-Shift Staffing

- Notes:**
- 1) Although multiple functions have been identified for some positions, no conflict exists requiring further action. Performance of these functions by the identified positions is either acceptable by NEI 10-05 guidance, or the functions are the same, or the functions are performed sequentially without issue.
  - 2) Actions to ensure availability of debris removal and towing operators as identified in the Salem Phase 2 Staffing Assessment (Reference 5).

**NEI 10-05 TABLE 2 - Plant Operations & Safe Shutdown**

**One Unit - One Control Room - Minimum Operations Crew (lines 1-10) and Non Operations Personnel (lines 11-16) Necessary to Implement ABs and EOPs, FLEX, or SAMGs if applicable**

| <b>Line</b> | <b>Generic Title/Role</b> | <b>On-Shift Position</b>               | <b>Task Performance Validation</b> |
|-------------|---------------------------|--|------------------------------------|
| 1.          | Shift Manager             | Shift Manager (SM)                     | Operator Training                  |
| 2.          | Shift Supervisor          | Control Room Supervisor (SRO1)         | Operator Training                  |
| 3.          | Shift Technical Advisor   | Shift Technical Advisor (STA)          | Operator Training                  |
| 4.          | Reactor Operator (OATC)   | Reactor Operator (RO1)                 | Operator Training                  |
| 5.          | Reactor Operator (BOP)    | Plant Operator (RO2)                   | Operator Training                  |
| 6.          | CR Communicator           | CR Communicator (CM1)                  | Operator Training                  |
| 7.          | CR Communicator           | CR Communicator (CM2)                  | Operator Training                  |
| 8.          | Auxiliary Operator        | Equipment Operator (EO1)               | Operator Training                  |
| 9.          | Auxiliary Operator        | Equipment Operator (EO2)               | Operator Training                  |
| 10.         | Radwaste Operator         | Equipment Operator (EO3)               | Operator Training                  |
| 11.         | Maintenance Supervisor    | Shift Maintenance Supervisor (SMS)     | Maintenance Training               |
| 12.         | I&C Technician            | Shift I&C Technician (IC1)             | Maintenance/I&C Training           |
| 13.         | Electrician               | Shift Electrician (EM1)                | Elec Maintenance Training          |
| 14.         | Debris Removal Operator   | Debris Removal Operations (DRO)        | Training                           |
| 15.         | Towing Operator           | Heavy Equipment Towing Operations (TO) | Training                           |
| 16.         | Fire Brigade              | Site Protection (SP1)                  | Fire Brigade Training              |

**Notes:** See Table 2A for AB/EOP/FLEX actions

 Supplemental Administrative On-Shift Staffing

**Table 2A – Procedure Task Timing**

| Procedure Step/Actions                  |  | Performance Time After Procedure Implementation |       |       |       |       |       |       |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|---|--|---|-------|-------|-------|-------|-------|-------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|   |  | Minutes – Hour 1                                |       |       |       |       |       | Hour  |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Step                                    | Task   | Resource  | 0-10  | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| HC.OP-EO.ZZ-0101                        | Post Scram actions/Stabilize the plant           | SRO1<br>RO1<br>RO2<br>STA                       | X     |       |       |       |       |       |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| HC.OP-AB.LOP-0001 and HC.OP-AB.SBO-0001 | Diesel Malfunction/LOP Response to offsite power | SRO1<br>RO1<br>RO2<br>STA                       | X     |       |       |       |       |       |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| HC.OP-EO.ZZ-0103 and 0104               | Spent Fuel Pool monitoring/control               | SRO1<br>RO1<br>RO2<br>STA                       |       |       |       |       |       |       |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| HC.OP-EO.ZZ-0105 and HC.OP-AB.SBO-0001  | RPV control                                      | SRO1<br>RO1<br>RO2<br>STA                       |       |       |       |       |       |       |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| HC.OP-EO.ZZ-0106                        | Primary containment control                      | SRO1<br>RO1<br>RO2<br>STA                       |       |       |       |       |       |       |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| NC-EP-EP.ZZ-0101                        | Attachment 3 and 4                               | SM  | ss1.1 |       |       |       |       | sg1.1 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|   | Classify the event                               | SM  |       |       |       |       |       |       |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|   | Activate the ERO                                 | SM  | X     |       |       |       |       |       |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|   | Communicator responds to Control Room            | CM1<br>CM2                                      |       |       |       |       |       |       |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| HC.OP-AB.SBO-0001 (continued)           | Dispatch operations/maintenance to EDGs          | EO1<br>EM1<br>SMS                               |       |       |       |       |       |       |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |





**Notes:** Communications is provided by the plant PA system, sound powered phones, radios, and satellite phones.  
Note 1 – Actions to preserve required water inventory for SGS tornado response.  
Note 2 – Debris removal and towing operation resources are shared with SGS. HCGS has priority on these resources for tornado response.



Pre-Augmentation

Post-Augmentation

Site Area Emergency Declaration – SS1.1

General Emergency Declaration – SG1.1

FLEX Strategy (FSG/EOP/AB)

Task completion time

**NEI 10-05 TABLE 3 – Firefighting**

| <b>Line</b> | <b>Performed By</b> | <b>Task Analysis Controlling Method</b> |
|-------------|---------------------|---|
| 1.          | N/A                 | N/A                                     |
| 2.          | N/A                 | N/A                                     |
| 3.          | N/A                 | N/A                                     |
| 4.          | N/A                 | N/A                                     |
| 5.          | N/A                 | N/A                                     |

**Notes:** Not required by scenario – Fire Brigade members available to support BDBEE response actions.

NEI 10-05 TABLE 4 – Radiation Protection & Chemistry

| Line | Position Performing Function/Task                                   | Performance Time Period After Event Initiation |       |       |       |       |       |   |   |   |   |   |   |   |   |    |  |  |  |
|------|---|--|-------|-------|-------|-------|-------|---|---|---|---|---|---|---|---|----|--|--|--|
|      |   | Minutes  |       |       |       |       | Hours |   |   |   |   |   |   |   |   |    |  |  |  |
|      |   | 0-10   | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |  |  |  |
| 1.   | In-Plant Survey<br>On-Shift Position: RP2                           |  |       |       |       |       |       |   |   |   |   |   |   |   |   |    |  |  |  |
| 2.   | Out of Plant Survey On-Shift<br>Position: RP2                       |  |       |       |       |       |       |   |   |   |   |   |   |   |   |    |  |  |  |
| 3.   | Personnel<br>On-Shift Position: RP2                                 |  |       |       |       |       |       |   |   |   |   |   |   |   |   |    |  |  |  |
| 4.   | Offsite Radiological Assessment<br>On-Shift Position: RP1           |  |       |       |       |       |       |   |   |   |   |   |   |   |   |    |  |  |  |
| 5.   | Chemistry function/task #1<br>– Describe:<br>On-Shift Position: CT1 |  |       |       |       |       |       |   |   |   |   |   |   |   |   |    |  |  |  |
| 6.   | Augmenting ERO  |  |       |       |       |       |       |   |   |   |   |   |   |   |   |    |  |  |  |

**Notes:** Augmented resources available to support response actions at T=6 hours.





Supplemental Administrative On-Shift  
Staffing Post-Augmentation  
Task completion time



NEI 10-05 TABLE 4 – Radiation Protection & Chemistry

| Line | Position Performing Function/Task   | Performance Time Period After Event Initiation (hours) |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
|------|---|--|----|----|----|----|----|----|----|----|----|----|----|----|----|--|--|
|      |   | 11   | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |  |  |
| 1.   | In-Plant Survey<br>On-Shift Position: Augmented ERO                           |  |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| 2.   | Out of Plant Survey<br>On-Shift Position: Augmented ERO                       |  |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| 3.   | Personnel Monitoring<br>On-Shift Position: Augmented ERO                      |  |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| 4.   | Job Coverage<br>On-Shift Position:  |  |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| 5.   | Offsite Radiological Assessment<br>On-Shift Position: Augmented ERO           |  |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| 6.   | Other Site-Specific RP –<br>Describe: On-Shift Position:                      |  |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| 7.   | Chemistry function/task #1<br>– Describe:<br>On-Shift Position: Augmented ERO |  |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |
| 8.   | Chemistry function/task #2<br>– Describe:<br>On-Shift Position: Augmented ERO |  |    |    |    |    |    |    |    |    |    |    |    |    |    |  |  |

Notes: Augmented resources available to support response actions at T=6 hours.

 Supplemental Administrative On-Shift  
 Staffing Post-Augmentation  
 Task completion time

**NEI 10-05 TABLE 5 – Emergency Plan Implementation**

| Line | Function/Task   | On-Shift   |
|------|---|------------|
| 1.   | Declare the Emergency Classification Level (ECL)  | SM         |
| 2.   | Approve Offsite Protective Action Recommendations   | SM         |
| 3.   | Approve content of State/local notifications  | SM         |
| 4.   | Approve extension to allowable dose limits  | N/R        |
| 5.   | Notification and direction to on-shift staff (e.g., to assemble, evacuate, etc.)              | RO1<br>SM  |
| 6.   | ERO notification <small>Note 1,2</small>  | SM         |
| 7.   | Complete State/local notification form  | SM         |
| 8.   | Perform State/local notifications   | CM1<br>CM2 |
| 9.   | Complete NRC event notification form  | SM         |
| 10.  | Activate ERDS <small>Note 3</small>   | N/A        |
| 11.  | Offsite radiological assessment <small>Note 4</small>   | N/A        |
| 12.  | Perform NRC notifications   | CM2        |
| 13.  | Perform other site-specific event notifications (e.g., INPO, ANI, etc.) <small>Note 5</small> | SM         |
| 14.  | Personnel accountability  | SEC1       |

**Notes:** EAL – SS1.1 (Site Area Emergency); SG1.1 (General Emergency)  
 Offsite notifications are performed using satellite phones in the control room. Phones are hard wired to an installed antenna.  
 Note 1 – Self activation of ERO also occurs during a BDBEE  
 Note 2 – SM can perform this function in ≈ 1 minute (as documented in current process)  
 Note 3 – ERDS not available due to infrastructure damage from BDBEE  
 Note 4 – Inputs for dose assessment not available due to ELAP  
 Note 5 – SM notifies National SAFER Response Center (≈ 1 minute to complete)

N/R – Not Required  
 N/A – Not Available  
 See Table 5A for E-Plan implementation timeline

Table 5A - E-Plan Implementation Timeline

| Function/Task   | On-shift | Time from Event Initiation (minutes) |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|---|----------|--------------------------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|   |          | 5                                    | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 |
| Declare the Emergency   | SM       |                                      | X  |    |    |    |    |    |    |    |    |    | X  |    |    |    |    |    |    |
| Approve Offsite PARS  | SM       |                                      |    |    |    |    |    |    |    |    |    | X  |    |    |    |    |    |    |    |
| Approve State/local notifications   | SM       |                                      |    |    | X  |    |    |    |    |    |    |    |    | X  |    |    |    |    |    |
| Approve extension to allowable dose   | N/R      |                                      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Notification and direction to on-shift staff (e.g., to assemble, evacuate,                | RO1      | X                                    |    |    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| ERO notification <sup>Note 1,2</sup>  | SM       |                                      |    |    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Complete State/local notification form  | SM       |                                      |    | X  |    |    |    |    |    |    |    |    |    | X  |    |    |    |    |    |
| Perform State/local notifications   | CM1      |                                      |    |    |    | X  |    |    |    |    |    |    |    |    |    |    |    |    |    |
|   | CM2      |                                      |    |    |    |    |    |    |    |    |    |    |    |    |    | X  |    |    |    |
| Complete NRC event notification form  | SM       |                                      |    |    |    |    |    |    | X  |    |    |    |    |    |    |    |    |    |    |
| Activate ERDS <sup>Note 3</sup>   | N/A      |                                      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Offsite radiological assessment <sup>Note 4</sup>   | N/A      |                                      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Perform NRC notifications   | CM2      |                                      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Perform other site-specific event notifications (e.g., INPO, ANI, etc.) <sup>Note 5</sup> | SM       |                                      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | X  |    |
| Personnel accountability  | SEC1     |                                      |    |    |    |    | X  |    |    |    |    |    |    |    |    |    |    |    |    |

**Notes:** Offsite notifications are performed using satellite phones in the control room. Phones are hard wired to an installed antenna.

Note 1 – Self activation of ERO also occurs during a BDBEE

Note 2 – SM can perform this function in ≈ 1 minute (as documented in current process)

Note 3 – ERDS not available due to infrastructure damage from BDBEE

Note 4 – Inputs for dose assessment not available due to ELAP

Note 5 – SM notifies National SAFER Response Center (≈ 1 minute to complete)

N/R – Not Required

N/A – Not Available



Site Area Emergency declaration action completion time

General Emergency declaration action completion time

Task completion time