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10 CFR 50.4

February 28, 2013
Serial: HNP-13-024

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Shearon Harris Nuclear Power Plant, Unit 1
Docket No. 50-400

Subject: **Overall Integrated Plan in Response to March 12, 2012, Commission Order Modifying Licenses With Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)**

References:

1. NRC Letter, E.J. Leeds (NRC) to All Power Reactor Licensees and Holders of Construction Permits in Active or Deferred Status, *Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond Design Basis External Events, EA-12-049*, dated March 12, 2012, Accession No. ML12054A736
2. NRC Interim Staff Guidance JLD-ISG-2012-01, *Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, Revision 0,* dated August 29, 2012, Accession No. ML12229A174

Ladies and Gentlemen:

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued an order (Reference 1) to Carolina Power & Light Company's (CP&L) Shearon Harris Nuclear Power Plant, Unit 1 (HNP). Reference 1 was immediately effective and directs CP&L to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool capabilities in the event of a beyond-design-basis external event at HNP. Specific requirements are outlined in Attachment 2 of Reference 1.

Reference 1 requires submission of an overall integrated plan, including a description of how compliance with the requirements described in Attachment 2 will be achieved, to the Commission for review by February 28, 2013, and subsequent submission of interim status reports at six-month intervals following submittal of the overall integrated plan. Pursuant to Section IV, Condition C.1 of Reference 1, CP&L hereby submits to the Commission for its review the enclosed overall integrated plan for HNP, including a description of how compliance with the requirements described in Attachment 2 of Reference 1 will be achieved.

The Enclosure contains the current design information as of the writing of this letter, much of which is still preliminary, pending completion of on-going evaluations and analyses. As further design details and associated procedure guidance are finalized, supplemental information will be communicated to the Staff in the six-month status reports required by Reference 1.

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NRR

This letter contains no new regulatory commitments.

If you have any questions or require additional information, please contact Dave Corlett, Supervisor, Licensing/Regulatory Programs, at 919-362-3137.

I declare under the penalty of perjury that the foregoing is true and correct. Executed on February 28, 2013.

Sincerely,

George T. Hamrick

Enclosure: Overall Integrated Plan: EA-12-049

cc: Mr. J. D. Austin, NRC Sr. Resident Inspector, HNP
Ms. A. T. Billoch Colón, NRC Project Manager, HNP
Mr. W. L. Cox III, Section Chief, North Carolina DENR
Mr. V. M. McCree, NRC Regional Administrator, Region II
Mr. E. J. Leeds, NRC Director, Office of Nuclear Reactor Regulation
Mr. S. R. Jones, NRR/DSS/SBPB, NRC

Shearon Harris Nuclear Power Plant, Unit 1

Docket No. 50-400

Enclosure to HNP-13-024

Overall Integrated Plan:

EA-12-049

General Integrated Plan Elements	
Determine Applicable Extreme External Hazard **Ref: NEI 12-06, Section 4.0 -9.0 JLD-ISG-2012-01, Section 1.0**	*Input the hazards applicable to the site; seismic, external flood, high winds, snow, ice, cold, high temps.* *Describe how NEI 12-06, Sections 5 – 9 were applied and the basis for why the plant screened out for certain hazards.* <u>Seismic Hazard Assessment</u>: The Shearon Harris Nuclear Power Plant (HNP) Updated Final Safety Analysis Report (UFSAR) states that the operating basis earthquake (OBE) and safe shutdown earthquake (SSE) have ground acceleration design values of 0.075g and 0.15g, respectively (UFSAR, Section 2.5.4.9). Per NEI 12-06, Table 4-2, all sites will consider seismic events. <u>External Flood Hazard Assessment:</u> HNP is a dry site with a nominal plant elevation of 260 feet (ft) mean sea level (MSL) and a maximum water level, due to the probable maximum flood event, of 257.7 ft. MSL. Therefore, the external flood hazard is not applicable for HNP (UFSAR, Section 3.4.1.1 and NEI 12-06, Section 6.2.1). <u>High Wind Hazard Assessment:</u> HNP is located at Latitude 35° 38' 0" N, and Longitude 78° 57' 22" W (UFSAR, Section 2.1.1.1). According to NEI 12-06, Figures 7-1 and 7-2, the location of HNP has a Peak-Gust Wind Speed of 160 miles per hour (mph) and a tornado design wind speed of 200 mph. These values indicate that HNP has the potential to experience severe winds from hurricanes and tornadoes with the capacity to do significant damage, which are generally considered to be winds above 130 mph, as defined in NEI 12-06, Section 7.2.1. Therefore, the high wind hazard is applicable for HNP. <u>Extreme Cold Hazard Assessment:</u> The location of HNP at Latitude 35° 38' 0" N and Longitude 78° 57' 22" W (UFSAR, Section 2.1.1.1), in accordance with NEI 12-06, Figure 8-1, is subject to significant snowfall accumulation and extreme low temperatures. Therefore, HNP must provide the capability to address the impedances caused by extreme snowfall. HNP is also in a region with Level 4 Ice Storm Severity as depicted in NEI 12-06, Figure 8-2, which is characterized as severe damage to power lines and/or the existence of large amounts of ice. Therefore, the extreme cold (including snow and ice) hazard is applicable for HNP.

	<u>Extreme High Temperature Hazard Assessment:</u> HNP is located at Latitude 35° 38' 0" N and Longitude 78° 57' 22" W (UFSAR, Section 2.1.1.1). NEI 12-06, Section 9.2 states that virtually every state in the lower 48 contiguous United States has experienced temperatures in excess of 110°F and many in excess of 120°F. In accordance with NEI 12-06, Section 9.2, all sites will address high temperatures. Therefore, the extreme high temperature hazard is applicable for HNP. The applicable extreme external hazards at HNP are seismic, high wind, snow, ice, extreme cold, and extreme high temperature.
Key Site assumptions to implement NEI 12-06 strategies. **Ref: NEI 12-06, Section 3.2.1**	*Provide key assumptions associated with implementation of Diverse and Flexible Coping Strategies (FLEX) Strategies:* Key assumptions associated with implementation of FLEX strategies: 1. Any future Station Blackout (SBO) or Extended Loss of Alternating Current Power (ELAP) Rule is assumed to be consistent with Order EA-12-049 (Reference 1) and JLD-ISG-2012-01 (Reference 2). Different or additional requirements in the Rule may necessitate a change in the plans made in the HNP response to the Order (Reference 1). 2. The 10 CFR 50.54(f) seismic and flood re-evaluations do not result in changes to the current design basis. In other words, it is assumed that HNP remains dry subsequent to the external flood event. Additionally, it is assumed that the seismic re-evaluation does not adversely impact the equipment that forms a part of the HNP FLEX strategy. Any changes to the seismic or flood design basis may require a change to the plans in the HNP response to the Order (Reference 1). 3. Installed alternating current (AC) power supplies (i.e., emergency on-site and SBO Alternate AC power sources as defined by 10 CFR 50.2) will be considered not available and not imminently recoverable. 4. Systems, structures, and components (SSC) will be considered seismically robust if seismic requirements are imposed by licensing requirements. 5. Where non-safety, non-seismically designed, permanently installed equipment is used for FLEX

	strategies, SSCs will be considered seismically robust if: • Seismic Qualification Utility Group (SQUG) methods are applied per existing plant licensing basis. • Testing, analysis or experience-based methods are applied for the equipment class at design basis seismic levels. • Methodologies in EPRI 1019199, Experience Based Seismic Verification Guidelines for Piping and Tubing Systems (Reference 3) can be successfully applied relative to the SSE. • Other industry recognized codes such as AWWA D100 (Reference 4) are applied to demonstrate functionality at SSE level ground motion. • High Confidence of a Low Probability of Failure (HCLPF) capacities are determined (e.g. EPRI NP-6041, Rev 1), (Reference 5) conservative compared to the SSE. 6. Personnel access to and qualification of equipment that forms a part of the FLEX strategy assumes no core damage. 7. For events with no advance warning, per NEI 12-06, Section 12.1, on-site resources will be used to cope with the first two Phases of the event and for a minimum of the first 24 hours of the event. Emergency Response Organization (ERO) personnel are assumed to begin arriving at 6 hours and the site ERO will be staffed at 24 hours into the event. 8. Phase 3 resources (personnel and equipment) are assumed to start arriving within 24 hours in accordance with the proposed Regional Response Center (RRC) playbook (Open Item #75). All resources from the RRC are assumed to be available within 72 hours. 9. This plan defines strategies capable of mitigating a simultaneous loss of all alternating current (AC) power and loss of normal access to the ultimate heat sink resulting from a beyond-design-basis external event (BDBEE) by providing adequate capability to maintain or restore core cooling, containment, and Spent Fuel Pool (SFP) cooling capabilities at all units on a site. Though specific strategies are being developed, due to the inability to anticipate all possible scenarios, the strategies are also diverse and flexible to encompass a wide range of possible conditions. These pre-planned

	strategies developed to protect the public health and safety will be incorporated into the unit emergency operating procedures in accordance with established Emergency Operating Procedure (EOP) change processes, and their impact to the design basis capabilities of the unit evaluated under 10 CFR 50.59 (Open Item #66). The plant Technical Specifications contain the limiting conditions for normal unit operations to ensure that design safety features are available to respond to a design basis accident and direct the required actions to be taken when the limiting conditions are not met. The result of the beyond-design-basis event may place the plant in a condition where it cannot comply with certain Technical Specifications and/or with its Security Plan, and, as such, may warrant invocation of 10 CFR 50.54(x) and/or 10 CFR 73.55(p).
Extent to which the guidance, JLD-ISG-2012-01 and NEI 12-06, are being followed. Identify any deviations to JLD-ISG-2012-01 and NEI 12-06. **Ref: JLD-ISG-2012-01** **NEI 12-06, Section 13.1**	*Include a description of any alternatives to the guidance, and provide a milestone schedule of planned action.* HNP has no known deviations to the guidelines in JLD-ISG-2012-01 (Reference 2) and NEI 12-06. If deviations are identified, then the deviations will be communicated in a future six month update following identification.
Provide a sequence of events and identify any time constraint required for success including the technical basis for the time constraint. **Ref: NEI 12-06, Section 3.2.1.7** **JLD-ISG-2012-01, Section 2.1**	*Strategies that have a time constraint to be successful should be identified with a technical basis and a justification provided that the time can reasonably be met (for example, a walk-through of deployment).* *Describe in detail in this section the technical basis for the time constraint identified on the sequence of events timeline Attachment 1A* *See attached sequence of events timeline (Attachment 1A).* *Technical Basis Support information, see attached NSSS Significant Reference Analysis Deviation Table (Attachment 1B)* See Attachment 1A.

Discussion of New Time Constraints Identified in Attachment 1A:

1. 1 hour – Operator declares ELAP event. Attempts to restore any AC power sources have failed. Transition from EOP-ECA-0.0 (Reference 6) to FLEX Support Guidelines (FSGs) (Open Item #66).

2. 2 hours – Perform ELAP Load Shedding (Reference 7). Removes additional non-critical loads from batteries beyond those already shed in the SBO load shedding. Preliminary validation of the load shed activity using a licensed operator confirms 30 minutes is adequate to complete the action. (Reference 8). Extends battery life beyond initial 4.4 hours (Reference 18) (Open Items #10, 27, 28, 66).

3. 2-8 hours – Locally control Steam Generated Power Operated Relief Valves (SG PORVs). Control of each SG PORV is required for symmetrical cooldown. The hydraulic accumulators that operate the PORVs have a limited number of cycles before they must be manually recharged. The local control of SG PORVs action item start time is two (2) hours in order to support commencing Reactor Coolant System (RCS) cooldown and depressurization as recommended in Reference 9. SG PORV actuator hydraulic pump motors require power which will be restored in six (6) hours (Reference Attachment 1A Action Item 12). Two (2) additional hours are allotted for time to restore from the local manual SG PORV operating alignment while still continuing with plant cooldown (Open Items #10, 44, 45, 66, 79).

4. 2 hours – Initiate cooldown and depressurization of the RCS as recommended in Reference 9 and 21 (Open Items #10, 66).

5. 6 hours - Align FLEX generators to power 1A3-SA or 1B3-SB SWGR and power Motor Control Centers (MCCs) 1A21-SA and 1A31-SA, or MCCs 1B21-SB and 1B31-SB (Figures 4, 5, and 6). This allows for an alternate method of charging the Class 1E batteries. Will repower the SG PORV hydraulic pump motors to allow resumption of control of the PORVs from the Main Control Room (MCR) (Figures 14, 15, and 18). A FLEX generator will be aligned to power an installed FLEX electrical distribution system (Figures 2, 3, 4, 7) This action will provide power for Attachment 1A Action Items 13, 14, 15, 16, 17, 18, and 19 (Open Items #10, 44, 57, 66, 73)

6. 8 hours – Align power to Class 1E Battery Chargers. Align the Dedicated Shutdown Diesel Generator (DSDG) or FLEX generator to power battery chargers to allow for indefinite coping time for equipment powered from Class 1E batteries (Figures 26 and 27) (Open Items #10, 40, 43, 44, 66).

7. 8-24 hours – Power to provide forced air flow, using portable or installed plant equipment, will be available at 6.0 hours into the event. Therefore, eight (8) hours allows time to perform Heating Ventilation and Air Conditioning (HVAC) systems alignments and/or deploy portable equipment to support forced air flow. Analysis will determine plant areas requiring ventilation and timeline to initiate/deploy forced or natural air flow (Figures 2, 3, 4, 7) (Open Items #10, 21, 22, 23, 24, 66, 73).

8. 10 hours – Stabilize SG pressure and isolate Cold Leg Accumulators (CLA) to prevent nitrogen injection as recommended in Reference 9 (Figures 23, 24, 25)

(Open Items #10, 55, 66).

9. 12 hours – Complete cooldown and depressurization of the RCS as recommended in Reference 9 and 21.

10. 12 hours – Align and operate a FLEX RCS makeup pump. This will provide a source of boration and make-up to the RCS (Figures 2 and 13). Per Reference 10, core uncovery does not occur until 55.1 hours. Per Reference 11, injection of borated water into the RCS will not be required until approximately 15 hours into the event to prevent a return to criticality (Open Items #10, 12, 48, 57, 66, 73)

11. 12 hours – Connect and operate a FLEX electric motor driven pump to feed the SGs (Figures 2, 8, 9, 19, 20, 21, 22). Per Reference 12, Establish plant conditions (as a contingency action) which will allow this pump to be utilized to provide defense in depth for maintaining an adequate heat sink should the Turbine Driven Auxiliary Feed Water (TDAFW) pump fail (Open Items #10, 46, 47, 57, 66, 73).

12. 12 hours – With normal plant conditions the limiting time to boil is 16.5 hours for Pool A based on a starting temperature of 105°F, a heat load of 7.084 MBTU/hour, and a heat up rate of 6.47°F/hour (Reference 13). Makeup to SFP from the Refueling Water Storage Tank (RWST) by using one of the SFP cooling pumps (4560 gpm, UFSAR, Table 9.1.3-2) that is repowered by 6 hours into the event (Figures 11 and 12) (Reference Attachment 1A Action Item 12). This is capable of providing the necessary 35 gpm to Pool A and B (Reference 14) and 15 gpm to Pool C (Reference 15) (Open Items #10, 38, 51, 52, 66, 73).

13. 12 hours – Refuel FLEX diesel equipment (Figures 1, 28). Time depends on capacity of individual tanks, the consumption rate, and when the equipment was started (Open Items #10, 25, 36, 50, 66, 73).

14. 14 hours - Recharge hand-held radios and hand-held satellite phones required for minimum Emergency Response Organization (ERO) communication links. Per NEI 12-06, Section 12.1, on-site resources will be used to cope with the first two Phases of the event and for a minimum of the first 24 hours of the event. ERO personnel are assumed to begin arriving at 6 hours and the site ERO will be staffed at 24 hours after the event. The hand-held satellite phones will be equipped with three high capacity batteries per handset (Open Item #78). A high capacity battery pack will remain active for 43 hours on standby, and have a talk time of 6.5 hours. Thus, 3 batteries will provide 19.5 hours of initial coping time (Reference 53). Hand-held radios will be provided with a minimum of one spare battery each. A fully charged radio battery pack will remain active for approximately 18 hours. HNP allows for more rigorous use and assumes the battery will last only for 12 hours. One spare battery per radio is provided to support 24 hours of initial coping time (Reference 52).

15. 36 hours – Connect and operate portable diesel driven FLEX pumps to pressurize A or B Emergency Service Water (ESW) header (Figures 1, 10). This action is required to provide an indefinite source of SG feedwater prior to the Condensate Storage Tank (CST) depleting at the 40 hour mark as stated in the Maintain Core Cooling and

Heat Removal – Phase 1 section of this document. Also provides a source of makeup water to the SFPs and the RCS (Open Items #10, 49, 66, 73).

16. 40 hours – Align ESW to the Auxiliary Feedwater System (AFW) upon Condensate Storage Tank (CST) depletion to provide indefinite coping (Figures 9, 10) (Open Items #10, 66).

17. 42 hours - Makeup to RWST. The RWST normally contains approximately 435,000 gallons of at least 2400 ppm borated water. It can be refilled from the Auxiliary Reservoir via SSE Fire Protection (FP) hose stations cross-tied to an ESW header pressurized by a portable diesel driven pump (Figure 10). The RWST will be filled in a similar manner using the guidance in Reference 33. Boron crystals can be added via the RWST upper manway (Open Item #26). The RWST is a seismic Category I tank (UFSAR, Table 3.8.4-3) which is housed in the Tank Building, but is not currently classified as protected from tornado missiles (UFSAR, Figure 3.8.4-21). Credit for partial protection of the RWST from tornado missiles is pending further analysis (Open Item #13).

Identify how strategies will be deployed in all modes. **Ref: NEI 12-06, Section 13.1.6**	*Describe how the strategies will be deployed in all modes.* Deployment routes shown in Figure 1 are expected to be utilized to transport FLEX equipment to the deployment areas. The identified paths and deployment areas will be accessible during all modes of operation. This deployment strategy will be included within an administrative program in order to keep pathways clear or actions to clear the pathways (Open Items #10, 72).

Provide a milestone schedule. This schedule should include:
• **Modifications timeline**
  o **Phase 1 Modifications**
  o **Phase 2 Modifications**
  o **Phase 3 Modifications**
• **Procedure guidance development complete**
  o **Strategies**
  o **Maintenance**
• **Storage plan (reasonable protection)**
• **Staffing analysis completion**
• **FLEX equipment acquisition timeline**
	The dates specifically required by the order are obligated or committed dates. Other dates are planned dates subject to change. Updates will be provided in the periodic (six month) status reports.
	
	See attached milestone schedule in Attachment 2.

Overall Integrated Plan: EA-12-049

• **Training completion for the strategies** • **Regional Response Centers operational** **Ref: NEI 12-06, Section 13.1**	
Identify how the programmatic controls will be met. **Ref: NEI 12-06, Section 11** **JLD-ISG-2012-01, Section 6.0**	*Provide a description of the programmatic controls equipment protection, storage and deployment and equipment quality. See Section 11 in NEI 12-06. Storage of equipment, 11.3, will be documented in later sections of this template and need not be included in this section.* *See Section 6.0 of JLD-ISG-2012-01.* HNP will implement programmatic controls as defined in NEI 12-06, Section 11. Procedures and guidelines will be reviewed and revised and/or generated as required to address additional programmatic controls as a result of FLEX requirements (Open Item #66). Equipment associated with these strategies will be procured as commercial equipment with design, storage, maintenance, testing, and configuration control in accordance with NEI 12-06, Section 11.1 (Open Item #71). Installed SSCs pursuant to 10 CFR 50.63(a) will continue to meet the augmented guidelines of Regulatory Guide 1.155, Station Blackout (SBO). The unavailability of equipment and applicable connections that directly performs a FLEX mitigation strategy will be managed using plant equipment control guidelines developed in accordance with NEI 12-06, Section 11.5 (Open Item #66). Programs and processes will be established to assure personnel proficiency in the mitigation of BDBEEs is developed and maintained in accordance with NEI 12-06, Section 11.6 (Open Item #67). The FLEX strategies and basis will be maintained in overall FLEX basis documents (Open Item #68). Existing plant configuration control procedures will be modified to ensure that changes to the plant design, physical plant layout, roads, buildings, and miscellaneous structures will not adversely impact the approved FLEX strategies in accordance with NEI 12-06, Section 11.8 (Open Item #69).

Describe training plan	*List training plans for affected organizations or describe the plan for training development* Training will be initiated through the Systematic Approach to Training (SAT) process. Training will be developed and provided to all involved plant personnel based on any procedural changes or new procedures developed to address and identify FLEX activities. Applicable training will be completed prior to the implementation of FLEX (Open Item #70).
Describe Regional Response Center plan	*Discussion in this section may include the following information and will be further developed as the Regional Response Center (RRC) development is completed.* • *Site-specific RRC plan* • *Identification of the primary and secondary RRC sites* • *Identification of any alternate equipment sites (i.e. another nearby site with compatible equipment that can be deployed)* • *Describe how delivery to the site is acceptable* • *Describe how all requirements in NEI 12-06 are identified* The industry will establish two (2) RRCs to support utilities during beyond design basis events. Each RRC will hold five (5) sets of equipment, four (4) of which will be able to be fully deployed when requested, the fifth set will have equipment in a maintenance cycle. Equipment will be moved from an RRC to a local staging area, established by the Strategic Alliance of FLEX Emergency Response (SAFER) team and the utility. Communications will be established between the affected nuclear site and the SAFER team and required equipment moved to the site as needed. First arriving equipment, as established during development of the nuclear site's playbook (Open Item #75), will be delivered to the site within 24 hours from the initial request. A contract has been signed between the site and the Pooled Equipment Inventory Company to provide Phase 3 services and equipment. (Reference 16)
Notes: None	

Maintain Core Cooling & Heat Removal

Determine Baseline coping capability with installed coping[1] modifications not including FLEX modifications, utilizing methods described in Table 3-2 of NEI 12-06:

- **AFW/EFW**
- **Depressurize SG for Makeup with Portable Injection Source**
- **Sustained Source of Water**

Ref: JLD-ISG-2012-01, Sections 2 and 3

PWR Installed Equipment Phase 1

Provide a general description of the coping strategies using installed equipment including station modifications that are proposed to maintain core cooling. Identify methods (AFW/EFW) and strategy(ies) utilized to achieve this coping time.

HNP is an AC independent plant and relies upon the direct current (DC) systems for the necessary coping power and decay heat generated steam to operate the Auxiliary Feedwater (AFW) System to cool the RCS (Reference 17). Upon loss of AC power, operators verify reactor and turbine trip and isolate the RCS. The TDAFW pump operation is then verified by the AFW flow rate (Reference 6).

The TDAFW pump control is available in the control room for 4.4 hours (Reference 18) from the 125V Class 1E Battery 1B-SB, after which TDAFW pump control can be performed locally/manually (References 19 and 20). To extend the control of the TDAFW pump from the control room, an ELAP load shedding strategy will be utilized to extend the coping time of Battery 1B-SB (Open Items #27, 28). The SBO DC bus load shedding should be completed by one (1) hour into the event, per Reference 41, and the ELAP load shedding will subsequently be completed by two (2) hours into the event (Reference 8). The ELAP load shedding will extend the coping time for Battery 1B-SB to approximately 19.5 hours (Reference 7) which extends the availability to control the TDAFW pump from the Main Control Room (Open Items #27, 28).

Implementation of the RCS cooling strategy, as described by References 9 and 21, requires depressurization of the SGs. During an ELAP event, only SG PORV C can be controlled from the Main Control Room for 4.4 hours (Reference 18 and 22) from the 125V Class 1E Battery 1A-SA. The ELAP load shedding strategy would extend the coping time for Battery 1A-SA to approximately 13 hours (Reference 7) which extends the availability to control SG PORV C from the main control room (Open Items #27, 28). SG PORVs A and B lose power to control solenoids upon loss of all AC power. A modification will power controls for SG PORVs A and B from a DC powered Instrument Bus (Figures 16 and 17). All SG PORVs (A, B, and C) can be operated locally/manually using existing procedures through Steam Tunnel access (Reference 23).

The CST, with a volume of 415,000 gallons (UFSAR, Section 9.2.6.2), is the water source to the TDAFW pump. A preliminary calculation (Reference 24) indicates approximately 235,000 gallons of water would be needed to cope for 24 hours, and approximately 342,000 gallons is needed to

[1] Coping modifications consist of modifications installed to increase initial coping time, i.e. generators to preserve vital instruments or increase operating time on battery powered equipment.

Maintain Core Cooling & Heat Removal	
cope for 40 hours. Due to the presence of a non-seismic condensate transfer pump suction line nozzle (Figure 9), the available CST volume for ELAP coping is limited to approximately 238,000 gallons (Reference 25). The non-seismic nozzle will be upgraded to seismic qualification, which will increase the available CST volume to at least 80% indicated level or 345,000 gallons, (References 26 and 54) and extend ELAP coping time to 40 hours (Reference 24) (Open Item #5). If the ELAP occurs when the RCS is depressurized (i.e. SGs not available as heat sink), the Refueling Water Storage Tank (RWST) will be used to gravity feed the RCS as the core cooling strategy (Reference 27). Injection flow will be manually controlled to maintain core exit thermocouple temperature indication stable and ensure effective use of available RWST inventory. Reference 28 contains guidance concerning flow rates required to remove decay heat, which indicates beyond 24 hours after reactor shutdown a flowrate of 95 gpm is sufficient (Open Item # 11).	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation.* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06 (Open Item #66).
Identify modifications	*List modifications and describe how they support coping time.* • Upgrade of the non-seismic condensate transfer pump suction nozzle to seismic qualification will increase the CST inventory availability time to 40 hours (Figure 9) (Open Item #59). • A modification will power controls for SG PORVs A and B from a DC powered Instrument Bus (Figure 16 and 17). Although this modification does not impact coping time, it allows continued operation from the Main Control Room, which reduces operator burden (no need for local operations in the Steam Tunnel) and improves ability to symmetrically cool the RCS loops (Open Item #45).
Key Reactor Parameters	*List instrumentation credited for this coping evaluation phase.* The essential instrumentation to maintain Core Cooling and Heat Removal during Phase 1 is included in the Instrumentation Table in Attachment 6. The safety 125 VDC batteries power essential instrumentation to maintain Core Cooling and Heat Removal. The power supply to the Essential Instruments is discussed in detail in the Safety Functions Support section of this document.

Overall Integrated Plan: EA-12-049

Maintain Core Cooling & Heat Removal
Notes: None

Maintain Core Cooling & Heat Removal

PWR Portable Equipment Phase 2

Provide a general description of the coping strategies using on-site portable equipment including station modifications that are proposed to maintain core cooling. Identify methods and strategy(ies) utilized to achieve this coping time.

Primary Strategy

HNP will establish plant conditions to allow transition from using the TDAFW pump to an electric motor driven FLEX pump to provide defense in depth for maintaining an adequate heat sink should the TDAFW pump fail. Taking suction from the CST, the electric motor driven FLEX pump will be capable of delivering water to the SG injection point at 300-gpm and 300-psig (Reference 29) (Figures 8 and 9). The electric motor driven pump will be powered by a diesel generator (Figure 2). Use of the existing AFW system flow control valves allows flow to each SG to be controlled from the main control board (Figure 19, 20, 21, and 22). As previously stated in Maintain Core Cooling & Heat Removal – Phase 1, the CST inventory will currently provide make-up water to the SG for at least 24 hours, and will provide make-up water for 40 hours with the upgrade of the non-seismic nozzle.

The electric motor driven FLEX pump suction can be aligned to a pressurized ESW header via installed ESW valves (Figure 9) when the CST inventory is depleted (Reference 30). An ESW header will be pressurized by a portable diesel-driven pump taking suction from an ESW pump bay in the Intake Structure. The ESW pump bay is gravity fed with water via existing ESW piping from the Screening Structure. If necessary, the traveling screens will be bypassed by use of an additional portable diesel-driven pump taking suction from the Auxiliary Reservoir Intake Canal and discharging to the applicable bay in the Screening Structure (Figure 10). The Auxiliary Reservoir will provide a sustained water supply with the Main Reservoir serving as a backup supply (UFSAR, Section 9.2.5).

To operate SG PORVs from the Main Control Room, power will be supplied to the SG PORV hydraulic pump motors (Figures 14, 15, 18). Power will be provided as described in the Electrical Distribution Network portion of Safety Functions Support – Phase 2. This will allow operation of all SG PORV controls indefinitely from the Main Control Room.

The Cold Leg Accumulators (CLAs) will be isolated when the RCS is approximately 650 psig to prevent injection of nitrogen gas into the RCS (Reference 9). Power will be supplied to the CLA outlet isolation motor operated valves (MOV) through the normal MCC 1A21-SA and 1B21-SB feeds (Figure 4 and 26). Power will be provided as described in the Electrical Distribution Network portion of Safety Functions Support – Phase 2 section of this document.

If the ELAP occurs when the RCS is depressurized (i.e. SGs not available as heat sink), the electric motor driven FLEX feedwater pump will be used to inject water to the RCS from the RWST as the primary core cooling strategy (Figure 13). The pump suction will be aligned to a connection point on either Train A or Train B Charging/Safety Injection Pumps (CSIPs) suction header. The pump discharge will be aligned to a connection point on either Train A or Train B CSIPs discharge header. Injection flow will be manually controlled to maintain core exit thermocouple temperature indications stable and ensure effective use of available RWST inventory. Reference 28 contains guidance concerning flow rates required to remove decay heat, which indicates beyond 24 hours after reactor shutdown a flowrate of 95 gpm is sufficient (Open Item # 11).

Overall Integrated Plan: EA-12-049

Maintain Core Cooling & Heat Removal	
PWR Portable Equipment Phase 2	
Alternate Strategy An additional electric motor driven FLEX pump can be connected to the opposite train AFW suction and discharge points (Figures 8 and 9) as an alternate path to inject makeup water to the SGs. The alternate strategy to power the SG PORVs hydraulic pump motors and the CLA outlet isolation MOVs is described in the Electrical Distribution Network portion of Safety Functions Support – Phase 2 section of this document (Figures 14, 15, 18, 23, 24, 25). If the ELAP occurs when the RCS is depressurized (i.e. SGs not available as heat sink), an additional electric motor driven FLEX feedwater pump will be used to inject water to the RCS from the RWST as the alternate core cooling strategy (Figure 13). The pump suction will be aligned to a connection point on either Train A or Train B CSIPs suction header. The pump discharge will be aligned to a connection point on either Train A or Train B CSIPs discharge header. Injection flow will be manually controlled to maintain core exit thermocouple temperature indications stable and ensure effective use of available RWST inventory. Reference 28 contains guidance concerning flow rates required to remove decay heat, which indicates beyond 24 hours after reactor shutdown a flowrate of 95 gpm is sufficient (Open Item # 11).	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation with a description of the procedure / strategy / guideline.* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4 (Open Item #66).
Identify modifications	*List modifications necessary for Phase 2* • Harden and protect the Dedicated Shutdown Diesel Generator (DSDG) to provide power to Motor Control Center (MCC) 1D23 (Figure 26) (Open Item #40). • Protect and seismically upgrade MCC 1D23 and all connections/distribution to provide power to one safety battery charger on each train (Figure 27) (Open Item #43). • MCCs 1A21-SA, 1A31-SA, 1B21-SB, and 1B31-SB require modifications to allow FLEX generator connection (Figure 4 and 26) (Open Item #44). • Permanent cable and raceway will be installed to make cable deployment directly to the 1A3-SA and 1B3-SB SWGR and MCCs 1A21-SA, 1A31-SA, 1B21-SB, and 1B31-SB feasible (Figures 4, 5, 6, and 26)(Open Item #44). • Modify MCC buckets for the CLA isolation valves to facilitate connection of temporary power (Figures 23, 24, and 25)(Open Item #55). • Modify motor-driven AFW flow control valves circuitry to allow

Maintain Core Cooling & Heat Removal	
PWR Portable Equipment Phase 2	
	operations during ELAP (Figures 19, 20, 21, and 22) (Open Item #47). • Add FLEX feedwater pump suction and discharge connection points to the AFW system (Figures 8 and 9). One set of connections to be installed on each train of motor-driven AFW pumps piping (Open Item #46). • Add FLEX RCS make-up pump suction and discharge connections on the A and B train Chemical Volume Control System (CVCS) headers (Figure 13) (Open Item #48). • Install FLEX power distribution network to deliver 480VAC to FLEX electric motor driven pumps (Figure 2), alternate temporary power to CLA outlet isolation MOVs, and alternate temporary power to SG PORV hydraulic pump motors (Figures 4, 5, 6, 26, and 27)(Open Item #57). • Modify SG PORVs hydraulic pump motor MCC cubicles to provide quick connection of a temporary FLEX power source (Figures 14, 15, and 18) (Open Item #79). • Add FLEX pump discharge connection points to both trains of the ESW system (Figure 10)(Open Item #49). • Add quick connect connection point at Diesel Fuel Oil Storage Tanks (DFOST) 4 inch flanges downstream of valves 2DFO-262 and 2DFO-280 to support transfer of inventory for use in FLEX equipment (Figure 28) (Open Item #50).
Key Reactor Parameters	*List instrumentation credited or recovered for this coping evaluation.* The essential instrumentation to maintain Core Cooling and Heat Removal during Phase 2 is included in the Instrumentation Table in Attachment 6. The safety 125 VDC batteries power essential instrumentation to maintain Core Cooling and Heat Removal. The power supply to the Essential Instruments is discussed in detail in the Safety Functions Support section of this document.

Storage / Protection of Equipment : Describe storage / protection plan or schedule to determine storage requirements	
Seismic	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date (Open Item #71). The HNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and

Maintain Core Cooling & Heat Removal	
PWR Portable Equipment Phase 2	
	FLEX equipment requirements relative to the hazards applicable to HNP (Open Item #72).
Flooding	*List how equipment is protected or schedule to protect* HNP is a dry site and the site elevation is above the maximum flood hazard level (UFSAR, Section 3.4.1.1). Therefore, the FLEX equipment storage location onsite will be above the flood elevation.
Severe Storms with High Winds	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date (Open Item #71). The HNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to HNP (Open Item #72).
Snow, Ice, and Extreme Cold	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date (Open Item #71). The HNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to HNP (Open Item #72). The FLEX equipment storage location has not yet been decided. However, the potential impact of extreme cold temperatures on storage of equipment will be considered in the structure design. The FLEX equipment will be maintained at a temperature within a range to ensure its likely function when called upon, in accordance with NEI 12-06, Section 8.3.1.2.
High Temperatures	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date (Open Item #71). The HNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to

Maintain Core Cooling & Heat Removal	
PWR Portable Equipment Phase 2	
	HNP (Open Item #72). The FLEX equipment storage location has not yet been decided. However, the potential impact of high temperatures on storage of equipment will be considered in the structure design. The FLEX equipment will be maintained at a temperature within a range to ensure its likely function when called upon, in accordance with NEI 12-06, Section 9.3.1.

Deployment Conceptual Design (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
The FLEX equipment storage building and location has not yet been decided. Specific deployment of the FLEX equipment to the point of use will be identified and conceptual sketches provided once storage building and location is identified and the deployment strategy is finalized, including an evaluation of the likely site hazards arising from different events (Open Item # 56).	A. Harden and protect the DSGD to provide power to MCC 1D23 (Figure 26) (Open Item #40). B. Protect and seismically upgrade MCC 1D23 and all connections/distribution to provide power to one safety battery charger on each train (Figure 27) (Open Item #43). C. MCCs 1A21-SA, 1A31-SA, 1B21-SB, and 1B31-SB require modifications to allow FLEX generator connection (Figure 4 and 26) (Open Item #44). D. Permanent cable and raceway will be installed to make cable deployment directly to the 1A3-SA and 1B3-SB SWGR and MCCs 1A21-SA, 1A31-SA, 1B21-SB, and 1B31-SB feasible (Figures 4, 5, 6, and 26)(Open Item #44). E. Modify MCC buckets for the CLA isolation valves to facilitate connection of temporary power (Figures 23, 24, and 25)(Open Item #55).	A. DSDG will be contained within a structure compliant with NEI 12-06, Section 11. B. MCC 1D23 is located within the Reactor Auxiliary Building (RAB) (Seismic Category I) (UFSAR, Table-3.2.1-1). MCC 1D23 will be seismically upgraded. Connections/distribution will be seismically upgraded and protected. C. All MCC connections from the FLEX generator will be located within the RAB (Seismic Category I) (UFSAR, Table-3.2.1-1) or a structure compliant with NEI 12-06, Section 11. D. All cables and raceways will be located within the RAB (Seismic Category I) (UFSAR, Table 3.2.1-1) or within a structure compliant with NEI 12-06, Section 11. E. MCC buckets for the CLA isolation valves are located within RAB (Seismic Category I) (UFSAR, Table 3.2.1-1). F. Circuitry for the motor-driven AFW flow control

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Maintain Core Cooling & Heat Removal		
PWR Portable Equipment Phase 2		
	F. Modify motor-driven AFW flow control valves circuitry to allow operations during ELAP (Figures 19, 20, 21, and 22) (Open Item #47). G. Add FLEX feedwater pump suction and discharge connection points to the AFW system (Figures 8 and 9). One set of connections to be installed on each train of train motor-driven AFW pumps piping (Open Item #46). H. Add FLEX RCS make-up pump suction and discharge connections on the A and B train CVCS headers (Figure 13) (Open Item #48). I. Install FLEX power distribution network to deliver 480VAC to FLEX electric motor driven pumps (Figure 2), alternate temporary power to CLA isolation MOVs, and alternate temporary power to SG PORV hydraulic pump motors (Figures 4, 5, 6, 26, and 27)(Open Item #57). J. Modify SG PORVs hydraulic pump motor MCC cubicles to provide quick connection of a temporary FLEX power source (Figures 14, 15, and 18) (Open Item #79). K. Add FLEX pump discharge connection points to both trains of the ESW system (Figure 10)(Open Item #49). L. Add quick connect connection point at DFOST 4 inch flanges downstream	valves is located within Seismic Category I structures. (Reference 35 and UFSAR, Table 3.2.1-1). G. FLEX feedwater pump connections will be located within RAB (Seismic Category I) (UFSAR, Table 3.2.1-1). H. FLEX RCS make-up pump connections will be located within RAB (Seismic Category I) (UFSAR, Table 3.2.1-1). I. FLEX power distribution network will be installed within the RAB (Seismic Category I) (UFSAR, Table 3.2.1-1) or a structure compliant with NEI 12-06, Section 11. J. SG PORVs hydraulic pump motor MCC cubicles are located within RAB (Seismic Category I) (UFSAR, Table 3.2.1-1). K. FLEX connection points will be located within the ESW and Cooling Tower Makeup Water Intake Structure and ESW Screening Structure (Seismic Category I) (UFSAR, Table 3.2.1-1). L. Connection points at the DFOST are located within the DFOST Structure (Seismic Category I) (UFSAR, Table 3.2.1-1).

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Maintain Core Cooling & Heat Removal		
PWR Portable Equipment Phase 2		
	of valves 2DFO-262 and 2DFO-280 to support transfer of inventory for use in FLEX equipment (Figure 28) (Open Item #50).	
Notes: None		

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Maintain Core Cooling & Heat Removal	
PWR Portable Equipment Phase 3	
Provide a general description of the coping strategies using Phase 3 equipment including modifications that are proposed to maintain core cooling. Identify methods and strategy(ies) utilized to achieve this coping time. To maintain core cooling and heat removal indefinitely requires obtaining diesel fuel and water (or a water purification/demineralizer platform), from off-site to ensure adequate supplies are available (Figure 1).	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation with a description of the procedure / strategy / guideline.* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4. (Open Item #66)
Identify modifications	*List modifications necessary for Phase 3* No modifications are required for Phase 3.
Key Reactor Parameters	*List instrumentation credited or recovered for this coping evaluation.* The essential instrumentation to maintain Core Cooling and Heat Removal during Phase 3 is included in the Instrumentation Table in Attachment 6. The safety 125 VDC batteries power essential instrumentation to maintain Core Cooling and Heat Removal. The power supply to the Essential Instruments is discussed in detail in the Safety Functions Support section of this document.

Deployment Conceptual Design **(Attachment 3 contains Conceptual Sketches)**		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
Phase 3 equipment will be provided by the RRC which is to be located in Memphis, TN. Specific deployment of Phase 3 equipment to the point of use will be identified and conceptual sketches provided once deployment strategy is	Currently, there are no known modifications to ensure deployment of Phase 3 equipment.	Not Applicable

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Maintain Core Cooling & Heat Removal		
PWR Portable Equipment Phase 3		
finalized, including an evaluation of the deployment routes from the staging area based on an assessment of the damage in the affected area (Open Item #75).		
Notes: None		

Maintain RCS Inventory Control
Determine Baseline coping capability with installed coping[2] modifications not including FLEX modifications, utilizing methods described in Table 3-2 of NEI 12-06: • **Low Leak RCP Seals or RCS makeup required** • **All Plants Provide Means to Provide Borated RCS Makeup**
PWR Installed Equipment Phase 1
Provide a general description of the coping strategies using installed equipment including modifications that are proposed to maintain core cooling. Identify methods (Low Leak RCP Seals and/or borated high pressure RCS makeup) and strategy(ies) utilized to achieve this coping time. HNP does not have low leakage seals installed in the Reactor Coolant Pumps (RCP). With the RCS pressurized, HNP does not have any active means of RCS makeup from a borated water source. HNP does not plan on injection of CLA inventory during the ELAP event. The CLA outlet isolation MOVs will be closed at approximately 650 psig RCS pressure. Per Reference 10, core uncovery does not occur until 55.1 hours into the event and to prevent core uncovery an RCS make-up method must be started prior but not in Phase 1. Injection of borated water into the RCS will not be required until 15 hours into the event to prevent a return to criticality (Reference 11) (Open Item #12). If the ELAP occurs when the RCS is depressurized (i.e. SGs not available as heat sink), the RWST will be used to gravity feed the RCS as the primary RCS inventory control strategy. Injection flow will be manually controlled to maintain RCS inventory (Reference 27).

Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4 (Open Item #66).
Identify modifications	*List modifications* There are no modifications necessary to support the coping strategies during Phase 1.
Key Reactor Parameters	*List instrumentation credited for this coping evaluation.* The essential instrumentation to maintain RCS Inventory Control during Phase 1 is included in the Instrumentation Table in Attachment 6. The safety 125 VDC batteries power essential instrumentation to maintain RCS Inventory Control. The power supply to the Essential

[2] Coping modifications consist of modifications installed to increase initial coping time, i.e. generators to preserve vital instruments or increase operating time on battery powered equipment.

Maintain RCS Inventory Control	
	Instruments is discussed in detail in the Safety Functions Support section of this document.
Notes: None	

Maintain RCS Inventory Control
PWR Portable Equipment Phase 2
Provide a general description of the coping strategies using on-site portable equipment including modifications that are proposed to maintain core cooling. Identify methods (Low Leak RCP Seals and/or borated high pressure RCS makeup)and strategy(ies) utilized to achieve this coping time. *Primary Strategy* High pressure borated makeup water will be delivered to the RCS from the Alternate Seal Injection (ASI) system. The ASI pump (2600 psig at 29.5 gpm per Reference 31) suction source is the ASI tank which will provide a coping time of approximately 18 hours (Reference 32). A plant specific calculation will be performed to determine the minimum pump performance requirements of Reference 34 are met (Open Item #15). The ASI pump discharge will be manually aligned to the normal charging header (Figure 13). Once the ASI tank is depleted, ASI pump suction can be taken from the RWST or the Boric Acid Tank (BAT) to provide additional coping time (Figure 13) (Open Item #12). The ASI system is housed in the RAB which is a seismic Category 1 structure (UFSAR, Table 3.2.1-1). To support this strategy the ASI System will be upgraded to meet seismic qualification requirements. The ASI System is powered by the DSDG, which will be protected against applicable hazards. If the ELAP occurs when the RCS is depressurized (i.e. SGs not available as heat sink), the electric motor driven FLEX feedwater pump will be used to inject water to the RCS from the RWST as the primary inventory control strategy (Figure 13). The pump suction will be aligned to a connection point (Figure 13) on either Train A or Train B CSIPs suction header. The pump discharge will be aligned to a connection point (Figure 13) on either Train A or Train B CSIPs discharge header. Injection flow will be manually controlled to maintain RCS inventory. The RWST can be refilled from the Auxiliary Reservoir via SSE Fire Protection hose stations cross-tied to an ESW header pressurized by a portable diesel driven pump (Figure 10). The RWST will be filled in a similar manner using the guidance in Reference 33. Boron crystals can be added via the RWST upper manway (Open Item #26). *Alternate Strategy* The alternate strategy for providing high pressure borated makeup employs an electric motor driven FLEX pump to supply borated water from the RWST and the BAT (Figure 13). The electric motor driven FLEX pump will be powered by a diesel generator (Figure 2). A plant specific calculation will be performed to determine the minimum pump performance requirements of Reference 34 are met (Open Item #14). The pump suction will be aligned to a connection point (Figure 13) on the CSIPs suction header. The pump discharge will be aligned to a connection point (Figure 13) on the CSIPs discharge header. If the ELAP occurs when the RCS is depressurized (i.e. SGs not available as heat sink), an additional electric motor driven FLEX feedwater pump will be used to inject water to the RCS from the RWST as the alternate inventory control strategy. The pump suction will be aligned to a connection point (Figure 13) on either Train A or Train B CSIPs suction header. The pump discharge will be aligned to a connection point (Figure 13) on either Train A or Train B CSIPs discharge header. Injection flow will be manually controlled to maintain RCS inventory.

Maintain RCS Inventory Control	
PWR Portable Equipment Phase 2	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4 (Open Item #66).
Identify modifications	*List modifications necessary for Phase 2.* • Harden and protect the DSDG to provide power to MCC 1D23 (Figure 26) (Open Item #40). • Protect and seismically upgrade MCC 1D23 and all connections/distribution to provide power to one safety battery charger on each train (Figure 27) (Open Item #43). • Seismically upgrade the ASI System (Open Item #41) (Figure 13). • Add an ASI pump discharge path to the CVCS charging header. Add an alternate suction path to the ASI pump from the RWST and BAT (Figure 13) (Open Item #42). • MCCs 1A21-SA, 1A31-SA, 1B21-SB, and 1B31-SB require modifications to allow FLEX generator connection (Figures 4 and 26) (Open Item #44). • Permanent cable and raceway will be installed to make cable deployment directly to the 1A3-SA and 1B3-SB SWGR and MCCs 1A21-SA, 1A31-SA, 1B21-SB, and 1B31-SB feasible (Figures 4, 5, 6, and 26) (Open Item #44). • Add FLEX RCS make-up pump suction and discharge connections on the A and B train CVCS headers. Provides the capability to inject inventory (borate) from a FLEX pump to the RCS from the BAT or RWST (Figure 13) (Open Item #48). • Add connection point at Diesel Fuel Oil Storage Tanks (DFOST) 4 inch flanges downstream of valves 2DFO-262 and 2DFO-280 to support transfer of inventory for use in FLEX equipment (Figure 28) (Open Item #50). • Install FLEX power distribution network to deliver 480VAC to FLEX electric motor driven pumps (Figure 2) (Open Item #57). • Add FLEX pump discharge connection points to both trains of the ESW system (Figure 10) (Open Item #49).
Key Reactor Parameters	*List instrumentation credited or recovered for this coping evaluation.* The essential instrumentation to maintain RCS Inventory Control during Phase 2 is included in the Instrumentation Table in Attachment 6.

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Maintain RCS Inventory Control	
PWR Portable Equipment Phase 2	
	The safety 125 VDC batteries power essential instrumentation to maintain RCS Inventory Control. The power supply to the Essential Instruments is discussed in detail in the Safety Functions Support section of this document.
Storage / Protection of Equipment: **Describe storage / protection plan or schedule to determine storage requirements**	
Seismic	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date (Open Item #71). The HNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to HNP (Open Item #72).
Flooding	*List how equipment is protected or schedule to protect* HNP is a dry site and the site elevation is above the maximum flood hazard level (UFSAR, Section 3.4.1.1). Therefore, the FLEX equipment storage location onsite will be above the flood elevation.
Severe Storms with High Winds	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date (Open Item #71). The HNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to HNP (Open Item #72).
Snow, Ice, and Extreme Cold	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date (Open Item #71). The HNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the

Maintain RCS Inventory Control	
PWR Portable Equipment Phase 2	
	hazards applicable to HNP (Open Item #72). The FLEX equipment storage location has not yet been decided. However, the potential impact of extreme cold temperatures on storage of equipment will be considered in the structure design. The FLEX equipment will be maintained at a temperature within a range to ensure its likely function when called upon (NEI 12-06, Section 8.3.1.2).
High Temperatures	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date (Open Item #71). The HNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to HNP (Open Item #72). The FLEX equipment storage location has not yet been decided. However, the potential impact of high temperatures on storage of equipment will be considered in the structure design. The FLEX equipment will be maintained at a temperature within a range to ensure its likely function when called upon (NEI 12-06, Section 9.3.1).

Deployment Conceptual Modification (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
The FLEX equipment storage building and location has not yet been decided. Specific deployment of the FLEX equipment to the point of use will be identified and conceptual sketches provided once storage building and location is identified and the deployment strategy is finalized, including an evaluation of the likely site	A. Harden and protect the DSDG to provide power to MCC 1D23 (Figure 26) (Open Item #40). B. Protect and seismically upgrade MCC 1D23 and all connections/distribution to provide power to one safety battery charger on each train (Figure 27) (Open Item #43). C. Seismically upgrade the	A. DSDG will be contained within a structure compliant with NEI 12-06, Section 11. B. MCC 1D23 is located within the RAB (Seismic Category I) (UFSAR, Table 3.2.1-1). MCC 1D23 will be seismically upgraded. Connections/distribution will be seismically upgraded and protected. C. ASI system is located

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Maintain RCS Inventory Control		
PWR Portable Equipment Phase 2		
hazards arising from different events (Open Item #56).	ASI System (Open Item #41) (Figure 13). D. Add an ASI pump discharge path to the CVCS charging header. Add an alternate suction path to the ASI pump from the RWST and BAT (Figure 13) (Open Item #42). E. MCCs 1A21-SA, 1A31-SA, 1B21-SB, and 1B31-SB require modifications to allow FLEX generator connection (Figures 4 and 26) (Open Item #44). F. Permanent cable and raceway will be installed to make cable deployment directly to the 1A3-SA and 1B3-SB SWGR and MCCs 1A21-SA, 1A31-SA, 1B21-SB, and 1B31-SB feasible (Figures 4, 5, 6, and 26) (Open Item #44). G. Add FLEX RCS make-up pump suction and discharge connections on the A and B train CVCS headers. Provides the capability to inject inventory (borate) from a FLEX pump to the RCS from the BAT or RWST (Figure 13) (Open Item #48). H. Add connection point at DFOST 4 inch flanges downstream of valves 2DFO-262 and 2DFO-280 to support transfer of inventory for use in FLEX equipment (Figure 28) (Open Item #50). I. Install FLEX power distribution network to deliver 480VAC to FLEX electric motor driven pumps	within RAB (Seismic Category I) (UFSAR, Table 3.2.1-1), and will be upgraded seismically. D. Connection points will be located within the RAB (Seismic Category I) (UFSAR, Table 3.2.1-1). E. All MCC connections from the FLEX generator will be located within the RAB (Seismic Category I) (UFSAR, Table 3.2.1-1) or a structure compliant with NEI 12-06, Section 11. F. All cables and raceways will be located within the RAB (Seismic Category I) (UFSAR, Table 3.2.1-1) or a structure compliant with NEI 12-06, Section 11. G. FLEX RCS make-up pump connections will be located within RAB (Seismic Category I) (UFSAR, Table 3.2.1-1). H. Connection points at the DFOST are located within the DFOST Structure (Seismic Category I) (UFSAR, Table 3.2.1-1). I. FLEX power distribution network will be installed within the RAB (Seismic Category I) (UFSAR, Table 3.2.1-1) or in a structure compliant with NEI 12-06, Section 11. J. FLEX connection points will be located within the ESW and Cooling Tower Makeup Water Intake Structure and ESW Screening Structure (Seismic Category I) (UFSAR, Table 3.2.1-1).

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Maintain RCS Inventory Control		
PWR Portable Equipment Phase 2		
	(Figure 2) (Open Item #57). J. Add FLEX pump discharge connection points to both trains of the ESW system (Figure 10) (Open Item #49).	
Notes: None		

Maintain RCS Inventory Control	
PWR Portable Equipment Phase 3	
Provide a general description of the coping strategies using Phase 3 equipment including modifications that are proposed to maintain core cooling. Identify methods (Low Leak RCP Seals and/or borated high pressure RCS makeup) and strategy(ies) utilized to achieve this coping time. To maintain RCS inventory control indefinitely requires obtaining diesel fuel, water (or a water purification/demineralizer platform), and boron from off-site to ensure an adequate supplies are maintained.	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4 (Open Item #66).
Identify modifications	*List modifications* No modifications are required for Phase 3.
Key Reactor Parameters	*List instrumentation credited or recovered for this coping evaluation.* The essential instrumentation to maintain RCS Inventory Control during Phase 3 is included in the Instrumentation Table in Attachment 6. The safety 125 VDC batteries power essential instrumentation to maintain RCS Inventory Control. The power supply to the Essential Instruments is discussed in detail in the Safety Functions Support section of this document.

Deployment Conceptual Modification (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
Phase 3 equipment will be provided by the RRC which is to be located in Memphis, TN. Specific deployment of Phase 3 equipment to the point of use will be identified and conceptual sketches provided once deployment	Currently, there are no known modifications that have been identified to ensure deployment of Phase 3 equipment.	Not Applicable

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Maintain RCS Inventory Control		
PWR Portable Equipment Phase 3		
strategy is finalized, including an evaluation of the deployment routes from the staging area based on an assessment of the damage in the affected area (Open Item #75).		
Notes: None		

Maintain Containment	
Determine Baseline coping capability with installed coping[3] modifications not including FLEX modifications, utilizing methods described in Table 3-2 of NEI 12-06: • Containment Spray • Hydrogen igniters (ice condenser containments only)	
PWR Installed Equipment Phase 1	
Provide a general description of the coping strategies using installed equipment including modifications that are proposed to maintain containment. Identify methods (containment spray/Hydrogen igniter) and strategy(ies) utilized to achieve this coping time. The containment building is designed for an internal pressure of 45.0 PSIG (UFSAR, Table 6.2.1-3). Four SBO with RCP seal Loss of Coolant Accident (LOCA) scenarios were evaluated in Reference 36. None of the evaluated scenarios exceeded containment pressure rise of 10.5 psi during the first 24 hours following a station blackout event. No challenge to containment integrity is expected and therefore no Phase 1 actions are required. A plant specific ELAP containment atmosphere analysis must be performed to confirm no action is required to maintain containment and potentially affected instrumentation (Open Item #31). HNP does not have an ice condenser containment and, therefore, hydrogen igniters are not required.	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation* Pending the outcome of the plant specific containment analysis, site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4 (Open Item #66).
Identify modifications	*List modifications* There are no modifications necessary to support the coping strategies during Phase 1 pending the outcome of the plant specific containment analysis (Open Item #31).
Key Containment Parameters	*List instrumentation credited for this coping evaluation.* The essential instrumentation to maintain containment during Phase 1 is included in the Instrumentation Table in Attachment 6. The safety 125 VDC batteries power essential instrumentation to maintain containment. The power supply to the Essential Instruments is discussed in detail in the Safety Functions Support

[3] Coping modifications consist of modifications installed to increase initial coping time, i.e. generators to preserve vital instruments or increase operating time on battery powered equipment.

Maintain Containment	
	section of this document.
Notes: None	

Maintain Containment	
PWR Portable Equipment Phase 2	
Provide a general description of the coping strategies using on-site portable equipment including modifications that are proposed to maintain containment. Identify methods (containment spray/hydrogen igniters) and strategy(ies) utilized to achieve this coping time. Based on preliminary reviews of existing analysis (Reference 36) containment integrity is not expected to be challenged. A plant specific ELAP containment atmosphere analysis must be performed. (Open Item #31).	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation* Pending outcome of plant specific containment analysis, site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4 (Open Item #66).
Identify modifications	*List modifications necessary for Phase 2* There are no modifications necessary to support the coping strategies during Phase 2 pending outcome of plant specific containment analysis (Open Item #31).
Key Containment Parameters	*List instrumentation credited or recovered for this coping evaluation.* The essential instrumentation to maintain containment during Phase 2 is included in the Instrumentation Table in Attachment 6. The safety 125 VDC batteries power essential instrumentation to maintain containment. The power supply to the Essential Instruments is discussed in detail in the Safety Functions Support section of this document.
Storage / Protection of Equipment: **Describe storage / protection plan or schedule to determine storage requirements**	
Seismic	*List how equipment is protected or schedule to protect* Not Applicable
Flooding	*List how equipment is protected or schedule to protect* Not Applicable
Severe Storms with High Winds	*List how equipment is protected or schedule to protect* Not Applicable
Snow, Ice, and Extreme Cold	*List how equipment is protected or schedule to protect* Not Applicable

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Maintain Containment		
PWR Portable Equipment Phase 2		
High Temperatures	*List how equipment is protected or schedule to protect* Not Applicable	
Deployment Conceptual Modification **(Attachment 3 contains Conceptual Sketches)**		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
Not Applicable	Not Applicable	Not Applicable
Notes: None		

Maintain Containment	
PWR Portable Equipment Phase 3	
Provide a general description of the coping strategies using Phase 3 equipment including modifications that are proposed to maintain containment. Identify methods (containment spray/hydrogen igniters) and strategy(ies) utilized to achieve this coping time. The Phase 3 strategy to maintain containment indefinitely is dependent upon the outcome of the containment analysis that will be performed (Open Item #31).	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation* Pending the outcome of the plant specific containment analysis, site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4 (Open Item #66).
Identify modifications	*List modifications* There are no modifications necessary to support the coping strategies during Phase 3 pending the outcome of the plant specific containment analysis (Open Item #31).
Key Containment Parameters	*List instrumentation credited or recovered for this coping evaluation.* The essential instrumentation to maintain containment during Phase 3 is included in the Instrumentation Table in Attachment 6. The safety 125 VDC batteries power essential instrumentation to maintain containment. The power supply to the Essential Instruments is discussed in detail in the Safety Functions Support section of this document.

Deployment Conceptual Modification (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
Not Applicable	Not Applicable	Not Applicable

Notes: None

Maintain Spent Fuel Pool Cooling	
Determine Baseline coping capability with installed coping[4] modifications not including FLEX modifications, utilizing methods described in Table 3-2 of NEI 12-06: • **Makeup with Portable Injection Source**	
PWR Installed Equipment Phase 1	
Provide a general description of the coping strategies using installed equipment including modifications that are proposed to maintain spent fuel pool cooling. Identify methods (makeup via portable injection source) and strategy(ies) utilized to achieve this coping time. During normal operating conditions, the time to boil for Pool A is 16.5 hours based on a starting temperature of 105°F, a heat load of 7.084 MBTU/hour, and a heat up rate of 6.47°F/hour (Reference 13). The time to boil for Pool B is 48.4 hours based on a starting temperature of 105°F, a heat load of 6.27 MBTU/hour, and a heat up rate of 2.21°F/hour (Reference 13). The time to boil for Pool C is 60.4 hours based on a starting temperature of 105°F, a heat load of 5.01 MBTU/hour, and a heat up rate of 1.77°F/hour (Reference 13). In the case of an emergency core offload, the time to reach boiling temperature in Pools A and B is 9.7 hours. This is based on a starting temperature of 105°F, a heat load of 46.23 MBTU/hour, and a heat-up rate of 11°F/hour (Reference 14). Pool C does not receive fuel during a core offload so its time to boil would be the same as during normal operations. Based on the limiting case of an emergency core offload in Pools A and B, it is not necessary to implement any coping strategies for Phase 1 to cool the SFP.	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4 (Open Item #66).
Identify modifications	• Modifications will be installed for the SFP level instrumentation per Reference 38 (Open Item #51)
Key SFP Parameter	*List instrumentation credited for this coping evaluation phase.* SFP level instrumentation is per Reference 38. The essential instrumentation to maintain SFP cooling during Phase 1 is included in the Instrumentation Table in Attachment 6.
Notes: None	

[4] Coping modifications consist of modifications installed to increase initial coping time, i.e. generators to preserve vital instruments or increase operating time on battery powered equipment.

Maintain Spent Fuel Pool Cooling

PWR Portable Equipment Phase 2

Provide a general description of the coping strategies using on-site portable equipment including modifications that are proposed to maintain spent fuel pool cooling. Identify methods (makeup via portable injection source) and strategy(ies) utilized to achieve this coping time.

During normal operations, Pools A and B will require a total makeup flow of 35 gpm to offset the losses due to boiling (Reference 14). Pool C will require a makeup flow of 15 gpm to offset the losses due to boiling (Reference 15).

In the case of an emergency core offload, Pools A and B will require a total makeup flow of 90 gpm to offset the losses due to boiling (Reference 15). Pool C will require a makeup flow of 15 gpm to offset the losses due to boiling (Reference 15).

Primary Strategy
Once 480 VAC switchgear 1A3-SA or 1B3-SB has been energized (Figures 5, 6, and 26) as described in Electrical Distribution Network portion of the Safety Functions Support Phase 2 section of this document, makeup water can be transferred from the RWST to the SFP via the Fuel Pool Cooling Pumps (Figures 11 and 12) 1&4A-SA or 1&4B-SB (4560 gpm, UFSAR, Table 9.1.3-2) per Reference 39. This can be performed before the SFP reaches 212°F in the limiting case of a full core off-load and meet the minimum makeup flow of 90 gpm for Pools A and B and 15 gpm for Pool C specified in Reference 15.

Alternate Strategy
The alternate strategy to provide SFP makeup water consists of using a FLEX portable diesel driven pump to supply makeup water from the ESW discharge canal per Reference 40. This is also the alternate strategy to provide spray cooling. This will provide a makeup rate in excess of 250 gpm as specified in NEI 12-06, Table D-3, page D-6.

Details:

Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4 (Open Item #66).
Identify modifications	*List modifications necessary for Phase 2.* • Permanent cable and raceway will be installed to make cable deployment directly to the 1A3-SA and 1B3-SB switchgear (Figures 4, 5, 6, and 26) (Open Item #44). • Add FLEX pump discharge connection points to both trains of the ESW system (Figure 10) (Open Item #49). • Add quick connect connection point at DFOST 4 inch flanges downstream of valves 2DFO-262 and 2DFO-280 to support transfer of inventory for use in FLEX equipment (Figure 28) (Open Item #50).

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Maintain Spent Fuel Pool Cooling	
PWR Portable Equipment Phase 2	
	• Verify seismic qualification or seismically upgrade piping bounded by valves 1CT-23, 1SF-10, 2SF-10, and 1SF-193. This allows HNP to credit Spent Fuel make-up from the RWST via the installed Fuel Pool Cooling Pumps which are being powered from a FLEX generator (Figures 11 and 12) (Open Item #52).
Key SFP Parameter	*List instrumentation credited for this coping evaluation phase.* SFP level instrumentation is per Reference 38. The essential instrumentation to maintain SFP cooling during Phase 2 is included in the Instrumentation Table in Attachment 6.
Storage / Protection of Equipment: **Describe storage / protection plan or schedule to determine storage requirements**	
Seismic	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date (Open Item #71). The HNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to HNP (Open Item #72).
Flooding	*List how equipment is protected or schedule to protect* HNP is a dry site and the site elevation is above the maximum flood hazard level (UFSAR, Section 3.4.1.1). Therefore, the FLEX equipment storage location onsite will be above the flood elevation.
Severe Storms with High Winds	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date (Open Item #71). The HNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to HNP (Open Item #72).
Snow, Ice, and Extreme Cold	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06,

Maintain Spent Fuel Pool Cooling	
PWR Portable Equipment Phase 2	
	Section 11. The structures will be built prior to the FLEX implementation date (Open Item #71). The HNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to HNP (Open Item #72). The FLEX equipment storage location has not yet been decided. However, the potential impact of extreme cold temperatures on storage of equipment will be considered in the structure design. The FLEX equipment will be maintained at a temperature within a range to ensure its likely function when called upon (NEI 12-06, Section 8.3.1.2).
High Temperatures	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date (Open Item #71). The HNP procedures and programs are being developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to HNP (Open Item #72). The FLEX equipment storage location has not yet been decided. However, the potential impact of high temperatures on storage of equipment will be considered in the structure design. The FLEX equipment will be maintained at a temperature within a range to ensure its likely function when called upon (NEI 12-06, Section 9.3.1).

Deployment Conceptual Design (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
The FLEX equipment storage building and location has not yet been decided. Specific deployment of the FLEX equipment to the point of use will be identified and	A. Permanent cable and raceway will be installed to make cable deployment directly to the 1A3-SA and 1B3-SB SWGR (Figures 4, 5, 6, and 26) (Open Item	A. Cables and raceways will be located within the RAB (Seismic Category I) (UFSAR, Table 3.2.1-1) or a structure compliant with NEI 12-06, Section 11.

Maintain Spent Fuel Pool Cooling		
PWR Portable Equipment Phase 2		
conceptual sketches provided once storage building and location is identified and the deployment strategy is finalized, including an evaluation of the likely site hazards arising from different events (Open Item #56).	#44). B. Add FLEX pump discharge connection points to the ESW system (both trains) (Figure 10) (Open Item #49). C. Add connection point at DFOST 4 inch flanges downstream of valves 2DFO-262 and 2DFO-280 to support transfer of inventory for use in FLEX equipment (Figure 28) (Open Item #50). **D.** Verify seismic qualification or seismically upgrade piping bounded by valves 1CT-23, 1SF-10, 2SF-10, and 1SF-193. Allows HNP to credit Spent Fuel Make-up from the RWST via the installed Fuel Pool Cooling Pumps which are being powered from a FLEX generator (Figures 11 and 12) (Open Item #52).	B. FLEX connection points will be located within the ESW and Cooling Tower Makeup Water Intake Structure and ESW Screening Structure (Seismic Category I).(UFSAR, Table 3.2.1-1). C. Connection points at the DFOST are located within the DFOST Structure (Seismic Category I). (UFSAR, Table 3.2.1-1). D. Valves and piping will be seismically upgraded and are located within the Fuel Handling Building (FHB) and RAB (Seismic Category I) (UFSAR, Table 3.2.1-1).
Notes: None		

Maintain Spent Fuel Pool Cooling	
PWR Portable Equipment Phase 3	
Provide a general description of the coping strategies using Phase 3 equipment including modifications that are proposed to maintain spent fuel pool cooling. Identify methods (makeup via portable injection source) and strategy(ies) utilized to achieve this coping time. To maintain Phase 2 spent fuel pool cooling and inventory strategies indefinitely requires obtaining diesel fuel to ensure adequate supplies are available.	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06, Section 11.4 (Open Item #66).
Identify modifications	*List modifications* No modifications are required for Phase 3.
Key SFP Parameter	*List instrumentation credited for this coping evaluation phase.* SFP level instrumentation is per Reference 38. The essential instrumentation to maintain SFP cooling during Phase 3 is included in the Instrumentation Table in Attachment 6.

Deployment Conceptual Design (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
Phase 3 equipment will be provided by the RRC which is to be located in Memphis, TN. Specific deployment of Phase 3 equipment to the point of use will be identified and conceptual sketches provided once deployment strategy is finalized, including an evaluation of the deployment routes from the staging area based on an assessment of the damage in the affected area (Open Item #75).	Currently, there are no known modifications to ensure deployment of Phase 3 equipment.	Not Applicable.

Maintain Spent Fuel Pool Cooling
Notes: None

Safety Functions Support
Determine Baseline coping capability with installed coping[5] modifications not including FLEX modifications.
PWR Installed Equipment Phase 1
Provide a general description of the coping strategies using installed equipment including station modifications that are proposed to maintain and/or support safety functions. Identify methods and strategy(ies) utilized to achieve coping times. <u>Essential Instrumentation</u> All instrumentation listed in Attachment 6, Essential Instrumentation, is powered by safety related Instrument Buses or the applicable safety battery. Existing battery capacities were assessed and it was determined that the batteries have a coping duration of 4.4 hours when loads are stripped from the batteries within the first hour of an SBO event (Reference 18). The Phase 1 strategy consists of performing a two part load shed which would extend battery coping times and allow for continued monitoring of key reactor parameters. The SBO DC bus load shedding will be completed by one (1) hour into the event (References 41, 42) and the ELAP load shedding will be subsequently completed by two (2) hours into the event (Reference 8). Preliminary analysis has determined that a ELAP load shedding would extend the coping time for Battery 1A-SA to approximately 13 hours and Battery 1B-SB to approximately 19.5 hours (Reference 7) (Open Items # 10, 27, 28, 66). <u>HVAC</u> All installed HVAC systems require AC power to function and are unavailable at the onset of an ELAP event. Current SBO analysis credits loss of HVAC for four (4) hours with no operational or accessibility concerns for installed Phase 1 equipment (Reference 43). There are no actions to restore power to the installed HVAC systems during Phase 1. Panel doors on the inverters and other electrical components will be opened to prevent overheating (Reference 44). Analysis will be performed to determine ELAP effects upon equipment performance and habitability (Open Items #1, 20, 21, 22, 23, 35). <u>Lighting</u> Sufficient lighting will be available for manual actions. DC lighting in the control room is powered by the 125V non-Class 1E battery capable of coping for four (4) hours when loads are stripped within the first 60 minutes of an SBO event (Reference 45). Preliminary analysis (Reference 7) has determined the ELAP load shedding scheme, when performed by two (2) hours (Reference 8) into the event, will extend coping time for the 125V non-Class 1E battery to

[5] Coping modifications consist of modifications installed to increase initial coping time, i.e. generators to preserve vital instruments or increase operating time on battery powered equipment.

approximately 14.5 hours (Open Items #10, 27, 28). The 125V non-Class 1E battery is located in the RAB, a Seismic Category I structure (UFSAR, Table 3.2.1-1), however, the battery itself is not Seismic Category I. Therefore, lighting as described below would be credited during a seismic event.

Currently two light equipped safe shutdown hard hats are staged in the MCR. Flashlights, batteries, and hard hats with lights are located in the Auxiliary Control Panel tool locker below the MCR (Reference 46). Self-Contained DC Emergency Lighting units are switched on after the loss of AC power to support SBO response. The units have a coping time of 8 hours (Reference 47). A planned modification to install Light Emitting Diode (LED) lamps in the Self-Contained DC Emergency Lighting units will extend the coping time.

Analysis will be performed to determine and address lighting needs to support implementation of FLEX strategies (Open Item #33).

<u>Communication</u>
Strategies to mitigate the loss of communication systems will be developed in accordance with the Request For Information (RFI) associated with Near Term Task Force (NTTF) Recommendation 9.3 (Reference 48) and NEI 12-01 (Reference 49) (Open Item #10).

<u>Staffing</u>
Staffing studies will be performed in accordance with the RFI associated with NTTF Recommendation 9.3 (Reference 48) and NEI 12-01 (Reference 49) to ensure adequate staffing is available to support, install, and operate FLEX equipment in the time necessary (Open Item #10).

Details:

Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation.* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06 (Open Item #66).
Identify modifications	*List modifications and describe how they support coping time.* • Upgrade the installed Self-Contained DC Emergency Lighting units with LED lamps (Open Item #58).
Key Parameters	*List instrumentation credited for this coping evaluation phase.* There is no additional instrumentation credited outside of those previously discussed to support safety function coping strategies during Phase 1.

Notes: None

Safety Functions Support

PWR Portable Equipment Phase 2

Provide a general description of the coping strategies using on-site portable equipment including station modifications that are proposed to maintain and/or support safety functions. Identify methods and strategy(ies) utilized to achieve coping times.

Electrical Distribution Network:

Primary Strategy

The primary strategy will use a FLEX diesel generator staged to repower the 480 VAC switchgear 1A3-SA or 1B3-SB with the opposite train as a backup connection point (Figures 4, 5, 6, and 26). For this alignment, components required to support FLEX strategies on the opposite train would not be repowered. Therefore, an additional generator will be used to repower the opposite train MCCs 1A21-SA and 1A31-SA, or 1B21-SB and 1B31-SB (Figures 4, 5, 6, and 26).

A FLEX diesel generator will be used to supply power to a FLEX electrical distribution system. The system will power installed FLEX power panels with electrical outlets inside the RAB (Figures 2, 3, 4, 7). FLEX equipment, such as electric motor driven pumps, portable blowers, and portable lighting will be powered by the FLEX power panels. The system will also serve as an alternate power source to MCC buckets for CLA outlet isolation MOVs and SG PORV hydraulic pump motors (Figures 14, 15, 18, 23, 24, and 25).

Alternate Strategy

The alternate strategy will use a FLEX diesel generator staged to repower the 480 VAC MCCs 1A21-SA and 1A31-SA, or 1B21-SB and 1B31-SB with the opposite train as a backup connection point (Figures 4, 5, 6, and 26). The alternate strategy for the SG PORV hydraulic pump motor(s) and CLA isolation valve(s) (Figures 14, 15, 18, 23, 24, and 25) on the opposite train is to directly power the MCC buckets from a temporary power source.

Instrument Bus

The Instrument Bus IDP-1A-SI has the normal power supply from MCC 1A21-SA and an additional power supply from the 125V Class 1E battery 1A-SA (Figure 27). Instrument Bus IDP-1A-SIII has the normal power supply from MCC 1A31-SA and an alternate power supply from the 125V Class 1E battery 1A-SA (Figure 27). The Instrument Bus IDP-1B-SII has the normal power supply from MCC 1B21-SB and an alternate power supply from the 125V Class 1E battery 1B-SB (Figure 27). Instrument Bus IDP-1B-SIV has the normal power supply from MCC 1B31-SB and an alternate power supply from the 125V Class 1E battery 1B-SB (Figure 27).

Essential Instrumentation

Primary Strategy

The Phase 2 strategies will repower the battery chargers to extend the coping time of the essential instrumentation. The A-safety train battery chargers are normally powered by MCC 1A21-SA and MCC 1A31-SA, while the B-safety train battery chargers are normally powered by MCC 1B21-SB and MCC 1B31-SB (Figure 27). An alternate power feed is installed to power one safety related battery charger per safety train. This alternate power feed is supplied from MCC 1D23 which is fed from the DSDG (Figures 26 and 27).

Safety Functions Support

PWR Portable Equipment Phase 2

The primary strategy will be to repower one battery charger per safety train by manually aligning the chargers to the alternate feed. The DSDG is a 400kV diesel generator with a full load fuel consumption rate of 31.9 gallons per hour. The 1400 gallon DSDG fuel tank is able to support full load DSDG operation for approximately 40 hours (Reference 50). This strategy requires upgrades to the DSDG, MCC 1D23, and associated electrical distribution.

Alternate Strategy
Per NEI 12-06, Section 5.3.3.1, a means of obtaining non-control room readouts for Essential Instruments listed on Attachment 6 will be developed (Open Item #60).

HVAC
Primary Strategy
The Phase 2 strategies will repower ventilation units by connecting a FLEX diesel generator to either the A-train or B-train 480 VAC switchgear 1A3-SA or 1B3-SB, with the opposite train as a backup connection point (defense-in-depth)) (Figures 4, 5, 6, and 26). This will restore power to HVAC system fans to provide forced air flow ventilation of key ELAP equipment areas such as: Main Control Room, Safety Battery Rooms, Electrical Switchgear Rooms, Reactor Auxiliary Building, Fuel Handling Building, and Steam Tunnel.

Analysis will be performed to determine ELAP effects upon equipment performance and habitability (Open Items #1, 20, 21, 22, 23, 35).

Alternate Strategy
The alternate strategy is to place portable ventilation blower units and ducting in areas identified by the ELAP equipment performance and habitability analysis (Figures 2, 3, 4, 7). A FLEX diesel generator will be used to supply power to installed FLEX power panels with electrical outlets inside the RAB (Figures 2, 3, 4, 7). Portable electrical carts with cables will connect to these boxes and run power to portable blower units.

Lighting
The Phase 2 strategies will repower AC lighting throughout the plant by connecting a FLEX diesel generator to either the A-train or B-train 480 VAC switchgear 1A3-SA or 1B3-SB (UFSAR, Section 9.5.3.2), with the opposite train as a backup connection point (Figures 4, 5, and 6).

Analysis will be performed to determine and address lighting needs to support implementation of FLEX strategies (Open Item #33). Additional lighting, if needed, will be powered by a FLEX diesel generator via installed FLEX power panels with electrical outlets (Figures 2, 3, and 4).

Portable self-contained lighting units and flashlights will be available to support ELAP activities throughout the plant site (Open Item #33).

Fuel For FLEX Equipment
To support the implemented strategies used during Phase 2, all fuel consuming FLEX equipment will be refueled as needed. Since the Emergency Diesel Generators will not be available during the

Safety Functions Support	
PWR Portable Equipment Phase 2	
BDBEE, the two DFOSTs can be used to replenish the fuel tanks of the FLEX equipment used during Phase 2. The DFOSTs can provide a total of 200,000 gallons (Reference 51) of fuel since the tanks are located underground, designed to Seismic Category 1, and flood protected (UFSAR, Section 9.5.4.1). Figure 1 provides a site plan showing both a primary and alternate delivery path from the DFOSTs to the staged FLEX equipment (Open Item #36). Extracting fuel from the fuel oil storage tanks will be done using a portable pump connected to a modified flanged connection (Figure 28). In addition, an analysis will be performed to determine the FLEX equipment total fuel consumption rate (Open Item #25). Communication Strategies to mitigate the loss of communication systems will be developed in accordance with the RFI associated with NTTF Recommendation 9.3 (Reference 48) and NEI 12-01 (Reference 49). The FLEX strategies will include refueling the generators used to provide battery recharging power to the communication equipment (Open Items #25, 36). Staffing Staffing studies will be performed in accordance with the RFI associated with NTTF Recommendation 9.3 (Reference 48) and NEI 12-01 (Reference 49) to ensure adequate staffing is available to support, install, and operate FLEX equipment in the time necessary (Open Item #10).	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation with a description of the procedure / strategy / guideline.* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06 (Open Item #66).
Identify modifications	*List modifications necessary for Phase 2* • Harden and protect the DSDG to provide power to MCC 1D23 (Figure 26) (Open Item #40). • Protect and seismically upgrade MCC 1D23 and all connections/distribution to provide power to one safety battery charger on each train (Figure 27) (Open Item #43). • MCCs 1A21-SA, 1A31-SA, 1B21-SB, and 1B31-SB require modifications to allow FLEX generator connection (Figure 26) (Open Item #44). • Permanent cable and raceway will be installed to make cable deployment directly to the 1A3-SA and 1B3-SB switchgear and MCCs 1A21-SA, 1A31-SA, 1B21-SB, and 1B31-SB feasible (Figures 4, 5, 6) (Open Item #44). • Add connection point at DFOST 4 inch flanges downstream of

Safety Functions Support	
PWR Portable Equipment Phase 2	
	valves 2DFO-262 and 2DFO-280 to support transfer of inventory for use in FLEX equipment (Figure 28) (Open Item #50). • Install FLEX power distribution network to deliver power for portable equipment such as pumps, ventilation blowers and additional lighting (Figures 2, 3, 4, and 7) (Open Item #57).
Key Parameters	*List instrumentation credited or recovered for this coping evaluation.* There is no additional instrumentation credited outside of those previously discussed for Safety Functions Support coping strategies during Phase 2.

Storage / Protection of Equipment : **Describe storage / protection plan or schedule to determine storage requirements**	
Seismic	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date (Open Item #71). The HNP procedures and programs will be developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to HNP (Open Item #72).
Flooding	*List how equipment is protected or schedule to protect* HNP is a dry site and the site elevation is above the maximum flood hazard level (UFSAR, Section 3.4.1.1). Therefore, the FLEX equipment storage location onsite will be above the flood elevation.
Severe Storms with High Winds	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date (Open Item #71). The HNP procedures and programs will be developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to HNP (Open Item #72).
Snow, Ice, and Extreme Cold	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be

Safety Functions Support	
PWR Portable Equipment Phase 2	
	constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date (Open Item #71). The HNP procedures and programs will be developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to HNP (Open Item #72). The FLEX equipment storage location has not yet been decided. However, the potential impact of extreme cold temperatures on storage of equipment will be considered in the structure design. The FLEX equipment will be maintained at a temperature within a range to ensure its likely function when called upon. (NEI 12-06, Section 8.3.1.2)
High Temperatures	*List how equipment is protected or schedule to protect* Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation date (Open Item #71). The HNP procedures and programs will be developed to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the hazards applicable to HNP (Open Item #72). The FLEX equipment storage location has not yet been decided. However, the potential impact of high temperatures on storage of equipment will be considered in the structure design. The FLEX equipment will be maintained at a temperature within a range to ensure its likely function when called upon. (NEI 12-06, Section 9.3.1)

Deployment Conceptual Design (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
The FLEX equipment storage building and location has not yet been decided. Specific deployment of the FLEX equipment to the point of use	A. Harden and protect the DSDG to provide power to MCC 1D23 (Figure 26) (Open Item #40). B. Protect and seismically	A. DSDG will be contained within a structure compliant with NEI 12-06, Section 11. B. MCC 1D23 is located within the RAB (Seismic Category

Safety Functions Support		
PWR Portable Equipment Phase 2		
will be identified and conceptual sketches provided once storage building and location is identified and the deployment strategy is finalized, including an evaluation of the likely site hazards arising from different events (Open Item #56).	upgrade MCC 1D23 and all connections/distribution to provide power to one safety battery charger on each train (Figure 27) (Open Item #43). C. MCCs 1A21-SA, 1A31-SA, 1B21-SB, and 1B31-SB require modifications to allow FLEX generator connection (Figure 26) (Open Item #44). D. Permanent cable and raceway will be installed to make cable deployment directly to the 1A3-SA and 1B3-SB SWGR and MCCs 1A21-SA, 1A31-SA, 1B21-SB, and 1B31-SB feasible (Figures 4, 5, 6) (Open Item #44). E. Add connection point at DFOST 4 inch flanges downstream of valves 2DFO-262 and 2DFO-280 to support transfer of inventory for use in FLEX equipment (Figure 28) (Open Item #50). F. Install FLEX power distribution network to deliver power for portable equipment such as pumps, ventilation blowers and lighting (Figures 2, 3, 4, and 7) (Open Item #57).	I) (UFSAR, Table 3.2.1-1). MCC 1D23 will be seismically upgraded. Connections/distribution will be seismically upgraded and protected. C. All MCC connections from the FLEX generator will be located within the RAB (Seismic Category I) (UFSAR, Table 3.2.1-1) or a structure compliant with NEI 12-06, Section 11. D. All cables and raceways will be located within the RAB (Seismic Category I) (UFSAR, Table 3.2.1-1) or a structure compliant with NEI 12-06, Section 11. E. Connection points at the DFOST are located within the DFOST Structure (Seismic Category I) (UFSAR, Table 3.2.1-1). F. FLEX power distribution network will be installed in the RAB (Seismic Category I) (UFSAR, Table 3.2.1-1) or a structure compliant with NEI 12-06, Section 11.
Notes: None		

Safety Functions Support
PWR Portable Equipment Phase 3
Provide a general description of the coping strategies using Phase 3 equipment including modifications that are proposed to maintain and/or support safety functions. Identify methods and strategy(ies) utilized to achieve coping times. <u>Essential Instrumentation</u> The Phase 3 strategy consists of providing indefinite coping by obtaining diesel fuel from offsite to ensure an adequate fuel supply is maintained for the Phase 2 diesel generators that power the battery chargers. <u>HVAC</u> The Phase 3 strategy consists of providing indefinite coping by obtaining diesel fuel from offsite to ensure an adequate fuel supply is maintained for the Phase 2 diesel generators. <u>Lighting</u> The Phase 3 strategy consists of providing indefinite coping by obtaining diesel fuel from offsite to ensure an adequate fuel supply is maintained for the Phase 2 diesel generators powering the switchgear and MCCs providing power to lights. <u>Fuel For FLEX Equipment</u> The Phase 3 strategy consists of providing indefinite coping by obtaining diesel fuel from offsite to ensure an adequate fuel supply is maintained for the Phase 2 fuel consuming FLEX equipment. An offsite fuel delivery will be provided to HNP before all onsite fuel is depleted. An analysis will be performed to determine the FLEX equipment total fuel consumption rate (Open Item #25). A contract for offsite fuel delivery will be obtained (Open Item #61). Figure 1 provides a site plan showing both a primary and alternate delivery path to the fuel oil tanks from off-site (Open Item #36). <u>Communication</u> Strategies to mitigate the loss of communication systems will be developed in accordance with the RFI associated with NTTF Recommendation 9.3 (Reference 48) and NEI 12-01 (Reference 49). The FLEX strategies will include refueling the generators used to provide battery recharging power to the communication equipment (Open Items #25, 36). <u>Staffing</u> Staffing studies will be performed in accordance with the RFI associated with NTTF Recommendation 9.3 (Reference 48) and NEI 12-01 (Reference 49) to ensure adequate staffing is available to support, install, and operate FLEX equipment in the time necessary (Open Item #10).

Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation with a description of the procedure / strategy / guideline.* Site-specific procedures and/or FSGs will be developed using industry guidance to address the criteria in NEI 12-06 (Open Item

Safety Functions Support	
PWR Portable Equipment Phase 3	
	#66).
Identify modifications	*List modifications necessary for Phase 3* There are no modifications necessary to support the coping strategies during Phase 3.
Key Parameters	*List instrumentation credited or recovered for this coping evaluation.* There is no additional instrumentation credited outside of those previously discussed for Safety Functions Support coping strategies during Phase 3.

Deployment Conceptual Design
(Attachment 3 contains Conceptual Sketches)

Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
Phase 3 equipment will be provided by the RRC which is to be located in Memphis, TN. Specific deployment of Phase 3 equipment to the point of use will be identified and conceptual sketches provided once deployment strategy is finalized, including an evaluation of the deployment routes from the staging area based on an assessment of the damage in the affected area (Open Item #75).	Currently, there are no known modifications to ensure deployment of Phase 3 equipment.	Not Applicable

Notes: None

Overall Integrated Plan: EA-12-049

PWR Portable Equipment Phase 2							
Use and (potential / flexibility) diverse uses						*Performance Criteria*	*Maintenance*
List portable equipment	Core	Containment	SFP	Instrumentation	Accessibility		Maintenance / PM requirements
Four (4) 480V Generators	X		X	X	X	Approximately 1 MW each (Open Items #34, 73).	Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5 (Open Item #74).
Two (2) 480V Generators	X			X	X	Approximately 100kW each (Open Items #34, 73).	Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5 (Open Item #74).
Two (2) SG Feed FLEX Electric Pumps	X					Capable of providing approximately 300-gpm at 300-psig (Open Items #9, 73).	Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5 (Open Item #74).
One (1) RCS High Pressure FLEX Electric Pump	X					Capable of providing approximately 40-gpm at 1600-psig (Open Items #14, 73).	Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5 (Open Item #74).

Overall Integrated Plan: EA-12-049

PWR Portable Equipment Phase 2							
Use and (potential / flexibility) diverse uses						*Performance Criteria*	*Maintenance*
List portable equipment	Core	Containment	SFP	Instrumentation	Accessibility		Maintenance / PM requirements
Four (4) FLEX Diesel Pump	X		X			Estimated performance of 3000-gpm at 150-psig (Open Items #19, 73).	Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5 (Open Item #74).
One (1) FLEX Diesel Pump			X			Capable of 1500-gpm at 320-psig (Open Item #73).	Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5 ((Open Item #74).
Two (2) FLEX Pumps	X		X	X	X	Rated for handling diesel fuel oil transfer from DFOSTs (Open Item #73).	Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5 (Open Item #74).
Fans/Blowers and ducting				X	X	(Open Items #20, 73)	Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5 (Open Item #74).

Overall Integrated Plan: EA-12-049

PWR Portable Equipment Phase 2							
Use and (potential / flexibility) diverse uses						*Performance Criteria*	*Maintenance*
List portable equipment	Core	Containment	SFP	Instrumentation	Accessibility		Maintenance / PM requirements
TBD (e.g., Lighting, hoses, cable, fittings, tools, debris/snow removal equipment, portable equipment transport vehicles))	X		X	X	X	(Open Item #73)	Maintenance will be performed in accordance with the requirements of NEI 12-06, Section 11.5 (Open Item #74).

Overall Integrated Plan: EA-12-049

PWR Portable Equipment Phase 3							
Use and (potential / flexibility) diverse uses						*Performance Criteria*	*Notes*
List portable equipment	Core	Containment	SFP	Instrumentation	Accessibility		
Bulk Boron from RRC	X		X			(Open Item #76)	

Overall Integrated Plan: EA-12-049

Phase 3 Response Equipment/Commodities	
Item	**Notes**
Radiation Protection Equipment • Survey instruments • Dosimetry • Off-site monitoring/sampling	An analysis will be performed to determine radiation protection equipment requirements (Open Item #77).
Commodities • Food • Potable water • Sanitary Facilities	An analysis will be performed to determine commodities requirements (Open Item #77).
Fuel Requirements • Diesel Fuel	An analysis will be performed to determine site-specific fuel consumption rates and available supplies (Open Item #25).
Heavy Equipment • Transportation equipment • Debris clearing equipment	Transportation equipment will be provided to move the large skid/trailer mounted equipment provided from off-site (Open Item #77).

Overall Integrated Plan: EA-12-049

Attachment 1A
Sequence of Events Timeline
(insert site specific time line to support submittal)

Action Item	Elapsed Time (hours)	Action	ELAP New Time Constraint Y/N [6]	Remarks / Applicability
	0	**Event Starts**	NA	Plant @100% power
1	0	Turbine Driven Auxiliary Feedwater Pump auto starts on under voltage on 6.9kV Emergency Buses	N	Installed plant equipment. Automatic Action.
2	0.2	Control Auxiliary Feedwater flow from Main Control Board	N	Monitoring of Steam Generator level is specified in EOP-ECA-0.0, Loss of All AC Power (Reference 6).
3	0.5	Locally open panel doors to prevent overheating	N	Current Station Blackout procedure directs this activity to be completed within approximately 30 minutes (Reference 6).
4	0.5 – 1.0	De-energize Load Sequencers	N	Prevent Automatic Loading on AC power sources per EOP-ECA-0.0 (Reference 6).
5	0.5 – 1.0	Check If RCP Seals Should Be Locally Isolated	N	Local actions are determined by status of ASI pump per EOP-ECA-0.0 (Reference 6).
6	1.0	Perform Station Black Out DC bus load shed	N	Perform Station Blackout breaker load sheds. EOP-ECA-0.0, Attachment 3 (Reference 6).
7	1.0	Operator declares ELAP	Y	Attempts to restore any AC power source have failed. Transition point from EOP-ECA-0.0 (Reference 6) to FSGs. See Discussion of Time Constraints Item 1.

[6] Instructions: Provide justification if No or NA is selected in the remark column
If yes include technical basis discussion as required by NEI 12-06, Section 3.2.1.7

Overall Integrated Plan: EA-12-049

Action Item	Elapsed Time (hours)	Action	ELAP New Time Constraint Y/N [6]	Remarks / Applicability
8	2.0	Perform ELAP Load Shedding	Y	Perform ELAP load shed to extend emergency DC battery life. See Discussion of Time Constraints Item 2
9	2.0-8.0	Locally Control Steam Generator (SG) Power Operated Relief Valves (PORV)	Y	See Discussion of Time Constraints Item 3
10	2.0	Initiate cooldown and depressurization of the Reactor Coolant System	Y	See Discussion of Time Constraints Item 4
11	6.0	Check containment isolated	N	EOP-ECA-0.0 (Reference 6) step to ensure containment integrity. No fuel damage anticipated.
12	6.0	Align FLEX generators to power: • 1A3-SA and MCCS 1B21-SB and 1B31-SB or, • 1B3-SB and MCCs 1A21-SA and 1A31-SA, and • FLEX Electrical Distribution System	Y	See Discussion of Time Constraints Item 5
13	8.0	Align power to Class 1E battery chargers	Y	See Discussion of Time Constraints Item 6
14	8 – 24	Operate installed HVAC fans or portable blowers for critical plant areas such as: • Main Control Room • Energized electrical distribution and instrumentation areas • Battery Rooms • Steam Tunnel • Internal plant areas housing in-service FLEX equipment • FHB	Y	See Discussion of Time Constraints Item 7
15	10.0	Stabilize SG pressure and isolate Cold Leg Accumulators	Y	See Discussion of Time Constraints Item 8
16	12.0	Complete RCS cooldown to 350°F	Y	See Discussion of Time Constraints Item 9
17	12.0	Align and operate a FLEX RCS makeup pump	Y	See Discussion of Time Constraints Item 10
18	12.0	Connect and operate FLEX electric motor driven pump to feed SGs.	Y	See Discussion of Time Constraints Item 11

Overall Integrated Plan: EA-12-049

Action Item	Elapsed Time (hours)	Action	ELAP New Time Constraint Y/N [6]	Remarks / Applicability
19	12.0	Make up to Spent Fuel Pools via RWST	Y	See Discussion of Time Constraints Item 12
20	12.0	Refuel FLEX diesel equipment.	Y	See Discussion of Time Constraints Item 13
21	14.0	Start NTTF 9.3 portable generators to allow charging of communications equipment batteries.	Y	See Discussion of Time Constraints Item 14
22	36.0	Connect and operate portable diesel driven FLEX pumps to pressurize A or B Emergency Service Water header	Y	See Discussion of Time Constraints Item 15
23	40.0	Align ESW to Auxiliary Feedwater System upon CST depletion	Y	See Discussion of Time Constraints Item 16
24	42.0	Makeup to RWST	Y	See Discussion of Time Constraints Item 17

Overall Integrated Plan: EA-12-049

Attachment 1B
NSSS Significant Reference Analysis Deviation Table

Item	Parameter of interest	WCAP value (WCAP-17601-P August 2012 Revision 0)	WCAP page	Plant applied value	Gap and discussion
	None				

Overall Integrated Plan: EA-12-049

Attachment 2
Milestone Schedule

Activity	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15
Licensing Actions																													
Submit Integrated Plan	★																												
6 Month Status Update							★						★						★						★				
Implementation Complete																												★	
Modifications																													
Develop Modifications		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■								
Procurement																													
Identify Significant Material/Equipment												■																	
Material/Equipment Procurement/Delivery													■	■	■	■	■	■	■	■	■	■	■	■					
Implementation Walkdowns																													
Conduct N-1 Outage Walkdowns										■																			
Conduct Implementation Walkdowns																						■	■						
Staffing																													
Conduct Staffing Analysis				■	■	■	■	■	■	■																			
Training																													
Develop Training Program								■	■	■	■	■	■	■															
Implement Training															■	■	■	■	■	■	■	■	■	■	■				
Procedures																													
Develop Flex Strategy Guidelines (FSGs)															■	■	■	■	■	■	■	■	■	■	■	■			
Develop Maintenance Procedures															■	■	■	■	■	■	■	■	■	■	■	■			
Regional Response Centers																													
Develop Strategies/Playbook with RRC								■	■	■	■	■	■	■															
Install Offsite Delivery Pad																								■	■				
Implementation																													
Implement Modifications																		■	■	■	■	■	■	■	■	■	■	■	

NOTE: The dates and sequences provided in this milestone schedule are best estimates based on information available at the time the schedule was developed and may change as designs are finalized and construction proceeds. Therefore, these dates and sequences are not considered to be regulatory commitments.

Overall Integrated Plan: EA-12-049

Attachment 3
Conceptual Sketches

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Enclosure, Attachment 3

Figure 1 - CAR-2165-G-003 Site Plan

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Figure 2 - CAR-2165-G-016 General Arrangement

Reactor Auxiliary Building Plan EL 236

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Figure 3 - CAR-2165-G-0017 General Arrangement
Reactor Auxiliary Building Plan EL 261

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Figure 4 - CAR-2165-G-018 General Arrangement

Reactor Auxiliary Building Plan EL 286

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Figure 5 - 1364-16186 480V SWGR Bus 1B3-SB RAB EL 286 GA

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Figure 6 - 1364-16189 480V SWGR Bus 1A3-SA RAB EL 286 GA

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Figure 7 - CAR-2165-G-019 General Arrangement

Reactor Auxiliary Building Plan EL 305

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Figure 8 - CAR-2165-G-044
Steam Generator Injection

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Figure 9 - CAR-2165-G-045 Steam Generator Water Source

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Figure 10 - CAR-2165-G-047 ESW Header Pressurization

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Figure 11 - CAR-2165-G-305 Unit 1 Spent Fuel Pool Make Up

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Figure 12 - CAR-2165-G-0307 Unit 2 Spent Fuel Pool Make Up

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Figure 13 - CAR-2165-G-0805 RCS Injection

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Figure 14 - CAR-2166-B-401 1252 SG PORV A Temporary Power

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Figure 15 - CAR-2166-B-401 1253 SG PORV B Temporary Power

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Figure 16 - CAR-2166-B-401 1254 SG PORV A SI-SII-SIV Bus Mod

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Figure 17 - CAR-2166-B-401 1255 SG PORV B SI-SII-SIV Bus Mod

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Figure 18 - CAR-2166-B-401 1257 SG PORV C Temporary Power

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Figure 19 - CAR-2166-B-401 1942 ARP 19A(SA) R2 Jumper Switch

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Figure 20 - CAR-2166-B-401 1944 FCV-2051A-SA Hydromotor

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Figure 21 - CAR-2166-B-401 1945 FCV-2051B-SA Hydromotor

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Figure 22 - CAR-2166-B-401 1946 FCV-2051C-SA Hydromotor

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Figure 23 - CAR-2166-B-401 SH 411 A
CLA Temporary Power

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Figure 24 - CAR-2166-B-401 SH 412 B

CLA Temporary Power

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Figure 25 - CAR-2166-B-401 SH 413 C

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Figure 26 - CAR-2166-G-030 480 Volt Auxiliary One Line Wiring Diagram

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Enclosure, Attachment 3

Figure 27 - CAR-2166-G-0042-S01 250V DC, 125V DC & 120V Uninterruptible AC One Line Wiring Diagram

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Enclosure, Attachment 3
Figure 28 - CPL-2165-S-563 Fuel Oil Tank Connections

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Overall Integrated Plan: EA-12-049

Attachment 4

The following references are provided for information only. Their inclusion within this document does not incorporate them into the current licensing basis (CLB) by reference nor does it imply intent to do so. References which have not been docketed are available onsite for NRC examination and inspection.

List of References

1. NRC Order EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, March 12, 2012
2. Japan Lessons-Learned Project Directorate JLD-ISG-2012-01, "Compliance with Order EA-12-049, Order Modifying License with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, Interim Staff Guidance, Revision 0, August 29, 2012
3. EPRI Report 1019199, "Experience-Based Seismic Verification Guidelines for Piping and Tubing: Volume I-Seismic Verification Procedure, and Volume II - Performance of Piping and Tubing in Strong-Motion Earthquakes"
4. AWWA D100, "Standard for Welded Carbon Steel Tanks for Water Storage"
5. EPRI NP-6041-SLR1, "A Methodology for Assessment of Nuclear Power Plant Seismic Margin (Revision 1)"
6. Progress Energy HNP Emergency Operating Procedure EOP-ECA-0.0, "Loss of All AC Power," Revision 1
7. EC 88887, "FLEX Strategies and Implementation Plan," Revision 1, A00 and Attachments Z06, Z07, and Z08
8. "Preliminary ELAP (Extended Loss of AC Power) Load Shed Time Validation" (NTM 582920, Action Item 67)
9. PA-PSC-0965 "Typical ELAP RCS Cooldown Strategy – Overview," Revision 0, Attachment 3
10. WCAP-17601-P, "Reactor Coolant System Response to the Extended Loss of AC Power Event for Westinghouse, Combustion Engineering and Babcock & Wilcox NSSS Designs" Revision 0, August 2012, Table 5.3.1.7-1 "Calculated Core Uncovery Time for Westinghouse NSSS Plants"
11. "Maintain Subcritical Conditions During ELAP Cooldown" (NTM 582920, Action Item 65)
12. PA-PSC-0965, "ELAP Coping Strategy Considerations," Revision 0, Attachment 2
13. Progress Energy HNP Calculation SF-0043, "Cycle-Specific Spent Fuel Pool Heat Up Rates," Revision 2, Attachment F, "EXCEL Spreadsheet Heat Up Rate Calculations"
14. Progress Energy HNP Calculation SF-0038, "Spent Fuel Pool Heat Up Rate/Time To Boil Calculation," Revision 3, Section 6.0
15. Progress Energy HNP Outage Management Procedure OMP-003, "Outage Shutdown Risk Management," Revision 36, Section 5.2.4.2,
16. Progress Energy HNP Contract #659094 Between Progress Energy Carolinas, Inc. and Pooled Equipment Inventory Company
17. Progress Energy HNP Calculation 8S44-P-101, "Station Blackout Coping Analysis Report," Revision 8, Section 4.2

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18. Progress Energy HNP Calculation E4-0008, "125VDC 1E Battery Sizing and Battery/Panel Voltages for Station Black-Out," Revision 005, Section 5.1
19. Progress Energy HNP Operating Procedure OP-137, "Auxiliary Feedwater System," Revision 36, Section 5.5
20. Progress Energy HNP Incident Stabilization Guideline Procedure ISG-DC, "DC Power" Revision 0, Attachment 1, "Local Operation of TDAFW Pump"
21. PA-PSC-0965, "Typical ELAP RCS Pressure Response," Revision 0, Attachment 4
22. Progress Energy HNP Emergency Operating Procedure EOP-ECA-0.0, "Loss of All AC Power," Revision 1, Page 44 of 94
23. Progress Energy HNP Operating Procedure OP-126, "Main Steam, Extraction Steam, and Steam Dump System," Revision 24, Section 8.2
24. "Technical Basis for CST ELAP Coping Time" (NTM 582920, Action Item 66)
25. Progress Energy HNP Calculation TANK-0020, "CST Minimum Useable and Maximum Required Inventory Analysis," Revision 2, Attachment A
26. Progress Energy HNP Operating Procedure OP-137, "Auxiliary Feedwater System," Revision 36, Section 6.0
27. Progress Energy HNP Abnormal Operating Procedure AOP-020, "Loss of RCS Inventory or Residual Heat Removal While Shutdown," Revision 37, Section 3.1, Step 10
28. Progress Energy HNP Severe Accident Management Guidance SAMG-CA-002, "Injection Flow for Long Term Decay Heat Removal," Revision 4
29. WCAP-17601-P, "Reactor Coolant System Response to the Extended Loss of AC Power Event for Westinghouse, Combustion Engineering and Babcock & Wilcox NSSS Designs," Revision 0, August 2012, Page 3-10
30. Progress Energy HNP Design Basis Document DBD-114, "Auxiliary Feedwater System," Revision 12, Section 1.2
31. Progress Energy HNP Design Basis Document DBD-320, "Alternate Seal Injection System," Revision 0, Section 5.1.3
32. Progress Energy HNP Design Basis Document DBD-320, "Alternate Seal Injection System," Revision 0, Section 4.3.1.1
33. Progress Energy HNP Incident Stabilization Guideline ISG-CVCS, "Chemical and Volume Control System," Revision 0, Attachment 5
34. PWROG PA-PSC-0965, "PWROG Core Cooling Position Paper," Revision 0, November 2012, Section V, Part C
35. Carolina Power & Light Company Shearon Harris Nuclear Power Plant Design Basis Document DBD-114, "Auxiliary Feedwater System," Revision 12
36. Progress Energy HNP Calculation HNP-F/PSA-0054, "HNP PRA - Appendix F - Thermal-Hydraulic Analyses," Revision 2, Section 4.2
37. "Preliminary ELAP Borated Water Usage Determination" (NTM 582920, Action Item 68)
38. NRC Order EA 12-051, "Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," March 12, 2012
39. Progress Energy HNP Operating Procedure OP-116, "Fuel Pool Cooling System," Revision 37, Section 8.5.2
40. Progress Energy HNP Incident Stabilization Guideline ISG-SFP, "Spent Fuel Pool," Revision 0, Attachment 8
41. Progress Energy HNP Emergency Operating Procedure EOP-ECA-0.0, "Loss of All AC Power," Revision 1, Page 32 of 94
42. Progress Energy HNP Calculation 8S44-P-101, "Station Blackout Coping Analysis Report," Revision 8, Section 7.2.2.1

43. Progress Energy HNP Calculation 8S44-P-101, "Station Blackout Coping Analysis Report," Revision 8, Section 7.2.4
44. Progress Energy HNP Emergency Operating Procedure EOP-ECA-0.0, "Loss of All AC Power," Revision 1, Page 12 of 94
45. Progress Energy HNP Calculation E4-0009, "125VDC Non-1E Battery Load Data and Duty Cycle," Revision 7, Section 4.2.1
46. Progress Energy HNP Operations Reliability Test ORT-1407, "ACP/Safe Shutdown Materials Audit Semiannual Interval Modes 1 – 6," Revision 20
47. Progress Energy HNP Design Basis Document DBD-203, "Plant Lighting System," Revision 6, Section 2.1.4
48. 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
49. NEI 12-01, "Guideline for Assessing Beyond-Design-Basis Accident Response Staffing and Communications Capabilities," Revision 0, May 2012.
50. Progress Energy HNP Design Basis Document DBD-321, "Dedicated Shutdown Diesel Generator System," Revision 0, Section 4.3.3
51. Progress Energy HNP Operating Procedure OP-155, "Diesel Generator Emergency Power System," Revision 63, Section 6.0
52. Motorola Radio Specification Sheet, "HT750™ Portable Radio"
53. SATTRANS High Capacity Sat Phone Battery Specifications, "Iridium 9555 Li-Ion Battery (High Capacity)"
54. Curve D-6, Condensate Storage Tank

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Attachment 5

List of Open Items

Item #	Open Item Description
1	Analysis to determine expected duration of TDAFW pump operation under ELAP conditions
2	Staging analysis timeline of FLEX feedwater pump and plant specific pump analysis at chosen FLEX injection points and water sources specifically for HNP
3	Determine highest rate of RCS cooldown with only one SG PORV
4	Determine if B.5.b connections 1AF-173/174/175 are adequately sized to meet SG feedwater requirements from decay heat (not credited)
5	Determine how much time the CST can be relied upon for
6	Projected Inventory usage for RCS and SGs
7	Determine the amount of SG inventory needed for the first 72 hours per cooldown strategy in PA-PSC-0965
8	Determine any adverse affects from using borated water from RWST in Steam Generators
9	Determine HNP specific FLEX FW pump capacity requirements (discharge pressure and flow)
10	A FLEX/ELAP staffing analysis needs to be performed for all coping strategies
11	Calculation needed to determine the cooling flow requirements beyond the 24 hours in SAMG-CA-002 in Mode 5 and 6
12	RCS boron concentration and boration in gallons to maintain inventory control and core cooling in regards to keeping the core subcritical with RCS cooldown strategy in PA-PSC-0965 Attachment 3
13	RWST is partially exposed to tornado missiles and analysis will need to be done to determine the volume that can be credited
14	Analysis to determine HNP specific high pressure make up pump minimum performance rating necessary to support FLEX coping strategies
15	Analysis to determine if the ASI pump can meet the HNP minimum high pressure makeup requirements. Analysis to determine HNP specific Modes 5 and 6 FLEX pump capacity requirements for RCS low pressure injection
16	Analysis needed to confirm RCS depressurization via Reactor Vessel Head Vents will be effective
17	Analysis of BAT and RWST during ELAP without heat tracing during cold weather conditions
18	Determine if RCS venting is needed
19	Analysis to determine minimum pump performance rating to support ESW delivery to all FLEX usage point simultaneously and prevent pump run-out

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Item #	Open Item Description
20	Analysis to determine HVAC requirements for operating installed and temporary equipment under ELAP conditions for maintaining reliable operation
21	Habitability analysis needed for local manual control of SG PORVs in the Steam Tunnel under ELAP conditions
22	Habitability analysis for local manual control of TDAFW pump at RAB 236 Elevation
23	Analysis needed for loss of HVAC on TDAFW equipment
24	Calculation to determine power consumption assuming all HVAC is provided by portable blower units to support selection of FLEX generator size
25	Analysis to determine total fuel consumption rates of all FLEX equipment
26	Calculation to determine pounds of boron versus RWST tank level percent to achieve desired boron concentration
27	Detailed analysis of consequences from performing a DC deep load shed. Specifically to determine what equipment is still needed to carry-out FSG coping functions. Instrument loops and etc
28	Detailed calculation needed to validate the coping time that will be added to Station Batteries to provide needed margin to the plant's installed equipment's coping time
29	Analysis of the affects of AUX Reservoir water being used for heat removal
30	Analysis of FLEX pump suction strainer sizes to any downstream FLEX flow path clearances.
31	Containment Pressure & Temperature Analysis at extended time periods (is containment spray needed as a coping action?)
32	Hydrogen production & removal in Battery Rooms
33	Seismic analysis of lighting fixtures and analysis of lighting needs in the plant during ELAP
34	Analysis needed to determine portable power and pump needs for selected FLEX strategies
35	Analysis to determine expected length of time for FLEX equipment to operate under extended ELAP conditions based on operation condition.
36	Analysis to provide delivery path to equipment from Fuel Oil Storage Tanks and FLEX Storage Facility
37	Determine impact of internal plant flooding events
38	Boil off analysis of Spent Fuel Pool during full core offload immediately following a full core offload, determine length of coping time without any make-up to SFP immediately following full core offload
39	Analysis to determine any radiological affects to the public by using contaminated water sources for feedwater use to the Steam Generators
40	Modification - Harden/Protect Dedicated Shutdown Diesel Generator to provide power to MCC 1D23

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Item #	Open Item Description
41	Modification - Seismically upgrade the Alternate Seal Injection System to serve as one coping strategy to provide High Pressure RCS injection
42	Modification - Add an Alternate Seal Injection pump discharge path to the CVCS charging header. Add an alternate suction path to the Alternate Seal Injection pump from the RWST and BAT. Provides alternate injection paths to the RCS while also providing a larger inventory source
43	Modification - Protect and seismically upgrade MCC 1D23 and all connections/distribution. Provides power to Safety Related Battery Chargers and the Alternate Seal Injection System
44	Modification - FLEX Generator(s) electrical connections at: • 1A3-SA 480V Bus (Pri) • 1B3-SB 480V Bus (Pri) • 1A21-SA 480V MCC (Alt) • 1A31-SA 480V MCC (Alt) • 1B21-SB 480V MCC (Alt) • 1B31-SB 480V MCC (Alt) • Primary & Alternate 480 VAC distribution/ control for FLEX pumps, FLEX outlets for lighting, ventilation, etc
45	Modification - Modify control power circuits for A & B SG PORVs to be powered from Instrument Buses SI, SII, or SIV. Modification provides the ability to control steaming/RCS cooldown
46	Modification - Add FLEX pump suction and discharge connection points to the AFW system upstream of Motor Driven AFW flow control valves. Modification will provide AFW flow control and the ability to provide inventory to the Steam Generators from portable pumps
47	Modification - Modify MDAFW FCVs control power circuit. Install key switch jumper in to simulate a Motor Driven Auxiliary Feedwater pump breaker closed. ARP 19A (SA) R2 terminal 119 & 120. Provides 125 V DC power to ARP19A(SA) and instrument bus SI for the purpose of operators controlling feedwater flow to the Steam Generators from the MCB
48	Modification - Add FLEX RCS suction and discharge connection points to CVCS on A & B train. Provides the capability to inject inventory (borated) from a FLEX pump to the RCS from the BAT or RWST
49	Modification - Add FLEX pump discharge connection points to the Emergency Service Water system. Provides a pressurized water source to CST, RAB & FHB Fire Protection SSE hose station headers, and Spent Fuel Pools
50	Modification - Add quick connect connection point at 4 inch flanges downstream of valves 2DFO-262 and 2 DFO-280. Allows connection of a FLEX pump to transfer fuel oil from the Fuel Oil Storage Tanks to support fuel delivery to operating FLEX equipment
51	Modification - Install enhanced Spent Fuel Pool level indication. Refer to NTTF 7.1

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Item #	Open Item Description
52	Modification - Verify seismic qualification or seismically upgrade piping bounded by valves 1CT-23, 1SF-10, 2SF-10, and 1SF-193. Allows HNP to credit Spent Fuel Make-up from the RWST via the installed Fuel Pool Cooling Pumps which are being powered from a FLEX generator. Also allows HNP to credit ESW Emergency Makeup to Spent Fuel Pools
53	Modification - Add quick connects at tank locations to support transfer of water using a FLEX transfer pump. This allows filling of the Refuel Water Storage Tank from the Reactor Make-up Water Storage Tank, and CST from the Condenser Hotwell, Demineralized Water Storage Tank, Filtered Water Storage Tank, and Refuel Water Storage Tank
54	Modification - Add FLEX connection points to the Containment Spray System. Abates high pressure/high temperature conditions inside containment
55	Modification -Add temporary power cables and connection points at select MOV MCC breaker/control cubicles. Provides the ability to perform a onetime stroke of valves that are needed to be repositioned in an ELAP event
56	Modification - Structure(s) built in compliance to ASCE 7-10 to house and protect FLEX generators and equipment
57	Modification - Install FLEX distribution network to power FLEX equipment (pumps, ventilation, lighting, power outlets, and temporary power to MOVs)
58	Modification - Upgrade the installed in-plant emergency DC lighting packs with Light Emitting Diode bulbs. This will significantly extend the operating time of the lights installed in the plant
59	Modification - Seismically qualify/upgrade the Condenser Hotwell Transfer Suction Piping and add isolation valve. This will significantly increase the credited volume of the Condensate Storage Tank
60	Develop a procedure to take local reading in containment electrical penetration, PIC, or RVLIS for all required readings
61	Contract for offsite fuel delivery
62	Contract for Demineralized Water Processing Skid or tanker delivery
63	Perform an analysis to determine the amount of volume for the RMWST that can be credited
64	Evaluate to determine that a modification can be implemented with reasonable assurance of success to seismically upgrade the condensate transfer pump suction line penetration to the CST and estimated total CST inventory we can credit. In the current configuration 238K gallons is credited as available and protected (Tank-0020)
65	Evaluate to determine that a modification can be implemented with reasonable assurance of success considering economic feasibility to harden (seismic, flood & missile protect) the DSDG, MCC 1D23, ASI Pump, ASI Tank, associated system piping and all electric connections/distribution and instrumentation

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Item #	Open Item Description
66	FLEX 4.2 Programmatic Controls – Implement programmatic controls for review, revision and/or generation of procedures and guidelines as required to address additional programmatic controls as a result of FLEX requirements
67	FLEX 4.2 Programmatic Controls – Implement programs and processes to assure personnel proficiency in the mitigation of beyond-design-basis external events in accordance with NEI 12-06
68	FLEX 4.2 Programmatic Controls – Establish FLEX Strategies and basis in an overall FLEX Basis Document
69	FLEX 4.2 Programmatic Controls – Modify existing plant configuration control procedures to ensure that changes to the plant design, physical layout, roads, buildings, and miscellaneous structures will not adversely impact the approved FLEX Strategies IAW NEI 12-06, Section 11.8
70	FLEX 4.2 Programmatic Controls – Training will be initiated through the Systems Approach to Training (SAT) Process. Training will be developed and provided to all involved plant personnel based on any procedural changes or new procedures developed to address and identify FLEX activities. Applicable training will be completed prior to the implementation of FLEX
71	External Hazards for Structures – Structures to provide protection of the FLEX equipment will be constructed to meet the requirements identified in NEI 12-06, Section 11. The structures will be built prior to the FLEX implementation Date
72	External Hazards for Structures – Develop Procedures and Programs to address storage structure requirements, deployment path requirements, and FLEX equipment requirements relative to the External Hazards applicable to HNP
73	Purchase sufficient amounts of portable equipment to fulfill selected FLEX strategies
74	Initiate PMs and develop testing procedures to support FSG guidelines for FLEX equipment
75	Develop Regional Response Center (RRC) playbook
76	Determine Regional Response Center (RRC) portable equipment requirements (water, boron, etc.)
77	Determine Phase 3 equipment/commodities requirements (food, fuel, etc.)
78	Convert to high capacity SAT phone batteries
79	Modification - Modify SG PORV hydraulic pump motor MCC cubicles to provide for quick connection of a temporary FLEX power source

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Attachment 6

ESSENTIAL INSTRUMENTATION TABLE					
PARAMETER	INSTRUMENT NUMBER(S)	CORE COOLING	RCS INVENTORY CONTROL/BORATION	CONTAINMENT	FUEL POOL
RCS Hot Leg Temperature (T_{HOT})	TE-413/TE-423/TE-433	X			
RCS Cold Leg Temperature (T_{COLD})	TE-410/TE-420/TE-430	X			
RCS Wide Range (WR) Pressure	PT-402 PT-403	X X			
SG Narrow Range (NR) Level	LT-473/LT-483/LT-493 LT-474/LT-484/LT-494 LT-475/LT-485/LT-495 LT-476/LT-486/LT-496	X X X X			
SG Wide Range (WR) Level	LT-477/LT-487/LT-497	X			
Core Exit Thermocouple Temperatures	ICCM Train A ICCM Train B	X X			
Pressurizer Level	LT-459/LT-460/LT-461	X			
Reactor Vessel Level Indicating System (RVLIS)	RVLIS Train A RVLIS Train B	X X	X X		
AFW Pump Flow	FT-2050A/ FT-2050B/ FT-2050C	X X			
SG Pressure	PT-474/PT-484/PT-494 PT-475/PT-485/PT-495 PT-476/PT-486/PT-496	X X X			
CST Level	LT-9010A LT-9010B	X X			
125 VDC Battery/DC Bus Voltage	EI-01EE-1798C1SAV (local) EI-01EE-1799D1SBV (local)	X X	X X	X X	X X

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ESSENTIAL INSTRUMENTATION TABLE					
PARAMETER	INSTRUMENT NUMBER(S)	CORE COOLING	RCS INVENTORY CONTROL/BORATION	CONTAINMENT	FUEL POOL
Safety Related Battery Charger Voltage	EI-01EE-1798A1SAV (local) EI-01EE-1798B1SAV (local) EI-01EE-1799A1SBV (local) EI-01EE-1799B2SBV (local)	X X X X	X X X X	X X X X	X X X X
Safety Related Battery Charger Amperage	EI-01EE-1798A2SAV (local) EI-01EE-1798B2SAV (local) EI-01EE-1799A2SBV (local) EI-01EE-1799B2SBV (local)	X X X X	X X X X	X X X X	X X X X
Neutron Flux	Neutron Flux Monitoring NI-60 Neutron Flux Monitoring NI-61		X X		
Containment Pressure	PT-950/PT-951/ PT-952/PT-953			X X	
Fuel Pool Level	TBD (Open Item #51) (Reference 38)				X