

VIRGINIA ELECTRIC AND POWER COMPANY  
RICHMOND, VIRGINIA 23261

August 28, 2014

10 CFR 2.202  
EA-12-049

Attention: Document Control Desk  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

Serial No.: 14-394  
NL&OS/MAE: R0  
Docket Nos.: 50-338/339  
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**VIRGINIA ELECTRIC AND POWER COMPANY**  
**NORTH ANNA POWER STATION UNITS 1 AND 2**  
**SIX-MONTH STATUS REPORT 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 Order Number EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events, dated March 12, 2012
2. Virginia Electric and Power Company's 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), dated February 28, 2013 (Serial No. 12-162B)
3. Virginia Electric and Power Company's Six-Month Status Report 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), dated February 27, 2014 (Serial No. 12-162E)

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued an order (Reference 1) to Virginia Electric and Power Company (Dominion). Reference 1 was immediately effective and directed Dominion to develop, implement, and maintain guidance and strategies to maintain core cooling, containment, and spent fuel pool cooling capabilities in the event of a beyond-design-basis external event.

Reference 1 required submission of an Overall Integrated Plan (OIP) (Reference 2) pursuant to Section IV, Condition C. Reference 1 also required submission of a status report at six-month intervals following submittal of the OIP.

The attachment to this letter provides the third six-month status report and an update of milestone accomplishments since the submittal of the prior six-month status report

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**Attachment**

**Six-Month Status Report for the Implementation of Order EA-12-049  
Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for  
Beyond-Design-Basis External Events**

**August 2014**

**North Anna Power Station Units 1 and 2  
Virginia Electric and Power Company (Dominion)**

**Six-Month Status Report for the Implementation of Order EA-12-049  
Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for  
Beyond-Design-Basis External Events**

## **1 Introduction**

Dominion developed an Overall Integrated Plan (OIP) (Reference 1) documenting the diverse and flexible strategies (FLEX) for North Anna Power Station (NAPS) in response to NRC Order Number EA-12-049 (Reference 2). This attachment provides an update of milestone accomplishments and open items since submittal of the last status report (Reference 13), including any changes to the compliance method, schedule, or need for relief/relaxation and the basis, if any.

## **2 Milestone Accomplishments**

The following milestones have been completed since the development of the OIP, and are current as of July 31, 2014.

- Submit Integrated Plan
- Develop Strategies
- Develop Modifications
- Develop Training Plan
- Purchase Equipment
- Receive Equipment
- Create Maintenance Procedures

## **3 Milestone Schedule Status**

The following table provides an update to Attachment 2A of the OIP. The table provides the activity status of each item, and whether the expected completion date has changed. The dates are planning dates subject to change as design and implementation details are developed.

The revised milestone and associated target completion dates for 'Implement Modifications' do not impact the Order implementation dates for North Anna Units 1 and 2, but accurately reflect that the Unit 2 modifications will be implemented at the end of the upcoming refueling outage.

<b>Milestone</b>	<b>Target Completion Date</b>	<b>Activity Status</b>	<b>Revised Target Completion Date</b>
Submit Integrated Plan	February 2013	Complete	
Develop Strategies	October 2013	Complete	
Develop Modifications	July 2014	Complete	

<b>Milestone</b>	<b>Target Completion Date</b>	<b>Activity Status</b>	<b>Revised Target Completion Date</b>
Implement Modifications*	April 2015*	Started	
Develop Training Plan	April 2014	Complete	
Implement Training	September 2014	Started	
Issue FLEX Support Guidelines and Associated Procedure Revisions	September 2014	Started	
Develop Strategies/Contract with National SAFER Response Center (NSRC)	August 2014	Started	
Purchase Equipment	February 2014	Complete	
Receive Equipment	August 2014	Complete	
Validation Walk-throughs or Demonstrations of FLEX Strategies and Procedures	August 2014	Started	September 2014*
Create Maintenance Procedures*	August 2014	Complete	
Unit 1 Outage Implementation	April 2015	Started	
Unit 2 Outage Implementation	October 2014	Started	

\* Refer to Section 8, Supplemental Information, for an explanation of the change to this Milestone.

#### **4 Changes to Compliance Method**

By letter dated February 28, 2013, Dominion provided an OIP to address Beyond-Design-Basis (BDB) events at NAPS Units 1 and 2 as required by Order Number EA-12-049, dated March 12, 2012. The first and second Six-Month Status Report of the OIP for NAPS were provided by letters dated August 23, 2013 (Reference 11) and February 28, 2014 (Reference 13), respectively. The following are changes to the compliance method information provided in the NAPS OIP and subsequent updates, which continues to meet NEI 12-06 (Reference 3):

- a) Dominion no longer plans to pre-stage the 120/240 VAC DGs in the Unit 1 and Unit 2 alleyways. The deployment strategy for the portable 120/240VAC diesel generators (DGs) used to re-power the vital bus circuits has been changed back to the original electrical re-powering strategy, described in Section F1.2 – PWR Portable Equipment Phase 2 of the OIP submitted on February 28, 2013 (Reference 1) with the exception that the DGs are sized for a single generator per unit.

- b) Regarding the previously reported strategy for Modes 5 & 6, credit was taken for the Refueling Water Storage Tanks (RWSTs) to provide a borated water source for injection into the RCS. Although the RWSTs are not missile protected, credit as a borated water source was based on the assumption that it was improbable that both tanks would be destroyed by a single tornado. Subsequently, the strategy has been enhanced to address the scenario that both RWSTs are unavailable. The revised strategy includes the provision to utilize clean water sources onsite (which are protected from a tornado), if both RWSTs are unavailable. If a clean water source is used, flow must be controlled in order to match the rate of water loss (due to boiling) so that dilution of the boron concentration in the RCS does not occur.
- c) Based on a study that included a chemical analysis of the various water sources onsite, the preferred order of clean water sources for use in both the primary and secondary sides of the Nuclear Steam Supply System (NSSS) was revised.
- d) Dominion is pursuing an alternate means of compliance to NEI 12-06, Section 3.2.2, regarding additional "spare" cables and hoses. Typically, the hoses utilized to implement a FLEX strategy are not a single continuous hose, but are composed of individual sections of a smaller length joined together to form a sufficient length. In the case of cables, multiple individual lengths of cable are used to construct a circuit.

Hoses and cables are passive devices, which are unlikely to fail provided they are appropriately inspected and maintained. The most likely cause of failure is mechanical damage during handling provided that the hoses and cables are stored in areas with suitable environmental conditions. The hoses and cables for the FLEX strategies will be stored and maintained in accordance with manufacturers' recommendations including any shelf life requirements. Initial inspections and periodic inspections or testing/replacement will be incorporated into the site's maintenance and testing program and implemented in accordance with Section 11.5 of NEI 12-06.

The industry has proposed for NRC Staff consideration alternate methods of compliance to the N+1 requirement applicable to hoses and cables, as stated in Section 3.2.2 of NEI 12-06. Dominion supports this industry proposal and has adopted the agreed upon method for hoses in that 10% of the total length and at least one of the longest single lengths for each hose size has been purchased. With regard to cables, the 120/240VAC generators and the 480VAC generators are backups to each other, therefore, only N sets of cables are required. Therefore, once NRC endorsement of this alternate approach is complete, Dominion will have achieved alternate compliance with the NEI 12-06 N+1 requirement for hoses.

- e) The structural integrity of the reactor Containment building will not be challenged due to increasing Containment pressure during a BDB Extended Loss of AC Power (ELAP) event. Additionally, analysis has shown that any increase in temperature following an ELAP event does not challenge the key parameter instrumentation in the Containment for at least 7 days.

Multiple Containment cooling methods described in previous submittals are available as options for heat removal to maintain Containment temperature for equipment design limits. However, they are not required to be specifically designated as primary and alternate strategies. Adequate time is available utilizing equipment from the NSRC to deploy the cooling methods described.

- f) The BDB and NSRC equipment details in OIP Table 1, PWR Portable Equipment Phase 2, and OIP Table 2, PWR Portable Equipment Phase 3, respectively, have changed. Updates to the 'List Portable Equipment' and 'Performance Criteria' are included as well as associated changes/deletions in footnotes. Changes to the number of components have been included for some of the support equipment categories, but no changes have been made to the quantities of any of the major FLEX components. Revised OIP Tables 1 and 2 are attached.

## **5 Need for Relief/Relaxation and Basis for the Relief/Relaxation**

Dominion expects to comply with the order implementation date and no relief/relaxation is required at this time.

## **6 Open Items**

The NRC has established an audit process to allow the exchange of information between the licensees and the NRC Staff (Reference 19). Between May 19, 2014 and May 22, 2014, North Anna Units 1 and 2 were the subject of an NRC onsite audit where the site specific aspects of Dominion's proposed FLEX Mitigating Strategies were reviewed. During this NRC onsite audit, the staff reviewed site specific documentation and upon completion of the audit, indicated that further review of several items was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051. These items are identified in the following tables in Section 6. Note that the tables provided in Sections 6.4 and 6.5 are new and are the result of the ongoing audit process.

### 6.1. Open Items from Overall Integrated Plan

The following table provides a summary of the status of Open Items (OI) identified by Dominion and documented in Attachment 2B of the NAPS Overall Integrated Plan submitted February 28, 2013 and the status of each item.

Overall Integrated Plan Open Items		
OI #	Description	Status
1	Verify response times listed in timeline and perform staffing assessment.	Complete. (Reference 20)  <b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b>
2	Preliminary analyses have been performed to determine the time to steam generator overfill without operator action to reduce AFW flow, time to steam generator dryout without AFW flow, and time to depletion of the useable volume of the ECST. The final durations will be provided when the analyses are completed.	Complete. (Reference 4)
3	Preliminary analyses have been performed to determine the Class 1E battery life based on implementation of load stripping actions. The final battery life duration will be provided when the analyses are completed.	Complete. (Reference 4)  <b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b>

Overall Integrated Plan Open Items		
OI #	Description	Status
4	The Phase 3 coping strategy to maintain Containment integrity is under development. Methods to monitor and evaluate Containment conditions and depressurize/cool Containment, if necessary, will be provided in a future update.	<p>Complete. (Reference 13)</p> <p><b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b></p>
5	Analyses will be performed to develop fluid components performance requirements and confirm fluid hydraulic-related strategy objectives can be met.	<p>Complete.</p> <p>Hydraulic calculations for the FLEX pumps deployed using their associated hose networks have confirmed that the core cooling/decay heat removal, RCS inventory, and reactivity control (RCS Injection), and SFP make-up strategies can be satisfactorily accomplished in response to an ELAP/Loss of Ultimate Heat Sink (LUHS) event. (References 6 and 7)</p> <p>Hydraulic calculations have confirmed that the SW flows for Containment cooling options are adequate. (Reference 14).</p>

Overall Integrated Plan Open Items		
OI #	Description	Status
6	A study is in progress to determine the design features, site location(s), and number of equipment storage facilities. The final design for BDB equipment storage will be based on the guidance contained in NEI 12-06, Section 11.3, Equipment Storage. A supplement to this submittal will be provided with the results of the equipment storage study.	<p>Complete.</p> <p>A single 10,000 sq. ft. Type 1 building is being constructed at NAPS for storage of BDB equipment. The building is designed to meet the plant's design basis for the Safe Shutdown Earthquake, high wind hazards, snow, ice and cold conditions, and will be located above the flood elevation from the most recent site flooding analysis. The BDB Storage Building will be sited in the Owner Controlled Area in the parking lot west of Warehouse #5. This update provides the supplemental information referred to in this open item. (Reference 21)</p> <p><b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b></p>
7	FLEX Support Guidelines (FSGs) will be developed in accordance with PWROG guidance. Existing procedures will be revised as necessary to implement FSGs.	<p>Started.</p> <p>Scheduled completion date: September 2014</p>

Overall Integrated Plan Open Items		
OI #	Description	Status
8	EPRI guidance documents will be used to develop periodic testing and preventative maintenance procedures for BDB equipment. Procedures will be developed to manage unavailability of equipment such that risk to mitigating strategy capability is minimized.	<p>Complete. (Reference 22)</p> <p>EPRI guidance documents have been used, where available, to develop the testing and preventative maintenance strategies for the sites. Fleet-wide templates have been developed and input into the individual site maintenance strategies. Specific Periodic Maintenance (PM) procedures based on these strategies will be implemented prior to the required North Anna compliance date for Order EA-12-049.</p> <p>A fleet-wide FLEX Strategy Program Document has been developed (Refer to Open Item 9). The program includes the requirement to manage unavailability of equipment such that risk to mitigating strategy capability is minimized. A fleet-wide procedure has been developed to specifically address equipment unavailability.</p>
9	An overall program document will be developed to maintain the FLEX strategies and their bases and provide configuration control and change management for the FLEX Program.	<p>Complete. (Reference 23)</p> <p><b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and</b></p>

Overall Integrated Plan Open Items		
OI #	Description	Status
		<b>EA-12-051.</b>
10	The Dominion Nuclear Training Program will be revised to assure personnel proficiency in the mitigation of BDB events is developed and maintained. These programs and controls will be developed and implemented in accordance with the Systematic Approach to Training (SAT).	Complete.  Documentation of the Job Analysis performed for new operational tasks has been provided via the ongoing NRC audit process. (Reference 19)
11	Complete the evaluation of TDAFW pump long term operation with $\leq 290$ psig inlet steam pressure.	Complete.  TDAFW pump operation and adequate AFW flow to the SGs at SG pressures $\leq 290$ psig has been confirmed. (Reference 5)
12	Plant modifications will be completed for permanent plant changes required for implementation of FLEX strategies.	Started.  Scheduled completion date: See Milestone Schedule above.
13	Details of the ventilation strategy are under development and will conform to the guidance given in NEI 12-06. The details of this strategy will be provided at a later date.	Complete.  (Reference 13)
14	Complete installation of N-9000 RCP seals in 2 of 3 RCPs in each unit.	Started.  Scheduled completion date: April 2015 (Unit 1) Oct 2014 (Unit 2)
15	Analyses will be performed to develop electrical components performance requirements and confirm electrical loading-related strategy objectives can be met.	Complete.  Final calculations confirming the sizing and loading analysis of the 120VAC, 480VAC, and 4KV generators confirm the electrical loading-related strategy objectives can be met are complete (References 16, 17, & 18).  <b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that</b>

Overall Integrated Plan Open Items		
OI #	Description	Status
		further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.
16	An evaluation of all BDB equipment fuel consumption and required re-fill strategies will be developed.	Complete. (Reference 21)  During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.
17	A lighting study will be performed to validate the adequacy of supplemental lighting and the adequacy and practicality of using portable lighting to perform FLEX strategy actions.	Complete. (Reference 21)  During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.
18	A comprehensive study of communication capabilities is being performed in accordance with the commitments made in Dominion letter S/N 12-207F dated October 29, 2012 in response to Recommendation 9.3 of the 10 CFR 50.54(f) letter dated March 12, 2012. The results of this study will identify the communication means available or needed to implement command and control of the FLEX strategies at NAPS. Validation of communications required to implement FLEX strategies will be performed as part of Open Item No. 1.	Complete.  A study documenting the communications strategy has been completed. The plan concludes that FLEX strategies can be effectively implemented with a combination of sound powered phones, satellite phones and hand-held radios. (Reference 10)

Overall Integrated Plan Open Items		
OI #	Description	Status
		During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.
19	Preferred travel pathways will be determined using the guidance contained in NEI 12-06. The pathways will attempt to avoid areas with trees, power lines, and other potential obstructions and will consider the potential for soil liquefaction.	Complete.  The soil liquefaction study has been completed (Reference 8), which supports the location of the storage building and the haul routes. The results will be included with the final design package for the storage building (Reference 9).  During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.
20	The equipment listed in Table 1 will be received on site.	Complete.

## 6.2. Open Items from the Interim Staff Evaluation (ISE)

The following table provides a summary of the Open Items (OI) from the NAPS Interim Staff Evaluation (Reference 12) and the current status of each item.

Interim Staff Evaluation Open Items		
OI #	Description	Status
3.2.1.2.B	Demonstration of the acceptability of the use the Flowserve N-9000 seals with the abeyance feature and validation of an acceptable leakage rate for these seals.	This ISE OI is being addressed through the ongoing NRC audit process. (Generic)  (Reference 19)
3.2.1.8.A	The Pressurized-Water Reactor Owners Group (PWROG) submitted to NRC a position paper, dated August 15, 2013 (ADAMS Accession No. ML13235A135 (non-public for proprietary reasons)), which provides test data regarding boric acid mixing under single-phase natural circulation conditions and outlined applicability conditions intended to ensure that boric acid addition and mixing would occur under conditions similar to those for which boric acid mixing data is available. During the audit process, the licensee informed the NRC staff that its boric acid mixing model is based on the PWROG method. Since the audit discussions, the NRC endorsed the PWROG guidance with several clarifications in letter dated January 8, 2014. The licensee should address the clarifications in alignment with the NRC endorsement letter for the development of an adequate model for determining the mixing of boric acid in the reactor coolant system during natural circulation with the potential for two-phase flow conditions.	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b> (References 19 and 21)

### 6.3. Confirmatory Items from Interim Staff Evaluation (ISE)

The following table provides a summary of the Confirmatory Items (CI) from the NAPS Interim Staff Evaluation (Reference 12) and the current status of each item.

Interim Staff Evaluation Confirmatory Items		
CI #	Description	Status
3.1.1.1.A	Storage & Protection of FLEX equipment – Confirm final design of FLEX storage structure conforms to NEI 12-06, Sections 5.3.1, 6.2.3.1, 7.3.1, and 8.3.1 for storage considerations for the hazards applicable to North Anna.	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b> (Reference 21)

Interim Staff Evaluation Confirmatory Items		
CI #	Description	Status
3.1.1.3.A	Procedural Interface Considerations (Seismic) – Confirm FLEX support guideline to provide operators with direction on how to establish alternate monitoring and control capabilities.	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b> (Reference 24)
3.1.1.4.A	Off-Site Resources – Confirm RRC local staging area, evaluation of access routes, and method of transportation to the site.	This ISE CI is being addressed through the ongoing NRC audit process. (Reference 19)
3.1.5.2.A	In the Integrated Plan, the licensee did not address considerations for any manual actions required by plant personnel in high temperature conditions as recommended in NEI 12-06, Section 9.3.2. Discuss effects of high temperatures on any manual action performed by plant personnel and any applicable contingencies and any related procedural changes or enhancements.	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b> (Reference 21)
3.2.1.1.A	Confirm that the use of NOTRUMP code for the ELAP analysis of North Anna is limited to the flow conditions before reflux condensation initiates, including specification of an acceptable definition for reflux condensation cooling.	This ISE CI is being addressed through the ongoing NRC audit process. (Generic) (Reference 21)
3.2.1.1.B	Confirmation that the generic analysis in Section 5.2.1 of WCAP-17601-P is applicable or bounding with respect to North Anna for an appropriate figure of merit for defining entry into the reflux condensation cooling mode.	This ISE CI is being addressed through the ongoing NRC audit process. (References 19 and 29)

Interim Staff Evaluation Confirmatory Items		
CI #	Description	Status
3.2.1.1.C	Confirm the consistency of the margin imposed to prevent accumulator nitrogen injection with the cooldown terminus assumed in WCAP-17601-P.	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b> (Reference 25)
3.2.1.2.C	Confirm that stresses resulting from a cooldown of the RCS will not result in the failure of seal materials. As applicable, confirm that reestablishing cooling to the seals will not result in increased leakage due to thermal shock.	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b> (References 25 and 26)
3.2.1.6.A	Sequence of Events – Confirm that the final timeline has been time validated after detailed designs are completed and procedures are developed. The results will be provided in a future 6-month update.	This ISE CI is being addressed through the ongoing NRC audit process. (Reference 19)
3.2.1.8.B	Complete calculations demonstrating adequate shutdown margin for North Anna in ELAP scenarios with and without seal leakage.	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b> (Reference 21)

Interim Staff Evaluation Confirmatory Items		
CI #	Description	Status
3.2.1.8.C	Confirm that shutdown margin calculations will be verified to remain bounding for future operating cycles and clarify the method that will be used to make this determination.	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b> (Reference 19)
3.2.1.9.A	Confirm that the licensee provides sufficient BDB RCS Injections Pumps to conform to the spare capability (N+1) guidance of NEI 12-06, Section 3.2.2.	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b> (Reference 21)
3.2.1.9.B	Confirm that calculations documenting the AFW supply, SFP makeup, and RCS inventory hydraulic analysis demonstrate the pumps have adequate capacity for the strategies they support.	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b> (References 6, 7, and 14)
3.2.2.A	SFP venting – Confirm that opening of the roll-up doors would provide an adequate ventilation path for the SFP area.	This ISE CI is being addressed through the ongoing NRC audit process. (Reference 19)

Interim Staff Evaluation Confirmatory Items		
CI #	Description	Status
3.2.3.A	Containment – Confirm Containment analysis to determine any Containment temperature and pressure actions beyond seven days.	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b> (References 13 and 21)
3.2.4.2.A	Ventilation – Equipment Cooling – Confirm development of the ventilation strategy.	This ISE CI is being addressed through the ongoing NRC audit process. (References 13, 19, and 21)
3.2.4.2.B	Confirm the adequacy of the battery room ventilation provided in the context of an ELAP.	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b> (Reference 21)
3.2.4.4.A	Verify the lighting study validates the adequacy of supplemental lighting and the adequacy and practicality of using portable lighting to perform FLEX strategy actions.	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b> (Reference 21)
3.2.4.4.B	Communications – Confirm the licensee's proposed enhancements and interim measures to the site's communications systems and that they have been completed.	This ISE CI is being addressed through the ongoing NRC audit process. (References 10 and 19)

Interim Staff Evaluation Confirmatory Items		
CI #	Description	Status
3.2.4.8.A	Electrical Power Sources – Confirm load calculations for the phase 2 and 3 FLEX generators will support supplied loads.	This ISE CI is being addressed through the ongoing NRC audit process. (References 16, 17, 18, and 19)
3.2.4.9.A	Fuel Supplies – Confirm the adequacy of the fuel consumption evaluation. Confirm that the procedural guidance governing re-fueling strategies addresses: (a) how the quality of the fuel oil and gasoline supplies will be controlled in order to ensure proper diesel or gasoline-powered FLEX equipment operation, (b) available sources of gasoline and how those sources will be protected to ensure availability following a BDB event, and (c) if the onsite fuel capacity provides an indefinite supply of fuel or if the RRC is capable of providing an indefinite, ongoing supply of fuel (both diesel and gasoline).	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b> (Reference 21)
3.4.A	Confirm the implementation of considerations 2 through 10 in NEI 12-06, Section 12.2.	This ISE CI is being addressed through the ongoing NRC audit process. (Reference 19)

#### 6.4. Audit Question Reviewed During NAPS Onsite Audit

Various NAPS Audit Questions (AQs) were evaluated during the NAPS NRC Onsite Audit. The following AQs were evaluated and remained "Open".

Audit Question #43	Provide the direct current (dc) load profile with the required loads for the mitigating strategies to maintain core cooling, containment, and spent fuel pool cooling.	This AQ is being addressed through the ongoing NRC audit process. (Reference 19)
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## 6.5. Additional Items Reviewed During NAPS Onsite Audit

The following table provides a list of the additional Safety Evaluation (SE) Review items identified and evaluated during the NAPS NRC Onsite Audit and the status of each item.

Safety Evaluation Review Item #1	Feb 2014 Update Section 4a. Portable 120/240VAC DG will now be pre-staged.	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051. (See Section 4a.)</b>
Safety Evaluation Review Item #2	SW reservoir and lake are credited as indefinite source of water. SW has a finite volume of water. Therefore, if the SW reservoir is used as a source for make-up flow, the SW reservoir will eventually need make-up water from the lake. The licensee is not clear in stating whether the dam forming the lake is seismically qualified or if a viable suction source can be maintained at the lake following a loss of the dam.	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051. (Reference 27)</b>
Safety Evaluation Review Item #3	1. (RCS Venting) The generic analysis in WCAP-17601-P strictly addressed ELAP coping time without consideration of the actions directed by a site's mitigating strategies. WCAP-17792-P extends these analytical results through explicit consideration of mitigating strategies involving RCS makeup and boration. In support of the RCS makeup and boration strategies proposed therein, a generic recommendation is made that PWRs vent the RCS while makeup is being provided. Please provide the following information in regard to this topic: a. Will the mitigating strategy include venting of the RCS? b. If so, please provide the following information: i. The vent path to be used and the means for its opening and closure. ii. The criteria for opening the vent path. iii. The criteria for closing the vent path. iv. Clarification as to whether the vent path could experience two-phase or single-phase liquid flow during an ELAP. If two-phase or liquid flow is a possibility, please clarify whether the vent path is designed to ensure isolation capability after relieving two-phase or liquid flow. If relief of two-phase or liquid flow is to be avoided, please discuss the availability of instrumentation or other means that would ensure that the vent path is isolated prior to	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051. (References 21 and 28)</b>

	<p>departing from single-phase steam flow. vi. If a pressurizer PORV is to be used for RCS venting, please clarify whether the associated block valve would be available (or the timeline by which it could be repowered) in the case that the PORV were to stick open. If applicable, please further explain why opening the pressurizer PORV is justified under ELAP conditions if the associated block valve would not be available. vii. If a pressurizer PORV is to be used for RCS venting, please clarify whether FLEX RCS makeup pumps and FLEX steam generator makeup pumps will both be available prior to opening the PORV. If they will not both be available, please provide justification. c. If RCS venting will not be used, please provide the following information: i. The expected RCS temperature and pressure after the necessary quantity of borated makeup has been added to an unvented RCS. ii. Adequate justification that the potential impacts of unvented makeup will not adversely affect the proposed mitigating strategy (e.g., FLEX pump discharge pressures will not be challenged, plant will not reach water solid condition, adequate boric acid can be injected, increased RCS leakage will not adversely affect the integrated plan timeline, etc.).</p>	
<p>Safety Evaluation Review Item #4</p>	<p>2. (Westinghouse Standard RCP Seals: NSAL-14-1) On February 10, 2014, Westinghouse issued Nuclear Safety Advisory Letter (NSAL)-14-1, which informed licensees of plants with standard Westinghouse RCP seals that 21 gpm may not be a conservative leakage rate for ELAP analysis. This value had been previously used in the ELAP analysis referenced by many Westinghouse PWRs, including the generic reference analysis in WCAP-17601-P. Therefore, please clarify whether the assumption of 21 gpm of seal leakage per RCP (at 550 degrees F, 2250 psia) remains valid in light of the issues identified in NSAL-14-1. In so doing, please identify the specifics of the seal leak off line design and #1 seal faceplate material relative to the categories in NSAL-14-1 and identify the corresponding presumed leakage rate from NSAL-14-1 that is deemed applicable.</p>	<p>This SE Review Item is being addressed through the ongoing NRC audit process. (Reference 19)</p>

Safety Evaluation Review Item #5	4. (RVLIS Measurement Principle) Please clarify whether the reactor vessel level instrumentation system (RVLIS) indication provides a measure of collapsed level that can be used with Figures 3.3-1 through 3.3-3 of WCAP-17792-P. If the RVLIS system does not provide an indication of collapsed level, then please clarify how the required timing for RCS makeup will be determined and provide justification.	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b> (Reference 21)
Safety Evaluation Review Item #6	(Timeline to reflux cooling) Please clarify whether procedural guidance for the timing of providing makeup to the reactor coolant system is based on analysis in WCAP-17792-P, pages 3-10 through 3-16. If so, please further provide adequate justification for basing the timing of primary makeup on the assumption that reactor coolant pump seal leakage rates that are less than the maximum expected value under ELAP conditions will not increase.	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b> (Reference 21)
Safety Evaluation Review Item #7	Please provide adequate basis that calculations performed with the NOTRUMP code (e.g., those in WCAP-17601-P, WCAP-17792-P) are adequate to demonstrate that criteria associated with the analysis of an ELAP event (e.g., avoidance of reflux cooling, promotion of boric acid mixing) are satisfied. NRC staff confirmatory analysis suggests that the need for implementing certain mitigating strategies for providing core cooling and adequate shutdown margin may occur sooner than predicted in NOTRUMP simulations.	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b> (Reference 21)
Safety Evaluation Review Item #8	Please provide adequate basis that, when considering mixing time, there is sufficient flow capacity to support borated makeup to both units from a single RCS makeup pump taking suction from a portable batching tank.	This SE Review Item is being addressed through the ongoing NRC audit process. (Reference 19)
Safety Evaluation Review Item #9	Please provide a clearly labeled sketch or marked-up plant drawing of the plan view of the SFP area, depicting the SFP inside dimensions, the planned locations/placement of the primary and back-up SFP level sensor, and the proposed routing of the cables that will extend from these sensors toward the location of the read-out/display device.	This SE Review Item is being addressed through the ongoing NRC audit process. (Reference 19)

Safety Evaluation Review Item #10	Human factors questions addressed during walkdowns of plant equipment as well as in discussion with personnel.	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b> (Reference 19)
Safety Evaluation Review Item #11	Unprotected water sources in Modes 5 & 6	This SE Review Item is being addressed through the ongoing NRC audit process. (See Section 4b and References 19 and 21)
Safety Evaluation Review Item #12	Provide details on maintenance and testing and Storage of 120v/480v pre-staged cables.	This SE Review Item is being addressed through the ongoing NRC audit process. (Reference 19)
Safety Evaluation Review Item #13	Provide discussion on evaluation of diesel powered equipment exhaust regarding habitability of other areas.	This SE Review Item is being addressed through the ongoing NRC audit process. (Reference 19)
Safety Evaluation Review Item #14	When do we plan to deploy hoses in SFP prior to bulk boiling to minimize exposure.	<b>During the May 2014 NRC Onsite Audit, the NRC Staff indicated that further review of this item was not anticipated as Dominion proceeds towards compliance for Orders EA-12-049 and EA-12-051.</b> (Reference 21)
Safety Evaluation Review Item #15	Walk-through of building access procedures, to include any unique access control devices	This SE Review Item is being addressed through the ongoing NRC audit process. (Reference 19)

## 7 Potential Safety Evaluation Impacts

Section 6.5 provides a list of the additional Safety Evaluation (SE) Review items identified and evaluated during the NAPS NRC Onsite Audit and the status of each item.

Additionally, Dominion is participating in the ongoing industry effort to develop guidance for the Final Integrated Plan that will support NRC preparation of the Safety Evaluation documenting NAPS's compliance with Order EA-12-049. The format of the Final Integrated Plan is consistent with the Safety Evaluation Template provided with the July 1, 2014 Jack Davis memorandum (ML14161A643)(Reference 15).

## 8 Supplemental Information

This supplemental information provides details of the changes identified in the status updates above and addresses a) Open Item 14, b) the Milestone Task 'Implement Modifications,' c) the Milestone Task 'Validation Walk-throughs or Demonstrations of FLEX Strategies and Procedures' and d) the Milestone Task 'Create Maintenance Procedures' as follows:

- a) **NAPS, Open Item 14:** The revision to the status wording more accurately reflects the status for each North Anna Unit. The split completion schedule reflects the current outage schedules.
- b) **NAPS, Milestone Task 'Implement Modifications':** The revision separates Units 1 and 2 to more accurately reflect the actual tasks as they will occur for each NAPS Unit. The updated completion schedules accurately reflect the current outage schedules. The revised Milestone Tasks and Completion Schedules are as follows:

Milestone Task: Implement Unit 1 Modifications  
Completion Schedule: April 2015

Milestone Task: Implement Unit 2 Modifications  
Completion Schedule: October 2014

- c) **NAPS, Milestone Task 'Validation Walk-throughs or Demonstrations of FLEX Strategies and Procedures':** The revision to the scheduled milestone target completion date is needed to allow for completion of the walk-throughs, which are in progress.
- d) **NAPS, Milestone Task 'Create Maintenance Procedures':** The Milestone is to be restated as 'Develop Maintenance Strategies.' This change is to revise the current milestone to reflect the intended activity which was to develop the maintenance strategies based on industry and vendor supplied information. As per the response provided above for Open Item 8, the restated task has been completed. The design change implementing the FLEX Mitigating Strategies Program identifies the maintenance strategies required for the FLEX implementation and requires that Periodic Maintenance (PM) procedures be developed. Submittal of requests for creation of these PMs is in accordance with the Design Control Program and will be tracked. The PMs will be prioritized such that the near-term requirements, (e.g., 30 day walkdown inspections) are in-place prior to FLEX Mitigating Strategy implementation date. The

PMs for the longer term requirements will be implemented prior to their first performance interval.

## 9 References

The following references support the updates to the OIP described in this attachment and are available in ADAMS or have been provided to the staff for their review.

1. "Virginia Electric and Power Company's 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)," dated February 28, 2013 (Serial No. 12-162B).
2. NRC Order Number EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated March 12, 2012.
3. NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," Revision 0, dated August 2012.
4. "Supplement to Overall Integrated Plan in Response to March 21, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis Events (Order Number EA-12-049)," dated April 30, 2013 (Serial No. 12-162C).
5. Dominion Calculation ME-0968, "Evaluation of the TDAFW Pump Performance at Low Steam Generator Pressures," August 2013.
6. Dominion Calculation ME-0965, "Evaluate the BDB High Head Injection pump for Beyond Design Basis (BDB) at the primary and alternative supply locations in Modes 1-4, and the BDB AFW Pump in Modes 5 and 6," Revision 0.
7. Dominion Calculation ME-0966, "Beyond Design Basis (BDB) – BDB High Capacity Pump and BDB AFW Pump Hydraulic Analysis for Spent Fuel Pool Makeup and AFW Injection at NAPS Units 1 and 2," Revision 0.
8. Geotechnical Engineering Report, "BDB FLEX Storage Building," North Anna Power Station, Louisa, VA, Schnabel Reference #13613081, October 3, 2013, Addendum 1.
9. Design Change NA-13-00016, "BDB Storage Building/ North Anna Power Station/ Units 1 & 2."
10. ETE-CPR-2013-0003, "Beyond Design Basis Communications Strategy/Plan," Rev. 1
11. "Virginia Electric and Power Company's Six-Month Status Report 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)," dated August 23, 2013 (Serial No. 12-162D).
12. "North Anna Power Station, Units 1 and 2 - Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Order EA-12-049 (Mitigating Strategies)," dated January 29, 2014.

13. "Virginia Electric and Power Company's Six-Month Status Report 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)," dated February 28, 2014 (Serial No. 12-162E).
14. Dominion Calculation ME-12126, "FLEX Beyond Design Basis (BDB) Service Water (SW) Containment Integrity Strategy Hydraulic Analysis," Rev 0.
15. Memorandum from Jack R. Davis, JLD, Office of NRR, to Stewart N. Bailey, Sheena A. Whaley, and Jeremy S. Bowen, "Supplemental Staff Guidance for the Safety Evaluations for Order EA-12-049 on Mitigation Strategies for Beyond-Design-Basis External Events and Order EA-12-051 on Spent Fuel Pool Instrumentation," dated July 1, 2014 (ML14161A643).
16. Dominion Calculation EE-0863, "NAPS BDB FLEX Electrical 480 and 120 VAC System Loading Analysis," Rev. 1 (Unit 1).
17. Dominion Calculation EE-0865, "NAPS BDB FLEX Electrical 480 and 120 VAC System Loading Analysis," Rev. 0 (Unit 2).
18. Dominion Calculation EE-0871, "NAPS BDB FLEX Electrical 4160VAC System Loading Analysis," Rev. 0.
19. NRC letter from Jack R. Davis, Director Mitigating Strategies Directorate to All Operating Reactor Licensees and Holders of Construction Permits, "Nuclear Regulatory Commission Audits of Licensee Responses to Mitigating Strategies Order EA-12-049," dated August 28, 2013 (ML13234A503).
20. Dominion Letter to NRS titled "North Ann Power Station Units 1 and 2, March 12, 2012 Information Request, Phase 2 Staffing Assessment Report," dated May 7, 2014 (SN:14-199)
21. ETE-CPR-2012-0012, Rev. 4, "Beyond Design Basis – FLEX Strategy Overall Integrated Plan Basis Document."
22. Procedure CM-AA-BDB-102, "Beyond Design Basis FLEX Equipment Unavailability Tracking."
23. Procedure CM-AA-BDB-10, Beyond Design Basis FLEX Program.
24. FSG-7, "Loss of Vital Instrumentation or Control Power."
25. Procedure ECA-0.0, "Station Blackout."
26. FlowServe document, "White Paper on the Response for the N-Seal Reactor Coolant Pump (RCP) Seal Package to Extend Loss of AC Power (ELAP)," Rev. 0 dated February 11, 2014 (Proprietary)
27. North Anna Power Station Updated Final Safety Analysis Report (UFSAR), Section 3.8.3.1.
28. FSG-8, "Alternate RCS Boration."
29. ETE-CPR-2012-0150, Rev. 1, Add. 0, "Core Cooling Evaluation for Dominion Fleet and Prepared Input for Response to Order EA-12-049."

Table 1 – PWR Portable Equipment Phase 2 <sup>1</sup>							
<i>Use and (Potential / Flexibility) Diverse Uses</i>						<i>Performance Criteria</i>	<i>Maintenance</i>
<i>List Portable Equipment</i>	Core	Containment	SFP	Instrumentation	Accessibility		Maintenance / Preventive Maintenance Requirements
BDB High Capacity diesel-driven pump (2) <sup>6</sup> and assoc. hoses and fittings	X	X	X			1200 gpm @ 150 psid	Will follow EPRI template requirements
BDB AFW pump (3) and assoc. hoses and fittings	X					300 gpm @ 500 psid	Will follow EPRI template requirements
BDB RCS Injection pump (2) <sup>5</sup> and assoc. hoses and fittings	X					45 gpm @ 3000 psid	Will follow EPRI template requirements
120/240VAC generators (3) <sup>3</sup> and associated cables, connectors and switchgear				X		40 kW	Will follow EPRI template requirements

Table 1 – PWR Portable Equipment Phase 2 <sup>1</sup>							
<i>Use and (Potential / Flexibility) Diverse Uses</i>						<i>Performance Criteria</i>	<i>Maintenance</i>
<i>List Portable Equipment</i>	Core	Containment	SFP	Instrumentation	Accessibility		Maintenance / Preventive Maintenance Requirements
120/240VAC generators (8) <sup>2</sup> and associated cables, connectors and switchgear (to power support equipment)					X	5-6.5 kW	Will follow EPRI template requirements
480VAC generators (2) <sup>3</sup> and associated cables, connectors and switchgear (to re-power battery chargers, inverters, and Vital Buses)		X		X		350 kW	Will follow EPRI template requirements
Portable boric acid batching tank (2)	X					1000 gal	Will follow EPRI template requirements

**Table 1 – PWR Portable Equipment Phase 2<sup>1</sup>**

<i>Use and (Potential / Flexibility) Diverse Uses</i>						<i>Performance Criteria</i>	<i>Maintenance</i>
<i>List Portable Equipment</i>	Core	Containment	SFP	Instrumentation	Accessibility		Maintenance / Preventive Maintenance Requirements
Light plants (2) <sup>2</sup>					X		Will follow EPRI template requirements
Front end loader (1) <sup>2</sup>					X		Will follow EPRI template requirements
Tow vehicles (2) <sup>2</sup>	X	X	X		X		Will follow EPRI template requirements
Hose trailer (2) and Utility vehicle (1) <sup>2</sup>	X	X	X		X		Will follow EPRI template requirements
Fans / blowers (10) <sup>2</sup>					X		Will follow EPRI template requirements
Air compressors (6) <sup>2</sup>	X				X		Will follow EPRI template requirements

Table 1 – PWR Portable Equipment Phase 2 <sup>1</sup>							
<i>Use and (Potential / Flexibility) Diverse Uses</i>						<i>Performance Criteria</i>	<i>Maintenance</i>
<i>List Portable Equipment</i>	Core	Containment	SFP	Instrumentation	Accessibility		Maintenance / Preventive Maintenance Requirements
Fuel truck (1) with 1,100 gal. tank and pumps	X	X	X	X	X		Will follow EPRI template requirements
Fuel carts with transfer pumps (2) <sup>2</sup>	X	X	X	X	X		Will follow EPRI template requirements
Communications equipment <sup>4</sup>	X	X	X	X	X		Will follow EPRI template requirements
Misc. debris removal equipment <sup>2</sup>					X		Will follow EPRI template requirements
Misc. Support Equipment <sup>2</sup>					X		Will follow EPRI template requirements

**Table 1 – PWR Portable Equipment Phase 2<sup>1</sup>**

<i>Use and (Potential / Flexibility) Diverse Uses</i>						<i>Performance Criteria</i>	<i>Maintenance</i>
<i>List Portable Equipment</i>	Core	Containment	SFP	Instrumentation	Accessibility		Maintenance / Preventive Maintenance Requirements

**NOTES:**

1. This table is based on one BDB Storage Building.
2. Support equipment. Not required to meet N+1.
3. 480VAC generators are an alternate strategy to the 120/240VAC generators. Therefore, only N is required.
4. Quantities are identified in ETE-CPR-2013-0003 that was developed in response to the results of the communications study performed for Recommendation 9.3 of the 10 CFR 50.54(f) letter dated March 12, 2012.
5. One BDB RCS Injection pump can be shared between units if necessary. A BDB RCS Injection pump from the RRC will be deployed from the RRC by 28 hours, if required, to replace an inoperable on-site BDB RCS Injection pump.
6. One BDB High Capacity pump is needed to implement the FLEX core and SFP cooling strategies. This pump is stored in the Type 1 BDB Storage Building and protected from hazards. The 50.54(hh)(2) high capacity pump is credited to meet the N+1 requirement as a backup to the BDB High Capacity pump. This pump is stored onsite in a location other than the BDB Storage Building.

**Table 2 – PWR Portable Equipment Phase 3**

Use and (Potential / Flexibility) Diverse Uses									Performance Criteria		Maintenance	Notes
List Portable Equipment	Quantity Req'd /Unit	Quantity Provided / Unit	Power	Core Cooling	Cont. Cooling/ Integrity	Access	Instrumentation.	RCS Inventory			Preventative Maintenance Required	
Medium Voltage Generators	2	3	Jet Turb.	X	X		X		4.16 KV	1 MW	Performed by RRC	(1)
Low Voltage Generators	0	1	Jet Turb		X		X	X	480VAC	1100 KW	Performed by RRC	(2)
High Pressure Injection Pump	0	1	Diesel					X	3000#	60 GPM	Performed by RRC	(2)
S/G RPV Makeup Pump	0	1	Diesel	X				X	500#	500 GPM	Performed by RRC	(2)
Low Pressure / Medium Flow Pump	0	1	Diesel		X	X			300#	2500 GPM	Performed by RRC	(2)
Low Pressure / High Flow Pump	1	1	Diesel	X	X				150#	5000 GPM	Performed by RRC	(3)
Lighting Towers	0	1	Diesel			X				40,000 Lu	Performed by RRC	(4)

### Table 2 – PWR Portable Equipment Phase 3

Use and (Potential / Flexibility) Diverse Uses									Performance Criteria		Maintenance	Notes
List Portable Equipment	Quantity Req'd /Unit	Quantity Provided / Unit	Power	Core Cooling	Cont. Cooling/ Integrity	Access	Instrumentation.	RCS Inventory			Preventative Maintenance Required	
Diesel Fuel Transfer	0	AR	N/A	X	X	X	X	X		500 Gal	Performed by RRC	(2)
Mobile Water Treatment	0	2	Diesel	X				X		150 GPM	Performed by RRC	(2) (5)
Mobile Boration Skid	0	1	N/A					X		1000 Gal	Performed by RRC	(2)

Note 1 - RRC 4KV generator supplied in support of Phase 3 for Core Cooling, Containment Cooling, and Instrumentation FLEX Strategies. (Includes a distribution panel and sufficient cables for connection to site 4kV buses.)

Note 2 - RRC Generic Equipment – Not required for FLEX Strategy – Provided as Defense-in-Depth.

Note 3 - RRC Low Pressure / High Flow pump supplied in support of Phase 3 for Core Cooling and Containment Cooling FLEX Strategies.

Note 4 - RRC components provided for low light response plans.

Note 5 - Usage dependent on Westinghouse Water Quality Study results.