VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

February 27, 2014

10 CFR 2.202
EA-12-049

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

Serial No.: 12-162E
NL&OS/MAE: R0A
Docket Nos.: 50-338/339
License Nos.: NPF-4/7

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 August 23, 2013 (Serial No. 12-162D)
4. NRC letter, "Nuclear Regulatory Audits of Licensee Responses to Mitigating Strategies Order EA-12-049," dated August 28, 2013 (ADAMS Accession No. ML13234A503)

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.

Attachment 1 of this letter provides the second six-month status report and an update of milestone accomplishments since the submittal of the first six-month status report

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(Reference 3), including any changes to the compliance method, schedule, or need for relief and the basis.

Attachment 2 provides the Phase 3 containment strategy and the ventilation strategy, identified as Open Items 4 and 13 respectively in the OIP. This information is provided in the template format used for the originally submitted OIP. The pages provided in Attachment 2 for Section D, "Maintain Containment" and Section F5, "Safety Functions Support (Ventilation)" supersede Section D and Section F5 in the originally submitted OIP.

Attachment 3 formally documents responses provided to several Audit Questions received for North Anna Power Station during the Audit of Licensee Responses to Mitigating Strategies Order EA-12-049 (Reference 4).

If you have any questions, please contact Ms. Margaret Earle at (804) 273-2768.

Sincerely,

Mark D. Sartain
Vice President - Nuclear Engineering
Virginia Electric and Power Company

Attachments (3)

Commitments made by this letter: No new Regulatory Commitments

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Mark D. Sartain who is Vice President Nuclear Engineering of Virginia Electric and Power Company. He has affirmed before me that he is duly authorized to execute and file the foregoing document in behalf of the Company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 27TH day of February, 2014.

My Commission Expires: May 31, 2014.

Vicki L. Hull
Notary Public

(SEAL)

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Attachment 1

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

February 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 Overall Integrated Plan, and are current as of January 31, 2014.

- Submit Integrated Plan
- Develop Strategies

3 Milestone Schedule Status

The following table provides an update to Attachment 2A of the Overall Integrated Plan. 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 target completion dates for 'Develop Modifications,' 'Implement Modifications,' 'Develop Strategies/ Contract with RRC' and 'Validation Walk-throughs or Demonstrations of FLEX Strategies and Procedures' do not impact the Order implementation date.

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Submit Integrated Plan	February 2013	Complete	
Develop Strategies	October 2013	Complete	
Develop Modifications	February 2014	Started	July 2014 *
Implement Modifications	September 2014	Started	April 2015 *
Develop Training Plan	April 2014	Started	

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Implement Training	September 2014	Started	
Issue FSGs and Associated Procedure Revisions	September 2014	Started	
Develop Strategies/Contract with RRC	April 2014	Started	August 2014 *
Purchase Equipment	February 2014	Started	
Receive Equipment	August 2014	Started	
Validation Walk-throughs or Demonstrations of FLEX Strategies and Procedures	April 2014	Not Started	August 2014 *
Create Maintenance Procedures	August 2014	Not Started	
Unit 1 Outage Implementation	April 2015	Started	
Unit 2 Outage Implementation	October 2014	Started	

* Refer to Section 8, Supplemental Information, for an explanation of Milestone changes.

4 Changes to Compliance Method

By letter dated February 28, 2013, Dominion provided an Overall Integrated Plan (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 Six-Month Status Update of the OIP for NAPS was provided by letter dated August 23, 2013 (Reference 13). The following are changes to the compliance method information provided in the NAPS OIP; which continue to meet NEI 12-06 (Reference 3):

a) The deployment strategy for the portable 120/240VAC diesel generators (DGs) used to re-power the vital bus circuits has changed from the electrical re-powering strategy, as described in Section F1.2 – PWR Portable Equipment Phase 2 of the OIP. As previously reported, the station Class 1E battery extended duty cycle resulting from load stripping is calculated to be 8 hours. This time has not changed, but in order to ensure availability within the first several hours following an Extended Loss of AC Power (ELAP) event, a decision has been made to pre-stage the 120/240VAC DGs. The Sequence of Events timeline has been revised to assume that initiation of the re-powering strategy will begin in one hour following onset of the ELAP event (no deployment needed) and to account for four additional hours for debris removal and actual hook-up of the cables to the distribution

panel receptacles. The deployment location of the DG and its connection to two BDB power distribution panels (per unit) is unchanged.

Dominion confirms that the Class 1E battery duty cycle of eight hours for NAPS was calculated in accordance with the IEEE-485 methodology using manufacturer discharge test data applicable to the licensee's FLEX strategy as outlined in the NEI white paper on Extended Battery Duty Cycles. The detailed calculations, supporting vendor discharge test data, FLEX strategy battery load profile, and other inputs/initial conditions required by IEEE-485 are available on Dominion's web portal for documents and calculations. The time margin between the calculated battery duration for the FLEX strategy and the expected deployment time for FLEX equipment to supply the DC loads is approximately three hours for NAPS.

b) The BDB and Regional Response Center (RRC) 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,' 'Performance Criteria,' and usage categories are included, as well as associated changes or deletions in footnotes. Minor changes to the number of components have been included for some of the support equipment categories, but no changes are made to the quantities of any of the major FLEX components. Revised OIP Tables 1 and 2 are included in this attachment.

Footnote 6 has been added to the quantity of BDB High Capacity pumps in Table 1. One BDB High Capacity pump is needed to implement the FLEX core and Spent Fuel Pool (SFP) cooling strategies. This pump will be stored in the Type 1 BDB Storage Building and protected from all hazards. The other pump, the site 10 CFR 50.54(hh)(2) high capacity pump (B.5.b), has adequate capacity to backup the BDB High Capacity pump and serves to meet the N+1 requirement. We are aware that the NRC expectation is that the 10 CFR 50.54(hh)(2) high capacity pump is to be readily available for a imminent threat scenario. However, we have determined that use of the 10 CFR 50.54(hh)(2) high capacity pump as a backup to the BDB High Capacity pump does not degrade the mitigating strategies associated with B.5.b in that the pump remains readily available in the event of a imminent threat scenario. This 10 CFR 50.54(hh)(2) pump is stored onsite in a separate location that is reasonably protected from flooding, extreme heat, and extreme cold hazards.

c) The OIP for NAPS, submitted on February 28, 2013, contained an open item for the development of the coping strategy to maintain Containment integrity following an ELAP event, if required. OIP Section A.4 (Action Item 16) and Attachment 1A, Sequence of Events, Item 16, discussed the timeframe for which action was required to address Containment temperature and pressure. Conservative analysis has concluded that Containment temperature and pressure response will remain below design limits following an ELAP event and that key parameter instrumentation subject to the Containment environment will remain functional for at least seven days (Reference 10).

The strategy for coping with Containment temperature and pressure increases has been developed. By maintaining these parameters below their design limits, Containment

structural integrity is ensured. To remain within analyzed limits for equipment qualification temperature, the Containment temperature will be procedurally monitored and, if necessary, the temperature will be reduced. This will require the implementation of the Phase 3 Containment cooling strategy such that heat removal from Containment is initiated in a timely manner.

The Phase 3 Containment coping strategy for NAPS was not provided in the initial submittal of the OIP. It is provided in Attachment 2 of this submittal in the original OIP template format as Section D and is intended to supersede the previous Section D in its entirety. Attachment 2 also contains two new OIP figures (Figures 13 and 14) in support of the Section D Containment strategy.

d) The OIP for NAPS, submitted on February 28, 2013, contained an open item for the development of the coping strategy to account for the loss of forced ventilation following an ELAP event. The loss of ventilation evaluation has been completed and concluded that no special equipment or immediate actions are required to maintain equipment and personnel habitability in areas requiring access to implement the FLEX strategies (Reference 12). The room containing the Turbine Drive Auxiliary Feedwater (TDAFW) pump will require a door to be opened within 4 hours and remain open to ensure temperatures do not increase unacceptably.

   The coping strategy for the loss of ventilation following an ELAP event at NAPS was not provided in the initial submittal of the OIP. It is provided in Attachment 2 of this submittal in the original OIP template format as Section F5 – Safety Function Support (Ventilation) and is intended to supersede the previous Section F5 in its entirety.

e) In response to the NRC staff concern that sufficient time and core flow conditions are available for adequate boron mixing, the PWROG in conjunction with Westinghouse developed a boron mixing position paper. This position paper has been endorsed by the NRC with clarifications as stated in a letter from Jack Davis, Director Mitigating Strategies, US NRC to Jack Stringfellow, PWROG, Endorsing PWROG Position Paper, January 8, 2014. The NAPS ELAP analyses verify that the conditions set forth in the NRC's endorsement of the boron mixing position paper with the NRC's clarifications are met. Accordingly, the endorsed boron mixing methodology has been applied to the final FLEX RCS inventory and reactivity management strategies.

f) Dominion no longer considers the Boric Acid Storage Tank as a source of concentrated boric acid for the purpose of preparing a solution in the portable boric acid mixing tank. If boric acid solution is required for RCS injection and the RWST is not available, bags of boric acid powder will be used to prepare a solution to the required boron concentration.

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

Dominion expects to comply with the Order implementation date and no required relief/relaxation has been identified at this time.

6 Open Items

6.1. Open Items from Overall Integrated Plan

The following table provides a summary of the status of open items documented in Attachment 2B of the NAPS Overall Integrated Plan submitted February 28, 2013 and the status of each item.

Overall Integrated Plan Open Item		
OI #	**Description**	**Status**
1	Verify response times listed in timeline and perform staffing assessment.	Started. Scheduled completion date is revised from April, 2013 to August 2014 **
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)
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.	Complete. See Attachment 2, OIP Section D. See Open Item 5 for confirmation of the effectiveness of Phase 3 Containment strategies.
5	Analyses will be performed to develop fluid components performance requirements and confirm fluid hydraulic-related strategy objectives can be met.	Started. Hydraulic calculations for the FLEX pumps deployed using their associated hose networks have confirmed that the core cooling/decay heat removal, RCS Inventory,

Overall Integrated Plan Open Item		
OI #	**Description**	**Status**
		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) Phase 3: Thermal and hydraulic calculations confirming that the Containment strategies are adequate will be completed by April 2014. Scheduled completion date is revised from September, 2013 to April 2014 **
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.	Complete. A single 10,000 sq. ft. Type 1 building will be constructed at NAPS for storage of BDB equipment. The building will be 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.

Overall Integrated Plan Open Item		
OI #	**Description**	**Status**
7	FLEX Support Guidelines (FSGs) will be developed in accordance with PWROG guidance. Existing procedures will be revised as necessary to implement FSGs.	Started. Scheduled completion date: September 2014
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.	Not started. Scheduled completion date: September 2014
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.	Started. Scheduled completion date: September 2014
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).	Started. Scheduled completion date: September 2014
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. See Attachment 2, OIP Section F5.
14	Complete installation of N-9000 RCP seals in 2 of 3 RCPs in each unit.	Started Scheduled completion date: April 2015
15	Analyses will be performed to develop electrical components performance requirements and confirm electrical loading-related strategy objectives can be met.	Started. Phase 2: Preliminary results for the sizing and loading analysis of the 120VAC and 480VAC generators confirm the

Overall Integrated Plan Open Item		
OI #	**Description**	**Status**
		electrical loading-related strategy objectives can be met. Final calculations confirming these results will be completed by March 2014. Phase 3: Calculations identifying the Phase 3 4160VAC generator load requirements and power cable ampacity rating along with breaker coordination between the RRC equipment and Dominion equipment will be completed by June 2014. Scheduled completion date is revised from December 2013 to June 2014 **
16	An evaluation of all BDB equipment fuel consumption and required re-fill strategies will be developed.	Not started. Scheduled completion date: June 2014
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.	Started. Scheduled completion date: June 2014
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 11)
19	Preferred travel pathways will be determined using the guidance	Started.

Overall Integrated Plan Open Item		
OI #	**Description**	**Status**
	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.	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). Scheduled completion date: June 2014
20	The equipment listed in Table 1 will be received on site.	Started. Scheduled completion date: August 2014

** Refer to Section 8, Supplemental Information, for an explanation of changes to Open Items.

6.2. Open Items from Interim Staff Evaluation

The following table provides a summary of the open items from the NAPS Interim Staff Evaluation (Reference 14) and the 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 Open Item will be addressed during the ongoing audit process.
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	The discussion provided in Section 4, Item e, above addresses this Open Item. Additional supporting documentation will be provided during the ongoing audit process.

Interim Staff Evaluation Open Items		
OI #	**Description**	**Status**
	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.	

6.3. Confirmatory Items from Interim Staff Evaluation

The following table provides a summary of the confirmatory items from the NAPS Interim Staff Evaluation and the 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.	This Confirmatory Item will be addressed during the ongoing audit process.
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.	This Confirmatory Item will be addressed during the ongoing audit process.
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 Confirmatory Item will be addressed during the ongoing audit process.
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.	This Confirmatory Item will be addressed during the ongoing audit process.
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 Confirmatory Item will be addressed during the ongoing audit process.
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 Confirmatory Item will be addressed during the ongoing audit process.

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	This Confirmatory Item will be addressed during the ongoing audit process.
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.	This Confirmatory Item will be addressed during the ongoing audit process.
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 Confirmatory Item will be addressed during the ongoing audit process and in a future Six-Month Status Update.
3.2.1.8.B	Complete calculations demonstrating adequate shutdown margin for North Anna in ELAP scenarios with and without seal leakage.	This Confirmatory Item will be addressed during the ongoing audit process.
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.	This Confirmatory Item will be addressed during the ongoing audit process.
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.	Note 4 on revised Table 1, "PWR Portable Equipment Phase 2" addresses this Confirmatory Item. Additional supporting documentation will be provided during the ongoing audit process.
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.	This Confirmatory Item will be addressed during the ongoing audit process.
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 Confirmatory Item will be addressed during the ongoing audit process.

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.	Details of the Phase 3 long term Containment cooldown and depressurization strategies for NAPS are provided in Attachment 2. Confirmation of the detailed Containment analysis will be addressed during the ongoing audit process.
3.2.4.2.A	Ventilation – Equipment Cooling – Confirm development of the ventilation strategy.	Details of the ventilation strategies for NAPS are provided in Attachment 2. The audit spreadsheet will be updated to reflect that the ventilation strategies have been completed and provided in this six-month status report. The completed ventilation analysis will be posted to the ePortal.
3.2.4.2.B	Confirm the adequacy of the battery room ventilation provided in the context of an ELAP.	This Confirmatory Item will be addressed during the ongoing audit process.
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.	This Confirmatory Item will be addressed during the ongoing audit process.
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 Confirmatory Item will be addressed during the ongoing audit process.
3.2.4.8.A	Electrical Power Sources – Confirm load calculations for the phase 2 and 3 FLEX generators will support supplied loads.	This Confirmatory Item will be addressed during the ongoing audit process.

Interim Staff Evaluation Confirmatory Items		
CI #	**Description**	**Status**
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).	This Confirmatory Item will be addressed during the ongoing audit process.
3.4.A	Confirm the implementation of considerations 2 through 10 in NEI 12-06, Section 12.2.	This Confirmatory Item will be addressed during the ongoing audit process.

7 Potential Safety Evaluation Impacts

Dominion is participating in the ongoing industry effort to develop guidance for the Overall Program Document that will support NRC preparation of the Safety Evaluation documenting NAPS's compliance with Order EA-12-049. As this Overall Program Document is developed, potential challenges and impacts will be identified in this section of future Six-Month Status Reports.

8 Supplemental Information

This supplemental information provides details of the changes identified in the status updates above and addresses the following topics: a) Milestone Task 'Develop Modifications', b) Milestone Task "Implement Modifications,' c) Milestone Task 'Develop Strategies/Contract with RRC', d) Milestone Task 'Validation Walk-throughs or Demonstrations of FLEX Strategies and Procedures,' e) a revision to Open Item No. 1, f) a revision to Open Item No. 5, and g) a revision to Open Item No. 15.

a) **NAPS, Milestone Task 'Develop Modifications':** The revision to the scheduled milestone target completion date is needed to complete development of minor modifications supporting FLEX strategies (e.g., standpipe, hose adapters, etc.).

b) **NAPS, Milestone Task 'Implement Modifications':** The revision to the scheduled milestone target completion date is needed for Unit 1 to complete minor modifications supporting FLEX strategies (e.g., standpipe, hose adapters, etc.). All other modifications being developed will be implemented by the original schedule of September 2014. The exception is a single BDB piping tie-in modification for Unit 1. The modification requires an outage and will be completed during the Spring 2015

outage. This schedule revision continues to meet the implementation schedule for Unit 1.

c) **NAPS, Milestone Task 'Develop Strategies/Contract with RRC':** The revision to the scheduled milestone target completion date is consistent with the date the RRC will be fully operational.

d) **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 FLEX support guidelines.

e) **NAPS, Open Item 1:** The Open Item completion date is revised to August 2014. Additional time is required to complete the FLEX Support Guidelines and construction of the permanent BDB Storage Building.

f) **NAPS, Open Item 5:** The Open Item completion date is revised to April 2014. Additional time is required to complete the thermal and hydraulic calculations to confirm the Containment strategies are adequate using the Phase 3 RRC pumps.

g) **NAPS, Open Item 15:** The Open Item completion date is revised to June 2014. Additional time is required to obtain design specification information on the Phase 3 RRC electrical components and to complete the calculations needed to confirm the electrical loading-related strategy objectives can be met with this equipment.

9 References

The following references support the updates to the OIP described in this attachment.

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. Calculation MISC-11793, "Evaluation of Long-Term Containment Pressure and Temperature Profiles Following and Extended Loss of AC Power (ELAP)," Rev. 0.
11. ETE-CPR-2013-0003, "Beyond Design Basis Communications Strategy/Plan," Rev. 0
12. Dominion Calculation ME-0972, "Evaluation of Room Air Temperatures Following Extended Loss of AC Power (ELAP)," Rev. 0 and Addendum.
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 August 23, 2013 (Serial No. 12-162D).
14. "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.
15. "Initial 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 October 25, 2012 (Serial No. 12-162A)

Table 1 – PWR Portable Equipment Phase 2[1] [Open Item 20]							
Use and (Potential / Flexibility) Diverse Uses						***Performance Criteria***	***Maintenance***
List Portable Equipment	Core	Containment	SFP	Instrumentation	Accessibility		Maintenance / Preventive Maintenance Requirements
BDB High Capacity diesel-driven pump (2)[6] 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)[5] and assoc. hoses and fittings	X					45 gpm @ 3000 psid	Will follow EPRI template requirements
120/240VAC generators (2)[3] and associated cables, connectors and switchgear				X		37 kW	Will follow EPRI template requirements

Table 1 – PWR Portable Equipment Phase 2[1] [Open Item 20]							
Use and (Potential / Flexibility) Diverse Uses						***Performance Criteria***	***Maintenance***
120/240VAC generators (8)[2] and associated cables, connectors and switchgear (to power support equipment)					X	5-6.5 kW	Will follow EPRI template requirements
480VAC generators (2)[3] 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
Light plants (2) + Light strings (15)[2]					X		Will follow EPRI template requirements

Table 1 – PWR Portable Equipment Phase 2[1] [Open Item 20]							
Use and (Potential / Flexibility) Diverse Uses						***Performance Criteria***	***Maintenance***
Front end loader (1)[2]					X		Will follow EPRI template requirements
Tow vehicles (2)[2]	X	X	X		X		Will follow EPRI template requirements
Hose trailer (2) and Utility vehicle (1)[2]	X	X	X		X		Will follow EPRI template requirements
Fans / blowers (10)[2]					X		Will follow EPRI template requirements
Air compressors (6)[2]	X				X		Will follow EPRI template requirements
Fuel truck (1) with 1,100 gal. tank and pumps	X	X	X	X	X		Will follow EPRI template requirements

Table 1 – PWR Portable Equipment Phase 2[1] [Open Item 20]							
Use and (Potential / Flexibility) Diverse Uses						***Performance Criteria***	***Maintenance***
Fuel carts with transfer pumps (2) [2]	X	X	X	X	X		Will follow EPRI template requirements
Communications equipment [4]	X	X	X	X	X		Will follow EPRI template requirements
Misc. debris removal equipment [2]					X		Will follow EPRI template requirements
Misc. Support Equipment [2]					X		Will follow EPRI template requirements

Table 1 – PWR Portable Equipment Phase 2[1] [Open Item 20]							
Use and (Potential / Flexibility) Diverse Uses						***Performance Criteria***	***Maintenance***
Cables for 4kv DG generator connection (3 sets)	X	X	X	X	X		

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 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	1	1	Jet Turb.	X	X		X		4.16 KV	2 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.
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.

Attachment 2

Overall Integrated Plan

Section D - Maintain Containment

Section F5 – Safety Functions Support (Ventilation)

North Anna Power Station (NAPS) Units 1 and 2

Virginia Electric and Power Company (Dominion)

D - Maintain Containment	
Determine Baseline coping capability with installed coping[1] modifications not including FLEX modifications, utilizing methods described in Table 3-2 of NEI 12-06: • Containment Spray • Hydrogen igniters (ice condenser containments only)	
D.1 - 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 Phase 1 coping strategy for Containment involves verifying Containment isolation per ECA-0.0, Loss of All AC Power, and monitoring Containment temperature and pressure using installed instrumentation. Evaluations have been performed and conclude that Containment temperature and pressure will remain below design limits and key parameter instruments subject to Containment environment will remain functional for at least seven days. Therefore, actions to reduce Containment temperature and pressure and to ensure continued functionality of the key parameters will not be required immediately and will utilize off-site equipment and resources during Phase 3.	
Details:	
D.1.1 - Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation.* Procedural guidance for monitoring Containment pressure is provided by ECA-0.0, Loss of All AC power. This procedure needs to be revised to ensure Containment isolation prior to load stripping. **[Open Item 7]**
D.1.2 - Identify modifications	*List modifications and describe how they support coping.* No plant modifications are required to support implementation of this Phase 1 strategy.
D.1.3 - Key Containment Parameters	*List instrumentation credited for this coping evaluation.* <u>Containment Pressure</u> Containment pressure indication is available in the main control room (MCR) throughout the event. <u>Containment Wide Range Temperature</u> Containment wide range temperature indication is available in the MCR throughout the event.

[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.

D - Maintain Containment
Notes: The information provided in this section is based on the following reference(s): Engineering Technical Evaluation, ETE-CPR-2012-0012, "Beyond Design Basis – FLEX Strategy Overall Integrated Plan Basis Document," Revision 2. Calculation MISC-11793, "Evaluation of Long Term Containment Pressure and Temperature Profiles Following Loss of Extended AC Power (ELAP)," Revision 0.

D – Maintain Containment	
D.2 - 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. Evaluations have been performed and conclude that Containment temperature and pressure will remain below design limits, and key parameter instruments subject to Containment environment will remain functional for at least seven days. Therefore, actions to reduce Containment temperature and pressure and to ensure continued functionality of the key parameters will not be required immediately and will utilize off-site equipment and resources during Phase 3. There is no separate Phase 2 strategy.	
Details:	
D.2.1 - Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation* None required for Phase 2.
D.2.2 - Identify modifications	*List modifications* None required for Phase 2.
D.2.3 - Key Containment Parameters	*List instrumentation credited or recovered for this coping evaluation.* Although a Phase 2 strategy is not required to maintain Containment, the Phase 1 Containment monitoring instrumentation will continue to be powered during Phase 2 from portable generators.
D.2.4 - Storage / Protection of Equipment: **Describe storage / protection plan or schedule to determine storage requirements**	
Seismic	*List how equipment is protected or schedule to protect.* None required for Phase 2.
Flooding	*List how equipment is protected or schedule to protect.* None required for Phase 2.
Severe Storms with High Winds	*List how equipment is protected or schedule to protect.* None required for Phase 2.
Snow, Ice, and Extreme Cold	*List how equipment is protected or schedule to protect.*

	None required for Phase 2.
High Temperatures	*List how equipment is protected or schedule to protect.* None required for Phase 2

D.2.5 - Deployment Conceptual Modification
(Attachment 3 contains Conceptual Sketches)

Strategy	**Modifications**	**Protection of connections**
a. *Identify Strategy including how the equipment will be deployed to the point of use.* None required for Phase 2.	*Identify modifications* None required for Phase 2.	*Identify how the connection is protected* None required for Phase 2.

Notes:

The information provided in Section D.2 is based on the following reference(s):

Engineering Technical Evaluation, ETE-CPR-2012-0012, "Beyond Design Basis – FLEX Strategy Overall Integrated Plan Basis Document," Revision 2.

Dominion Nuclear Engineering Calculation MISC-11793, "Evaluation of Long Term Containment Pressure and Temperature Profiles Following Loss of Extended AC Power (ELAP)," Revision 0.

D. Maintain Containment

D.3 - 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.

An evaluation has been performed and concludes that Containment temperature and pressure will remain below design limits, and key parameter instruments subject to Containment environment will remain functional for at least seven days. To remain within analyzed limits for equipment qualification temperature, the Containment temperature will be procedurally monitored and, if necessary, the temperature will be reduced. This will require the implementation of the Phase 3 Containment cooling strategy such that heat removal from Containment is initiated in a timely manner.

The strategy to reduce Containment temperature is to provide for Containment heat removal through water spray into the Containment atmosphere using portable pumps, the installed Recirculation Spray (RS) system pumps, and Quench Spray (QS) rings. This strategy requires repowering a Class 1E 4160VAC and 480VAC bus using a 4160VAC DG from the Regional Response Center (RRC) and restoration of cooling water flow (Service Water) to the RS heat exchanger. An alternate strategy is also available which will provide Containment ventilation cooling using the Containment Air Recirculation (CAR) system fans.

Primary Containment Cooling Strategy – Containment Recirculation Spray

The 4160VAC DG from the RRC will be aligned to power a Class 1E 4160VAC and 480VAC bus as described in Section F1.3, which will provide power to the RS pump 480v (or 4kV, depending upon the selected pump) motor.

The Containment sump must be filled to provide a suction water source for the RS pump. The Casing Cooling Tank will be gravity drained to the Containment sump by establishing the flowpath alignment and flowing through the idle Casing Cooling pumps. Since the volume of water from this tank is not sufficient to adequately fill the Containment sump, water from the Refueling Water Storage Tank (RWST) will be pumped through the spray ring header nozzles into Containment using the RRC Low Pressure / Medium Flow pump connected to the BDB RCS/QS Pump Suction connection, located in the Quench Spray Pump House (QSPH), and discharging to the BDB QS Blind Flange connection located in the Safeguards Building (refer to Figure 13). This initial flow will provide heat removal from the Containment atmosphere and will fill the Containment sump in preparation for initiation of Containment RS flow. When the Containment sump level is adequate, an RS pump will be started to draw water from the sump and recirculate flow through the RS heat exchangers and the spray nozzles. Service Water (SW) system flow will be established through the RS heat exchangers to provide a heat sink. In this manner, Containment atmosphere heat will be rejected to the ultimate heat sink via the sump water recirculation spray flowpath.

The Casing Cooling Tank and RWST are not high wind and associated missile protected, and if unavailable as a water source to fill the Containment sump, adequate sump inventory can be provided from the Service Water Reservoir or Lake Anna. Raw water from these sources can be pumped to the BDB QS Blind Flange connection using the BDB High Capacity pump or the RRC

D. Maintain Containment

Low Pressure / Medium Flow pump. Water strainers are provided for this use to prevent clogging of the CS ring header nozzles (Refer to Figure 13).

In the event that the Service Water system pumps are unavailable, the SW system can be pressurized by the site diesel-driven Fire Protection (FP) system pump drawing from the Service Water Reservoir, or by a portable RRC Low Pressure / High Flow pump (or two RRC Low Pressure / Medium Flow pumps). The FP pump pressurizes the FP main piping and, through the Auxiliary Feedwater (AFW) pump supply connection, can be aligned to flow to the SW system and provide cooling water flow through the RS heat exchangers. The FP pump is adequately sized to provide flow to the turbine-driven AFW pump suction (described in Section B.1) and flow to the RS heat exchangers. **[Open Item 5]** Alternately, a portable RRC Low Pressure / High Flow pump (or two RRC Low Pressure / Medium Flow pumps) will be located near the Service Water Chemical Addition Building to draw from the Service Water Reservoir and discharge to the SW system via a flanged opening in the 36" piping in the Service Water Pump House Expansion Joint Vault using a hose adapter (see Figure 14).

The seismic Category 1 Service Water Pump House Expansion Joint Vault is designed to withstand missiles and high wind. The system connection points are located inside the structure and are protected from flooding, extreme cold, ice and snow, and extreme high temperature.

Thermal/hydraulic and Containment analyses will be performed to support this Containment cooling strategy **[Open Item 5]**.

Alternate Containment Cooling Strategy – Containment Ventilation Cooling

The 4160VAC DG from the RRC will be aligned to power a Class 1E 4160VAC and 480VAC bus as described in Section F1.3, which will provide power to Component Cooling (CC) Water system and SW pump (if available) 4kV motors, an Instrument Air (IA) system compressor, and Containment Air Recirculation (CAR) fan motors. Containment ventilation flow will be established by starting the CAR fan with air flow through the CAR fan coil unit and recirculating within the Containment. Instrument Air (IA) system pressure will be restored to remotely operate valves inside Containment, as required. SW system flow will be established through a CC heat exchanger to provide a heat sink, and CC flow will be established through the CAR fan coil unit and the CC heat exchanger to transfer heat to the SW system. In this manner, Containment atmosphere heat will be rejected to the ultimate heat sink via the recirculation of Containment atmosphere through the CAR fan coil unit.

In the event that the SW pumps are unavailable, cooling water flow to the CC heat exchanger will be established by pressurizing the SW system as described for the primary Containment cooling strategy.

Thermal/hydraulic and Containment analyses will be performed to support this Containment cooling strategy **[Open Item 5]**.

D. Maintain Containment	
Details:	
D.3.1 - Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation* Site specific procedural guidance governing the Containment cooling strategy will be developed using industry guidance and will address the necessary steps to align and operate permanent plant equipment, deploy portable pumps and hoses, establish connections, and operate the portable equipment to perform the required function. **[Open Item 7]**
D.3.2 - Identify modifications	*List modifications* The BDB QS Blind Flange connection consists of a tee in the QS pump discharge line, located in the Safeguards Building, closed with a blind flange, which can be removed for installation a hose adapter. **[Open Item 12]**
D.3.3 - Key Containment Parameters	*List instrumentation credited or recovered for this coping evaluation.* Containment Pressure: Containment pressure indication is available in the main control room (MCR) throughout the event. Containment Wide Range Temperature: Containment wide range temperature indication is available in the MCR throughout the event. Containment Sump Level: Containment sump level indication is available in the MCR throughout the event.

D.3.4 - Deployment Conceptual Modification
(Attachment 3 contains Conceptual Sketches)

Strategy	Modifications	Protection of connections
a. *Identify Strategy including how the equipment will be deployed to the point of use.* The primary strategy for Containment cooling is to provide Containment RS flow using installed plant equipment and portable pumps. Water from the RWST will be pumped into Containment to fill the Containment sump using the RRC Low Pressure /	*Identify modifications* (The BDB RCS/QS Pump Suction connection is described in Section C.3.4) The BDB QS Blind Flange connection consists of a tee in the QS pump discharge line, located in the Safeguards Building, closed with a blind	*Identify how the connection is protected* (The protection of the BDB RCS/QS Pump Suction connection is described in Section C.3.4) The BDB QS Blind Flange connection is located in the seismic category I Safeguards Building, and is protected from

D. Maintain Containment		
Medium Flow pump connected to the BDB RCS/QS Pump Suction connection, located in the QSPH, and discharging to the BDB QS Blind Flange connection, located in the Safeguards Building, through flexible hoses. The pump will be received from the RRC and staged in the yard area near the RWST. Hoses will be routed to inside the QSPH and Safeguards Building to the BDB connections providing pump suction and discharge flowpaths. See Figure 13. The Casing Cooling Tank and RWST are not protected from high winds and associated missiles. If these tanks are not available for response to an ELAP, raw water from the Service Water Reservoir or from Lake Anna can be pumped to the BDB QS Blind Flange connection using the BDB High Capacity pump or the RRC Low Pressure / Medium Flow pump. The BDB High Capacity pump would be deployed from the BDB Storage Building and located near the Service Water Pump House or the Intake Structure for suction from the reservoir or lake, respectively. Pump discharge flexible hoses would be routed to the BDB QS Blind Flange connection in the Safeguards Building. Water strainers are provided at the pump suction to prevent clogging of the CS ring header nozzles. See Figure 13. If the RRC Low Pressure / Medium Flow pump is used, the pump	flange, which can be removed for installation a hose adapter.	high wind generated missiles, floods, and extreme high and low temperatures.

D. Maintain Containment		
will be received from the RRC and staged near the Service Water Pump House or the Intake Structure for suction from the reservoir or lake, respectively. Hose routing, suction strainers, and system connections are the same as for the BDB High Capacity pump. In the event that the Service Water system pumps are unavailable to provide cooling water flow to the RS heat exchangers, the SW system can be pressurized by the installed diesel-driven Fire Protection (FP) system pump drawing from the Service Water Reservoir, or by a portable RRC Low Pressure / High Flow pump (or two RRC Low Pressure / Medium Flow pumps). If used, the portable RRC Low Pressure / High Flow pump (or two RRC Low Pressure / Medium Flow pumps) will be received from the RRC and staged near the Service Water Chemical Addition Building to draw from the Service Water Reservoir and discharge to the SW system via a flanged opening in the 36" piping in the Service Water Pump House Expansion Joint Vault using a hose adapter. Flexible hoses will be routed from the pump discharge to the hose adapter. See Figure 14. The alternate strategy for Containment cooling is to provide Containment ventilation		

D. Maintain Containment		
cooling using installed plant equipment and portable pumps. In the event that the SW pumps are unavailable, cooling water flow to the CC heat exchanger will be established by pressurizing the SW system as described for the primary Containment cooling strategy. See Figure 14.		

Notes:

The information provided in this section is based on the following reference(s):

Engineering Technical Evaluation, ETE-CPR-2012-0012, "Beyond Design Basis – FLEX Strategy Overall Integrated Plan Basis Document," Revision 2.

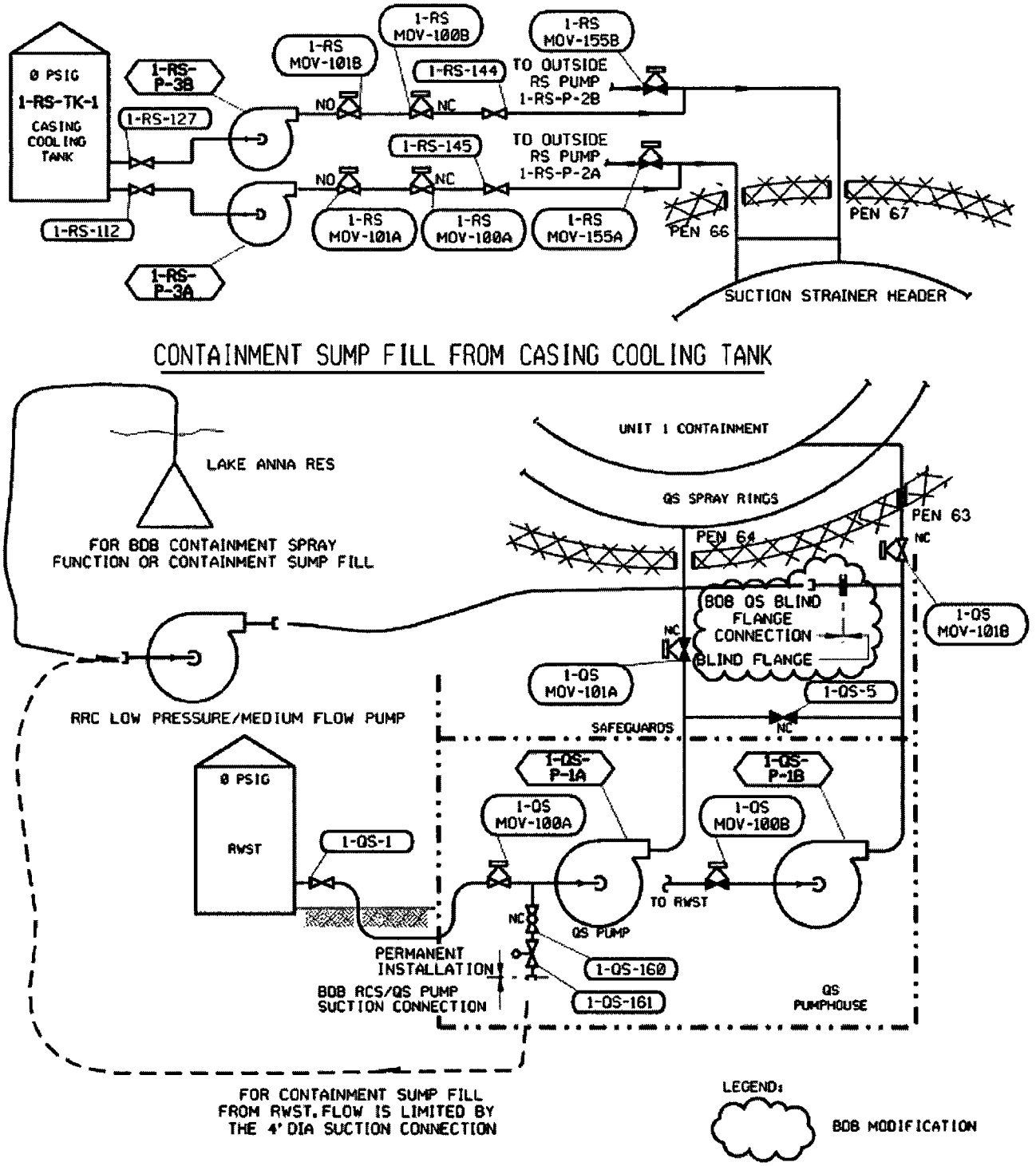

FIGURE 13
CONTAINMENT COOLING
BDB FLEX PRIMARY MECHANICAL CONNECTIONS
NORTH ANNA UNIT 1 (TYPICAL FOR UNIT 2)

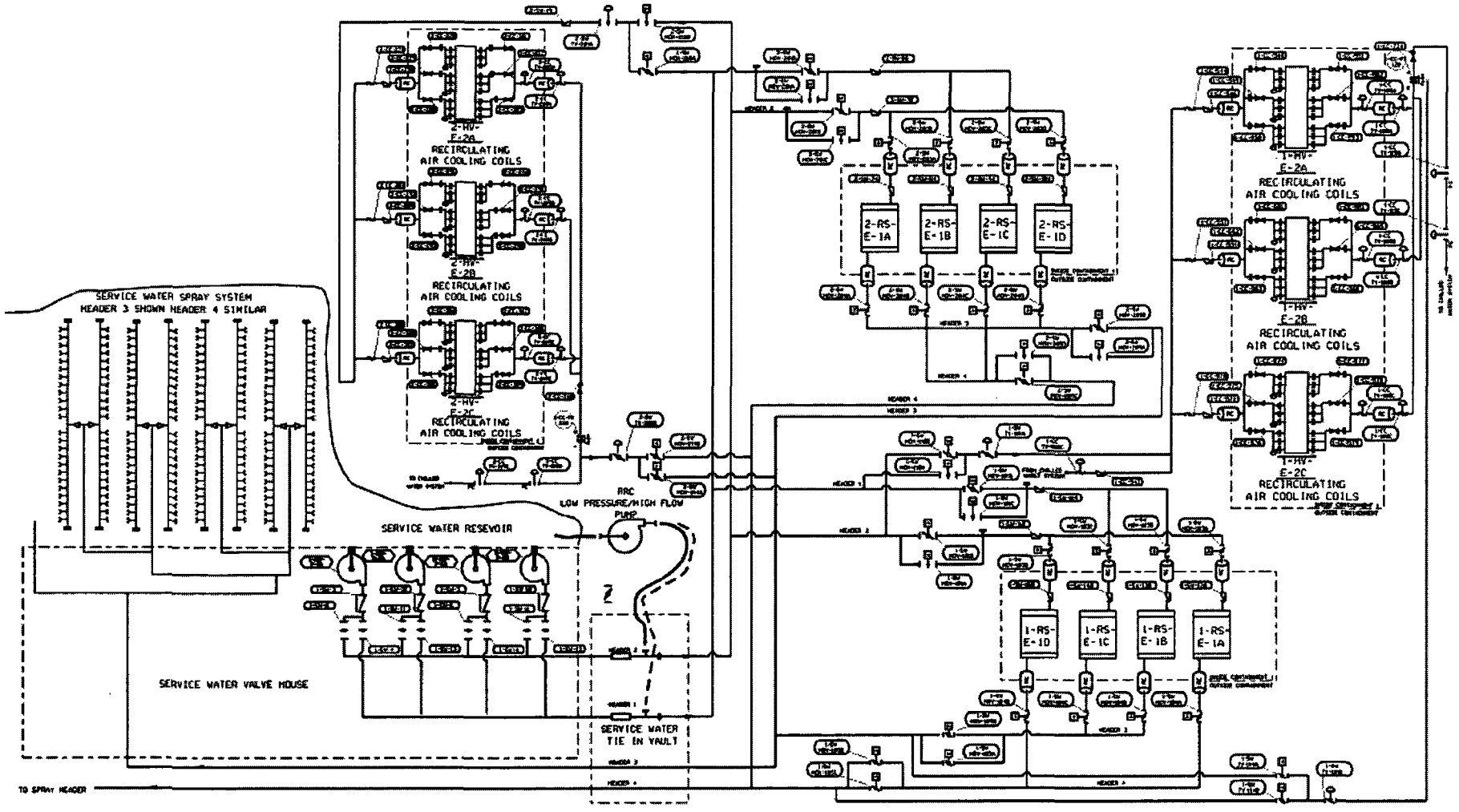

FIGURE 14
CONTAINMENT COOLING
BDB FLEX ALTERNATE MECHANICAL CONNECTIONS
NORTH ANNA UNITS 1 AND 2

F5 - Safety Functions Support (Ventilation)
9.1.1.1 **Determine Baseline coping capability with installed coping[2] modifications not including FLEX modifications.**
F5.1 - 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. The FLEX strategies for maintenance and/or support of safety functions involve several elements. One element is to ensure that ventilation, heating, and cooling are adequate to maintain acceptable environmental conditions for equipment operation and personnel habitability. Per the guidance given in NEI 12-06, FLEX strategies must be capable of execution under the adverse conditions (unavailability of installed plant lighting, ventilation, etc.) expected following a BDB External Event (BDBEE) resulting in an ELAP/LUHS. The primary concern with regard to ventilation is the heat buildup which occurs with the loss of forced ventilation in areas that continue to have heat loads. The key areas identified for all phases of execution of the FLEX strategy activities are the MCR, ESGR, MSVH (SG PORV area), TDAFW pump room, Quench Spray pumphouse, Auxiliary Building, and the Mechanical Equipment Room in the Turbine Building. These areas have been evaluated using the GOTHIC-7.2a computer code to determine the temperature profiles following an ELAP/LUHS event. With the exception of the TDAFW pump room, results of the calculation have concluded that temperatures remain within acceptable limits based on conservative input heat load assumptions for all areas with no actions being taken to reduce heat load or to establish either active or passive ventilation (e.g., portable fans, open doors, etc.) In the case of the TDAFW Pump room, the door to the pump room will be opened and left open within 4 hours of the ELAP to ensure that the temperatures remain within the acceptable range for equipment and personnel habitability. This action taken for the TDAFW pump room in Phase 1 will be in effect as long as the TDAFW pump is in service. The temperatures expected in the MSVH for local operation of the SG PORV (OIP Section B.1) are similar to conditions experienced during normal station operations, testing, and maintenance. Therefore, actions performed for FLEX activities will be essentially the same as those performed for the current site procedure ECA-0.0, *Loss of All AC Power*, which also addresses local operation of the SG PORVs.

[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.

Details:	
F5.1.1 - Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation.* The FLEX strategy procedures will include the action to open the door to the TDAFW pump room to allow for circulation of air. This action alone will ensure that the temperatures in the room remain acceptable. No other actions are required to maintain equipment operation or personnel habitability following an ELAP/LUHS event in Phase 1.
F5.1.2 - Identify modifications	*List modifications and describe how they support coping time.* No ventilation related modifications are required for any phase of the ELAP/LUHS response.
F5.1.3 - Key Parameters	*List instrumentation credited for this coping evaluation phase.* No key ventilation parameters have been identified as required to maintain acceptable equipment and personnel environments for any phase of the ELAP/LUHS response.
Notes: The information provided in this section is based on the following reference(s): – Calculation ME-0972, Evaluation of Room Air Temperatures Following Extended Loss of All AC Power (ELAP), Revision 0, Addendum A.	

F5 - Safety Functions Support (Ventilation)	
F5.2 - 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. Per the guidance given in NEI 12-06, FLEX strategies must be capable of execution under the adverse conditions (unavailability of installed plant lighting, ventilation, etc.) expected following a BDBEE resulting in an ELAP/LUHS. A calculation has been performed to evaluate ventilation concerns for areas where Phase 2 FLEX strategy activities are performed. Results of the calculation have concluded that temperatures remain within acceptable limits in these areas based on conservative input heat load assumptions and with no additional actions being taken to reduce heat load or to establish either active or passive ventilation (e.g., portable fans, open doors, etc.). Therefore, no Phase 2 actions are required to maintain equipment operation or personnel habitability. The action taken for the TDAFW pump room in Phase 1 will be in effect as long as the TDAFW pump is in service. An additional ventilation concern applicable to Phase 2 is the potential buildup of hydrogen in the battery rooms. Off-gassing of hydrogen from batteries is only a concern when the batteries are charging. Once a 480VAC power supply is restored in Phase 2 (OIP Section F1.2) and the station Class 1E batteries begin re-charging, power is also restored to the battery room ventilation fans to prevent any significant hydrogen accumulation.	
Details:	
F5.2.1 - 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.* No procedures/strategies are required to maintain any Phase 2 equipment operation or personnel habitability following an ELAP/LUHS event.
F5.2.2 - Identify modifications	*List modifications necessary for phase 2* No ventilation related modifications are required for any phase of the ELAP/LUHS response.
F5.2.3 - Key Parameters	*List instrumentation credited or recovered for this coping evaluation.* No key ventilation parameters have been identified as required

F5 - Safety Functions Support (Ventilation)		
F5.2 - PWR Portable Equipment Phase 2		
	to maintain acceptable equipment and personnel environments for any phase of the ELAP/LUHS response.	
F5.2.4 - Storage / Protection of Equipment : Describe storage / protection plan or schedule to determine storage requirements		
Seismic	*List how equipment is protected or schedule to protect* No Phase 2 BDB equipment is required.	
Flooding	*List how equipment is protected or schedule to protect* No Phase 2 BDB equipment is required.	
Severe Storms with High Winds	*List how equipment is protected or schedule to protect* No Phase 2 BDB equipment is required.	
Snow, Ice, and Extreme Cold	*List how equipment is protected or schedule to protect* No Phase 2 BDB equipment is required.	
High Temperatures	*List how equipment is protected or schedule to protect* No Phase 2 BDB equipment is required.	
F5.2.5 - Deployment Conceptual Design		
Strategy	**Modifications**	**Protection of connections**
a. *Identify Strategy including how the equipment will be deployed to the point of use.* There is no required deployment of supplemental ventilation equipment in the ELAP/LUHS coping strategies. Although no additional compensatory cooling measures, other than those	*Identify modifications* No ventilation related modifications are needed to support the implementation of the ELAP/LUHS coping strategies.	*Identify how the connection is protected* No ventilation related connections are needed to support the implementation of the ELAP/LUHS coping strategies.

F5 - Safety Functions Support (Ventilation)		
F5.2 - PWR Portable Equipment Phase 2		
identified for the TDAFW pump room, are expected to be necessary, for defense in depth, the operating staff will periodically monitor area temperatures to insure habitability and equipment survivability conditions are acceptable. Additional natural convection flow paths or portable ventilation fans and/or stand alone AC units may be utilized if the area temperature measurements indicate unacceptable increasing trends.		
Notes: The information provided in this section is based on the following reference(s): – Calculation ME-0972, Evaluation of Room Air Temperatures Following Extended Loss of All AC Power (ELAP), Revision 0.		

F5 - Safety Functions Support (Ventilation)	
F5.3 - 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. Per the guidance given in NEI 12-06, FLEX strategies must be capable of execution under the adverse conditions (unavailability of installed plant lighting, ventilation, etc.) expected following a BDBEE resulting in an ELAP/LUHS. A calculation has been performed to evaluate ventilation concerns for areas where Phase 3 FLEX strategy activities are performed. Results of the calculation have concluded that temperatures remain within acceptable limits in these areas based on conservative input heat load assumptions and with no additional actions being taken to reduce heat load or to establish either active or passive ventilation (e.g., portable fans, open doors, etc.). Therefore, no Phase 3 actions are required to maintain equipment operation or personnel habitability.	
Details:	
F5.3.1 - 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.* No procedures/strategies are required to maintain any Phase 3 equipment operation or personnel habitability following an ELAP/LUHS event.
F5.3.2 - Identify modifications	*List modifications necessary for phase 3* No ventilation related modifications are required for any phase of the ELAP/LUHS response.
F5.3.3 - Key Parameters	*List instrumentation credited or recovered for this coping evaluation.* No key ventilation parameters have been identified as required to maintain acceptable equipment and personnel environments for any phase of the ELAP/LUHS response.

F5 - Safety Functions Support (Ventilation)		
F5.3 - PWR Portable Equipment Phase 3		
F5.3.4 - Deployment Conceptual Design		
Strategy	**Modifications**	**Protection of connections**
a. *Identify Strategy including how the equipment will be deployed to the point of use.* There is no required deployment of supplemental ventilation equipment in the ELAP/LUHS coping strategies. Although no additional compensatory cooling measures, other than those identified for the TDAFW pump room, are expected to be necessary, for defense in depth, the operating staff will periodically monitor area temperatures to insure habitability and equipment survivability conditions are acceptable. Additional natural convection flow paths or portable ventilation fans and/or stand alone AC units may be utilized if the area temperature measurements indicate unacceptable increasing trends.	*Identify modifications* No ventilation related modifications are needed to support the implementation of the ELAP/LUHS coping strategies.	*Identify how the connection is protected* No ventilation related connections are needed to support the implementation of the ELAP/LUHS coping strategies.
Notes: The information provided in this section is based on the following reference(s): – Calculation ME-0972, Evaluation of Room Air Temperatures Following Extended Loss of All AC Power (ELAP), Revision 0.		

Attachment 3

Formal Responses to October 2013 Audit Questions

North Anna Power Station Units 1 and 2

Virginia Electric and Power Company (Dominion)

Response to October 2013 Audit Questions
North Anna Power Station

Background

By letter dated February 28, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13063A182), Virginia Electric and Power Company (Dominion) submitted an Overall Integrated Plan (OIP) in response to the March 12, 2012, U.S. Nuclear Regulatory Commission (NRC) Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049; ADAMS Accession No. ML12056A045) for North Anna Power Station (NAPS) Units 1 and 2, which is consistent with NEI 12-06.

The NRC staff reviewed the February 28, 2013 OIP submittal for NAPS and conducted an audit of the OIP in October 2013. Some of the information provided during that audit is presented below.

NRC Audit Question No. 3

As discussed in NEI 12-06, Section 6, the evaluation of external flood-induced challenges has three parts. The first part is determining whether the site is susceptible to external flooding. As further discussed in NEI 12-06, Section 6, for the characterization of the applicable flood hazard, each site that has identified that external flooding is an applicable hazard should review the current design basis to determine which external floods are limiting.

The licensee failed to provide a definitive statement as to whether the site is determined to be a "dry site" or "wet site". Further, since the licensee's plan does address the hazards of flooding, a characterization of the applicable flood hazard should be made to determine which external floods are limiting. Therefore, the licensee's integrated plan with respect to screening for external flooding hazard fails to provide reasonable assurance that the plan is consistent with the guidance found in NEI 12-06, Section 6.

The licensee is requested to provide a definitive statement as to whether the site is determined to be a "dry site" or "wet site", and to provide a characterization of the flood hazard to identify which external floods are limiting.

Dominion Response:

Per the definitions provided in Section 6.2.1 of NEI 12-06, NAPS is a "wet" site because the site is kept "dry" by a permanently installed dike. Specifically, although the majority of the site grade is above the Design Basis Flood Level (DBFL) for the NAPS site, the western portion of the Unit 2 Turbine Building is protected by a dike to prevent flooding during a design basis flood. There is no deployment or transport of FLEX equipment in the area west of the Unit 2 Turbine Building, therefore, there are no deployment limitations due to flooding from a design basis flood.

A characterization of the applicable flood hazards is provided in the NAPS Overall Integrated Plan, Section A.1, pages 2 and 3. The DBFL is based on the maximum potential lake level of 267.3' msl resulting from a Probable Maximum Precipitation (PMP) event over the Lake Anna watershed causing a significant rise in lake level.

By letter dated March 11, 2013, NAPS submitted its Flooding Hazards Reevaluation Report (FHRR) per the requirements of NTTF Recommendation 2.1: Flooding. The FHRR identified a Local Intense Precipitation (LIP) event as a more limiting event than what was considered in the NAPS Current Licensing Basis. A detailed characterization of the LIP event, the potential site vulnerabilities from the LIP, and actions being taken are provided in the March 11, 2013 letter (Serial No. 13-121) (ML13074A925 and ML13318A107).

NRC Audit Question No. 8

NEI 12-06, Rev. 0, as endorsed by JLD-ISG-2012-01, Rev. 0, in Section 3.2.2, guideline (12) states that Plant procedures/guidance should consider loss of heat tracing effects for equipment required to cope with an ELAP. Alternate steps, if needed, should be identified to supplement planned action.

Heat tracing is used at some plants to ensure cold weather conditions do not result in freezing important piping and instrumentation systems with small diameter piping. Procedures/guidance should be reviewed to identify if any heat traced systems are relied upon to cope with an ELAP. For example, additional condensate makeup may be supplied from a system exposed to cold weather where heat tracing is needed to ensure control systems are available. If any such systems are identified, additional backup sources of water not dependent on heat tracing should be identified.

The licensee plan did not address the loss of heat tracing in the integrated plan. The licensee screened in for extreme cold, ice and snow and thus there is a need for the licensee to address loss of heat tracing effects on FLEX strategies.

The licensee is requested to provide a discussion on the effects of the loss of heat tracing in regards to the effects for equipment required to cope with an ELAP, including alternate steps, if needed, to supplement planned actions.

Dominion Response:

Heat trace is used to provide two protection functions:

- Heat trace is used to maintain highly concentrated soluble boron solutions above the temperature where the soluble boron will precipitate out of solution.

- Heat trace is also used to protect piping systems and components from freezing in extreme cold weather conditions.

The FLEX strategies that have been developed do not depend on highly concentrated soluble boron solutions. The FLEX strategies will use borated water sources with boron concentrations below 4000 PPM; therefore, boron precipitation is not expected to occur.

Additionally, the FLEX strategies have been developed to protect the existing piping systems and components from freezing. Commercially available Heat Tape and insulation rolls will be maintained in the BDB Storage Building for use on piping systems and components that will be used during an ELAP event where freezing is a concern in extreme cold weather conditions. In addition, major components being procured for FLEX strategies are being provided with cold weather protection packages and small electrical generators to power the heat tape circuits as well as protect the equipment from damage due to extreme cold weather and help assure equipment reliability. In addition, the Emergency Condensate Storage Tank level instrument tubing credited for BDB and subject to freezing conditions during an ELAP, will be protected with the use of heat lamps which can be powered from small generators that have been procured for FLEX strategies or from the small generators that will be included as part of the large BDB pump skids being purchased.

Equipment used for the mixing of borated water in the portable Boric Acid Batch Tanks will include components such as an agitator and a tank heater to facilitate complete dissolution of the boric acid crystals. FLEX Strategies will provide guidance for mixing to maintain concentrations below the solubility limit corresponding to freezing temperatures. This will ensure that boron precipitation does not occur during an extreme cold weather event.

NRC Audit Question No. 13

On pages one and two of the licensee's submittal, the licensee states that during a seismic event in August 2011 the peak ground acceleration (PGA) values exceeded the horizontal and vertical design basis PGA values. In addition, the licensee states that that there was no significant physical or functional damage to seismically designed SSCs and the seismic hazard remains the design basis earthquake.

The development of a site specific SSE is based on the maximum probable earthquake for the site and surrounding area and the resulting PGA. In relation to reasonable protection of FLEX equipment, the staff requests that the licensee provide a justification for using a base seismic hazard that is lower than the currently known maximum probable PGA.

Dominion Response:

Consistent with NEI 12-06, Section 5.3.1.1.a, stored FLEX equipment will be protected within a structure that meets the NAPS design basis for the Safe Shutdown Earthquake (SSE). In

accordance with the NAPS licensing basis, and as stated in the response to NRC Licensing Branch Q3 provided in Dominion letter S/N 11-577B dated October 28, 2011 (ML11305A091), the design-basis was not re-evaluated to define a new SSE following the magnitude 5.8 earthquake that occurred on August 23, 2011. As described in Dominion letter S/N 11-577C dated November 4, 2011 (ML11312A243), NAPS has implemented a Seismic Margin Management Plan (SMMP) applicable to future plant design modifications to maintain adequate seismic margins. The SMMP accounts for the seismic loadings resulting from the August 23, 2011 earthquake using in-structure response spectra developed from actual time-histories recorded during the event. The SMMP was applied to the design of the BDB Storage Building.

NRC Audit Question No. 14

In developing the basis for protecting equipment from external events, the licensee uses outdated data. For example, when determining the extent of the effects snow, ice, and cold temperature at NAPS the licensee uses data from 1977 to 1987. This date range leaves a gap of more than 25 years of current data. The staff requests that the licensee provide a justification for not using current data when developing a basis for the protection of FLEX equipment.

Dominion Response:

As stated in the Overall Integrated Plan (OIP) Section A.1, the data provided in the OIP to develop the basis for protecting equipment was taken from the current licensing basis for NAPS (i.e., the Updated Final Safety Analysis Report). Justification for the use of this data is as follows:

1. Current event data from the August 23, 2011 seismic event was addressed in OIP Section A.1 and has been included in the UFSAR.

2. The record high temperature and record low temperature for Richmond, VA stated in the OIP have been confirmed to be accurate, based on published data for the southeast region of the US, up through 2012.

(References: http://www.sercc.com/climateinfo/historical/recordlow.html and http://www.sercc.com/climateinfo/historical/recordhigh.html).

3. As stated in the response to NRC Audit Question No. 20, the design basis flood reported in the NAPS Units 1 and 2 UFSAR is essentially unchanged from the most recent NAPS Unit 3 COL Application results. However, the determination of the design basis flood is not based on historical data, but on regional parameters. The NAPS Unit 3 evaluation used the currently applicable parameters.

4. Industry design values are used for tornado wind speeds, not historical data.

5. Straight line wind data available is only 85% of the predicted 100-year wind speed used for the NAPS Units 1 and 2 design criteria. The most significant hurricane to impact Richmond, VA since the NAPS UFSAR wind data was compiled was Hurricane Isabel in September 2003. The maximum wind "gusts" recorded during Hurricane Isabel were 71 mph which are still below the NAPS wind speed design criteria.

(Reference: http://www.glenallenweather.com/alink/09hur/richmondhur.pdf).

Therefore, the characterization of external events provided in Section A.1 of the OIP is both consistent with the NAPS current licensing basis and appropriate for the development of the basis for the protection of FLEX equipment.

NRC Audit Question No. 20

On page three of the licensee's submittal, the licensee states that the current flood analysis for Unit 3 is applicable according to NEI 12-06. The staff request that the licensee clarify whether all of the information regarding external flooding in the submittal is derived from the most recent flood analysis (i.e., Unit 3 flood analysis).

Dominion Response:

The information in the OIP Section A.1 regarding external flooding was based on the current NAPS Units 1 and 2 Update Final Safety Analysis Report (UFSAR), not the NAPS Unit 3 COLA. However, since a seiche event had not been addressed in the NAPS Units 1 and 2 UFSAR, a reference to the NAPS 3 COLA evaluation was used for completeness.

Since the submittal of the NAPS OIP, Dominion has completed and submitted the Flood Hazard Reevaluation Report (FHRR) for NAPS per the requirements of NTTF Recommendation 2.1: Flooding. The reevaluation represents the most current flooding analysis for NAPS Units 1 and 2. The reevaluation results were mostly bounded by the original NAPS UFSAR site flooding vulnerabilities and characteristics, in that the non-events such as seiche and dam failures continued to be non-events. The maximum flood level due to elevated lake levels resulting from a Probable Maximum Precipitation (PMP) event over the Lake Anna watershed exceeded the UFSAR value by 0.1'. This difference is insignificant since the plant grade is nearly 4' ft above this flood level.

The only significant difference identified from the UFSAR was a Local Intense Precipitation (LIP) event. Using conservative drainage assumptions and current PMP rates, some areas of the site were subject to short term flooding which required minimal protective actions.

Details of the LIP event can be obtained from Section 2.1 of the FHRR that was submitted to the NRC on March 11, 2013 (Serial No. 13-121) (ML13074A925 and ML13318A107).

Therefore, the most current analysis for flooding is the FHRR for NAPS, and is neither the current NAPS Units 1 and 2 UFSAR nor the NAPS Unit 3 COLA.

NRC Audit Question No. 25

Please clarify the means of communication between the control room and local equipment operators for the steam generator makeup pumps (i.e., TDAFW or FLEX pumps) and atmospheric dump valves to effect a symmetric cooldown of the reactor coolant system. Please further clarify whether environmental factors such as elevated temperatures or ambient noise of exiting steam have been considered in the evaluation to determine that the necessary coordination is feasible.

Dominion Response:

There are multiple communication strategies available to the operating staff. During the first couple of hours of an ELAP event the station's Public Address (PA) system (powered from the station vital 120VAC Bus) is expected to remain available. Following load stripping actions the PA system would become unavailable and the staff would then rely on BDB hand-held analog radios or on the site sound-powered phone circuits. Neither of these options rely on electrical power; however, the hand-held radios are powered by rechargeable batteries. Spare batteries will be available and the FLEX strategies include provisions to provide portable generators to power the various battery chargers. Should the analog radios experience difficulty with reception signal strength the staff would rely on the sound-powered phones circuits that are permanently installed throughout the plant.

In high noise areas, the sound-powered phone circuits will provide the preferred communication strategies since the head sets on these phones provide significant noise dampening attributes. Multiple phone circuits are available in the BDB response areas and the ability to cross-tie the phone circuits provides additional flexibility. BDB dedicated sound-powered headsets are being purchased as part of the FLEX strategies.

Temperatures in the Main Steam Valve House (MSVH) where local operation of the atmospheric dump valves (Steam Generator PORVs) would be manually performed have been evaluated and determined to remain in the normal operating range. Normal plant practices for accessing this area during full power operation would be employed in the event of an ELAP.

Therefore, local temperatures and high noise have been considered and communications with operators is expected to be effective and coordination of activities feasible.

NRC Audit Question No. 50

The licensees' plans for equipment maintenance and testing which endorses the EPRI industry program for maintenance which is currently under development does not provide reasonable assurance that guidance and strategies developed and implemented under them will conform to the guidance of NEI 12-06, Section 11.5 with respect to maintenance and testing. Please provide details of the EPRI industry program for maintenance and testing of FLEX electrical equipment such as batteries, cables, and diesel generators.

Dominion Response:

NEI 12-06 "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," Section 11.5 requires in part:

> "Portable equipment that directly performs a FLEX mitigation strategy for the core, Containment, or SFP should be subject to maintenance and testing guidance provided in INPO AP 913, Equipment Reliability Process, to verify proper function. The maintenance program should ensure that the FLEX equipment reliability is being achieved. Standard industry templates (e.g., EPRI) and associated bases will be developed to define specific maintenance and testing ...."

EPRI has completed and issued "Preventive Maintenance Basis for FLEX Equipment—Project Overview Report" (Report 3002000623). Preventative Maintenance Templates for several of the FLEX Portable diesel pumps and generators have been issued. Additional PM templates are under development for the remaining FLEX equipment. PM Templates include activities such as those listed below:

- Periodic Static Inspections – Monthly walkdown
- Fluid analysis (Yearly)
- Periodic operational verifications – Quarterly starts
- Periodic functional verifications with performance tests – Annual 1 hour run with pump flow and head verifications

The EPRI PM Templates for FLEX equipment will conform to the guidance of NEI 12-06 providing assurance the FLEX equipment is being properly maintained and tested.

EPRI Templates will be used for most equipment. However, in the event EPRI templates are not available, Preventative Maintenance (PM) actions will be developed based on manufacturer provided information / recommendations. Additionally, EPRI Templates will be adopted for new pieces of FLEX equipment as they are purchased / received on site.

NRC Audit Question No. 52

Please clarify whether you plan to abide by the Nuclear Energy Institute position paper addressing mitigating strategies in shutdown and refueling modes that is dated September 18, 2013 (ADAMS Accession No. ML13273A514), and which has been endorsed by the NRC staff (ADAMS Accession No. ML13267A382). If not, please clarify how mitigating strategies for shutdown and refueling modes will be addressed and provide justification for the planned approach.

Dominion Response:

NAPS will follow the Nuclear Energy Institute position paper entitled "Shutdown / Refueling Modes" addressing mitigating strategies in shutdown and refueling modes that is dated September 18, 2013 and has been endorsed by the NRC staff.