

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

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NL&OS/MAE: R1
Docket Nos.: 50-280/281
License Nos.: DPR-32/37

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY 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. 12-163B)
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. 12-163E)

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 previous six-month status report (Reference 3), including any changes to the compliance method, schedule, or need for relief and the basis.

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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

**Surry 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 Surry Power Station (Surry) 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 16), 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 OIP
- Develop Strategies
- Develop Training Plan
- Purchase Equipment
- Create Maintenance Procedures

3 Milestone Schedule Status

The following table provides an update to Attachment 2A of the OIP. It 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 Surry Units 1 and 2, but accurately reflect that each Unit's modifications will be implemented during the next scheduled refueling outage.

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

| Milestone | Target Completion Date | Activity Status | Revised Target Completion Date |
|--|-------------------------------|------------------------|---------------------------------------|
| Implement Training | August 2014 | Started | |
| Issue FLEX Support Guidelines and Associated Procedure Revisions | September 2014 | Started | December 2014* |
| Develop Strategies/Contract with National SAFER Response Center (NSRC) | August 2014 | Started | |
| Purchase Equipment | February 2014 | Complete | |
| Receive Equipment | August 2014 | Started | September 2014* |
| Validation Walk-throughs or Demonstrations of FLEX Strategies and Procedures | December 2014 | Not Started | |
| Create Maintenance Procedures* | August 2014 | Complete | |
| Unit 1 Outage Implementation | April 2015 | Started | May 2015* |
| Unit 2 Outage Implementation | October 2015 | Not Started | November 2015* |

* 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 OIP to address Beyond-Design-Basis (BDB) events at Surry Units 1 and 2 (Reference 1) as required by Order Number EA-12-049, dated March 12, 2012 (Reference 2). The first and second Six-Month Status Report of the OIP for Surry were provided by letters dated August 23, 2013 (Reference 15) and February 27, 2014 (Reference 16), respectively. The following are changes to the compliance method information provided in the Surry OIP, which continues to meet NEI 12-06 (Reference 3):

- a) Regarding the previously reported strategy for Modes 5 and 6 (designated Cold Shutdown and Refueling operational modes for Surry), credit was taken for the Refueling Water Storage Tanks (RWSTs) to provide a borated water source for injection into the Reactor Coolant System (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.

- b) 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. Additionally, use of water from the James River as a water source for either the primary or secondary sides of the NSSS is available, but is only considered a water source of last resort. The James River is also available as a water source for the Spent Fuel Pool.
- c) As a result of the water quality chemical analysis and evaluation (see item b above), the draft point for the BDB High Capacity Pump has been changed from the James River to the Settling Pond located adjacent to the site Protected Area (PA). The Settling Pond had previously been identified as an alternate onsite clean water source.
- 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 that are unlikely to fail provided they are appropriately inspected and maintained. The most likely cause of failure is mechanical damage during handling provided 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. Consequently, 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.
- g) On July 17, 2014, the SAFER Organization and the staff from Surry Power Station conducted a demonstration of SAFER's ability to activate the SAFER Control Center in Lynchburg, Virginia, as well as the Phoenix Regional Response Center, to deliver Phase 3 offsite equipment to the Surry site in accordance with the SAFER response plan. The NRC audited this Proof of Concept demonstration and provided observations.

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 Surry 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. | Not started. Scheduled completion date: December 2014 |
| 2 | 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 16, See Section 4, Item a.) |
| 3 | 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 and ECMT. The final durations will be provided when the analyses are completed. | Complete. (Reference 4) |

| 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. | Complete. (See Reference 16, Attachment 2.) |
| 5 | Analyses will be performed to develop fluid components performance requirements and confirm fluid hydraulic-related strategy objectives can be met. | Complete. 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) A hydraulic calculation to confirm that the SW flow to support the Containment cooling options is not required since the source is expected to be gravity fed from the Intake Canal. |
| 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 is being constructed at Surry 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 just east of the south employee parking lot, inside the Owner Controlled |

| Overall Integrated Plan Open Items | | |
|---|---|--|
| OI # | Description | Status |
| | | Area. The location lies in an area between the Surry Nuclear Information Center and the Intake Canal. This update provides the supplemental information referred to in this open item. (Reference 11) |
| 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: December 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. | Complete. 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 site compliance date for Order EA-12-049. 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. (Reference 19) |

| Overall Integrated Plan Open Items | | |
|---|--|--|
| OI # | Description | Status |
| 9 | An overall program document will be developed to maintain the FLEX strategies and their bases and to provide configuration control and change management for the FLEX Program. | Complete. The fleet-wide programmatic control procedure has been provided for Staff review through the ongoing NRC audit process. (Reference 20) |
| 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 will be provided via the ongoing NRC audit process. (Reference 18) |
| 11 | Plant modifications will be completed for permanent plant changes required for implementation of FLEX strategies. | Started. Scheduled completion date: See Milestone Schedule above. |
| 12 | The following actions will be completed to qualify the ECMT as a source of water to the TDAFW pump in response to an ELAP/LUHS event: (1) Upgrade the piping system from the ECMT to the TDAFW pump suction to Seismic Category I (2) Modify the TDAFW pump discharge piping to install local AFW flowrate indication (3) Confirm adequate TDAFW pump NPSH from the ECMT through the idle AFW booster pumps using conservative analysis. | Items (1) and (3): Complete (Reference 11, Section 2.1.6) Item (2): Started. Scheduled completion date: May 2015 (Unit 1) November 2015 (Unit 2)* |
| 13 | Complete the evaluation of TDAFW pump long term operation with ≤ 290 psig inlet steam pressure. | Complete. TDAFW pump operation and adequate AFW flow to the SGs at SG pressures ≤ 290 psig have been confirmed. (Reference 5) |
| 14 | 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 Reference 16, Attachment 2, OIP Section F5.) |

| Overall Integrated Plan Open Items | | |
|---|---|--|
| OI # | Description | Status |
| 15 | Analyses will be performed to develop electrical components performance requirements and confirm electrical loading-related strategy objectives can be met. | <p>Complete.</p> <p>Results for the sizing and loading analysis of the 120VAC and 480VAC generators confirm the electrical loading-related strategy objectives can be met. Final calculations confirming these results have been completed (Reference 13).</p> <p>Calculations identifying the Phase 3 4160VAC generator load requirements and power cable ampacity rating have been completed (Reference 14).</p> |
| 16 | An evaluation of all BDB equipment fuel consumption and required re-fill strategies will be developed including any gasoline required for small miscellaneous equipment. | <p>Complete.</p> <p>An evaluation of all BDB equipment fuel consumption and required refill strategies has been completed. (Reference 11)</p> |
| 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. | <p>Complete.</p> <p>A lighting study has been completed validating the adequacy of supplemental lighting and the adequacy and practicality of using portable lighting to perform FLEX Strategy actions. (Reference 11)</p> |

| Overall Integrated Plan Open Items | | |
|------------------------------------|---|---|
| OI # | Description | Status |
| 18 | A comprehensive study of communication capabilities is being performed in accordance with the commitments made in Dominion letter S/N 12-208F 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 Surry. 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 8) |
| 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. | Started. The soil liquefaction study has been completed (Reference 9), 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 10). A Haul Route Evaluation Report is scheduled for completion in November 2014*. |
| 20 | The equipment listed in Table 1 will be received on site. | Started. Scheduled completion date: September 2014* |

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

6.2 Open Items from the Interim Staff Evaluation (ISE)

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

| Interim Staff Evaluation Open Items | | |
|--|--|--|
| OI # | Description | Status |
| 3.2.1.8.A | Core Sub-Criticality- Verify that Surry will apply the generic resolution for boron mixing under natural circulation conditions potentially involving two-phase flow, in accordance with the Pressurized-Water Reactor Owners Group (PWROG) position paper, dated August 15, 2013 (ADAMS Accession No. ML13235A135 (non-public for proprietary reasons)), and subject to the conditions provided in the NRC endorsement letter dated January 8, 2014 (ADAMS Accession No. ML13276A183). Alternatively, justify the boric acid mixing assumptions that will ensure adequate shutdown margin exists through all 3 phases of an ELAP event. | This ISE OI is being addressed through the ongoing NRC audit process. (Generic) (Reference 18) |
| 3.2.4.10.A | Battery Duty Cycle. Verify that the licensee will abide by the generic approach for demonstrating that vented lead-acid batteries can be credited for durations longer than 8 hours, or justify an acceptable alternate approach. | This ISE OI is being addressed through the ongoing NRC audit process. (References 16 and 18) |

6.3 Confirmatory Items from the Interim Staff Evaluation (ISE)

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

| Interim Staff Evaluation Confirmatory Items | | |
|--|---|--|
| CI # | Description | Status |
| 3.1.1.2.A | Deployment of FLEX equipment- (Seismic Hazard, Flooding). Confirm protection of connections for maintaining containment-Phase 3. | This ISE CI is being addressed through the ongoing NRC audit process. (References 11 and 18) |
| 3.1.1.3.A | Procedural Interface Considerations - Seismic Hazard. Confirmation that the Flex Support Guidelines (FSG) being developed for obtaining local instrument readings addresses critical actions to perform until alternate indications can be connected. | This ISE CI is being addressed through the ongoing NRC audit process. (References 21 and 18) |
| 3.1.1.4.A | Off-Site Resources. Confirm ARC local staging area, evaluation of access routes, and method of transportation to the site. | This ISE CI is being addressed through the ongoing NRC |

| Interim Staff Evaluation Confirmatory Items | | |
|--|---|--|
| CI # | Description | Status |
| | | audit process. (Reference 18) |
| 3.2.1.A | RCS Cooling & RCS Inventory Control. Confirm the appropriate use of the analysis from Section 5.2 of WCAP-17601-P by demonstrating the important parameters and assumptions are representative of Surry. | This ISE CI is being addressed through the ongoing NRC audit process. (References 22 and 18) |
| 3.2.1.1.A | ELAP Analysis – Reliance on the NOTRUMP code for the ELAP analysis of Westinghouse plants is limited to the flow conditions prior to reflux condensation initiation. This includes specifying an acceptable definition for reflux condensation cooling. Confirm that the NOTRUMP code is used within acceptable limits. | This ISE CI is being addressed through the ongoing NRC audit process. (Generic) (Reference 18) |
| 3.2.1.2.A | RCP Seal Leakage. Confirm that, if the seals are changed to non-Westinghouse seals, the licensee addresses the acceptability of the use of non-Westinghouse seals, and provides the acceptable justification for the RCP seal leakage rates for use in the ELAP analysis, to include whether the FlowServe white paper justifies the use of the FlowServe N-9000 seals and bounds the 21 gpm/seal leakage rate assumed in the analysis. | This ISE CI is being addressed through the ongoing NRC audit process. (Generic) (Reference 18) |
| 3.2.1.2.B | RCP Seal Leakage. Confirm FlowServe white paper justifies that the integrity of the O-rings will be maintained above the temperature conditions experienced during the ELAP event (approximately 556 °F) and if the SG PORV modification to add a protected backup air bottle system has an impact in the analysis. | This ISE CI is being addressed through the ongoing NRC audit process. (Generic) (Reference 18) |
| 3.2.1.9.A | Use of Portable Pumps. Confirm that intermittent RCS injection by alternating between units is adequate using only one RCS injection pump. | This ISE CI is being addressed through the ongoing NRC audit process. (References 11 and 18) |
| 3.2.1.9.B | Use of Portable Pumps. Confirm the capacity of one high capacity pump can supply 300 gpm AFW flow to each unit's SG and 500 gpm to the dual unit SFP simultaneously. | This ISE CI is being addressed through the ongoing NRC audit process. (References 6 and 11) |
| 3.2.3.A | Containment. Confirm the Phase 3 coping strategy for containment is appropriate. | This ISE CI is being addressed through the ongoing NRC |

| Interim Staff Evaluation Confirmatory Items | | |
|---|--|---|
| CI # | Description | Status |
| | | audit process. (References 16 and 18) |
| 3.2.4.2.A | Ventilation - Equipment cooling. Confirm that the licensee's ventilation strategy adequately supports equipment cooling. | This ISE CI is being addressed through the ongoing NRC audit process. (References 16 and 18) |
| 3.2.4.4.A | Communications. Confirm that upgrades to the site's communications systems have been completed. | This ISE CI is being addressed through the ongoing NRC audit process. (References 8 and 18) |
| 3.2.4.6.A | Personnel Habitability- Elevated Temperature. Confirm appropriate plans are made to account for the results of the ventilation study for personnel habitability when complete. | This ISE CI is being addressed through the ongoing NRC audit process. (References 11 and 18) |
| 3.2.4.8.A | Electrical Power Source/Isolation and Interactions. Confirm that 2MW portable DGs are adequate to supply loads assumed in Phase 3. | This ISE CI is being addressed through the ongoing NRC audit process. (References 14 and 18) |
| 3.4.A | Confirm the licensee's arrangements for off-site resources addresses the guidance of Guidelines 2 through 10 in NEI 12-06, Section 12.2. | This ISE CI is being addressed through the ongoing NRC audit process. (Reference 18) |

7 Potential Safety Evaluation Impacts

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 Surry'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 (Reference 17).

8 Supplemental Information

This supplemental information provides details of the changes identified in the status updates above and addresses the following topics: a) the Milestone Task 'Develop Modifications,' b) the Milestone Task 'Implement Modifications,' c) the Milestone Task 'Issue FSGs and Associated Procedure Revisions,' d) a revision to Milestone Task 'Receive Equipment,' e) a revision to Milestone Task 'Create Maintenance Procedures,' f) the Milestone Task 'Unit 2 Outage Implementation,' g) a revision to Open Item No. 7, h) a revision to Open Item No. 12, i) a revision to Open Item No. 19, and j) a revision to Open Item No. 20.

- a. **Surry, Milestone Task 'Develop Modifications'**: The revision to the scheduled target completion date is needed to obtain final approval of the Surry communications upgrade modifications design change.
- b. **Surry, Milestone Task 'Implement Modifications'**: The revision separates Units 1 and 2 to more accurately reflect the actual tasks as they will occur for each Surry 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: May 2015

Milestone Task: Implement Unit 2 Modifications
Completion Schedule: November 2015

- c. **Surry, Milestone Task 'Issue FSGs and Associated Procedure Revisions'**: The revision to the scheduled milestone target completion date allows for completion of the Surry FSGs in line with the schedule for validation and training on the FSGs. (See also revision to Open Item 7.)
- d. **Surry, Milestone Task 'Receive Equipment'**: The majority of the purchased major equipment has been received onsite. However, delivery of the final items has been delayed and is not expected until September 2014. (See also revision to Open Item 20.)
- e. **Surry, 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.

- f. **Surry, Milestone Task 'Unit 1 Outage Implementation' and 'Unit 2 Outage Implementation'** : The Milestone Task dates are revised to reflect the current outage schedules which have been moved to May 2015 and November 2015, respectively.
- g. **Surry, Open Item 7:** The Open Item completion date is revised to December 2014. The revision to the scheduled milestone target completion date allows for completion of the Surry FSGs in line with the schedule for validation and training on the FSGs.
- h. **Surry, Open Item 12:** The revision to the status wording more accurately reflects the status for each Surry Unit. The split completion schedules reflect the current outage schedules.
- i. **Surry, Open Item 19:** The liquefaction aspect of this item has been completed. However, the documentation of the evaluation of the haul routes for obstacles is still in progress and will be completed by November 2014.
- j. **Surry, Open Item 20:** The large majority of the purchased major equipment has been received onsite. However, delivery of the final items has been delayed and is not expected until September 2014.

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 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. 12-163B).
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. Virginia Electric and Power Company 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. 12-163C).
5. Dominion Calculation ME-0969, "Evaluation of the TDAFW Pump Performance at Low Steam Generator Pressures," August 2013.
6. Dominion Calculation ME-0967, "Beyond Design Basis (BDB) – BDB High Capacity Pump and BDB AFW Pump Hydraulic Analysis for Spent Fuel Pool Makeup and AFW Injection at SPS Units 1 and 2," Rev. 0.

7. Dominion Calculation ME-0964, "Evaluate the 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," Rev. 0.
8. ETE-CPR-2013-0003, Beyond Design Basis Communications Strategy/Plan, Rev. 1.
9. Geotechnical Engineering Report, BDB FLEX Storage Building, Surry Power Station, Surry County, VA, Schnabel Reference #13613080, September 19, 2013, including Addendum No. 1.
10. Design Change SU-13-00015, BDB Storage Building/ Surry Power Station/ Units 1 & 2.
11. ETE-CPR-2012-0011, Rev. 3, "Beyond Design Basis – FLEX Strategy Overall Integrated Plan Basis Document."
12. NRC Letter from Jeremy S. Bowen (NRC) to David A. Heacock (Dominion), "Surry Power Station, Units 1 and 2 – Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Order EA-12-049 (Mitigation Strategies)," dated February 19, 2014.
13. Calculation EE-0864, Rev 2, "FLEX Electrical 480VAC and 120VAC System Loading Analysis."
14. Calculation EE-0872, Rev. 0, "SPS BDB FLEX Electrical 4160VAC System Loading Analysis."
15. 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. 12-163D).
16. 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. 12-163E).
17. 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).
18. 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).

19. Procedure CM-AA-BDB-102, "Beyond Design Basis FLEX Equipment Unavailability Tracking."
20. Procedure CM-AA-BDB-10, "Beyond Design Basis FLEX Program."
21. FSG-7, "Loss of Vital Instrumentation or Control Power."
22. 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 2¹

| <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) 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 (3) ³ and associated cables, connectors and switchgear | | | | X | | 40 kW | Will follow EPRI template requirements |

Table 1 – PWR Portable Equipment Phase 2¹

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

| Table 1 – PWR Portable Equipment Phase 2¹ | | | | | | | |
|--|--------------------|---------------------------|-------------------|-------------------------------|-----------------------------|------------------------------------|---|
| <i>Use and (Potential / Flexibility) Diverse Uses</i> | | | | | | <i>Performance Criteria</i> | <i>Maintenance</i> |
| <i>List Portable Equipment</i> | <i>Core</i> | <i>Containment</i> | <i>SFP</i> | <i>Instrumentation</i> | <i>Accessibility</i> | | <i>Maintenance / Preventive Maintenance Requirements</i> |
| Light plants (2) ² | | | | | X | | Will follow EPRI template requirements |
| 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 |

Table 1 – PWR Portable Equipment Phase 2¹

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

Table 1 – PWR Portable Equipment Phase 2¹

| <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 |
| Misc. Support Equipment ² | | | | | X | | Will follow EPRI template 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.