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Dominion®

February 28, 2014

10 CFR 2.202
EA-12-049

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

Serial No.: 12-161E
NL&OS/MAE: R1
Docket Nos.: 50-336
License Nos.: DPR-65

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 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. Dominion Nuclear Connecticut, Inc.'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. 12-161B)
3. Dominion Nuclear Connecticut, Inc'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. 12-161D)
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 Dominion Nuclear Connecticut (DNC). Reference 1 was immediately effective and directed DNC 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, identified as Open Item 14 for 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" supersede Section D in the originally submitted OIP.

Attachment 3 formally documents responses provided to several Audit Questions received for Millstone Power Station Unit 2 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
Dominion Nuclear Connecticut, Inc.

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 Dominion Nuclear Connecticut, Inc. 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 28TH day of February, 2014.

My Commission Expires: 5-31-14.

VICKI L. HULL
Notary Public
Commonwealth of Virginia
140542
My Commission Expires May 31, 2014

(SEAL)

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NRC Senior Resident Inspector
Millstone Power Station

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

Millstone Power Station Unit 2

Dominion Nuclear Connecticut, Inc. (DNC)

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 Nuclear Connecticut (DNC) developed an Overall Integrated Plan (OIP) (Reference 1), documenting the diverse and flexible strategies (FLEX) for Millstone Power Station Unit 2 (MPS2), in response to NRC Order Number EA-12-049 (Reference 2). This attachment provides an update of milestone accomplishments and open items since the last status report (Reference 14), 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 January 31, 2014.

- Submit Integrated Plan

3 Milestone Schedule Status

The following table provides an update to Attachment 2A of the OIP. It provides the activity status of each item as of January 31, 2014, 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 Strategies,' 'Develop Modifications' and 'Develop Strategies/Contract with the RRC' 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	December 2013	Started	April 2014 *
Develop Modifications	February 2014	Started	July 2014 *
Implement Modifications	August 2014	Started	
Develop Training Plan	April 2014	Started	
Implement Training	August 2014	Started	
Issue FSGs and Associated Procedure Revisions	September 2014	Started	
Develop Strategies/Contract with RRC	April 2014	Started	August 2014 *

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Purchase Equipment	February 2014	Started	
Receive Equipment	August 2014	Started	
Validation Walk-throughs or Demonstrations of FLEX Strategies and Procedures	December 2014	Not Started	
Create Maintenance Procedures	August 2014	Not Started	
Outage Implementation	October 2015	Not Started	

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

4 Changes to Compliance Method

By letter dated February 28, 2013, Serial No. 12-161B, DNC provided an OIP to address Beyond-Design-Basis (BDB) events at MPS2 and MPS3 as required by Order Number EA-12-049, dated March 12, 2012. The first Six-Month Status Update of the OIP for MPS2 and Millstone Power Station Unit 3 (MPS3) was provided by letter dated August 23, 2013. The following are changes to the compliance method information provided in the MPS2 OIP; which continue to meet NEI 12-06 (Reference 3):

a) Details of the deployment locations and connections have changed for the portable 120/240VAC and the 480VAC diesel generators (DGs) used to re-power the vital bus circuits as described below. However, the electrical re-powering strategy, as described in Section F1.2 – PWR Portable Equipment Phase 2 of the OIP, as modified in the August 2013 Six-Month Status Update, have not changed.

   The deployment location of the single 120/240VAC DG shown in OIP Figure 6 has not changed. However, the cable routing and location of the connection receptacles has been revised. The attached revised OIP Figure 7 shows the updated configuration with the cable being routed through the "A" and "B" DC Switchgear rooms and connected to local receptacle boxes near the VA20 and VA40 Distribution Panels.

   The deployment location of the 480VAC DG has changed. The attached revised OIP Figure 6 shows the new location in the courtyard east of the MPS2 DC Switchgear rooms. The attached revised OIP Figure 8 shows that the cable is now routed through the Millstone Power Station Unit 1 Cable Vault to a receptacle box permanently connected to Bus 22F.

b) Details of the deployment locations and connections have changed for the portable 4160VAC Diesel Generators (DGs) used to re-power the vital bus circuits as described below. However, the electrical re-powering strategy, as described in Section F1.3 – PWR Portable Equipment Phase 3 of the original OIP, has not changed for MPS2.

The deployment location and cable routing for the 4160VAC DG have changed and now reflect a simpler tie-in into the 4160 Vital Bus 24D. This new configuration eliminated the need to tie into the non-vital 24A bus as previously presented. (This simplification is reflected in the revised response to Audit Question No. 42 in Attachment 3 to this letter.) The new tie-in is to a panel in the Emergency Diesel Generator (EDG) room. The leads from an existing (and non-operational) "B" EDG connection to Panel C39 will be lifted and the cables from the BDB 4160VAC DG will be connected in their place. The attached revised Figures 6 and 9 reflect the new deployment and cable tie-in locations.

c) The location and type of alternate connection for the BDB Auxiliary Feedwater (AFW) pump has changed. The discharge connection will no longer use the steam generator feedwater regulating bypass valves. Instead, the discharge connection will utilize a 2" flanged connection on the Steam Generator (SG) pump down skid. The connection is not seismically designed, but is at a location in the lower level of the Auxiliary Building which is a seismic, flood, and missile protected structure. The attached revised OIP Figure 3 shows this new AFW connection.

d) In response to OIP Open Item No. 10, a strategy has been developed for use of the BDB AFW Pump to provide SG injection in the unlikely event of loss of the TDAFW pump due to hurricane related storm surge flooding of the Turbine Building. Procedure AOP 2560, *Storms, High Winds and High Tides, will be revised to pre-deploy o*ne BDB AFW pump in theMPS2 Turbine Building Truck Bay as part of storm preparations. In the event of failure of the TDAFW pump, located in the lower levels of the Turbine Building (Elevation 4 feet 8 inches), the early-deployed BDB AFW Pump will be available without waiting for flood waters to recede in order to obtain a portable pump from the BDB Storage Building. SG level will be controlled using the Auxiliary Feedwater Regulating Valves or the Auxiliary Feedwater Bypass valves. The diesel driven BDB AFW pump exhaust will be directed outdoors.

   AOP 2560 provides procedure guidance to shutdown the unit prior to severe hurricane conditions on site. Guidelines will be provided for operations to start the BDB AFW Pump and initiate flow following failure of the TDAFW pump. The BDB AFW pump takes suction from the Condensate Storage Tank (CST) through a connection which is located inside the Turbine Building Truck Bay. With a pre-emptive shutdown occurring 4 hours before an Extended Loss of AC Power (ELAP) event, the CST will supply the SGs for approximately 13.4 hours beyond the loss of power. This is adequate time for the worst case storm surge to recede.

e) The calculation to determine the battery life of the Class 1E battery banks for MPS2 has been revised. The resulting re-calculation supports the extension of the Class 1E battery duty cycle to 29 hours based on the implementation of load stripping within 45 minutes of the onset of an ELAP event and completion of the load stripping action within 75 minutes of the onset of the ELAP event.

DNC confirms that the Class 1E battery duty cycle MPS2 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 licensee calculations, supporting vendor discharge test data, FLEX strategy battery load profile, and other inputs/initial conditions required by IEEE-485 are available on DNC's web portal for documents and calculations. The time margin between the calculated battery depletion for the FLEX strategy and the expected deployment time for FLEX equipment to supply the DC loads is approximately 17 hours for Millstone Unit 2.

f) 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/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 attached.

g) The strategy has been revised regarding the flowpath for supplying water to the SGs following depletion of the contents of the CST. The CST has been removed from the flowpath once it is depleted. Attached is the revised OIP Figure 2 showing the updated connection strategy and flowpaths.

h) The OIP 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 17) and Attachment 1A, Sequence of Events, Item 17, 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 was not provided in the initial submittal of the OIP. It is provided in Attachment 2 of this submittal. The Containment coping strategy is provided 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 2 new OIP figures (Figures 10 and 11) in support of the Section D Containment strategy.

i) In response to the NRC staff concern that sufficient time and core flow conditions are available for adequate boron mixing, the , Pressurized Water Reactor Owners Group (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, USNRC to Jack Stringfellow, PWROG, Endorsing PWROG Position Paper, January 8, 2014. The MPS2 ELAP analyses verify that the conditions set forth in the NRC's endorsement of the boron mixing position paper with clarifications are met. Accordingly, the endorsed boron mixing methodology has been applied to the final FLEX RCS inventory and reactivity management strategies.

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

DNC expects to comply with the order implementation date and no relief/relaxation is required 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 MPS2 Overall Integrated Plan submitted on 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.	Not started Scheduled completion date: December, 2014
2	Preliminary analyses have been performed to determine the time to steam generator (SG) overfill without operator action to reduce Auxiliary Feedwater (AFW) flow, time to SG dryout without AFW flow, and time to depletion of the Condensate Storage Tank (CST). Final durations will be provided when the analyses are completed.	Complete. (Provided in Reference 4)
3	Analyses will be performed to develop fluid components performance requirements and confirm fluid hydraulic-related strategy objectives can be met.	Started. Phase 2: The hydraulic calculation for the FLEX pumps deployed using their associated hose networks have confirmed that the primary connections for core cooling/decay heat removal, RCS Inventory, and Reactivity Control (RCS Injection), and

Overall Integrated Plan Open Item		
OI #	**Description**	**Status**
		Spent Fuel Pool (SFP) Make-up strategies can be satisfactorily accomplished in response to an ELAP/Loss of Ultimate Heat Sink (LUHS) event. (Reference 8) The hydraulic calculations for the Phase 2 FLEX strategies for core cooling/decay heat removal, Reactor Coolant System RCS) Inventory, and Reactivity Control (RCS Injection), and SFP Make-up using the alternate connections will be fully completed by June 2014. Phase 3: Thermal and hydraulic calculations confirming that the Containment strategies are adequate will be completed by June 2014. Scheduled completion date is revised from September, 2013 to June, 2014 **
4	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 Millstone Power Station for storage of BDB equipment. The building will be designed to meet the plant's design basis for the Safe Shutdown

Overall Integrated Plan Open Item		
OI #	**Description**	**Status**
		Earthquake, high wind hazards, snow, ice and cold conditions, and located above the flood elevation from the most recent site flood analysis. The BDB Storage Building will be sited south of the railroad bridge, on the west side of the MPS access road, adjacent to the existing northeast contractor parking lot. **
5	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
6	Electric Power Research Institute (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: December 2014
7	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: December 2014
8	The DNC 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: December 2014
9	Confirm consistency of the FLEX strategies with the PWROG evaluation of post-loss of all AC power plant response for Combustion Engineering plants.	Complete. The Combustion Engineering (CE) Owners Group has issued generic guidelines to address plant response for post-loss of all AC power for Combustion Engineering plants. Based on these guidelines, DNC will develop plant specific

Overall Integrated Plan Open Item		
OI #	**Description**	**Status**
		FSGs for MPS2 to address plant response for post-loss of all AC power. Specifically, depressurization of SGs to a plant specific value of either a target SG pressure to prevent Safety Injection Tank (SIT) nitrogen injection OR a minimum steam pressure to support continuous operation of the turbine driven (TD) AFW pump will be specified. (Reference 7)
10	Develop strategy for use of the BDB AFW Pump to provide SG injection in the unlikely event of loss of TDAFW pump due to hurricane related storm surge flooding of the Turbine Building.	Complete. In accordance with storm preparation procedures, one BDB AFW pump will be early deployed in the MPS2 Turbine Building Truck Bay. See additional discussion in Section 4, Item d.
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	Complete the engineering evaluation of the main steam atmospheric dump valve (MS ADV) outlet lines. **	Started. Scheduled completion date is revised from December 2013 to July 2014 **
13	Complete the evaluation of TDAFW pump long term operation with $\leq$ 120 psig inlet steam pressure.	Complete. TDAFW pump operation and adequate AFW flow

Overall Integrated Plan Open Item		
OI #	**Description**	**Status**
		to the SGs at SG pressures < 120 psig has been confirmed. (References 5 and 6)
14	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 3 for confirmation of the effectiveness of Phase 3 Containment strategies.
15	Analyses will be performed to develop electrical components performance requirements and confirm electrical loading-related strategy objectives can be met.	Started. Phase 2: Calculations have been completed for the sizing and loading analysis of the 120VAC and 480VAC generators and confirm the electrical loading-related strategy objectives can be met (Reference 11). 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 DNC 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.	Started. Scheduled completion date: June 2014
17	A lighting study will be performed to validate the adequacy of	Started.

Overall Integrated Plan Open Item		
OI #	**Description**	**Status**
	supplemental lighting and the adequacy and practicality of using portable lighting to perform FLEX strategy actions.	Scheduled completion date: June 2014
18	A comprehensive study of communication capabilities is being performed in accordance with the commitments made in DNC letter S/N 12-205F 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 Millstone. 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 study concludes that effective implementation of the FLEX strategies will include the use of satellite phones and hand-held radios. The study acknowledges that MPS2 does not have a sound-powered phone system or equivalent and that radio usage is limited (Reference 9). Accordingly, the tabletop assessment of the FLEX strategies performed as part of the Phase 2 Staffing study has identified that the coordination of command and control of the FLEX strategies will require the use of dispatched personnel.
19	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.	Started. Scheduled completion date is revised from October, 2013 to April 2014 **
20	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 12), which supports the location of the storage building and the haul routes. The results will

Overall Integrated Plan Open Item		
OI #	**Description**	**Status**
		be included with the final design package for the storage building (Reference 13). Scheduled completion date: June 2014
21	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 the change to this Open Item.

6.2. Open Items from Interim Staff Evaluation

The following table provides a summary of the open items from the MPS2 Interim Staff Evaluation (Reference 15) and the status of each item.

Interim Staff Evaluation Open Items		
OI #	**Description**	**Status**
3.2.1.8.A	Core Subcriticality and Boron Mixing: The PWROG submitted to NRC a position paper, dated August 15, 2013, 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 of its intent to abide by the generic approach discussed above. The licensee should address the clarifications in the NRC endorsement letter dated January 8, 2014.	The discussion provided above in Section 4, Item i, addresses this Open Item. Additional supporting documentation will be provided during the ongoing audit process.

Interim Staff Evaluation Open Items		
OI #	**Description**	**Status**
3.2.4.1.A	The licensee did not provide sufficient information regarding cooling functions provided by such systems as auxiliary building cooling water, service water, or component cooling water cooling when ac power is lost during the ELAP for Phase 1 and 2. For example, the potential need for cooling water for the TDAFW pump bearings was not discussed. Additional analysis by the licensee is required to determine the acceptability of the licensee's plans to provide supplemental cooling to the subject components when normal cooling will not be available during the ELAP.	This Open Item has been addressed as follows: Permanently installed plant equipment used to support FLEX strategies do not require cooling support systems, such as component cooling water and service water, to perform their required functions. Therefore, no additional analysis is required to confirm the acceptability of supplemental cooling to plant equipment supporting Phase 1 or 2 strategies.

6.3. Confirmatory Items from Interim Staff Evaluation

The following table provides a summary of the confirmatory items from the MPS2 Interim Staff Evaluation and the status of each item.

Interim Staff Evaluation Confirmatory Items		
CI #	**Description**	**Status**
3.1.1.2.A	Confirm that the preferred travel pathways are 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. This is scheduled to be completed in June 2014.	This Confirmatory Item will be addressed during the ongoing audit process.
3.1.1.3.A	Confirm that a review is completed to determine impacts from large internal flooding sources that are not seismically robust and do not require ac power.	This Confirmatory Item will be addressed during the ongoing audit process.
3.1.1.4.A	The licensee's plan for implementing the use of off-site resources is not complete. The local assembly areas have not been identified. The licensee is also evaluating the possibility of boat transport for personnel.	This Confirmatory Item will be addressed during the ongoing audit process.

Interim Staff Evaluation Confirmatory Items		
CI #	**Description**	**Status**
3.1.2.2.A	The licensee has identified open items related to deployment of equipment during flooding conditions resulting from a hurricane; to verify response times listed in the timeline and perform staffing assessment, and to perform an evaluation of all BDB equipment fuel consumption and required re-fill strategies, and to determine preferred travel pathways using the guidance contained in NEI 12- 06. The pathways will attempt to avoid areas with trees, power lines, and other potential obstructions.	This Confirmatory Item will be addressed during the ongoing audit process.
3.2.1.A	Confirm that Combustion Engineering Case 21 in WCAP-17601-P, as evaluated in MPS2 document ETE-NAF-2012-0150, Section 6.1, is representative for MPS2 and appropriate for simulating the ELAP transient.	This Confirmatory Item will be addressed during the ongoing audit process.
3.2.1.1.A	Confirm that Westinghouse letter LTR-TDA-13-31, Rev. 0-B, Attachment 1, shows that the CENTS code used in the ELAP analysis for Combustion Engineering (CE) plants is limited to analyzing the flow conditions before reflux boiling initiates. This review should confirm an acceptable definition for the initiation of reflux boiling.	This Confirmatory Item will be addressed during the ongoing audit process.
3.2.1.2.A	The RCP seal initial maximum leakage rate should be greater than or equal to the upper bound expectation for the seal leakage rate for the ELAP event discussed in the PWROG position paper addressing the RCP seal leakage for CE plants (ADAMS Accession No. ML13235A151 (Non-Publicly Available)) or justification should be provided for use of a lower value.	This Confirmatory Item will be addressed during the ongoing audit process.
3.2.1.6.A	Sequence of Event (SOE) action Item 5 indicates that the ELAP is declared at 45 minutes, and Action Item 6 indicates that at 50 minutes (5 minutes after the declaration of the ELAP), the operator controls SG atmospheric dump valves (ADVs) and AFW flow locally as an on-going action for cooldown and decay heat removal. On page 105 of the integrated plan in Attachment 1B NSSS Significant Reference Analysis Deviation Table, the licensee notes in item 6 that cooldown starts at 2 hours at 75 degrees F/hr. to a SG pressure of 135 psia. Clarification is needed to correct this apparent inconsistency.	This item has been addressed in Attachment 3, Audit Question 21. 50 minutes has been corrected to 2 hours to be consistent with WCAP-17601.
3.2.1.6.B	The licensee did not provide a discussion regarding the operator actions required to control SG ADVs and AFW flow and justification is needed to determine that all the required operator actions are reasonably achievable within the required time constraint of 50 minutes during the ELAP conditions, or a discussion regarding the required cooldown completion time that is supportable by analysis.	This Confirmatory Item will be addressed during the ongoing audit process.

Interim Staff Evaluation Confirmatory Items		
CI #	**Description**	**Status**
3.2.1.6.C	Confirm that response times listed in the SOE timeline are verified and that staffing assessment has been performed.	This Confirmatory Item will be addressed during the ongoing audit process.
3.2.2.A	Following a BOB event, a vent pathway would be required in the event of SFP bulk boiling and can be established by opening the Fuel Building roll-up doors for inlet and outlet air flow. However the licensee's strategy for providing air flow to remove steam generated from pool boiling is not clear. The path for inlet and exhaust air is apparently the same i.e., the fuel building rollup doors. It is not clear from the discussion provided how this will enable a flow path to vent the steam and condensate from the Fuel Building.	This Confirmatory Item will be addressed during the ongoing audit process.
3.2.3.A	During the audit process the licensee stated that the details of the long term Containment cooldown and depressurization strategies for MPS2 are still under development. Upon selection of the preferred strategy, detailed GOTHIC analysis will be performed to document and validate the strategy and also to provide operators with timelines and guidelines for actions to ensure the long term integrity of the Containment throughout the Phase 3 of the postulated ELAP/LUHS scenario. Confirm that the revised analyses and the selected strategy are acceptable.	Details of the Phase 3 long term Containment cooldown and depressurization strategies for MPS2 are provided in Attachment 2. Confirmation of the detailed Containment analysis will be addressed during the ongoing audit process.
3.2.4.2.A	The ventilation evaluation will be completed later this year and the results will be provided in the February 2014 6-Month update. Confirm that the evaluation and results are acceptable.	This Confirmatory Item will be addressed during the ongoing audit process and the August 2014 6-month status update.
3.2.4.4.A	Confirm the adequacy of existing lighting and the adequacy of portable lighting to perform FLEX strategy actions.	This Confirmatory Item will be addressed during the ongoing audit process and the August 2014 6-month status update.
3.2.4.4.B	Confirm that upgrades to the site's communications systems have been completed.	This Confirmatory Item will be addressed during the ongoing audit process.

Interim Staff Evaluation Confirmatory Items		
CI #	**Description**	**Status**
3.2.4.6.A	Additional information is needed to confirm habitability of the Main Control Room during the ELAP.	This Confirmatory Item will be addressed during the ongoing audit process.
3.2.4.7.A	Westinghouse is currently performing an analysis to determine the consequences of usage of impure water sources in the steam generators. The results of the analysis are expected to provide the allowed time limits on usage of these sources. The RRC will provide equipment to initiate residual heat removal and water treatment equipment such that heat removal can be ensured for extended durations. Confirm that the analysis results and resultant strategies are acceptable.	This Confirmatory Item will be addressed during the ongoing audit process.
3.2.4.9.A	A secondary source for fuel oil will be the MPS3 Diesel Fuel Oil Storage Tanks. These underground tanks contain a minimum of 32,670 gallons of fuel oil. They are seismic and missile protected. Confirm the ability to transfer this fuel, and complete an evaluation of all BDB equipment fuel consumption and required re-fill strategies, including any gasoline required for small miscellaneous equipment.	This Confirmatory Item will be addressed during the ongoing audit process and the August 2014 6-month status update.
3.2.4.10.A	The licensee has completed an analysis of the battery capability regarding expected time available with ac power. Site specific procedural guidance governing load stripping will be developed. Confirm electrical components performance requirements and electrical loading-related strategy objectives can be met.	This Confirmatory Item will be addressed during the ongoing audit process and the August 2014 6-month status update.
3.4.A	The licensee's plans for the use of off-site resources conform to the minimum capabilities specified in NEI12-06 Section 12.2, with regard to the capability to obtain equipment and commodities to sustain and backup the site's coping strategies (item 1). Confirm the licensee addresses the remaining items (2 through 10), or provides an appropriate alternative.	This Confirmatory Item will be addressed during the ongoing audit process.

7 Potential Safety Evaluation Impacts

DNC is participating in the ongoing industry effort to develop guidance for the Overall Program Document that will support the NRCs preparation of the Safety Evaluation documenting MPSU2 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) a revision to Milestone Task 'Develop Strategies', b) a revision to Milestone Task 'Develop Modifications', c) a revision to Milestone Task 'Develop Strategies/ Contract with RRC', d) a revision to Open Item No. 3, e) a revision to Open Item No. 4, f) a revision to Open Item No. 12, g) a revision to Open Item No.15, and h) a revision to Open Item No.19.

a) **MPS2, Milestone Task 'Develop Strategies':** The revision to the scheduled milestone target completion date allows for completion of calculations needed to finalize the ventilation strategies for the Spent Fuel Pool General Area at Elevation 38' 6" of the Auxiliary Building and the CRACS Mechanical Equipment Room at Elevation 38' 6" of the Auxiliary Building.

b) **MPS2, Milestone Task 'Develop Modifications':** The revision to the scheduled milestone target completion date is needed to complete minor modifications supporting FLEX strategies (e.g., standpipe, hose adapters, etc.).

c) **MPS2, 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) **MPS2, Open Item 3:** The Open Item completion date is revised to June 2014. Additional time is required to complete the hydraulic calculations for the Phase 2 strategies using alternate connections and to confirm the fluid-hydraulic-related strategy objectives can be met utilizing the Phase 3 RRC pumps.

e) **MPS2, Open Item 4:** The location for the MPS BDB Storage Building has changed. The BDB storage Building will be sited south of the railroad bridge, on the west side of the MPS access road, adjacent to the existing northeast contractor parking lot instead of north of the bridge near the salt shed as previously reported in the August 2013 Six-Month Status Report.

f) **MPS2, Open Item 12:** The revision to the wording more accurately reflects the actual evaluation being performed on the ADV pipe supports for seismic loading and the ADV vent piping for tornado missile protection. The updated completion schedule accurately reflects the current project schedule for completion of the engineering evaluation. The revised Open Item and revised completion schedule are as follows:

> Open Item 12: Complete the engineering evaluation of the main steam atmospheric dump valve (MS ADV) outlet lines.
> Completion Schedule: July 2014

g) **MPS2, 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 complete the calculations needed to confirm the electrical loading-related strategy objectives can be met with this equipment.

h) **MPS2, Open Item 19:** The Open Item completion date is revised to April, 2014. Additional time is required to complete the ventilation calculations needed to finalize the MPS2 ventilation strategies for the Spent Fuel Pool General Area at Elevation 38' 6" of the Auxiliary Building and the CRACS Mechanical Equipment Room at Elevation 38' 6" of the Auxiliary Building.

9 References

The following references support the updates to the Overall Integrated Plan described in this enclosure.

1. DNC'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 29, 2013 (Serial No. 12-161B).
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. DNC's 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. 12-161C).
5. Calculation 13-024, "Turbine Driven Auxiliary Feedwater (TDAFW) Pump Delivered Flow at Reduced Steam Generator Pressure," April 22, 2013.
6. Engineering Technical Evaluation ETE-MP-2013-1034, "MP2 Turbine Driven Aux Feedwater Pump Minimum Continuous Operating Speed," dated March 12, 2013.
7. PWROG letter, OG-13-197, Transmittal of PA-PSC-0965 Final CE-NSSS Specific ELAP Response (FLEX) Guidelines, May 17, 2013.
8. Calculation 13-015, "MP2 & MP3 FLEX Strategy Hydraulic Calculations," Rev. 0.
9. ETE-CPR-2013-0003, "Beyond Design Basis Communications Strategy/Plan," Rev. 0
10. Dominion Calculation MISC-11793, "Evaluation of Long-Term Containment Pressure and Temperature Profiles Following and Extended Loss of AC Power (ELAP)," Rev. 0.
11. Calculation 2013-ENG-04383E2, "Millstone Power Station Unit 2 Beyond Design Basis – FLEX Electrical 4160V, 4840V and 120VAC System Loading Analysis," Rev. 0.

12. URS Geotechnical Investigation and Engineering Report, FLEX Storage Building Project, Millstone Power Station, Waterford, Connecticut, dated January 27, 2014.

13. Design Change MPG-13-00010, "BDB Storage Building/Millstone Power Station/Units 2&3."

14. DNC'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. 12-161D).

15. Millstone Power Station, Units 2 and 3 - Interim Staff Evaluation Relating to Overall Integrated Plan in Response to Order EA-12-049 (Mitigating Strategies), dated January 31, 2014.

Table 1 – PWR Portable Equipment Phase 2[1] [Open Item 21]

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) 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) and assoc. hoses and fittings	X					45 gpm @ 3000 psid	Will follow EPRI template requirements
120/240VAC generators (3) and associated cables, connectors and switchgear				X		23.3 kW	Will follow EPRI template requirements

Table 1 – PWR Portable Equipment Phase 2[1] [Open Item 21]

Use and (Potential / Flexibility) Diverse Uses						Performance Criteria	Maintenance
List Portable Equipment	***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 (3) and associated cables, connectors and switchgear (to re-power battery chargers, inverters, and Vital Buses)	X	X		X		500 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 21]

Use and (Potential / Flexibility) Diverse Uses						Performance Criteria	Maintenance
List Portable Equipment	***Core***	***Containment***	***SFP***	***Instrumentation***	***Accessibility***		***Maintenance / Preventive Maintenance 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
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[3]	X	X	X	X	X		Will follow EPRI template requirements

Table 1 – PWR Portable Equipment Phase 2[1] [Open Item 21]

Use and (Potential / Flexibility) Diverse Uses						Performance Criteria	Maintenance
List Portable Equipment	***Core***	***Containment***	***SFP***	***Instrumentation***	***Accessibility***		***Maintenance / Preventive Maintenance Requirements***
Misc. debris removal equipment[2]					X		Will follow EPRI template requirements
Misc. Support Equipment[2]					X		Will follow EPRI template requirements
Cables for 4160VAC generator connections	X	X	X	X	X		Will follow EPRI template requirements

NOTES:
1. This table is based on one BDB Storage Building containing equipment for both MPS2 and MPS3.
2. Support equipment. Not required to meet N+1.
3. 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.

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			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.

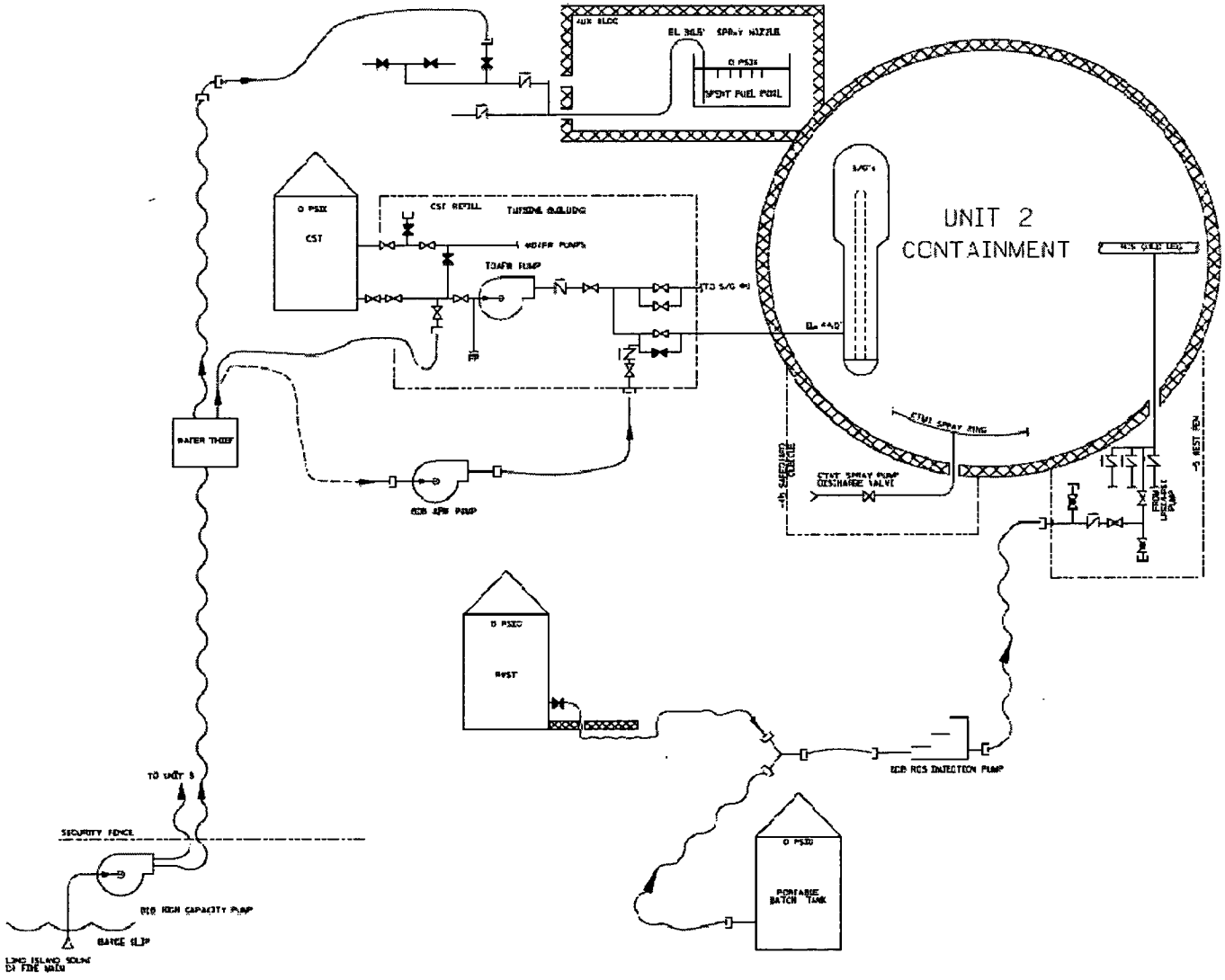

FIGURE 2 (FEBRUARY 2014 UPDATE)
BDB FLEX STRATEGY
MECHANICAL CONNECTIONS FLOW DIAGRAM
MILLSTONE UNIT 2

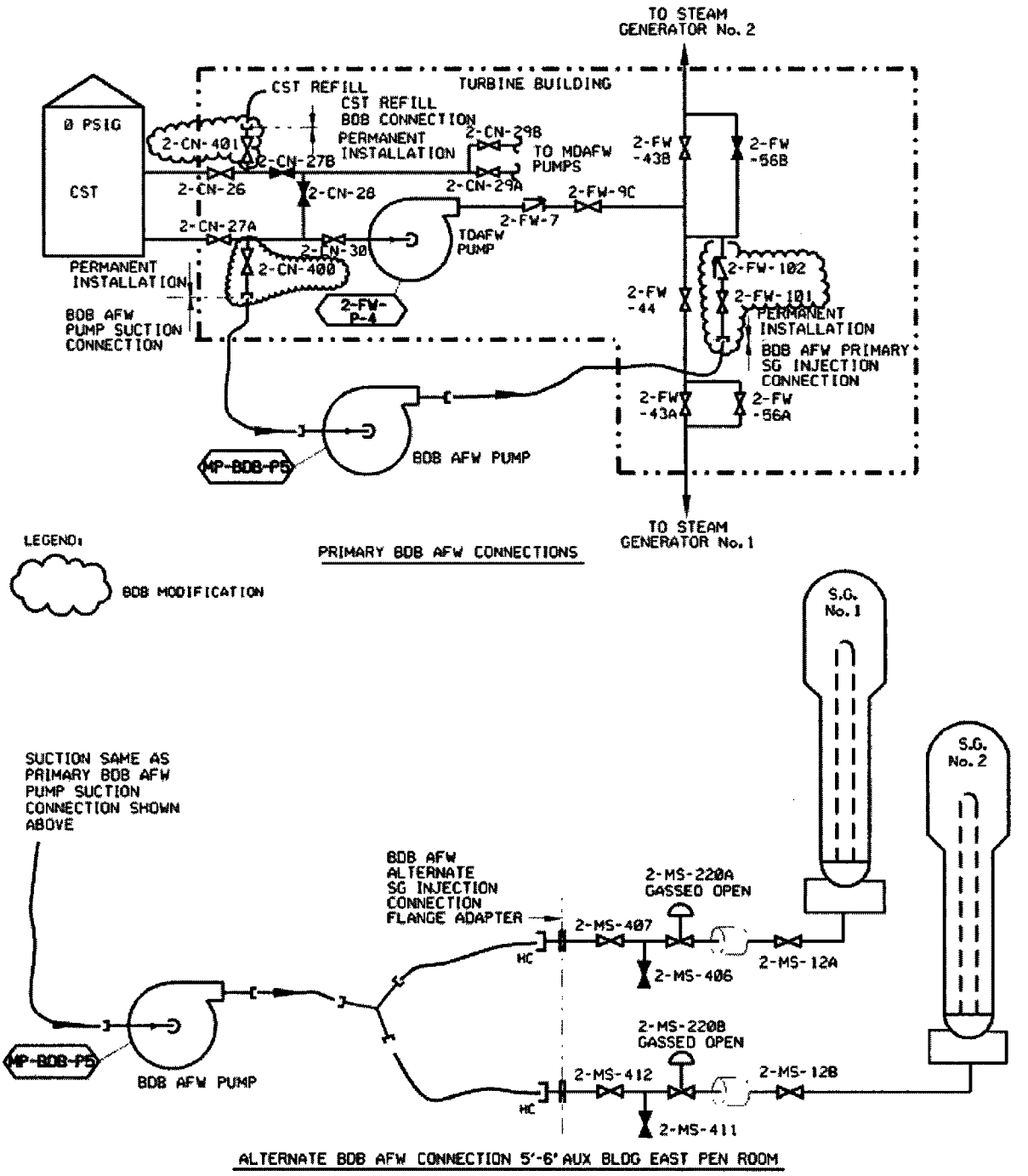

FIGURE 3 (FEBRUARY 2014 UPDATE)
CORE COOLING AND DECAY HEAT REMOVAL
MILLSTONE UNIT 2

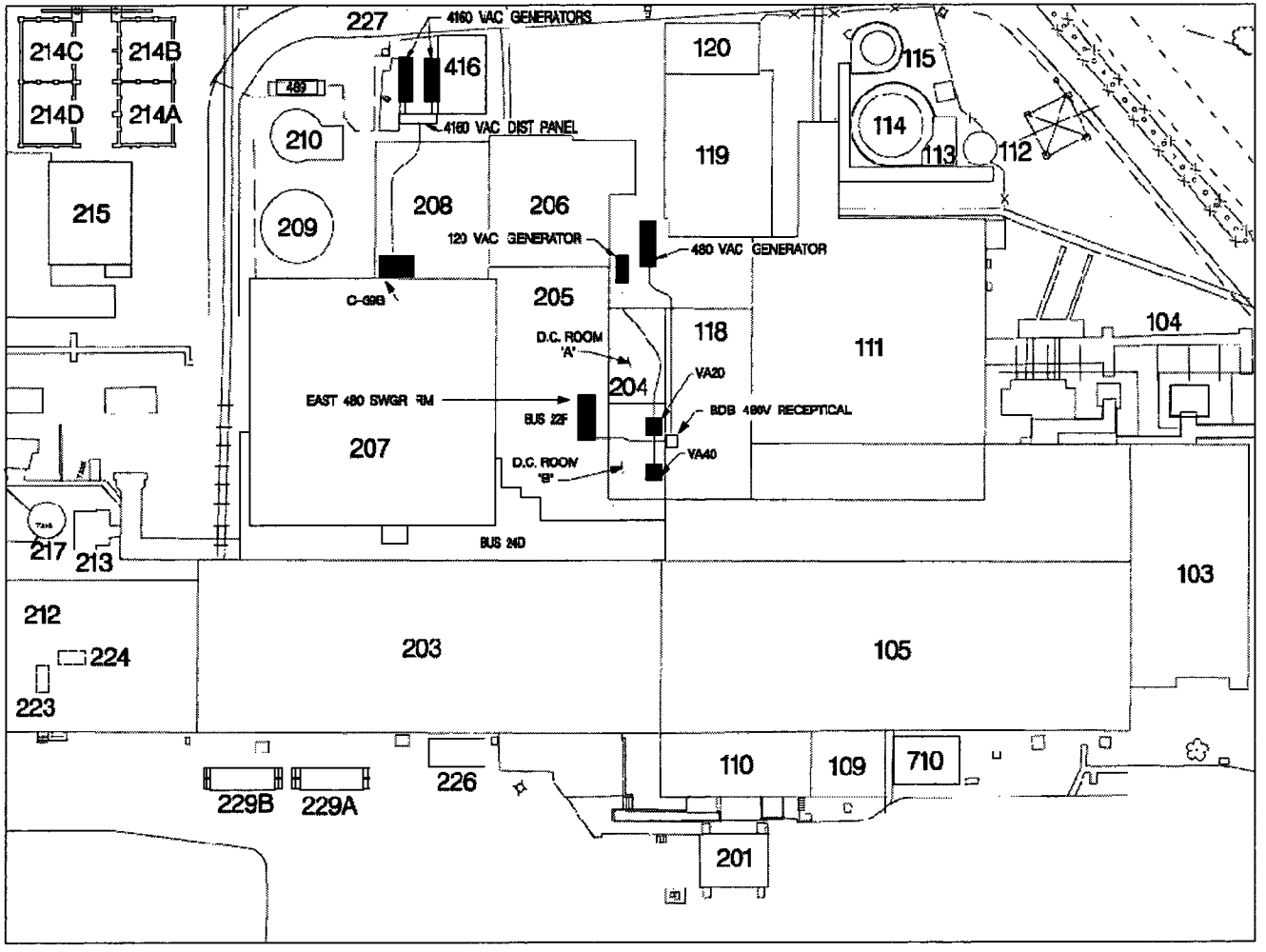

FIGURE 6 (FEBRUARY 2014 UPDATE)
ELECTRICAL GENERATOR DEPLOYMENT
MILLSTONE UNIT 2

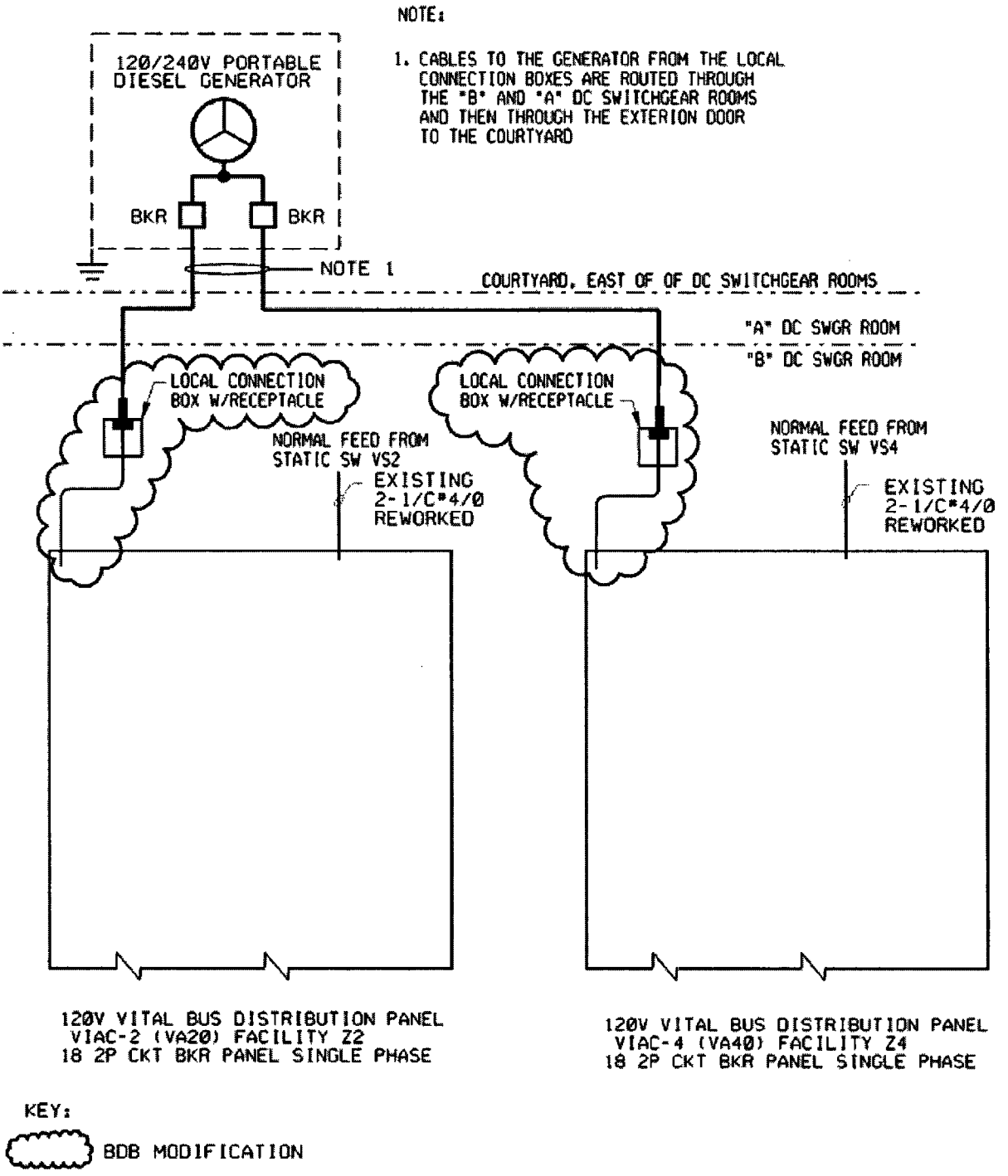

FIGURE 7 (FEBRUARY 2014 UPDATE)
120/240VAC GENERATOR ELECTRICAL CONNECTIONS
MILLSTONE UNIT 2

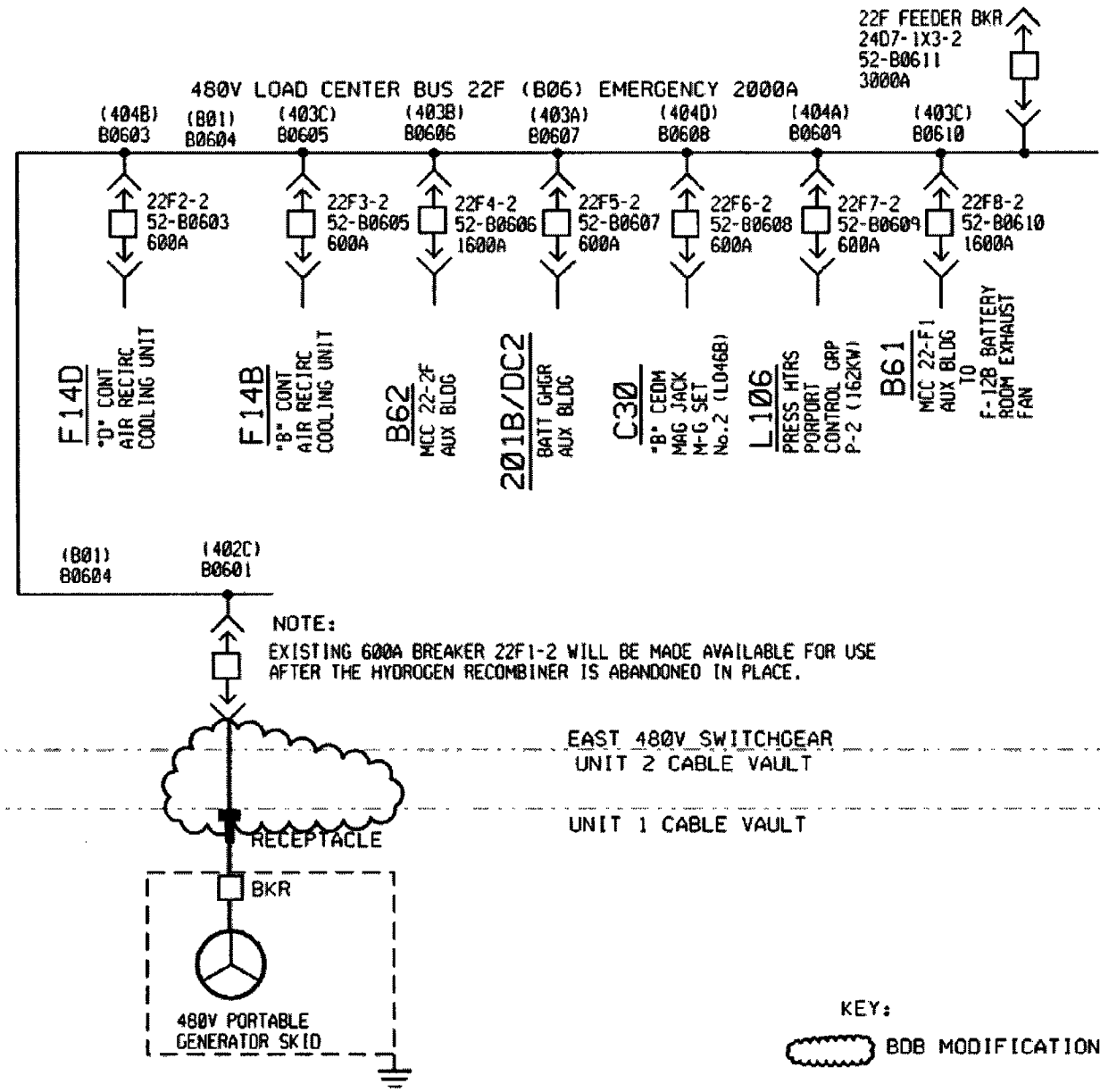

FIGURE 8 (FEBRUARY 2014 UPDATE)
480VAC GENERATOR ELECTRICAL CONNECTIONS
MILLSTONE UNIT 2

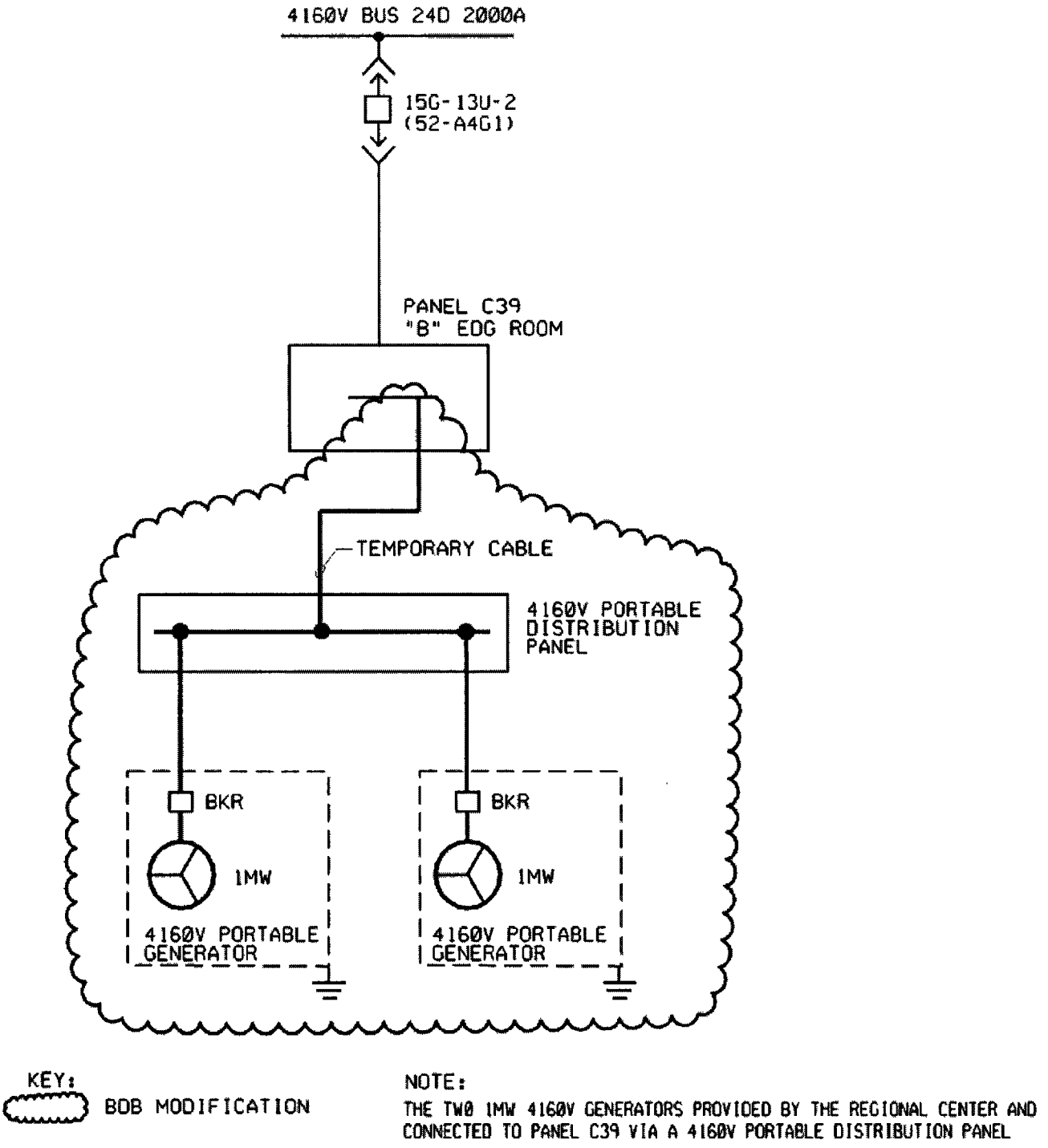

FIGURE 9 (FEBRUARY 2014 UPDATE)
4160VAC GENERATOR ELECTRICAL CONNECTIONS
MILLSTONE UNIT 2

Attachment 2

Overall Integrated Plan Section D

Maintain Containment

Millstone Power Station Unit 2

Dominion Nuclear Connecticut, Inc. (DNC)

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 EOP-2530, Station Blackout, and monitoring Containment temperature and pressure. 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 7 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 EOP-2530, Station Blackout. Procedural guidance for monitoring Containment temperature will be provided by FSGs. **[Open Item 5]**
D.1.2 - Identify modifications	*List modifications* 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 MCR throughout the event. <u>Containment Temperature</u> - Containment temperature indication is available locally by handheld meter at Containment penetrations associated with the temperature elements TE-8108, TE-8109, and TE-8110. **[Open Item 5]**

[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): Dominion Nuclear Engineering ETE-CPR-2012-0009, "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.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 7 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, the Phase 1 Containment monitoring instrumentation will continue to be utilized during Phase 2.
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.

D. Maintain Containment		
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 this section is based on the following reference(s):

Dominion Nuclear Engineering ETE-CPR-2012-0009, "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 7 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 the installed Containment Spray (CS) pumps and spray rings. This strategy requires repowering a Class 1E 4160VAC bus using a 4160VAC DG from the Regional Response Center (RRC) and restoration of cooling water flow to the CS heat exchanger. An alternate strategy is also available which will provide Containment ventilation cooling using the safety-related Containment Air Recirculation Fans.

Primary Containment Cooling Strategy – Containment Recirculation Spray

The 4160VAC DG from the RRC will be aligned to power a Class 1E 4160VAC bus as described in Section F1.3, which will provide power to CS, Reactor Building Closed Cooling Water (RBCCW), and Service Water (SW) pumps 4kV motors. Flow will be initially established from the RWST to the Containment through the normal CS flowpath through the spray ring header nozzles. This initial flow will provide heat removal from the Containment atmosphere and fill the Containment sump in preparation for initiation of Containment recirculation flow. When the Containment sump level is adequate to support swap over to sump suction, the CS pumps will be aligned to draw water from the sump and recirculate flow through the CS heat exchangers and the spray nozzles. SW flow will be established through the RBCCW heat exchangers to provide a heat sink, and RBCCW flow will be established through the CS heat exchangers and the RBCCW heat exchangers to transfer heat to the SW system. In this manner, Containment atmosphere heat will be rejected to the ultimate heat sink via the sump water recirculation spray flowpath.

In the event that the Service Water system pumps are unavailable, portable 5,000 gpm (low pressure/high flow) diesel driven pumps from the RRC will be utilized to provide water flow from the Niantic Bay to the RBCCW heat exchangers via connection of the pump discharge to existing inspection port flanged openings in the Service Water pumps discharge header located in the Intake Structure. The seismic Category 1 Intake Structure is designed to withstand missiles and high wind. The system connection points are located inside the Intake Structure and are protected from extreme cold, ice and snow, and extreme high temperature.

Thermal/hydraulic and Containment analyses will be performed to confirm this Containment cooling strategy **[Open Item 3]**.

D. Maintain Containment

Alternate Containment Cooling Strategy – Containment Ventilation Cooling

The 4160VAC DG from the RRC will be aligned to power a Class 1E 4160VAC bus as described in Section F1.3, which will provide power to Reactor Building Closed Cooling Water (RBCCW) and Service Water (SW) pumps 4kV motors. A portable 480VAC DG from the BDB Storage Facility will be aligned to power a Class 1E 480VAC bus as described in Section F1.2, which will provide power to a Containment Air Recirculation Fan (CARF) motor. Containment ventilation flow will be established by starting the CARF fan with air flow through the CARF heat exchanger and recirculating within the Containment. SW flow will be established through the RBCCW heat exchanger to provide a heat sink, and RBCCW flow will be established through the CARF heat exchanger and the RBCCW 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 CARF heat exchanger.

In the event that the Service Water system pumps are unavailable, cooling water flow to the RBCCW heat exchanger will be established as described for the primary Containment cooling strategy.

Thermal/hydraulic and Containment analyses will be performed to confirm this Containment cooling strategy **[Open Item 3]**.

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 5]**
D.3.2 - Identify modifications	*List modifications* None required.
D.3.3 - Key Containment Parameters	*List instrumentation credited for this coping evaluation.* Containment Pressure - Containment pressure indication is available in the MCR throughout the event. Containment Temperature - Containment temperature indication is available locally by handheld meter at Containment penetrations associated with the temperature elements TE-8108, TE-8109, and TE-8110. **[Open Item 5]**

D. Maintain Containment	
	Following 120VAC bus re-powering described in Section F1.2, the following instrumentation will be available in the MCR: - CS Flow Rate - CS Temperature - CS Discharge Pressure - Containment Sump Level - RBCCW Flow Rate - RBCCW Temperature - RWST Level - CAR Fan Discharge Temperature

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 recirculation spray flow using installed plant equipment. Therefore, no deployment of equipment is required. In the event that SW pumps are unavailable, the cooling water will be provided by a portable low pressure/high flow (5,000 gpm) diesel driven pump deployed from the RRC. The pump will be staged near the Intake Structure with a suction hose routed to the Niantic Bay and the discharge hose routed inside the Intake Structure to the 12" flanged inspection port connection point in the SW pump discharge header. See Figure 10. The alternate strategy for Containment cooling is to	*Identify modifications* None	*Identify how the connection is protected* The SW system connection to provide flow from the portable low pressure/ high flow (5,000 gpm) diesel driven pumps from the RRC to the Service Water pumps discharge header is located in the Intake Structure. The Intake Structure is a seismic Category 1 structure designed to withstand missiles and high wind. The system connection points are protected from extreme cold, ice and snow, and extreme high temperature.

D. Maintain Containment		
provide Containment ventilation cooling using installed plant equipment. Therefore, no deployment of equipment is required. See Figure 11.		
Notes: The information provided in this section is based on the following reference(s): Dominion Nuclear Engineering ETE-CPR-2012-0009, "Beyond Design Basis – FLEX Strategy Overall Integrated Plan Basis Document," Revision 2.		

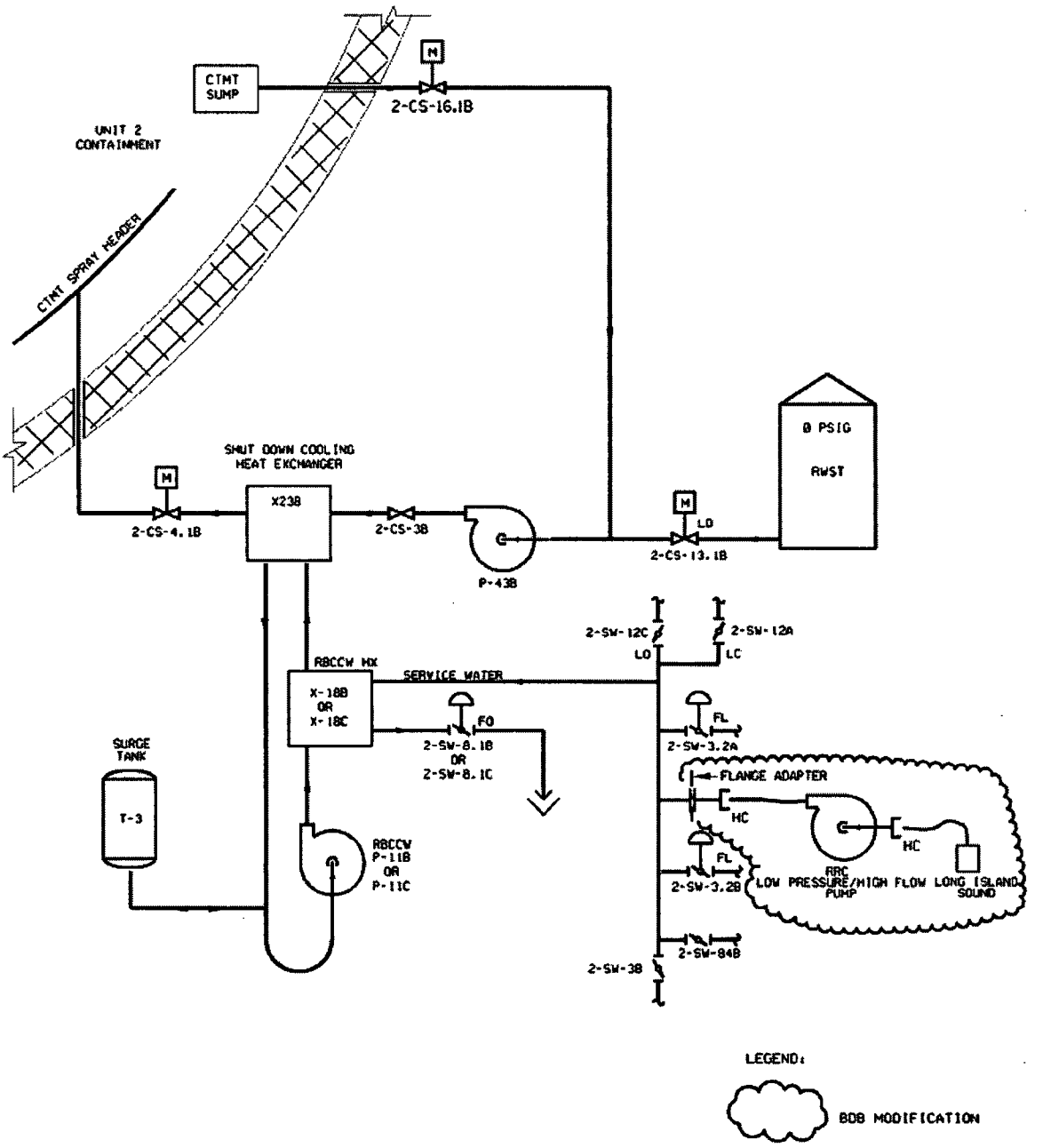

FIGURE 10
CONTAINMENT COOLING
BDB FLEX PRIMARY MECHANICAL CONNECTIONS
MILLSTONE UNIT 2

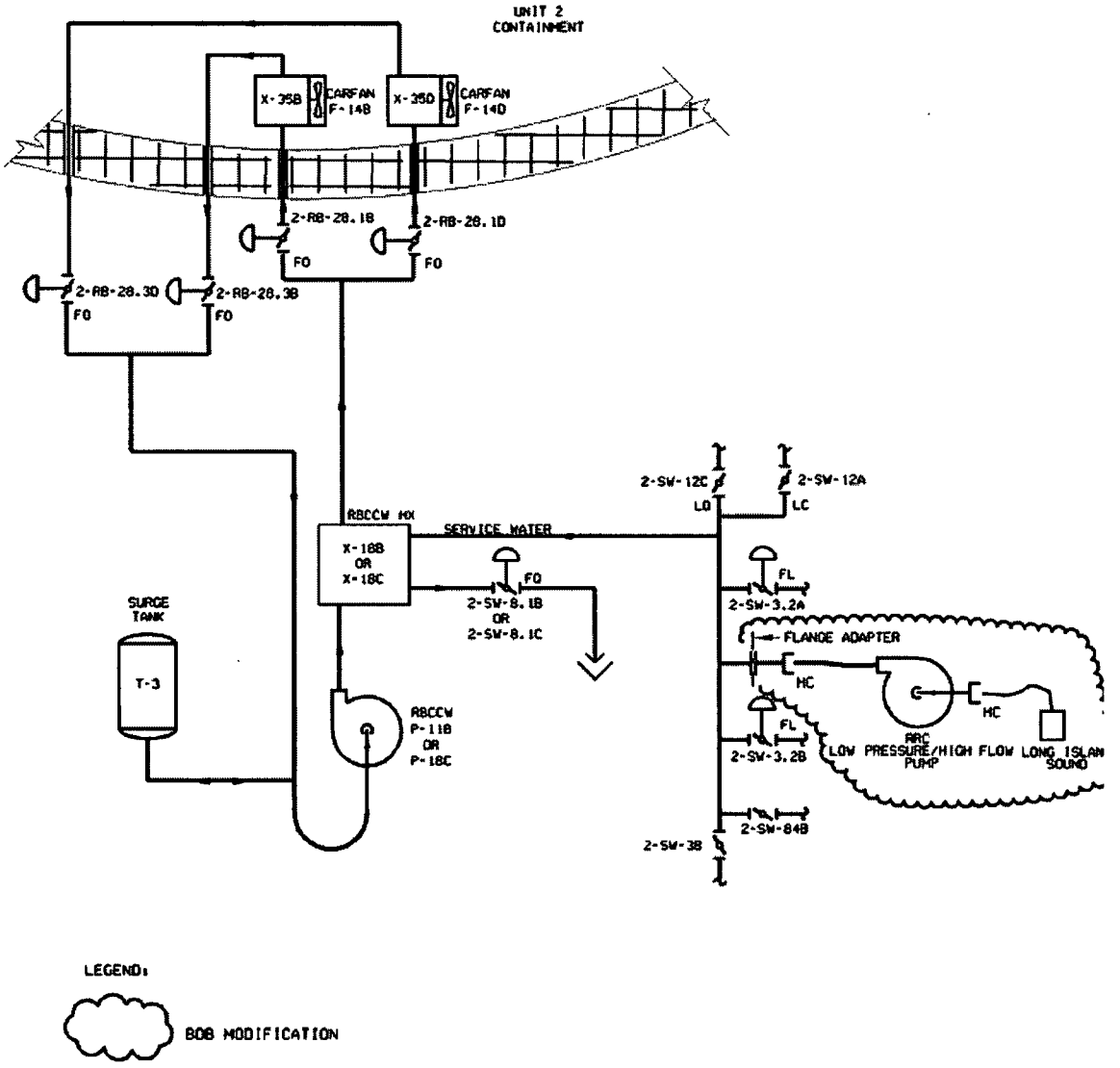

FIGURE 11
CONTAINMENT COOLING
BDB FLEX ALTERNATE MECHANICAL CONNECTIONS
MILLSTONE UNIT 2

Attachment 3

Formal Responses to September 2013 Audit Questions

Millstone Power Station Unit 2

Dominion Nuclear Connecticut, Inc. (DNC)

Response to September 2013 Audit Questions
Millstone Power Station Unit 2

Background

By letter dated February 28, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13064A265), Dominion Nuclear Connecticut, Inc., (DNC) 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 Millstone Power Station Units 2 and 3 (MPS2 and MPS3), which is consistent with NEI 12-06.

The NRC staff reviewed the February 28, 2013 OIP submittal for MPS2 and conducted an audit of the OIP in September 2013. Some of the information provided during that audit is provided below.

NRC Audit Question No. 21

Dominion provided apparently conflicting information regarding the start of cooldown. Action Item 5 in the SOE notes that the initiation of cooldown (5 minutes following ELAP) at 50 minutes. This information appears inconsistent with the information in Item 6 of Attachment 1B (page 105) that indicates that based on the analysis of Case 21 in WCAP-17601, plant cooldown begins 2 hours following declaration of the ELAP with cooldown rate of 75 oF/hr until the SG pressure reaches 135 psia. Clarification is needed to correct this apparent inconsistency. Specify the required operator actions prior to the initiation of cooldown at 50 minutes. Also, specify the required cooldown completion time that is supportable by adequate analysis and identify the required operator actions for completing the cooldown. Discuss how all the required actions can be reasonably achievable within the required time constraint during the ELAP conditions. (Reference Item 3.2.1.6.A)

DNC Response:

The initiation time of 50 minutes that is listed in Sequence of Event (SOE) Action Item 6 is being revised to a time of 2 hours to provide consistency with the reference plant case 21 of WCAP-17601. That reference case is applicable for MPS2. The correct time for initiation of cooldown is listed in Attachment 1B of the Overall Integrated Plan for MPS2. As stated in the sixth line of Attachment 1B, the initiating time for cooldown is at 2 hours with a rate <75°F/hr to a steam generator pressure of 120 psig.

2 hours is considered more than adequate time to dispatch operators to the Enclosure Building (EB) for Atmospheric Steam Dump local operation, establish communication

with the Control Room and initiate the cooldown. Personnel will be able to access the EB and initiate cooldown prior to 2 hours. Steam release from the SGs will be controlled locally within the EB using the handwheels installed on the atmospheric dump valves.

Initiation of the cooldown at a time earlier than 2 hours would not invalidate the conclusions of the generic analysis. This would result in more rapid depressurization of the RCS and less leakage through the RCP seals. Review of the analysis (Calculation No. MISC-11790) results show that there is more than adequate shutdown reactivity throughout the event to offset this effect.

NRC Audit Question No. 35

In the integrated plan Dominion did not discuss the effects of loss of power to heat tracing. Provide a discussion and analysis of the effects of the loss of heat tracing for equipment required to cope with an ELAP. (Reference Item 3.2.4.3.A)

DNC 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 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 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.

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 during an extreme cold weather event is not challenged.

NRC Audit Question No. 37

The licensee's plan for electrical isolation and interactions did not provide reasonable assurance that the plan conforms to the guidance in NEI 12-06, Section 3.2.2, Paragraph (13) because there is insufficient information on electrical isolations and interactions to determine how the portable FLEX generator and the Safeguards Buses are isolated to prevent simultaneously supplying power to the same bus from different sources. Please provide information on how Dominion addresses electrical isolation to prevent simultaneously supplying power to the same bus from different sources.

DNC Response:

Electrical isolation to prevent simultaneously supplying power to a Class 1E Emergency Bus from different sources will be administratively controlled. The FLEX Support Guidelines will be written to ensure the breakers from other potential supply sources are racked out and tagged before power is supplied to any of the Class 1E Emergency Busses by the BDB portable diesel generators which are to be back fed through the "B" heater drain pumps for the 4160VAC Emergency Bus tie-in and the "B" retired Hydrogen Recombiner for the 480VAC Emergency Bus tie-in.

MPS2 FSAR Figure 8.2-1 provides a Single Line Diagram for the unit. A copy of Figure 8.2-1, with notations highlighting the 4160VAC and 480VAC BDB diesel generator tie-in locations was provided during the audit process.

NRC Audit Question No. 42

Systems and Equipment for Mitigation Strategies: List the non-safety related installed systems or equipment that are credited in the ELAP analysis supporting the FLEX mitigation strategies. Specify the functions of each system or equipment credited in the ELAP analysis. For all the systems or equipment listed, justify that they are available and reliable to provide the desired functions on demand during the ELAP conditions.

DNC Response:

The response to Audit Question No. 42 has been revised. There are no non-safety related installed systems or equipment credited in the ELAP analysis supporting the FLEX mitigation strategies.

NRC Audit Question No. 48

Reference Item 3.1.1.2.A: Describe the fuel oil supply system and flow paths for the fuel oil (i.e., fuel oil storage tank volume, supply pathway, etc.). In addition, explain how fuel quality will be assured if stored for extended periods of time.

DNC Response:

Fuel sources for the BDB portable pumps and generators used for the FLEX strategies during Phase II and Phase III of an ELAP event are provided from the following on-site fuel oil sources:

1. Two 12,000 gallon (TS Minimum) seismically installed, missile protected fuel oil storage tanks located on the 38'6" elevation in the MPS2 Auxiliary Building. These two tanks are located well above the maximum postulated flood elevation so they can reasonably be expected to survive following a BDB external event (BDBEE).

2. Two below-ground fuel oil storage tanks, each containing 32,670 gallons (TS Minimum), are located outside the MPS3 Emergency Diesel Generator facility. These tanks are seismically installed, missile protected, and located above the maximum postulated flood elevation. Therefore, these fuel oil storage tanks can be reasonably expected to survive following a BDBEE.

Diesel fuel in the fuel oil storage tanks is routinely sampled and tested to assure fuel oil quality is maintained to ASTM standards. This sampling and testing surveillance program also assures the fuel oil quality is maintained for operation of the station Emergency Diesel generators.

The fuel sources will be used to fill a fuel oil truck with a self-powered pump that will be procured and stored in the BDB Storage Building. The truck will be deployed from the BDB Storage Building facility to the east side of the MPS2 Auxiliary Building and will be gravity filled from the 12,000 gallon MPS2 fuel oil storage tanks.

As an alternate fuel source, the fuel oil truck can be dispatched to the west side of the MPS3 EDG facility where it can be filled from underground fuel sources using the trucks' self-powered pump.

To facilitate deployment of the BDB portable pumps and generators the equipment will be stored in a fueled condition. As a part of the Preventative Maintenance (PM) templates being created by EPRI, the fuel oil tanks for this FLEX equipment will also be routinely sampled and tested to assure proper fuel oil quality is maintained.

The proposed BDB Storage Building where the fuel truck will be stored, will be located south of the railroad bridge, and on the west side of the MPS access road, adjacent to

the existing northeast contractor parking lot. This location was shown in a figure provided during the audit process.

NRC Audit Question No. 49

Reference Item 3.2.4.2.D: Ventilation. There are insufficient details regarding the effects of loss of ventilation in the TDAFW pump room, such that the staff is unable to conclude that the equipment in the TDAFW pump room will perform its function and assist in core cooling throughout all Phases of an ELAP. Please provide information on the adequacy of the ventilation provided in the TDAFW pump room to support equipment operation throughout all phases of an ELAP. Specifically, provide a discussion on the impact of elevated temperatures, as a result of loss of ventilation and/or cooling, on electrical equipment being credited as part of the ELAP strategies (e.g., electrical equipment in the turbine driven emergency feedwater pump room). In your response, specify whether the initial temperature condition assumed the worst-case outside temperature with the plant operating at full power. Provide the list of electrical components that are located in the pump rooms that are necessary to ensure successful operation of required pumps. Also provide the qualification level for temperature and pressure for these electrical components for the duration that the pumps are assumed to perform its mitigating strategies function.

DNC Response:

As documented in the MPS2 SBO safe shutdown evaluation, the TDAFW Pump room temperature during SBO is bounded by the steady state normal room operating temperature of the pump. The room has a water tight door that is not assumed to be open and the heat up analysis for the room does not take credit for ventilation. The room temperature has been calculated to not exceed 130°F. This temperature is less than the room design temperature of 135°F specified in the MPS2 Specification for Environmental Conditions for Equipment Qualification.

Since this room is not expected to experience a heat load during the ELAP/LUHS scenario that is any greater than the heat load during normal TDAFW pump operation, no compensatory cooling measures are required for this room.

NRC Audit Question No. 53

Reference Item 3.2.4.8.F. Section F1.2 states that the BDB electrical receptacles 53 will be connected to a new breaker on the 120VAC vital bus panels. However, this new breaker is not identified in Section A.4, Action item 12 (page 11), nor in F1.2.2. Please clarify if this is a breaker will be installed as part of the FLEX and if it is part of the modifications necessary for Phase 2

DNC Response:

The receptacles identified in Section F1.2 are to be installed and connected to new breakers within the 120VAC distribution panels. Regarding F1.2.2, the new breakers were considered part of the receptacle modification. OIP Section A.4 (Action Item 12) addressed the complete action to provide 120VAC to the distribution panels. However, the discussion only stated the actions to deploy the portable DGs and connect the DGs to the receptacles. Starting the DGs and closing the breakers to power the panels was an implied action necessary to complete the re-powering of the distribution panels. These additional actions were included in the stated approximate completion time and do not impact the margin available to meet the depletion of battery life.

NRC Audit Question No. 64

The Order requires mitigating beyond-design-basis external events. On page 3 of 109, as part of the discussion of external flooding, the licensee states that seiche-related flooding is not addressed in the FSAR.

The licensee is requested to discuss why a beyond-design-basis external event such as a seiche cannot occur on Long Island Sound. If a seiche is possible, please discuss why the licensee does not consider a seiche as a beyond-design-basis external event applicable to MPS2.

DNC Response:

As stated, the MPS2 FSAR does not address seiche-related flooding. However, the MPS3 FSAR does include seiche conditions, but states that the Probable Maximum Hurricane (PMH) surge is the more significant flooding event at the MPS site. Although this statement is made for MPS3, it is applicable to both units at the MPS site.

Based on the above, DNC does not consider a seiche as a beyond-design-basis external event applicable to MPS2.

NRC Audit Question No. 80

Generic Open Item: 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.

DNC 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 has 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 that 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. 82

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.

DNC Response:

MPS2 will abide by 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.