VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

10 CFR 2.202
Order EA-12-051

March 2, 2015

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

Serial No.: 14-392A
NL&OS/MAE: R3
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 RELIABLE SPENT FUEL POOL INSTRUMENTATION (ORDER NUMBER EA-12-051)

References:

1. NRC Order Number EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," 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 Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051), dated February 28, 2013 (Serial No. 12-167B)

3. Virginia Electric and Power Company's Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051), dated February 27, 2014 (Serial No. 12-167D)

4. Virginia Electric and Power Company's Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051), dated August 28, 2014 (Serial No. 14-392)

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 install reliable Spent Fuel Pool (SFP) Level Instrumentation (SFPLI).

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.

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Attachment 1 to this letter provides the fourth Six-Month Status Report and an update of milestone accomplishments since the submittal of the previous six-month status report (Reference 4), including any changes to the compliance method, schedule, or need for relief and the basis. Attachment 2 to this letter provides the SFPLI request for additional information (RAI) responses, with the exception of RAI 17. RAI 17 will be submitted with the compliance letter for Order EA-12-051.

If you have any questions, please contact Mr. Gary D. Miller at (804) 273-2771.

Sincerely,

Mark D. Sartain
Vice President Nuclear Engineering

Attachments: 1. Six Month Status Report for the Implementation of Order EA-12-051
2. Response to SFPLI RAIs and Safety Evaluation Review Item 1

Commitments made by this letter: No new Regulatory Commitments

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

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

Acknowledged before me this 2ND day of March, 2015.

My Commission Expires: December 31, 2016.

CRAIG D SLY
Notary Public
Commonwealth of Virginia
Reg. # 7518653
My Commission Expires December 31, 2016

Notary Public

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NRC Senior Resident Inspector
Surry Power Station

Attachment 1

Six Month Status Report for the Implementation of Order EA-12-051, Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation

February 2015

Virginia Electric and Power Company
(Dominion)
Surry Power Station Units 1 and 2

Six Month Status Report for the Implementation of Order EA-12-051
Surry Power Station Units 1 and 2

1 Introduction

Dominion developed an Overall Integrated Plan (OIP) (Reference 1) documenting the requirements to install reliable Spent Fuel Pool Level Instrumentation (SFPLI) in response to Order EA-12-051 (the Order) (Reference 2). This attachment provides an update of milestone accomplishments since submittal of the last status report (Reference 4), 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 Surry Power Station (SPS) OIP for Order EA-12-051 and are current as of January 31, 2015.

- Submit OIP
- Commence Engineering and Design
- Complete Engineering and Design
- Complete Procurement of SFP Instruments
- Commence Installation of SFP Instruments

3 Milestone Schedule Status

The following table provides an update to the milestone schedule supporting the OIP. This table provides the activity status of each item and the expected completion date, noting any change. The target completion dates are subject to change as design and implementation details are developed.

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Submit OIP	Feb 2013	Complete	
Commence Engineering and Design	March 2013	Complete	
Complete Engineering and Design	May 2014	Complete	

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Complete Procurement of SFP Instruments	August 2014	Complete	
Commence Installation of SFP Instruments	November 2014	Complete	
Level Measurement System Functional	December 2014	Started	May 2015*

* The revised milestone target completion date for 'Level Measurement System Functional' does not impact the Order implementation date for SPS.

4 Changes to Compliance Method

There are no changes to Dominion's compliance method with NEI 12-02 (Reference 5).

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 from Overall Integrated Plan and Interim Staff Evaluation

No open items were identified in the SPS OIP. However, Requests for Additional Information (RAIs) were identified in the Interim Staff Evaluation (Reference 6).

Responses to these SFPLI RAIs, with the exception of RAI 17, are provided in Attachment 2 to this letter. The response to SFPLI RAI 17 will be provided with the Surry compliance letter for Order EA-12-051.

One additional item, identified as Safety Evaluation (SE) Review Item 1, was identified during the January 2015 Onsite NRC Audit. SE Review Item 1 was a question regarding the potential effect that Electro Magnetic Interference (EMI) may have on the SFPLI. The response to this item is also addressed in Attachment 2 of this letter.

7 Potential Interim Staff Evaluation (ISE) Impacts

In the second Six Month Status Report letter (Reference 3), Dominion reported a change in the SFPLI vendor and reported conclusions of a comparison between the Westinghouse SFPLI design and the design details previously provided to the staff that were included in the ISE (Reference 6).

8 Supplemental Information

This supplemental information provides details of the changes identified in the status updates above and addresses a revision to Milestone Task 'Level Measurement System Functional.'

a) **SPS, Milestone Task 'Level Measurement System Functional':** The revision to the scheduled milestone target completion date allows for approval of the finalized SPS FLEX Support Guidelines (FSGs). In accordance with Attachment 2 to Order EA-12-051, implementing procedures for use of the SFPLI system are required to be in compliance with the Order. FSG-11 is the implementing procedure for operation of the SFPLI system. Therefore, when FSG-11 is issued, the SFPLI system will be considered 'Functional' and in compliance with the Order.

9 References

The following references support the update to the SFPLI OIP described in Attachment 1:

1. Virginia Electric and Power Company's Overall Integrated Plan in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051), dated February 28, 2013 (Serial No. 12-167B).

2. NRC Order Number EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," dated March 12, 2012.

3. Virginia Electric and Power Company's Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051), dated February 28, 2014 (Serial No. 12-167D).

4. Virginia Electric and Power Company's Second Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051), dated August 28, 2014 (Serial No. 14-392).

5. NEI 12-02 (Revision 1), Industry Guidance for Compliance with NRC Order EA-12-051, "To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," dated August 2012.

6. Surry Power Station, Units 1 and 2: Interim Staff Evaluation and Request for Additional Information Regarding Overall Integrated Plan for Implementation of Order EA-12-051, Reliable Spent Fuel Pool Instrumentation," dated November 1, 2013.

Attachment 2

Response to SFPLI RAIs and Safety Evaluation Review Item 1

Virginia Electric and Power Company
(Dominion)
Surry Power Station Units 1 and 2

Response to SFPLI RAIs and Safety Evaluation Review Item 1

Spent Fuel Pool Level Instrumentation (SFPLI) RAIs 3, 8, 9, 10, 11, 12, 14, and 15

Dominion Response:

On November 1, 2013, Dominion received an Interim Staff Evaluation (ISE) and Request for Additional Information Regarding the Overall Integrated Plan for Implementation of Order EA-12-051 for Surry Power Station (SPS) Units 1 and 2 in a letter from Ms. Karen Cotton to Mr. David Heacock (Reference 1). Responses to RAIs 3, 8, 9, 10, 11, 12, 14, and 15 contained in the ISE were provided to the NRC in Attachment 2 to the second Six-Month Status Report dated February 27, 2014 (Reference 4).

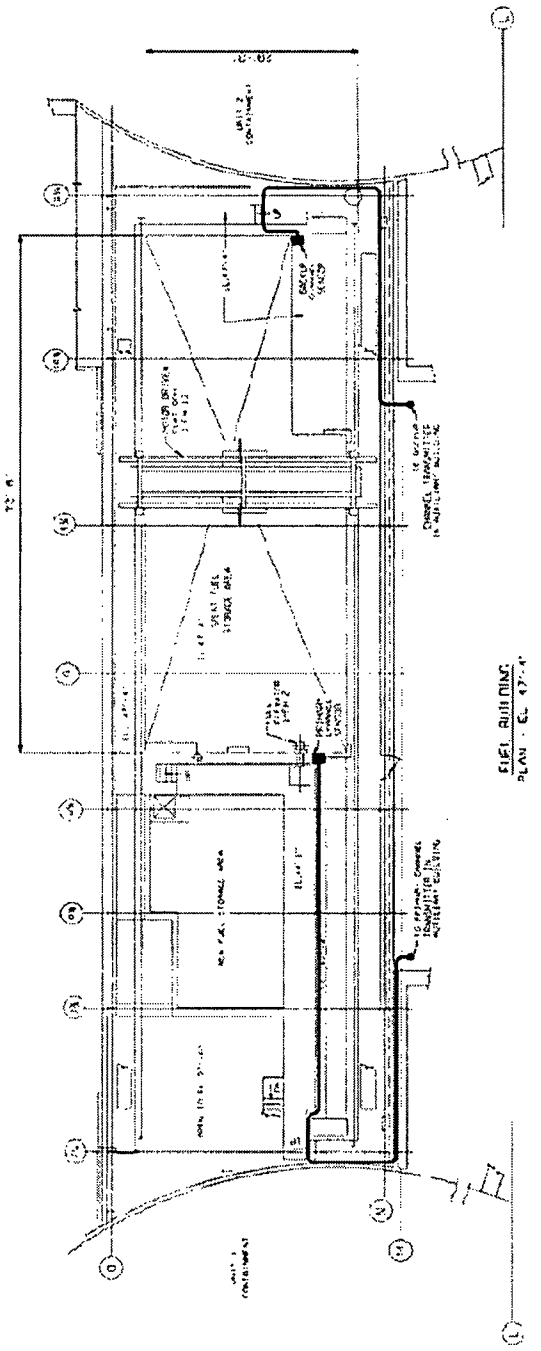
SFPLI RAIs 1, 2, 4, 5, 6, 7, 13, 16, and 18

SFPLI RAI No. 1

Please provide a clearly labeled sketch or marked-up plant drawing of the plan view of the SFP area, depicting the SFP inside dimensions, the planned locations/placement of the primary and back-up SFP level sensor, and the proposed routing of the cables that will extend from these sensors toward the location of the read-out/display device.

Dominion Response:

A plan view sketch of the SPS Spent Fuel Pool (SFP) area is provided in the figure below. The sketch depicts the SFP inside dimensions, the planned locations/placement of the primary and back-up channel sensors, and the proposed cable routing that extends the sensors toward the location of the electronics.



Surry Power Station SFPLI Plan View
(EL. 47'-4")

SFPLI RAI No. 2

Provide the following:

a) The design criteria that will be used to estimate the total loading on the mounting device(s), including static weight loads and dynamic loads. Describe the methodology that will be used to estimate the total loading, inclusive of design basis maximum seismic loads and the hydrodynamic loads that could result from pool sloshing or other effects that could accompany such seismic forces.

b) A description of the manner in which the level sensor will be attached to the refueling floor and/or other support structures for each planned point of attachment of the probe assembly. Indicate in a schematic the portions of the level sensor that will serve as points of attachment for mechanical/mounting or electrical connections.

c) A description of the manner by which the mechanical connections will attach the level instrument to permanent SFP structures so as to support the level sensor assembly.

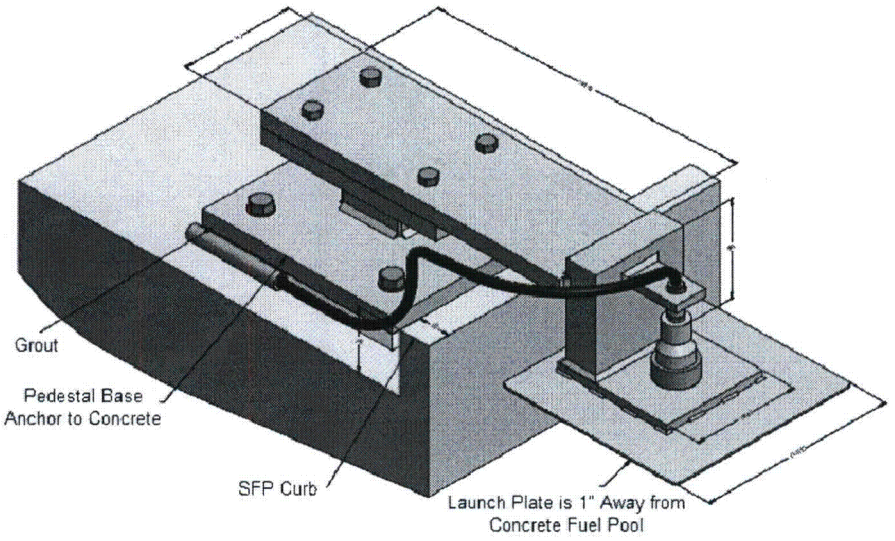
Dominion Response:

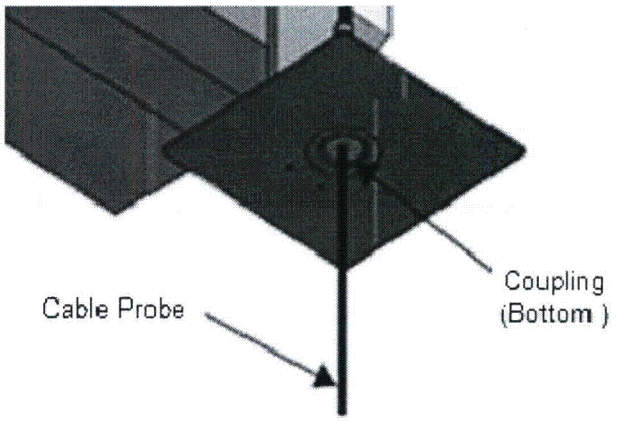
a) The mounting device (mounting bracket) for the SFPLI system is designated as Quality Classification NSQ (Non-safety related, with special quality requirements) in accordance with the Dominion Nuclear Quality Assurance Program (Reference 3). The mounting bracket design meets the SPS design requirements for Seismic Category I components and includes consideration of static weight loads and hydrodynamic loads.

The mounting bracket was qualified by analysis for the loading conditions, including design basis maximum seismic loads and the hydrodynamic loads that could result from pool sloshing. The Surry-specific analysis of the mounting bracket was performed by Westinghouse (SFPLI equipment supplier) and the methods, design criteria, and results of the analysis are documented in a Westinghouse calculation (Reference 4).

b) The level sensor consists of the braided stainless steel cable level probe, which is attached to the mounting bracket and extends into the pool. The attachment to the bottom of the mounting bracket and to the signal cable is made via a coaxial coupling. The mounting bracket is attached to the SFP structure at the concrete curb utilizing expansion-type concrete anchor bolts. The probe is not attached to the floor of the pool.

The following simplified drawings show a representation of the attachment of the probe and the sensor cable to the mounting bracket (launch plate) and mounting bracket attachment to the SFP structure.





c) The level sensor (probe) is designed to be attached near its upper end to the mounting bracket, as described in the response to RAI #2b above. The mounting bracket is attached to the SFP concrete curb utilizing expansion-type concrete anchor bolts. The mounting bracket to the SFP structure concrete curb anchorage is designed to meet the requirements of the Surry design basis for Seismic Category I components including seismic loads, static weight loads and hydrodynamic loads.

SFPLI RAI No. 4

For each of the mounting attachments required to attach SFP Level equipment to plant structures, please describe the design inputs, and the methodology that was used to qualify the structural integrity of the affected structures/equipment.

Dominion Response:

As described in the responses to RAIs 2a, 2b, and 2c above, the level sensing probe is attached to the mounting bracket, which is anchored to the SFP structure at the concrete curb using concrete expansion anchors. The anchorage to the Seismic Category I SFP structure meets the design requirements described in the response to RAI 2c.

Each of the additional SFPLI components required to be mounted / anchored are fixed to plant structures consistent with the Surry design and licensing bases for Seismic Category I components, and include consideration of design basis maximum seismic loads and static weight loads.

SFPLI RAI No. 5

Please provide analysis of the maximum expected radiological conditions (dose rate and total integrated dose) to which the equipment (including transmitters, control boxes, and display panels) will be exposed. Also, please provide documentation indicating how it was determined that the electronics for the SFP level instrumentation is capable of withstanding a total integrated dose of 1E4 Rads. Please discuss the time period over which the analyzed total integrated dose was applied.

Dominion Response:

A radiation dose analysis was performed to support the radiological assessment requirements defined by NEI 12-02 (Reference 5) for the SFP, Auxiliary Building areas, and Cable Spreading Rooms. The results are provided in Calculation RA-0047, "Radiological Evaluation following a Beyond Design Basis SPS SFP Draindown for NEI 12-02," (Reference 6). The results of the analysis provided integrated doses for 7-days and dose rates post-event with SFP water level at one foot above the fuel rack. The analysis also provided dose rates and integrated doses for 40-year normal operation. The 7-day integrated doses and dose rates were based on the core inventories (spent fuel sources) at 100 hours after shutdown as defined in NEI 12-02.

In the SFP area where the coupler and coaxial cable are located, the dose analysis resulted in a 7-day integrated dose of 2.9E6 Rads and a 40-year integrated dose of 880 Rads. In the Auxiliary Building where the SFPLI sensor transmitters are located, the

dose analysis resulted in a 7-day integrated dose of 990 Rads and 40-year integrated dose of 880 Rads. In the Cable Spreading Rooms where the display cabinets are located, the dose analysis resulted in a 7-day integrated dose of 320 Rads and 40-year integrated dose of 270 Rads. These values were compared to the design criteria of 1E7 Rads for the SFP area and 1E3 Rads for the areas outside of the SFP area and formed the basis for demonstrating reliability of the permanently installed SFPLI.

Reference 6 also calculated the highest dose rates, with Spent Fuel Pool water level at one foot above the fuel rack, experienced by the equipment inside the Spent Fuel pool, Auxiliary Building, and Cable Spreading Rooms. These dose rates are: Spent Fuel Pool area: 1.7 E+04 R/hr; Auxiliary Building: 6 R/hr; Cable Spreading Room: 1.9 R/hr.

Radiation test results supplied from Westinghouse in qualification summary test report EQ-QR-269, "Design Verification Testing Summary Report for the Spent Fuel Pool Instrumentation System" (Reference 8), have qualified the coupler and coaxial connecting cable to greater than 1E7 Rads demonstrating reliability of this permanently installed equipment located in the SPS SFP. Westinghouse document EQ-QR-269 is available for review upon request. (Reference 18)

The SFPLI electronics utilize Commercial-off-the-Shelf (COTS) components containing Complementary Metal Oxide Semiconductor (CMOS) devices which are capable of withstanding ionizing dose radiation levels of up to 1E3 Rads as described in EPRI 1021067, "Nuclear Power Plant Equipment Qualification Reference Manual" Rev. 1, and discussed in RG 1.209, "Guidelines for Environmental Qualification of Safety-Related Computer Based Instrumentation and Control Systems in Nuclear Power Plants." Comparing the calculated integrated dose for both the short-term post-BDB event and the long-term normal operating conditions to the industry accepted limit formed the basis to demonstrate reliability of the permanently installed sensor transmitter equipment located within the Auxiliary Building under post-BDB event radiological conditions.

SFPLI RAI No. 6

Please provide information indicating:

a) What are the temperature ratings and whether the temperature ratings for the system electronics (including transmitters, control boxes, and display panels) are continuous duty ratings; and,

b) What will be the maximum expected ambient temperature in the rooms in which the system electronics will be located under BDB conditions in which there are no AC power available to run Heating Ventilation and Air Conditioning (HVAC) systems?

Dominion Response:

a) The temperature rating for the electronic equipment located in the Auxiliary Building and the Cable Spreading Rooms (transmitter, control box, uninterruptable power supply (UPS), display) is 120 degrees F based on a continuous duty rating and 140 degrees F under abnormal conditions. The basis for the temperature ratings is provided in Section 4.6 of Westinghouse design specification WNA-DS-02957-GEN (Reference 9). The temperature rating test results for abnormal conditions are provided in Section 4.5 of Westinghouse report EQ-QR-269, "Design Verification Testing Summary Report for the Spent Fuel Pool Instrumentation System" (Reference 8). Both WNA-DS-02957-GEN and EQ-QR-269 are available for review upon request. (Reference 18)

b) The electronic transmitter equipment is mounted within the Auxiliary Building one elevation below the SFP Operating Deck. The displays, control box and UPS are located in the Cable Spreading Rooms which are one elevation above the Main Control Room (MCR). These areas are described in SU-EQUAL-00038-EZD, "Environmental Zone Description Surry Unit 1 and 2," (Reference 10). Worst case conditions are not expected to exceed 105 degrees F (i.e., mild zone) during normal operations. The maximum temperature under postulated BDB conditions in which there is no AC power available to run heating, ventilation and air conditioning (HVAC) systems is not expected to exceed 120 degrees F. The room temperatures were analyzed utilizing GOTHIC computational code for BDB conditions, and the results are included in Addendum 00A to SPS calculation ME-0973, "Evaluation of Room Air Temperatures Following Extended Loss of AC Power (ELAP)" (Reference 11). Calculation ME-0973 has been previously provided to the staff and is available for their review. (Reference 18)

SFPLI RAI No. 7

Please provide information indicating the maximum expected relative humidity in the rooms in which the system electronics will be located under BDB conditions, in which there are no AC power available to run HVAC systems, and whether the sensor electronics are capable of continuously performing its required functions under this expected humidity condition.

Dominion Response:

The electronic transmitter equipment is mounted within the Auxiliary Building one elevation below the SFP Operating Deck. The displays, control boxes, and UPS are located in the Cable Spreading Rooms one elevation above the Main Control Room. The maximum humidity for SPS postulated BDB conditions in which there is no AC power available to run heating, ventilation and air conditioning (HVAC) systems is expected to be less than 95% relative humidity which was analyzed utilizing GOTHIC

computational code, and the results are included in Addendum 00A to SPS calculation ME-0973, "Evaluation of Room Air Temperatures Following Extended Loss of AC Power (ELAP)" (Reference 11). Equipment testing under normal and abnormal conditions with humidity levels up to 95% was performed by Westinghouse and the results documented in Section 4.5 of EQ-QR-269, "Design Verification Testing Summary Report for the Spent Fuel Pool Instrumentation System" (Reference 8). The results from testing performed by Westinghouse compared to the maximum post BDB humidity level of 95% were found to be acceptable. This comparison formed the basis to demonstrate reliability of the permanently installed electronic equipment located within the Auxiliary Building and Cable Spreading Rooms under the BDB post event humidity conditions. Calculation ME-0973, Rev. 0, Add. 00A, has been previously provided to the staff and is available for review. Westinghouse document EQ-QR-269 is available for review upon request. (Reference 18)

SFPLI RAI No. 13

Please provide the following:

a) A description of the electrical AC power sources and capabilities for the primary and backup channels.

b) Please provide the NRC staff with the final configuration of the power supply source for each channel so that the staff may conclude that the two channels are independent from a power supply assignment perspective.

Dominion Response:

a & b) Each instrument channel is normally powered by 120V AC distribution panels to support continuous monitoring of the SFP level. The 120V AC distribution panels for the primary and backup channels are powered by different 480V AC buses. Therefore, the loss of any one 480V AC bus will not result in the failure of both instrument channels. On loss of normal 120V AC power, each channel is equipped with a separate uninterruptible power supply (UPS) that will automatically transfer to a dedicated back-up battery. If normal power is restored, the channel will automatically transfer back to the normal 120V AC power source. The backup batteries are maintained in a charged state by the associated UPS.

The instrument channels can also be powered through a manually selected alternate AC power source. The Westinghouse SFPLI system design does not include an optional external DC power input.

SFPLI RAI No. 16

Please provide the following:

a) For both SFP level instrumentation read-out/displays located outside the main control room, please describe the evaluation used to validate that the display location can be accessed without unreasonable delay following a BDB event. Include the time available for personnel to access the display as credited in the evaluation, as well as the actual time (e.g., based on walk-throughs) that it will take for personnel to access the display. Additionally, please include a description of the radiological and environmental conditions on the paths personnel might take. Describe whether the display location remains habitable for radiological, heat and humidity, and other environmental conditions following a BDB event. Describe whether personnel are continuously stationed at the display or monitor the display periodically.

Dominion Response:

The primary display location for the SFPLI system is located in the Unit 1 Cable Spreading Room directly above the Main Control Room near the Appendix R remote monitoring panels. This location was selected due to its proximity to a current Appendix R access path inside a seismic structure and proximity to the Main Control Room that allows rapid access for the emergency response staff to and from the display.

Radiological habitability at this location has been evaluated against the radiological conclusions in 1) Calculation 12846.38-RP-026, Revision 0, Addendum A, "Surry Auxiliary Building Radiation Zone Maps for the Post-LOCA Mitigation Phase (No Letdown) Based on NUREG-0578," February 2009 (Reference 12), 2) Calculation 12846.38-RP-031, Revision 0, Addendum A, "NUREG-0578 Shielding Review – Site Dose Rates following a LOCA," February 2009 (Reference 13), and 3) Calculation SU-CALC-PA-011, Revision 0, "Low Water Level Spent Fuel Pool Dose Rate," October 1988 (Reference 14). Results of the evaluation have concluded that due to the physical distance from the SFP and shielding from structures, radiological exposure to personnel monitoring SFP levels would remain less than emergency exposure limits allowable for emergency responders to perform this action, per the Surry Emergency Plan. Heat and humidity from SFP boildown conditions have been evaluated for this location in Calculation ME-0973, Rev. 0, Add. 00A, "Evaluation of Room Air Temperatures Following Extended Loss of AC Power (ELAP)" (Reference 11). The location is physically separated from the SFP by closed fire doors, and the entire Auxiliary Building such that heat and humidity from a boiling SFP would not compromise habitability at this location. Calculations 12846.38-RP-026, Revision 0, Addendum A, 12846.38-RP-031, Revision 0, and Calculation SU-CALC-PA-011, Revision 0 have been previously provided to the staff and are available for their review (Reference 18).

The secondary display location for the SFPLI system is in the Unit 2 Cable Spreading Room. This location is physically separated from the primary monitoring location to allow for scenarios where access to the primary control location is not desirable. The secondary monitoring location allows rapid access to and egress from the Main Control Room (MCR) via pathways that are enclosed within seismically qualified structures. This location has similar characteristics physically to the Unit 1 Cable Spreading Room and would not be significantly different with regard to exposure during accident scenarios or habitability from the primary location.

Spent fuel pool level display monitoring will be primarily the responsibility of the Service Building Inside Operator, who will normally perform periodic monitoring at the location where the primary display is mounted once dispatched from the MCR. Travel time from the MCR to the primary display is approximately one minute based on walkdowns. Travel time from the MCR to the secondary display location is approximately one minute based on walkdowns. The transit routes to both displays are primarily contained within the MCR pressure boundary and due to both areas being physically directly above the MCR, there is no significant change associated with the travel path to the primary or secondary display locations, and similar exposure rates would be expected based on similar distance from the Containment structures and Spent Fuel Pool.

Diverse communications are accessible at both display locations. The Gai-tronics system is available at both locations if it survives the BDB event. If not, the credited sound power phone receptacles are available as a backup. The Cable Spreading Rooms are considered Radio Frequency Interference Boundaries; therefore, the station radio system would not normally be used in these areas, but could be evaluated as needed by the Station Emergency Manager during station emergencies, since the units would already be shutdown, and there would be no risk of unit transient associated with their use at that time.

SFPLI RAI No. 18

Please provide the following:

a) Further information describing the maintenance and testing program the licensee will establish and implement to ensure that regular testing and calibration is performed and verified by inspection and audit to demonstrate conformance with design and system readiness requirements. Please include a description of the plans for ensuring that necessary channel checks, functional tests, periodic calibration, and maintenance will be conducted for the level measurement system and its supporting equipment.

b) Information describing compensatory actions when both channels are out-of-order, and the implementation procedures.

c) Additional information describing expedited and compensatory actions in the maintenance procedure to address when one of the instrument channels cannot be restored to functional status within 90 days.

Dominion Response:

a) Operators will record the SFP level from both channels of the SFP level indicators twice daily as part of operations walkdowns (i.e., Operator Logs) and will check the UPS to ensure it is being supplied by the proper source and the batteries are fully charged. The SFP level nominal operating range is $\geq$23.87 ft., but $\leq$24.37 ft. The readings taken from each SFP level indicator channel during the operations walkdowns will be compared to each other. There will be an established acceptable delta between the values obtained. If either reading is outside of the nominal operating range or the difference in the readings exceeds the established acceptable delta, the Control Room will be notified and corrective actions will be initiated to resolve the discrepancy. While the SFP is operating within design basis and at normal level, the indicators may be compared to fixed marks within the SFP by visual observation to confirm indicated level. The periodic calibration verification will be performed within 60 days of a refueling outage considering normal testing scheduling allowances (e.g., 25%). Calibration verification is not required to be performed more than once per 12 months. These calibration requirements are consistent with the guidance provided in Section 4.3 of NEI 12-02. Periodic calibration verification procedures provided by Westinghouse in WNA-TP-04709-GEN, "Spent Fuel Pool Instrumentation System Calibration Procedure," (Reference 16) are in place. Site specific calibration verification procedures have been developed based on Westinghouse document WNA-TP-04709-GEN. Preventive maintenance procedures, which include tests, inspection and periodic replacement of the backup batteries, have been provided by Westinghouse. The Recurring Task Evaluations (RTEs) that prepare and implement the corresponding site specific preventative maintenance (PM) activities using recommended vendor guidance have been approved and PM development is in progress.

b & c) Provisions associated with out of service (OOS) or non-functional equipment including Allowed Outage Times and compensatory actions are consistent with the guidance provided in Section 4.3 of NEI 12-02. If one OOS channel cannot be restored to service within 90 days, appropriate compensatory actions, including the use of alternate suitable equipment, will be taken. If both channels become OOS, actions would be initiated within 24 hours to restore one of the channels to operable status and to implement appropriate compensatory actions (e.g., use of alternate suitable equipment or supplemental personnel) within 72 hours. Additionally, if both channels are OOS, a Condition Report will be initiated and addressed through Dominion's Corrective Action Program.

Surry will maintain sufficient spare parts for the SFPLI, taking into account the lead time and availability of spare parts, in order to expedite maintenance activities, when

necessary, to provide assurance that a channel can be restored to service within 90 days.

Safety Evaluation (SE) Review Item

SE#1

Please provide an assessment of potential susceptibilities of EMI/RFI in the areas where the SFP instrument located and how to mitigate those susceptibilities.

Dominion Response:

The base configuration necessary to meet Criterion B (instrument will function before and after an Electro-Magnetic Compatibility (EMC) event) was confirmed during EMC qualification testing performed by Westinghouse. NRC representatives audited the Westinghouse test documents. As a result, Westinghouse specified materials, installation, and grounding requirements necessary to ensure the installed SFPLI system meets the tested EMI/RFI qualifications. These requirements and characteristics are detailed in Westinghouse proprietary letter LTR-EQ-14-32, Rev. 2 dated August 1, 2014 (Reference 17), which is available for review upon request. (Reference 18)

Additionally, placards have been installed in the SPS Auxiliary Building. The placards read, "Be aware that use of hand-held radios within 3 ft. may cause interference with the SFP level channels. The reading returns to normal when radio usage is stopped."

References:

1. Surry Power Station, Units 1 and 2: NRC Interim Staff Evaluation and Request for Additional Information Regarding the Overall Integrated Plan for Implementation of Order EA-12-051, Reliable Spent Fuel Pool Instrumentation, dated November 1, 2013 (ML13298A625).
2. Surry Power Station Units 1 and 2, Second Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051), dated February 27, 2014 (Serial No. 12-167D). (ML14069A010).
3. Nuclear Facility Quality Assurance Program Description, Topical Report DOM-QA-1, Revision 18.
4. 38-0-W893-CN-PEUS-14-3, "Seismic Analysis of the SFP Mounting Bracket for Surry Power Station, Millstone Power Station Unit 3, & North Anna Power Station."

5. NEI 12-02, Rev. 1, "Industry Guidance for Compliance with NRC Order EA-12-051, "To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," dated August 2012.

6. CALC-RA-0047, Rev. 0, "Radiological Evaluation following a Beyond Design Basis SPS SFP Draindown for NEI 12-02," dated February 14, 2014.

7. ETE-CPR- 2013-0004, "Calculation of SFP Elevation Boiloff and Refill Rates for Shielding Purposes."

8. Westinghouse document EQ-EE-269, "Design Verification Testing Summary Report for the Spent Fuel Pool Instrumentation System," dated September 2014.

9. Westinghouse document WNA-DS-02957-GEN, "Spent Fuel Pool Instrumentation System-System Design Specification," dated March 2014.

10. SU-EQUAL-00038-EZD, "Environmental Zone Description Surry Unit 1 and 2."

11. Calculation ME-0973, Rev. 0, Add. 00A, "Evaluation of Room Air Temperatures Following Extended Loss of AC Power (ELAP)."

12. Calculation 12846.38-RP-026, Revision 0, Addendum A, "Surry Auxiliary Building Radiation Zone Maps for the Post-LOCA Mitigation Phase (No Letdown) Based on NUREG-0578," February 2009.

13. Calculation 12846.38-RP-031, Revision 0, Addendum A, "NUREG-0578 Shielding Review – Site Dose Rates following a LOCA," February 2009.

14. Calculation SU-CALC-PA-011, Revision 0, "Low Water Level Spent Fuel Pool Dose Rate," October 1988.

15. IEEE 338-1987, "IEEE Standard Criteria for the Periodic Surveillance Testing of Nuclear Power Generating Station Safety Systems."

16. Westinghouse document WNA-TP-04709-GEN, "Spent Fuel Pool Instrumentation System Calibration Procedure," dated March 2014.

17. Westinghouse letter LTR-EQ-14-32, Rev. 2, "Spent Fuel Instrumentation System – Hardware Configuration for EMC testing to satisfy Performance Criteria B," dated August 1, 2014.

18. NRC letter to All Operating Reactor Licensees and Holders of Construction Permits, "Online Reference Portal for Nuclear Regulatory Commission Review of Fukushima Near-Term Task Force Related Documents," dated August 1, 2013 (ML13206A427).