VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

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

July 20, 2015

Serial No.: 14-392B
NLOS/DEA: R5
Docket No.: 50-280/281
License No.: NPF-32/37

VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)
SURRY POWER STATION UNITS 1 AND 2
CONFIRMATION OF COMPLIANCE WITH EA-12-051
ORDER MODIFYING LICENSES WITH REGARD TO
RELIABLE SPENT FUEL POOL INSTRUMENTATION

On March 28, 2012 the NRC issued EA-12-051, "Order Modifying Licenses with regard to Reliable Spent Fuel Pool Instrumentation," which required the installation of reliable indication for the water level in associated spent fuel storage pools. The Order requires the indication to be capable of supporting identification of the following pool water level conditions by trained personnel: (1) level that is adequate to support operation of the normal fuel pool cooling system, (2) level that is adequate to provide substantial radiation shielding for a person standing on the spent fuel pool operating deck, and (3) level where fuel remains covered and actions to implement make-up water addition should no longer be deferred. Condition C.3 of the Order requires all Licensees to report to the Commission when full compliance with the requirements of the Order is achieved.

This letter provides confirmation that Dominion has completed the requirements of Order EA-12-051 and Surry Units 1 and 2 are in full compliance with the Order. The attachments to this letter provide: 1) a summary of how the requirements were met, 2) a compliance element summary, and 3) the response to Spent Fuel Pool Level Instrumentation (SFPLI) requests for additional information (RAIs) or references to the source document for the RAI.

Should you have any questions or require additional information, please contact Margaret Earle at (804) 273-2768.

Respectfully,

Mark Sartain
Vice President – Nuclear Engineering

Commitment contained in this letter: None

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Mr. 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 that company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 20th day of July, 2015.

My Commission Expires: January 31, 2016

WANDA D. CRAFT
Notary Public
Commonwealth of Virginia
Reg. # 7520495
My Commission Expires January 31, 2016

Wanda D. Craft
Notary Public

A001
NRR

Attachments:
1. Order EA-12-051 Compliance Requirements Summary
2. Compliance Elements Summary
3. Order EA-12-051 Response to SFPI RAI 17

Commitment contained in this letter: None

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NRC Senior Resident Inspector
Surry Power Station

Attachment 1

Order EA-12-051 Compliance Requirements Summary

Surry Power Station Units 1 and 2

Virginia Electric and Power Company (Dominion)

Surry Power Station
Order EA-12-051 Compliance Requirements Summary

BACKGROUND

Surry Power Station (SPS) developed an Overall Integrated Plan (OIP) (Reference 1), documenting how the requirements for reliable spent fuel pool level instrumentation (SFPLI) would be achieved, in response to Order EA-12-051, "Order Modifying Licenses with Regard to Spent Fuel Pool Instrumentation," (Reference 2). The SPS Units 1 and 2 OIP was submitted to the NRC on February 28, 2013 and was supplemented by Six-Month Status Reports (References 3, 4, and 5) in accordance with Order EA-12-051 (the Order). By letter dated November 1, 2013, the NRC provided its Interim Staff Evaluation and Request for Additional Information Regarding Order EA-12-051 (Reference 6).

SPS shares a common Spent Fuel Pool (SFP) between Units 1 and 2. Two independent SFP level measurement channels supplied and qualified by Westinghouse have been installed in response to Reference 2. On May 24, 2015, SPS achieved full compliance with Order EA-12-051 prior to the end of the second refueling outage following submittal of the OIP.

Completion of the elements identified below, as well as References 1, 3, 4, and 5, document full compliance with Order EA-12-051 for SPS.

COMPLIANCE SUMMARY

NRC RAI, ISE AND AUDIT ITEMS – COMPLETE

During the ongoing audit process (Reference 7), Dominion provided responses to the 17 Requests for Additional Information (RAIs) identified in the Interim Staff Evaluation (ISE) as well as an additional Safety Evaluation Review Item identified during the NRC Onsite Audit.

As requested by the NRC, Dominion's responses, or references to the source document for the responses, to the SFPLI RAIs and Safety Evaluation Review Item 1 (SE #1) related to the SPS SFPLI are provided in Attachment 3 of this letter. This completes Dominion's actions related to the SFPLI RAIs and SE #1 for SPS.

MILESTONE SCHEDULE – ITEMS COMPLETE

Surry Power Station Milestone	Completion Date
Submit Overall Integrated Plan	February 2013
Commence Engineering and Design	March 2013
Complete Engineering and Design	May 2014
Complete Procurement of SFP Instruments	August 2014

Surry Power Station Milestone	Completion Date
Commence Installation of SFP Instruments	November 2014
Level Measurement System Functional	February 2015

IDENTIFICATION OF LEVELS OF REQUIRED MONITORING - COMPLETE

SPS has identified the three required levels for monitoring SFP level in compliance with Order EA-12-051. These levels have been integrated into the site processes for monitoring level in the event of beyond-design-basis external events and for responding to a loss of SFP inventory.

INSTRUMENT DESIGN FEATURES - COMPLETE

The design of the SFPLI system installed at SPS complies with the requirements specified in Order EA-12-051 and described in NEI 12-02, *Industry Guidance for Compliance with NRC Order EA-12-051, "To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation"* (Reference 8). The SFPLI system has been installed in accordance with the station design control process.

The design features identified in Attachment 2 of Reference 2 are summarized as follows:

The instruments have been arranged to provide reasonable protection against missiles. The instruments have been mounted to retain design configuration during and following the maximum expected ground motion. The instruments will be reliable during expected environmental and radiological conditions when the SFP water is near or at boiling conditions for extended periods. The instruments are independent of each other and have separate and diverse power supplies. The instruments will maintain their designed accuracy following a power interruption and are designed to allow for routine testing and calibration.

The instrument display is readily accessible during postulated events and allows for SFP level information to be promptly available to decision makers.

A more detailed Compliance Element Summary of the design features identified in Attachment 2 of Reference 2 is provided in Attachment 2 to this letter.

PROGRAM FEATURES - COMPLETE

Training of personnel performing maintenance functions including calibration and surveillance associated with the SFPLI channels at SPS has been completed. Additional or continuing training will be determined in accordance with an accepted training process as recommended in NEI 12-02, Section 4.1.

Procedures for monitoring and use of the SPS SFPLI channels by operators have been developed and integrated with existing procedures. These procedures have been verified and are available for use in accordance with the site procedure control program.

Westinghouse guidelines (procedures and manuals) are currently available for use in maintenance, calibration and testing of the SPS SFPLI channels. Site specific calibration and testing procedures have been developed in accordance with the design control program, based on these vendor guidelines. Site specific preventative maintenance (PM) requirements have been approved and will be implemented in accordance with site PM processes.

Site processes have been established to ensure the instruments are maintained at their design accuracy.

REFERENCES

The following references support the SPS SFPLI Compliance Summary:

1. Surry Power Station, Units 1 and 2, "Overall Integrated Plan with regard to Reliable Spent Fuel Pool Implementation," February 28, 2013 (ML13063A181).
2. NRC Order Number EA-12-051, "Issuance of Order to Modify Licenses with regard to Reliable Spent Fuel Pool Instrumentation," March 12, 2012.
3. Dominion, 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 23, 2013 (Serial No. 12-167C). (ML13242A013).
4. Dominion, 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).
5. Dominion, 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 26, 2014 (Serial No. 14-392). (ML14245A402).
6. 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).
7. NRC letter to All Operating Reactor Licensees and Holders of Construction Permits, "Nuclear Regulatory Commission Audits of Licensee Responses to Mitigation Strategies Order EA-12-049," dated August 28, 2013 (ML13234A503).
8. 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.

Attachment 2

Compliance Elements Summary

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

Compliance Elements Summary

In accordance with NRC Order EA-12-051, Attachment 2, "Requirements for Reliable Spent Fuel Pool Level Instrumentation at Operating Reactor Sites and Construction Permit Holders," Surry Power Station shall have a reliable indication of the water level in associated spent fuel storage pools capable of supporting identification of the following pool water level conditions by trained personnel:

(1) Level that is adequate to support operation of the normal fuel pool cooling system,

This level is based on the elevation at which the top of the SFP cooling pump suction lines penetrate the pool walls. It is the indicated level of greater than elevation 42'-2" plus the accuracy of the SFPLI channel (Reference 1).

(2) Level that is adequate to provide substantial radiation shielding for a person standing on the spent fuel pool operating deck, and

This level is approximately 10' above the top of the fuel racks. It is the indicated level of greater than elevation 31'-4" plus the accuracy of the SFPLI channel. This water level ensures there is sufficient depth such that necessary operations in the vicinity of the SFP can be completed without significant dose consequences from direct gamma radiation from stored spent fuel (Reference 1).

(3) Level where fuel remains covered and actions to implement make-up water addition should no longer be deferred.

This level corresponds to one foot above the highest point of any fuel rack seated in the SFP. It is the indicated level of elevation 22'-4", which is one foot above the highest point of any fuel rack in the SFP based on field measurements (Elevation 21'-4"), plus the accuracy of the SFPLI channel. This is the water level at which the spent fuel remains covered (Reference 1).

1. The spent fuel pool level instrumentation shall include the following design features:

1.1 ***Instruments: The instrumentation shall consist of a permanent, fixed primary instrument channel and a backup instrument channel. The backup instrument channel may be fixed or portable.***

The Westinghouse SFPLI system uses Guided Wave Radar (GWR) technology. GWR level measurement instruments work based on the Time Domain Reflectometry (TDR) principle. The level measurement instrumentation sends low intensity microwave electromagnetic pulses along a flexible conductor where pulses

travel at the speed of light. When the pulses reach the surface of the medium to be measured, a portion of the signal is reflected back to the electronics. The electronics calculate the SFP water level by measuring the time elapsed between the initial pulse and the reflected one. One complete measurement cycle is made up of several thousand pulses. The measurement cycles are made two times per second and processed by special filtering techniques before generating a current output proportional to the SFP water level. The current output of the electronics is representative of the measured level and converted for use in displaying level information.

1.2 Arrangement: The spent fuel pool level instrument channels shall be arranged in a manner that provides reasonable protection of the level indication function against missiles that may result from damage to the structure over the spent fuel pool. This protection may be provided by locating the primary instrument channel and fixed portions of the backup instrument channel, if applicable, to maintain instrument channel separation within the spent fuel pool area, and to utilize inherent shielding from missiles provided by existing recesses and corners in the spent fuel pool structure.

The level sensor probes in the pool are separated by a distance comparable to the shortest length of a side of the pool. The transmitters and displays for each channel are installed in separate locations. Cables associated with each channel are routed independently in accordance with the physical safety related separation criteria within the Surry design specifications.

The steel superstructure of the Fuel Building above elevation 47'-4" does not provide protection against the tornado missile spectrum as defined in the FSAR Table 15.2-1; therefore, a defense in depth strategy is employed. The separation of the components of each independent channel provides reasonable protection against missiles. Per Section 3.2 of 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'," reasonable channel separation should be maintained by separating them by a distance comparable to the shortest length of a side of the pool. The sensor probes are on opposite ends of the SFP and are located greater than 29'-3" apart, the shortest width of the SFP (Reference 1).

1.3 Mounting: Installed instrument channel equipment within the spent fuel pool shall be mounted to retain its design configuration during and following the maximum seismic ground motion considered in the design of the spent fuel pool structure.

Components of each instrument channel are mounted using Seismic Category I criteria.

1.4 Qualification: The primary and backup instrument channels shall be reliable at temperature, humidity, and radiation levels consistent with the spent fuel pool water at saturation conditions for an extended period. This reliability shall be established through use of an augmented quality assurance process (e.g., a process similar to that applied to the site fire protection program).

The primary and backup instrument channel reliability has been demonstrated by design, analyses, and/or testing as discussed below.

Conditions

Beyond Design Basis (BDB) event environmental conditions were determined for temperature, humidity and radiation levels in locations where instrument channel components are installed. These conditions form the basis for ensuring the equipment operates during and after a BDB event. The sensor probe and mounting bracket are comprised of stainless steel which is not adversely affected by relative changes in temperature, humidity, radiation, or continuous exposure to borated water.

Temperature

The probe, bracket, and coaxial cable are located in the Fuel Building and are subject to abnormal BDB conditions in the SFP area up to 212 °F. The probe and bracket are comprised of stainless steel which is inherently resistant to environmental effects. Westinghouse Design Verification Testing Summary Report, EQ-QR-269 (Reference 3) demonstrates that the probe, coaxial cable, and coupler are able to perform at 212 °F for 185 hours. The coaxial cable installed in the Fuel Building is rated for 105 °C (221 °F).

The electronic transmitter equipment is mounted within the Auxiliary Building one elevation below the SFP operating floor, and the display cabinets are in the Units 1 and 2 Cable Spreading Rooms (CSRs) located in the Service Building. These areas of the Auxiliary Building are described in SPS "Environmental Zone Description" (Reference 4) and are not expected to exceed 90 and 105 °F, respectively, during normal operations. The maximum temperature under postulated BDB conditions, during which there is no ac power available to run heating ventilation and air conditioning (HVAC) systems, is not expected to exceed 120 °F (Reference 5). The temperature rating for the electronic equipment located in the Auxiliary Building and the CSRs is 120 °F based on a continuous duty rating and 140 °F under abnormal conditions according to Westinghouse Final Summary Design Verification Report, WNA-TR-03149-GEN (Reference 6). The instrumentation cable installed in the Auxiliary and Service Buildings is rated for 90 °C (194 °F).

Humidity

Westinghouse report EQ-QR-269, "Design Verification Testing Summary Report for the Spent Fuel Pool Instrumentation System" (Reference 3) demonstrates that the probe, coaxial cable, and coupler are able to perform in a 100% saturated steam environment for 185 hours. The electronic equipment is mounted within the Auxiliary Building one elevation below the SFP operating floor. The maximum humidity for SPS postulated BDB conditions, during 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 (Reference 5). Testing of electronic equipment under normal and abnormal conditions with humidity levels up to 95% were performed by Westinghouse and the results documented in Westinghouse report EQ-QR-269. These test results from Westinghouse were compared to the maximum post-BDB humidity level of 95% and were found to be acceptable.

Radiation

A radiation dose rate analysis was performed in calculation RA-0047 (Reference 7) to support the radiological assessment requirements defined by NEI 12-02 for the SFP and Auxiliary Building areas. The results of the analysis provided dose rates and integrated doses for 7-days 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 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 probe, coupler and coaxial cable are located, the dose rate 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 rate analysis resulted in a 7-day integrated dose of 990 Rads and 40-year integrated dose of 880 Rads. In the CSRs where the display cabinets are located, the dose rate analysis resulted in a 7-day integrated dose of 320 Rads and 40-year integrated dose of 270 Rads.

Radiation test results supplied by Westinghouse in qualification summary test report EQ-QR-269 (Reference 3) have qualified the probe, coupler, and coaxial connecting cable to 1E7 Rads. Comparing the calculated integrated dose for both the short-term post-BDB event and the long-term normal operating conditions to the qualification results of 1E7 Rads forms the basis to demonstrate reliability of the permanently installed SFPLI equipment located within the SFP area under post-BDB event radiological conditions.

The SFPLI electronics located in the Auxiliary Building and the CSRs 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 radiation dose limit forms the basis to demonstrate reliability of the permanently installed sensor transmitter and display equipment located within the Auxiliary Building and CSR under post-BDB event radiological conditions.

Shock and Vibration

Components of both instrumentation channels are permanently installed and fixed to rigid, structural walls or floors of Seismic Category I structures and are not subject to anticipated shock or vibration inputs. The display enclosure utilizes NEMA-4X rated stainless steel housing to aid in protecting internal components from vibration induced damage according to Westinghouse report WNA-TR-03149-GEN (Reference 7). Therefore, in accordance with NRC Order EA-12-051, NEI guidance (Reference 2), and as clarified by the Interim Staff Guidance (Reference 8), the probe, coaxial cable, and mounting brackets are inherently resistant to shock and vibration loadings.

Seismic

The instrumentation meets the Surry Power Station design and licensing basis requirements for Seismic Category I components and includes consideration of static weight loads and hydrodynamic loads. Seismic testing has been performed by Westinghouse on the sensor probe, coaxial cable, transmitter, and display cabinet in accordance with IEEE 344-2004. Results of the seismic testing have been documented in Westinghouse Testing Summary Report EQ-QR-269 (Reference 3). Seismic and hydrodynamic qualification of the level sensor mounting bracket is qualified by analysis in Westinghouse Calculation CN-PEUS-14-3 (Reference 9).

1.5 ***Independence: The primary instrument channel shall be independent of the backup instrument channel.***

Independence of the instrument channels is achieved by the physical separation of components and use of separate power divisions. Each channel is powered by different distribution panels fed from different buses. The components for each channel have been physically installed in separate locations and the cable routes meet the physical safety related separation guidelines within the Surry design specifications.

1.6 Power supplies: Permanently installed instrumentation channels shall each be powered by a separate power supply. Permanently installed and portable instrumentation channels shall provide for power connections from sources independent of the plant ac and dc power distribution systems, such as portable generators or replaceable batteries. Onsite generators used as an alternate power source and replaceable batteries used for instrument channel power shall have sufficient capacity to maintain the level indication function until offsite resource availability is reasonably assured.

The instrument channels are normally powered from separate 120 VAC distribution panels. Power is provided to one display cabinet from bus 1C1. Power is provided to the other display cabinet from a bus 2C1. Use of these power sources ensures the loss of one power train does not result in the functional loss of both instrumentation channels.

Back-up power for the instrument channels is provided by a sealed lead battery located in the display cabinets that is maintained in a charged state by a 24 VDC power switchover module (UPS). At full charge, the battery is capable of supporting the channel operations for approximately 4.2 days according to Westinghouse calculation WNA-CN-00300-GEN (Reference 10).

The BDB onsite equipment includes several small electric generators which can provide, if necessary, a portable power source within the 4.2 day battery operating timeframe to ensure reliable instrument channel operation until off-site resources can be deployed. Each display cabinet is furnished with an external connection and manual transfer switch which provides the ability to use an alternate 120 VAC power source to re-power the channel.

1.7 Accuracy: The instrument channels shall maintain their designed accuracy following a power interruption or change in power source without recalibration.

The level measurement channels provide measurement accuracy to within +/- 3 inches of the actual surface of the SFP water. Actual instrument channel accuracy is documented within Westinghouse calculation WNA-CN-00301-GEN (Reference 11). This accuracy is maintained without the need for recalibration following an interruption or change in power source as described in Westinghouse report WNA-TR-03149 (Reference 6).

1.8 Testing: The instrument channel design shall provide for routine testing and calibration.

The new SFPLI system is comprised of fixed sensors, transmitters, and display cabinets. This system can be tested and calibrated in-situ without removing the

sensor probes from the pool or removing other equipment from their permanently installed locations.

1.9 Display: Trained personnel shall be able to monitor the spent fuel pool water level from the control room, alternate shutdown panel, or other appropriate and accessible location. The display shall provide on-demand or continuous indication of spent fuel pool water level.

The level indicators are mounted within display cabinets installed in the Units 1 and 2 CSRs of the Service Building. Level indicator 1-FC-LI-105-1 and display cabinet 1-FC-CAB-105-1 are located in the Unit 1 CSR at approximate column line E-7¾ on elevation 45'-3". Level indicator 1-FC-LI-105-2 and display cabinet 1-FC-CAB-105-2 are located in the Unit 2 CSR at approximate column line E-9½ on elevation 45'-3". The operation of the level indicators is checked during operator rounds in the Service Building.

The internal electronics of the display cabinets consists of an Electro-Magnetic Compatibility (EMC) surge protection filter, a 24 VDC power supply module, a 24 VDC power switchover module, a 24 VDC Valve-Regulated Lead Acid (VRLA) Absorbed Glass Mat (AGM) battery, a signal duplicator, and a door mounted digital display indicator. The 5-digit level indicator displays SFP level to one-tenth of a foot in terms of "POOL LEVEL (FEET ABOVE FUEL)". The 4-20 mA signals from the transmitters are scaled to the entire measured range for the displays.

2. The spent fuel pool instrumentation shall be maintained available and reliable through appropriate development and implementation of the following programs:

2.1 Training: Personnel shall be trained in the use and the provision of alternate power to the primary and backup instrument channels.

To provide sufficient instructions for operation and use of the system by plant staff personnel, Knowledge Based Training is conducted during initial Operator Qualification and has been integrated into the Continuing Operations Training Program. Refer to the response to RAI #17 in Attachment 3 of this letter.

2.2 Procedures: Procedures shall be established and maintained for the testing, calibration, and use of the primary and backup spent fuel pool instrument channels.

Refer to the response to RAI #17 in Attachment 3 of this letter.

2.3 Testing and Calibration: Processes shall be established and maintained for scheduling and implementing necessary testing and calibration of the primary and backup spent fuel pool level instrument channels to maintain the instrument channels at the design accuracy.

Refer to the response to RAI #17 in Attachment 3 of this letter.

References:

1* DC-SU-13-01042, "Beyond Design Basis Spent Fuel Pool Level Instrument Installation – Surry Units 1 & 2."

2 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.

3 EQ-QR-269, "Westinghouse Design Verification Testing Summary Report."

4 SU-EQUAL-38-EZD, Revision 24, "Surry Environmental Zone Description, Units 1 & 2."

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

6 WNA-TR-03149-GEN, "Westinghouse Final Summary Design Verification Report."

7* Calculation RA-0047, Revision 0, "Radiological Evaluation following a Beyond Design Basis SPS SFP Draindown for NEI 12-02."

8 JLD-ISG-2012-03, Revision 0, Interim Staff Guidance – Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation, August 2012.

9 59-0-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."

10 WNA-CN-00300-GEN, "Spent Fuel Pool Instrumentation System Power Consumption Calculation."

11 WNA-CN-00301-GEN, "Spent Fuel Pool Instrumentation System Channel Accuracy Analysis."

* References have been previously provided to the staff and are available for their review. All other references are available for review upon request.

Attachment 3

Order EA-12-051 Response to SFPLI RAIs and Safety Evaluation Review Item 1

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

Order EA-12-051 Response to SFPLI RAIs and Safety Evaluation Review Item 1

Spent Fuel Pool Level Instrumentation (SFPLI) Requests for Additional Information (RAIs) 1 through 16 and 18 along with Safety Evaluation Review Item 1

Dominion Response:

On November 1, 2013, Dominion received an Interim Staff Evaluation (ISE) and RAIs 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 2). Responses to RAIs 1, 2, 4, 5, 6, 7, 13, 16, and 18 contained in the ISE and Safety Evaluation Review Item 1 were provided to the NRC in Attachment 2 to the fourth Six-Month Status Report dated March 2, 2015 (Reference 3).

Spent Fuel Pool Level Indication RAI No. 17

SFPLI RAI No. 17

Please provide a list of the procedures addressing operation (both normal and abnormal response), calibration, test, maintenance, and inspection procedures that will be developed for use of the spent SFP instrumentation. The licensee is requested to include a brief description of the specific technical objectives to be achieved within each procedure.

Dominion Response:

Appropriate quality assurance measures that are consistent with Appendix A-1 of NEI 12-02 (Reference 4) have been established for the SFP level instrumentation as required by Order EA-12-051. Procedures for system inspection, calibration and test, maintenance, repair, operation, and normal and abnormal responses have been provided by Westinghouse. Corresponding site-specific procedures have either been developed based on these vendor documents or a Recurring Task Evaluation (RTE) has been established to evaluate, prepare, and implement the stated Preventative Maintenance (PM) procedures at the recommended frequencies. A list of procedures and RTEs supporting the Surry SFP Level Instrumentation is provided below. Technical objectives for the various types of procedures are also included.

1) System Inspection* -- To verify the system components are in place, complete, and in the correct configuration.

- LOG-SBIS-001R: Procedure to conduct plant walkdowns and record SFPLI System status, conditions, and level readings.

2) Calibration and Test* -- To verify that the system is within specified accuracy, is functioning as designed, and is properly indicating SFP level.

   - 0-ICP-FC-L-105-1, "Spent Fuel Pool Level (1-FC-L-105-1) Calibration."

   - 0-ICP-FC-L-105-2, "Spent Fuel Pool Level (1-FC-L-105-2) Calibration."

3) Maintenance* -- To establish and define scheduled and preventative maintenance (PM) requirements and activities necessary to minimize the possibility of interruption.

   - RTE # P-SURR-340705: PM for 24 Volt Battery Replacement at 3-Years [e.g., Battery Replacement Before End of Life].

   - RTE # P-SURR-340706: PM to Perform 18-Month Loop Calibration of the BDB SFP Wide Range Level Indication System.

   - RTE # P-SURR-340707: PM to Replace Cable and Connectors at 10-Years.

   - RTE # P-SURR-340708: PM to Replace Transmitter Electronics Module.

   - RTE # P-SURR-340709: PM to Replace Electronics Enclosure Components at 10-years.

4) Repair -- To specify troubleshooting steps and component repair and replacement activities in the event of a system malfunction.

   - Work Management Process: A Condition Report (CR) is written when a deviating condition is found. The CR is evaluated by the Station Condition Report Review Team (CRT) and a Corrective Action (CA) is assigned to the responsible organization. Work orders are developed to address/repair the deviating condition. The system Technical Manual and repair procedures supplied by Westinghouse are available as input into the work orders.

5) Operation -- To provide sufficient instructions for operation and use of the system by plant staff personnel.

   - Knowledge Based Training is conducted during initial Operator Qualification and has been integrated into the Continuing Operator Training Program. Initial training has been completed for current operations personnel.

6) FLEX Support Guideline (FSG)** -- To define the actions to be taken upon observation of system level indications, including actions to be taken at the levels defined in NEI 12-02.

- Emergency Contingency Action, ECA-0.0, "Loss of All A/C Power": This procedure directs the operator to procedure 0-AP-22.02, "Malfunction of Spent Fuel Pool System", which provides guidance for checking and monitoring fuel pool level. When level is low, the procedure directs the user to FSG-11, "Alternate SFP Makeup and Cooling."

- FSG-5, "Initial Assessment & Equipment Staging": When the High Capacity Pumps are staged, the procedure directs the user to FSG-11 to monitor and to add water to SFP as required.

- FSG-11, "Alternate SFP Makeup and Cooling": Provides instruction for monitoring and adding water to SFP. FSG-11 also provides instruction for the use of alternate power to the primary and backup instrument channels.

* Documents referenced in this response are available for review upon request.

** Station documents identified in this response have been previously provided to the staff and are available for their review.

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. 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), dated March 2, 2015 (Serial No. 14-392A).

4. 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.