WOLF CREEK
NUCLEAR OPERATING CORPORATION

Jaime H. McCoy
Vice President Engineering

June 30, 2015
ET 15-0014

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

References: 1) Letter dated March 12, 2012, from E. J. Leeds and M. R. Johnson, USNRC, to M. W. Sunseri, WCNOC, "Issuance of Order to Modify Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation"

2) NRC Interim Staff Guidance JLD-ISG-2012-03, Compliance with Order EA-12-051, "Reliable Spent Fuel Pool Instrumentation," Revision 0, dated August 29, 2012

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

4) Letter ET 12-0028, dated October 29, 2012, from J. P. Broschak, WCNOC, to USNRC

5) Letter WO 13-0015, dated February 28, 2013, from R. A. Smith, WCNOC, to USNRC

6) Letter ET 13-0026, dated August 28, 2013, from J. P. Broschak, WCNOC, to USNRC

7) Letter ET 14-0010, dated February 26, 2014, from J. P. Broschak, WCNOC, to USNRC

8) Letter ET 14-0025, dated August 21, 2014, from C. O. Reasoner, WCNOC, to USNRC

9) Letter ET 15-0006, dated February 24, 2015, from J. H. McCoy, WCNOC, to USNRC

Subject: Docket No. 50-482: Wolf Creek Nuclear Operating Corporation's Compliance Report for the Implementation of Order EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation"

A001
NRR

Gentlemen:

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued Order EA-12-051 (Reference 1) to Wolf Creek Nuclear Operating Corporation (WCNOC). Reference 1 was immediately effective and directs WCNOC to have a reliable indication of the water level in associated spent fuel storage pools. Specific requirements are outlined in Attachment 2 of Reference 1.

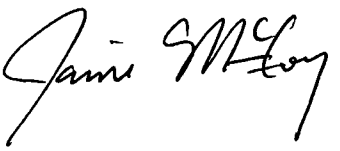
Reference 1 required submission of an initial status report 60 days following issuance of the final interim staff guidance (Reference 2) and an Overall Integrated Plan (OIP) pursuant to Section IV, Condition C. Reference 2 endorses industry guidance document Nuclear Energy Institute (NEI) 12-02, Revision 1 (Reference 3) with clarifications and exceptions identified in Reference 2.

Reference 4 provided the WCNOC initial status report for Wolf Creek Generating Station (WCGS) regarding mitigation strategies, as required by Reference 1. Reference 5 provided the WCNOC OIP. References 6, 7, 8, and 9 provided the first, second, third, and fourth six-month status report for the implementation of Order EA-12-051, respectively.

Reference 1 requires submission of a report to the NRC when full compliance with the requirements described in Attachment 2 or Attachment 3 of Reference 1 is achieved. The purpose of this letter is to provide the full compliance report pursuant to Section IV, Condition C.3, of Reference 1. The report in Attachment I of this letter provides the full compliance report. Attachment II of this letter transmits responses to the NRC Request for Additional Information (RAI) as described in Attachment I. Attachment III contains the design bridge document comparing the instrumentation vendor assumptions to the site.

This letter contains no commitments. If you have any questions concerning this matter, please contact me at (620) 364-4171, or Mr. Bill T. Muilenburg at (620) 364-4186.

Sincerely,



Jaime H. McCoy

JHM/rlt

Attachments: I Wolf Creek Nuclear Operating Corporation's Spent Fuel Pool Instrumentation Compliance Report in Response to Order EA-12-051, "Issuance of Order to Modify Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation"
II Wolf Creek Nuclear Operating Corporation's Response to Request for Additional Information
III Wolf Creek Nuclear Operating Corporation's Design Bridge Document

cc: M. L. Dapas (NRC), w/a
C. F. Lyon (NRC), w/a
A. A. Rosebrook (NRC), w/a
Senior Resident Inspector (NRC), w/a

STATE OF KANSAS)
) SS
COUNTY OF COFFEY)

Jaime H. McCoy, of lawful age, being first duly sworn upon oath says that he is Vice President Engineering of Wolf Creek Nuclear Operating Corporation; that he has read the foregoing document and knows the contents thereof; that he has executed the same for and on behalf of said Corporation with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By Jaime H McCoy
Jaime H. McCoy
Vice President Engineering

SUBSCRIBED and sworn to before me this 30th day of June, 2015.

GAYLE SHEPHEARD
Notary Public - State of Kansas
My Appt. Expires 7/24/2015

Gayle Shepheard
Notary Public

Expiration Date 7/24/2015

Wolf Creek Nuclear Operating Corporation's Spent Fuel Pool Instrumentation *Compliance Report in Response to Order* EA-12-051, "*Issuance of Order to Modify* Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation"

1. Introduction

Wolf Creek Nuclear Operating Corporation (WCNOC) developed an Overall Integrated Plan (OIP) (Reference 1), documenting the modification with regard to Reliable Spent Fuel Pool (SFP) Instrumentation in response to Reference 2. Reference 2 directed licensees to implement reliable means of remotely monitoring wide-range Spent Fuel Pool (SFP) levels to support effective prioritization of event mitigation and recovery actions in the event of a beyond-design-basis external event.

This attachment documents full compliance with the requirements described in Attachments 2 and 3 of Reference 2.

2. Request for Additional Information (RAI) Resolution

The Nuclear Regulatory Commission (NRC) issued an initial set of Requests for Additional Information (RAI)'s in Reference 3. WCNOC provided responses to the RAI in Reference 4. Subsequently, the NRC issued an Interim Staff Evaluation (ISE) and a RAI (Reference 5) regarding the OIP (Reference 1), on October 29, 2013. Reference 6 announced the transition to an audit based review process, and notified each licensee participating in the audit not to formally submit their RAI response on the docket but, instead, put their response and any other supporting information on their ePortals by the date identified in their ISE to support the staff's review process. Attachment II to this letter provides the response to the RAI (Reference 5).

3. Milestone Schedule Status

The following table lists the milestones identified in the OIP (Reference 1). The table reflects the status of each milestone on the required compliance date, May 3, 2015, when the unit startup was commenced.

Milestone	Activity Status
Commence Engineering and Design	Complete
Complete Generic Design	Complete
Submit 6 Month Updates:	
Update 1	Complete
Update 2	Complete
Update 3	Complete
Update 4	Complete
Receipt of SFP Instruments	Complete
Complete Site Specific Design	Complete
Complete SFP Instrumentation Procedures & Training	Complete
SFP Instruments Operational	Complete

4. Summary of Compliance Elements for Order EA-12-051

WCNOC compliance with Order EA-12-051 was achieved using the guidance in Nuclear Energy Institute (NEI) document NEI 12-02 (Reference 7) which has been endorsed by the NRC (Reference 8). The significant compliance elements were addressed as described below.

IDENTIFICATION OF LEVELS OF REQUIRED MONITORING – COMPLETE

WCNOC has identified the three required levels for monitoring SFP level in compliance with Order EA-12-051, as indicated on Reference 9.

INSTRUMENT DESIGNED FEATURES – COMPLETE

The design of the instruments installed at WCGS comply with the requirements specified in Order EA-12-051 and described in NEI 12-02. The instruments have been installed in accordance with the station configuration control process.

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 for environmental and radiological conditions when the SFP is at saturation for extended periods.

PROGRAM FEATURES – COMPLETE

Training for WCNOC has been completed in accordance with an accepted training process as recommended in Section 4.1 of Reference 7.

Operating and maintenance procedures are developed and integrated with existing site processes for WCGS.

References:

1. WCNOC Letter WO 13-0015, "Wolf Creek Nuclear Operating Corporation Overall Integrated Plan in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements For Reliable Spent Fuel Pool Instrumentation (Order EA-12-051," February 28, 2013. ADAMS Accession No. ML13071A419.

2. Letter from E. J. Leeds and M. R. Johnson, USNRC, to M. W. Sunseri, WCNOC, "Issuance of Order to Modify Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation," March 12, 2012. ADAMS Accession No. ML12054A679.

3. Letter from C. F. Lyon, USNRC, to M. W. Sunseri, WCNOC, "Wolf Creek Generating Station – Request for Additional Information RE: Overall Integrated Plan in Response to Order EA-12-051, 'Reliable Spent Fuel Pool Instrumentation' (TAC NO. MF0781)," July 17, 2013. ADAMS Accession No. ML13197A205.

4. WCNOC Letter ET 13-0025, "Wolf Creek Nuclear Operating Corporation's Response to Request for Additional Information Regarding Overall Integrated Plan in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Level Instrumentation (Order EA-12-051)," August 15, 2013. ADAMS Accession No. ML13232A008.

5. Letter from C. F. Lyon, USNRC, to M. W. Sunseri, WCNOC, "Wolf Creek Generating Station – Interim Staff Evaluation and Request for Additional Information Regarding Overall Integrated Plan in Response to Order EA-12-051, Reliable Spent Fuel Pool Instrumentation (TAC No. MF0781)," October 29, 2013. ADAMS Accession No. ML13295A681.

6. Letter from J. R. Davis, USNRC, to A. C. Heflin, WCNOC, "Nuclear Regulatory Commission Audits of Licensee Responses to Reliable Spent Fuel Pool Instrumentation Order EA-12-051," March 26, 2014. ADAMS Accession No. ML14083A620.

7. NEI 12-02, "Industry Guidance for Compliance with NRC Order EA-12-051, 'To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation'," Revision 1, August 2012. ADAMS Accession No. ML122400399.

8. JLD-ISG-2012-03, "Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation," Revision 0, August 29, 2012. ADAMS Accession No. ML12221A339.

9. Wolf Creek Drawing J-481A-00071, Revision W01, "Full Range Level Measurement."

Wolf Creek Nuclear Operating Corporation's
Response to Request for Additional Information

Reference 1 provided the Wolf Creek Nuclear Operating Corporation (WCNOC) Overall Integrated Plan (OIP). Reference 2 provided a Nuclear Regulatory Commission (NRC) Interim Staff Evaluation and Request for Additional Information (RAI) related to the OIP. Provided below are the responses to the questions in Reference 2. The specific request is provided in italics followed by WCNOC's response.

RAI No. 1

Please provide the results of the calculation used to determine the water elevation necessary for the pump's required NPSH to confirm that Level 1 has been adequately identified.

Response: The existing calculation, EC-48, "Minimum Safety Limit for LSL-57 & 58"concludes that the Spent Fuel Pool (SFP) water elevation that is sufficient for the pump's required Net Positive Suction Head (NPSH) is EL. 2043'-6". Level 1 indication is at the normal SFP water operating level of EL. 2046'-0". This confirms that Level 1 has sufficiently covered the calculated level to maintain the pump's required NPSH.

RAI No. 2

Please provide the following:

a) *The plant-specific performance evaluation result and a brief summary of the proposed wireless technology that will be used in the primary and backup measurement systems to address the criteria summarized in Section 3.1 of NEI 12-02.*

b) *A description of the proposed wireless SFP instrumentation connections. Indicate whether the proposed SFP wireless instrumentation will use an existing wireless network or would use a dedicated point-to-point transmission path.*

c) *Further information on how the proposed SFP wireless instrumentation will be designed and installed to address electromagnetic interference/radiofrequency interference (EMI/RFI) emissions/susceptibility issues under BDB event conditions.*

d) *A description of the manner by which the proposed SFP wireless instrumentation will be operable and available under BDB event conditions.*

Response: For items a) through d) above, WCNOC has opted to use hardwired Spent Fuel Pool Instrumentation System (SFPIS) instead of wireless during final design development.

RAI No. 3

Please provide additional information describing how the proposed arrangement of the routing of the cabling between the sensor probes in the SFP to the wireless transmitters meets the Order requirement to arrange the SFP level instrument channels in a manner that provides reasonable protection of the level indication function against missiles that may result from damage to the structure over the SFP.

Response: The primary element is located at the North end of the pool at the East corner. The element terminates into a 90 degree metal coupler. The coupler is connected into liquid tight EMI/RFI resistant flex conduit, transitioning into rigid metal conduit. The rigid metal conduit is first routed horizontally close to the fuel pool floor and then routed vertically, up the North wall before turning West and running horizontally before exiting the fuel handling building into the auxiliary building.

The backup element is located at the North end of the pool at the West corner. Like the primary element, the backup element terminates into a 90 degree metal coupler. The coupler is connected into liquid tight EMI/RFI resistant flex conduit, transitioning into rigid metal conduit. The rigid metal conduit is first routed horizontally close to the fuel pool floor and maintains this above floor level route before turning West and running horizontally before exiting the fuel handling building into the auxiliary building.

A separation distance of greater than 16' is maintained between primary and backup conduits routed in the fuel handling building.

By routing primary and backup cables in flex and rigid conduit and providing significant physical separation between primary and backup cables in the fuel handling building, missiles will not disable both primary and backup systems of the SFPIS.

RAI No. 4

Please provide the results of the analyses used to verify the design criteria and methodology for seismic testing of the SFP instrumentation and the electronics units, including, design basis maximum seismic loads and the hydrodynamic loads that could result from pool sloshing or other effects that could accompany such seismic forces.

Response: Analysis results: The mounting bracket for the sensing probe was designed according to the plant design basis for Safe Shutdown Earthquake (SSE) seismic hazard curve at the pool deck elevation. Loads that were considered in the evaluation of the bracket and its mounting are: 1) Static loads including the dead weight of the mounting bracket in addition to the weight of the level sensing instruments and cabling; 2) Dynamic loads including the seismic load due to excitation of the instruments dead weight in addition to the hydrodynamic effects resulting from the excitation of the SFP water.

A response spectra analysis was performed for the seismic evaluation of the mounting bracket using GT STRUDL. Hydrodynamic effects on the mounting bracket were evaluated using Reference 5 and added to the GT STRUDL model. Plant acceptance criteria and applicable codes were used for the design of the bracket and its anchorage. All members' results were shown to be adequate for the loads and load combinations used in the analysis. Welded and bolted connections were evaluated and were shown to be adequate with significant margin. Base plate of the mounting bracket and anchorage to concrete were evaluated using Plate Wizard in GT STRUDL and designed to meet the plant criteria for base plates and anchors.

Seismic testing results: Seismic testing results analyses are provided in the response for RAI 8. The seismic testing for the Westinghouse SFPIS demonstrated that the SFPIS operates reliably per the seismic requirements.

RAI No. 5

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.

Response: The design input and qualification methodology is consistent with the current seismic design for existing plant structures/equipment. As stated in Reference 6, industry standards, such as those published by the American Society for Testing and Materials (ASTM), are used whenever possible to specify material properties, testing procedures, fabrication, and construction methods. The applicable standards used within the Auxiliary and Fuel Building are discussed in Reference 6, Section 3.8.3.6. For example, embedded anchor bolt materials conform to the applicable requirements of ASTM A540 for Alloy Steel bolting Materials for Special Applications.

The mounting attachments are qualified by analysis. With the exception of the level sensor probe mounting bracket, all the system equipment is seismically qualified by testing. The outputs of the seismic test of all equipment were used as the design input for the qualification of the mounting for that specific equipment.

The mounting bracket for the sensing probe was designed according to the plant design basis for SSE seismic hazard curve at the appropriate plant elevation. Loads that were considered in the evaluation of the bracket and its mounting are: 1) Static loads including the dead weight of the mounting bracket in addition to the weight of the level sensing instruments, pipe guard and cabling; 2) Dynamic loads including the seismic load due to excitation of the dead weight of the system in addition to the hydrodynamic effects resulting from the excitation of the SFP water.

A response spectra analysis was performed for the seismic evaluation of the mounting bracket using Finite Element Analysis (FEA) software and using floor response spectrum at the operating deck elevation. Hydrodynamic effects on the mounting bracket were evaluated using Reference 5. Plant acceptance criteria and applicable codes were used for the design of the bracket and its anchorage.

RAI No. 6

Please provide the following:

a) *Information describing the temperature ratings for all system electronics (including sensor electronics, system electronics, level and wireless transmitter, wireless receiver and display) and whether the ratings are continuous duty ratings; and,*

b) *Information describing what will be the maximum expected temperature and relative humidity conditions in the room(s) in which the sensor electronics and wireless technologies will be located under BDB conditions in which there is no ac power available to run Heating Ventilation and Air Conditioning (HVAC) systems.*

c) *Analysis of the maximum expected radiological conditions (dose rate and total integrated dose) to which the equipment will be exposed. Also, please provide documentation indicating the radiological dosage amount that the electronics for this equipment is capable of withstanding. Please discuss the time period over which the analyzed total integrated dose was applied.*

Response:

a) Components in the Fuel Building (the probe, cable assembly and coupler for the level sensors) are qualified for Beyond Design Basis (BDB) conditions of 212°F at atmospheric pressure.

For components in the Auxiliary Building, the sensor electronics are rated for and were tested at 140°F at atmospheric pressure.

These ratings are continuous duty ratings.

b) The equipment qualifications delineated in Reference 7 are not exceeded in the location of the sensor electronics.

Qualitatively, due to the lack of water sources in the rooms, the increasing temperatures in the rooms will cause the relative humidity of the rooms to decrease relative to their starting humidity.

There is no non-Heating Ventilation and Air Conditioning (HVAC) flowpath into the Auxiliary Building HVAC Area rooms (Room 1501 and Room 1512) or Personal Hatch Area (Room 1507), so there will be minimal outside influence to the room humidity if the HVAC fails.

The sensor electronics are located at the 2047' elevation in the Auxiliary Building Control Room HVAC Equipment Rooms (Room 1501 and Room 1512) and the Personal Hatch Area (Room 1507). There are no high energy lines located on the 2047' elevation of the Auxiliary Building. The sensor electronics are rated for humidity of 0-95% (non-condensing). The normal temperature for these three rooms is 104°F. Without ventilation and no significant heat sources, the temperatures will not exceed the 140°F temperature used by Westinghouse as the operating temperature of the equipment.

The Fuel Building is connected to the Auxiliary Building on the 2047' elevation by a pressure door (Door 15071). As a pressure boundary door, it is designed to limit leakage. Leakage through the pressure boundary door would be diluted by the large volume of the hallways. Therefore, environmental conditions in Rooms 1501, 1507, and 1512 are expected to remain within equipment qualification parameters.

Components in the Fuel Building (level sensors and their respective cables) are qualified for BDB conditions of 100% humidity (saturated steam).

c) A summary of the radiological conditions to which the equipment is qualified is provided below. Vendor tests and analysis demonstrating the qualifications of the equipment installed are detailed in Westinghouse proprietary documents References 9 and 10.

<u>Radiological conditions for the SFPIS components in the SFP area:</u>

The coaxial cable, the coupler, the pool-side bracket, and the probe in the SFP area are required to operate reliably in the service radiological conditions specified in the table below.

Parameter	Normal	Beyond Design Basis
Radiation Total Integrated Dose (TID) (above pool)	1E03 Rads γ	1E07 Rads γ
Radiation TID (12" above top of fuel rack)	≤ 1E09 Rads γ (probe & weight only)	1E07 Rads γ

The SFP area radiological conditions are detailed in Reference 9.

Radiological conditions outside of the SFP area:

The level sensor electronics, sensor electronics bracket, indicators, and the electronics enclosures outside of the spent fuel pool area are required to operate reliably in the service environmental conditions specified in the table below.

Parameter	Normal	Beyond Design Basis
Radiation TID	≤ 1E03 Rads γ	≤ 1E03 Rads γ

There are no active electronics in the Fuel Building. The transmitter electronics are physically located in the Auxiliary Building and therefore are not subjected to the same post-event (BDB) radiological conditions as identified in Section 3.4, "Qualifications" of Reference 11.

During a BDB event, the expected radiological conditions (dose rate and total integrated dose) in the Auxiliary Building are consistent with normal operating conditions identified in Attachment A and Attachment B of Reference 12 based on the following:

- During a BDB event, the Reactor Coolant System remains intact and the Mitigating Strategies per EA-12-049 maintain core cooling.
- SFP makeup capabilities (>250 gpm) exceed calculated full core offload boil off of approximately 136 gpm.

RAI No. 7

Please provide the following:

a) *Information describing the evaluation of the sensor electronics design, the shock test method, test results, and forces applied to the sensor electronics applicable to its successful tests demonstrating that the testing provides an appropriate means to demonstrate reliability of the sensor electronics under the effects of severe shock.*

b) *Information describing the evaluation of the sensor electronics design, the vibration test method, test results, the forces and their frequency ranges and directions applied to the sensor applicable to its successful tests, demonstrating that the testing provides an appropriate means to demonstrate reliability of the sensor electronics under the effects of high vibration.*

Response: Reference 13 documents an audit by the NRC of the Westinghouse SFP Instrumentation in support of the review of the Watts Bar Nuclear (WBN) Plant Integrated Plan in response to Order EA-12-051. Reference 13 states, "The review of the audit activities and results summarized in this report apply to WBN and other licensees using Westinghouse's level instrumentation technology."

a) Item 5 of Reference 13 provides information describing the evaluation of the sensor electronics design, the shock test method, test results, and forces applied to the sensor electronics applicable to its successful tests.

b) Item 5 of Reference 13 provides information describing the evaluation of the sensor electronics design, the vibration test method, test results, the forces and their frequency ranges and directions applied to the sensor applicable to its successful tests.

RAI No. 8

Please provide analysis of the seismic testing results and show that the instrument (including wireless technology) performance reliability, following exposure to simulated seismic conditions representative of the environment anticipated for the SFP structures at Wolf Creek Generating Station has been adequately demonstrated. Include information describing the design inputs and methodology used in any analyses of the mountings of electronic equipment onto plant structures, as requested in RAI No. 4 above.

Response: Item 2 of the audit report enclosed with Reference 13 addresses the seismic testing results.

RAI No. 9

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.

Response: The primary and backup SFPIS channels are powered by separate Alternating Current (AC) buses. One of the channels is powered by Class 1E electrical bus NG01A via non-Class 1 electrical panel PN07, while the other channel is powered by Class 1E electrical bus NG02A via non-Class 1 electrical panel PN08.

Each SFPIS channel of equipment has an independent Uninterruptible Power Supply (UPS) with 24V battery backup that ensures at least 72 hours of battery power without AC. Additionally, an interface is provided for an alternate power supply, such as a FLEX generator. The SFP level can be continuously monitored for at least 3 days under station blackout conditions with battery power only and for the required 7 days with an alternate power supply (References 14, 15, and 16).

RAI No. 10

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 results of the calculation depicting the battery backup duty cycle requirements demonstrating that its capacity is sufficient to maintain the level indication function until offsite resource availability is reasonably assured.*

Response:

a) The primary and backup SFPIS channels are powered by separate AC buses. One of the channels is powered by Class 1E electrical bus NG01A via non-Class 1 electrical panel PN07, while the other channel is powered by Class 1E electrical bus NG02A via non-Class 1 electrical panel PN08.

Each SFPIS channel of equipment has an independent UPS with 24V battery backup that ensures at least 72 hours of battery power without AC. Additionally, an interface is provided for an alternate power supply, such as a FLEX generator. The SFP level can be continuously monitored for at least 3 days under station blackout conditions with battery power only and for the required 7 days with an alternate power supply (References 14, 15, and 16).

b) Power consumption calculation Reference 18 demonstrates that the SFPIS will last for greater than 3 days from a fully charged battery after AC power loss. The calculation includes design and aging margin.

RAI No. 11

Please provide the following:

a) *An estimate of the expected instrument channel accuracy performance under both (a) normal SFP level conditions (approximately Level 1 or higher) and (b) at the BDB conditions (i.e., radiation, temperature, humidity, post-seismic and post-shock conditions) that would be present if the SFP level were at the Level 2 and Level 3 datum points.*

b) *A description of the methodology that will be used for determining the maximum allowed deviation from the instrument channel design accuracy that will be employed under normal operating conditions as an acceptance criterion for a calibration procedure to flag to operators.*

Response:

a) Channel accuracy for each SFPIS instrument channel is ± 3 inches for the full level measurement span. This span extends from the normal SFP surface level or higher to within six inches of the fuel assembly under both normal and BDB conditions. More details describing measurement accuracy are described in References 7 and 19.

b) Channel accuracy requirements are identified in Reference 7 and demonstrated by Reference 19. Both SFP primary and backup redundant sensor electronics require periodic calibration verification to check that the channel's measurement performance is within the specified tolerance (± 3 inches). If the difference is larger than the allowable tolerance during the verification process, an electronic output calibration will be required. If the electronic output calibration does not restore the performance, a troubleshooting Work Request will be generated for further adjustments or parts replacement.

The electronic output verification/calibration will verify electronics are working properly using simulated probe signals.

The calibration adjustment is performed to restore level measurement accuracy to within the acceptance criteria at 0%, 25%, 50%, 75%, and 100% points of the full span.

The calibration verification and calibration acceptance criteria and procedures are defined in the proprietary Westinghouse procedure Reference 20.

RAI No. 12

Please provide the following:

a) *A description of the capability and provisions the proposed level sensing equipment will have to enable periodic testing and calibration, including how this capability enables the equipment to be tested in-situ.*

b) *A description of how such testing and calibration will enable the conduct of regular channel checks of each independent channel against the other, and against any other permanently installed SPF level instrumentation.*

c) *A description how calibration tests and functional checks will be performed and the frequency at which they will be conducted. Please discuss how these surveillances will be incorporated into the plant surveillance program.*

d) *A description what preventive maintenance tasks are required to be performed during normal operation, and the planned maximum surveillance interval that is necessary to ensure that the channels are fully conditioned to accurately and reliably perform their functions when needed.*

Response:

a) Reference 13 documents an audit by the NRC of the Westinghouse SFP Instrumentation in support of the review of the Watts Bar Nuclear (WBN) Plant integrated plan in response to Order EA-12-051. Reference 13 states, "The review of the audit activities and results summarized in this report apply to WBN and other licensees using Westinghouse's level instrumentation technology." Item 6 of Reference 13 describes the capability and provisions the proposed level sensing equipment will have.

b) Channel comparisons, comparing level indication on one channel against the level indication on the other channel, will be performed on a daily basis.

c) The SFPIS calibration tests and functional checks are summarized in part a) above and in more detail in Reference 20. The periodic calibration tests and functional checks will be performed within 60 days of a planned refueling outage considering normal testing scheduling allowances (e.g., 25%). This calibration check is not required to be performed more than once per 12 months.

d) Preventive maintenance tasks include the periodic calibration tests and functional checks described above. These tasks will be performed within 60 days of a planned refueling outage considering normal testing scheduling allowances (e.g., 25%). Additionally, this task will inspect the probe to ensure no frays or nicks have occurred since the last task performance and to remove any significant accumulation of boron. The indication and other electronics will also be checked or calibrated at the same frequency as the functional checks described in the response to c) above.

RAI No. 13

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. Include a description of your 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) A description of the in-situ calibration process at the SFP location that will result in the channel calibration being maintained at its design accuracy.

c) A description of what compensatory actions are planned in the event that the non-functioning instrument channel cannot be restored to functional status within 90 days.

Response:

a) The maintenance and testing program will ensure that regular testing and calibration is performed and verified. Calibration and testing for the instruments will be based on Reference 20, as adapted to specific site procedures.

Site specific procedures will define the periodicity for Operator rounds to compare the primary and backup instrument channel indications to determine if more immediate action is required for calibration, maintenance or compensatory action implementation. The periodic testing recommended to validate the functionality of the installed instrument channel will be performed within 60 days of a planned refueling outage with a normal testing allowance of 25% but not more than once per 12 month period.

b) Reference 13 documents an audit by the NRC of the Westinghouse SFP Instrumentation in support of the review of the Watts Bar Nuclear (WBN) Plant integrated plan in response to Order EA-12-051. Reference 13 states, "The review of the audit activities and results summarized in this report apply to WBN and other licensees using

Westinghouse's level instrumentation technology." Item 6 of Reference 13 addresses the in-situ calibration process.

c) If the non-functioning instrument channel cannot be returned to service within the 90 day period, enhanced monitoring through operator rounds will be performed to compare the available instrument channel indications to existing SFP level. The determination for time frames for enhanced monitoring will be defined as procedure development is finalized.

References:

1. WCNOC Letter WO 13-0015, "Wolf Creek Nuclear Operating Corporation Overall Integrated Plan in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements For Reliable Spent Fuel Pool Instrumentation (Order EA-12-051," February 28, 2013. ADAMS Accession No. ML13071A419.
2. Letter from C. F. Lyon, USNRC, to M. W. Sunseri, WCNOC, "Wolf Creek Generating Station – Interim Staff Evaluation and Request for Additional Information Regarding Overall Integrated Plan in Response to Order EA-12-051, Reliable Spent Fuel Pool Instrumentation (TAC No. MF0781)," October 29, 2013. ADAMS Accession No. ML13295A681.
3. Bechtel Calculation, EC-48, "Minimum Safety Limit for LSL-57 & 58."
4. GTSTRUDL, Structural Design & Analysis Software.
5. TID-7024, "Nuclear Reactors and Earthquakes," dated 1963.
6. Wolf Creek Updated Safety Analysis Report (USAR), Rev. 28 (03/11/2015)
7. Westinghouse Proprietary Document WNA-DS-02957-GEN, Revision 4; Wolf Creek Document Number J-481A-00043.
8. Specification A-081, Pressure Resistant Doors
9. Westinghouse Proprietary Document WNA-TR-03149-GEN; Wolf Creek Document Number J-481A-00052.
10. Westinghouse Proprietary Document EQ-QR-269; Wolf Creek Document Number J-418A-00032.
11. NEI 12-02, "Industry Guidance for Compliance with NRC Order EA-12-051, 'To modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation'," Revision 1.
12. Wolf Creek Equipment Qualification Design Basis Document EQSD-1.
13. Tennessee Valley Authority Letter "Watts Bar Nuclear Plant, Units 1 and 2 – Report for the Westinghouse Audit in Support of Reliable Spent Fuel Instrumentation Related to Order EA-12-051 (TAC NOS. MF0951 and MF1178)," August 18, 2014. ADAMS Accession No. ML14211A346.
14. Wolf Creek Drawing E-11PN01, Revision 5, "Instrument A.C. Power (Non Class 1E PWR System)."
15. Wolf Creek Drawing E-13PN01, Revision 19, "Non-Class 1E Instrument AC Three-Line Meter & Relay Diagram."

16. Wolf Creek Drawing E-13PN01A, Revision 24, "Non Class 1E Instrument AC Three-Line Meter & Relay Diagram."

17. IEEE Standard 323-2003, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations."

18. Westinghouse Proprietary Document, WNA-CN-00300-GEN; Wolf Creek Document Number J-481A-00040.

19. Westinghouse Proprietary Document, WNA-CN-00301-GEN; Wolf Creek Document Number J-481A-00041.

20. Westinghouse Proprietary Document, WNA-TP-04709-GEN; Wolf Creek Document Number J-481A-00049.

Wolf Creek Nuclear Operating Corporation's
Design Bridge Document

#	Topic	Parameter Summary	Westinghouse Reference Document #	Additional Comment	Test or Analysis Results	Licensee Evaluation
1	Design Specification	Spent Fuel Pool Instrumentation System (SFPIS) Requirements derived from References 1, 2, and 3	WNA-DS-02957-GEN	Contains technical SFPIS requirements based on Nuclear Regulatory Commission (NRC) order, Nuclear Energy Institute (NEI) guidance, and the Interim Staff Guidance (ISG) listed.	N/A	Wolf Creek Nuclear Operating Corporation (WCNOC) has determined that WNA-DS-02957-GEN bounds the Wolf Creek Generating Station (WCGS) requirements from References 1, 2, and 3.
2	Test Strategy	Per Requirements	WNA-PT-00188-GEN	Strategy for performing the testing and verification of the SFPIS and pool-side bracket.	N/A	WCNOC has determined WNA-PT-00188-GEN to be acceptable for the current design.
3	Environmental Qualification for Electronics Enclosure with Display	50°F to 140°F 0 to 95% relative humidity (RH)	EQ-QR-269 and WNA-TR-03149-GEN for all conditions.	Results are summarized in EQ-QR-269 and WNA-TR-03149-GEN.	Test passed conditions described.	Temperature is ≤ 140°F and humidity is ≤ 95% RH for abnormal conditions in Room 1501 and Room 1512 of the Auxiliary Building (Reference 4). The above values are bounded by the values in Section 3.3 of WNA-TR-03149-GEN.
		Total Integrated Dose (TID) ≤ 1E3 R γ normal (outside Spent Fuel Pool (SFP))	EQ-QR-269 and WNA-TR-03149-GEN for all conditions.	Radiation aging verification summarized in Section 5 of WNA-TR-03149-GEN	Test passed conditions described.	The normal and abnormal TID of < 1E3 R γ from Reference 4 for Auxiliary Building Room 1501 and Room 1512, is bounded by the justification for TID less than 1E3 Rad from Section 5.1.3

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		area) TID ≤ 1E3 R γ abnormal (outside SFP area)				of WNA-TR-03149-GEN. Aging Tests – Westinghouse has completed its aging qualification of SFPIS to 10 years. Westinghouse has provided an interim position regarding the aging qualification and the open item from Steris. WCNOC will complete the test report reviews when provided.
4	Environmental Testing for Level Sensor Components in SFP Area – Saturated Steam & Radiation	50°F to 212°F and 100% humidity	EQ-QR-269	Testing summarized in Section 5.7 of EQ-QR-269, with additional clarifications/explanation in Section 5.2 of WNA-TR-03149-GEN and LTR-SFPIS-15-34.	Passed	The temperature and humidity values of 212°F and 100% RH from Reference 5 are bounded by Section 3.2 of WNA-TR-03149-GEN.
		1E3 R γ normal (SFP area)	WNA-TR-03149-GEN	Thermal aging and radiation aging verification summarized in Sections 3 and 4 (entire system) of WNA-TR-03149-GEN.	Passed	The generic radiation analysis documented in WNA-TR-03149, Section 5.0, contains significant conservatism with the intention to bound sites installing the system. The normal operating dose in the SFP area determined in Section 5.1.2 of WNA-TR-03149-GEN is 1E3 R γ. Justification that the system components are inherently resistant to radiation effects is provided in Section 5.1.1 of WNA-TR-03149-GEN.
		1E7 R γ BDB (SFP area)	EQ-TP-354 (procedure) EQ-QR-269 (10	Additional thermal and radiation aging programs were	Additional aging program is in progress to	The Beyond Design Basis (BDB) radiation value to which the Westinghouse equipment is qualified to

#	Topic	Parameter Summary	Westinghouse Reference Document #	Additional Comment	Test or Analysis Results	Licensee Evaluation
			year thermal/radiation testing completed)	completed under rest procedure EQ-TP-354. The results are captured in Sections 5.2 and 5.3 of EQ-QR-269 with additional clarification/explanation in Sections 3 and 4 of WNA-TR-03149-GEN and LTR-SFPIS-15-34.	achieve longer life.	is 1E9 R γ for the probe, stainless steel cable and weight and 1E7R γ for the equipment above the pool, per Section 5.1.2 of WNA-TR-03149-GEN. This generic analysis contains significant conservatism with the intention of bounding plants installing this system. With SFP water level at Level 3, the only components of the SFPIS that are exposed to high radiation are the stainless steel probe and the stainless steel anchor. The materials with which the probe and the anchor are manufactured are resistant to radiation effects. The justification that the system components are inherently resistant to radiation effects is provided in Section 5.1.1 of WNA-TR-03149-GEN. 10466-J-830 states that the TID basis for all electrical equipment and instrumentation outside of containment is 1E7 R. Section 5.3 of EQ-QR-269 demonstrates that the test specimens were subjected to a minimum TID of 11.00 Mrad. Section 5.1.1 of WNA-TR-03149-GEN states that "Westinghouse engineering evaluation saw no reasonable way to exceed 10 MR for the beyond design basis TID." Aging Tests – Westinghouse completed its aging qualification of SFPIS to 10 years. Westinghouse has provided an

#	Topic	Parameter Summary	Westinghouse Reference Document #	Additional Comment	Test or Analysis Results	Licensee Evaluation
						interim position regarding the aging qualification and the open item from Steris. WCNOC will complete the test report reviews when provided.
5	Environmental Testing for Level Sensor Electronics Housing – Outside SFP	50°F to 140°F 0% to 95% RH	EQ-QR-269	Testing summarized in Section 5.5 of EQ-QR-269 with additional clarifications/explanation in Section 5.2 of WNA-TR-03149-GEN and LTR-SFPIS-15-34.	Passed	Temperature is ≤ 140°F and the humidity is ≤ 95% RH for abnormal conditions in Auxiliary Building Personal Hatch Area Room 1507 from Reference 4. The above values are bounded by the values in Section 3.3 of WNA-TR-03149-GEN.
		100% RH	WNA-TR-03149-GEN	100% humidity addressed in Section 7.5 of WNA-TR-03149-GEN	Passed	The humidity is ≤ 100% RH for abnormal conditions in Auxiliary Building Personal Hatch Area Room 1507 from Reference 4.
		TID ≤ 1E3 R γ normal (outside SFP area) TID ≤ 1E3 R γ abnormal (outside SFP area)	WNA-TR-03149-GEN	Radiation aging verification summarized in Section 4 of WNA-TR-03149-GEN	Passed	The normal and abnormal TID of < 1E3 R γ from Reference 4 (for Auxiliary Building Personal Hatch Area Room 1507) is bounded by Section 5.1.3 of WNA-TR-03149-GEN.
6	Thermal & Radiation Aging – Organic Components in SFP Area	1E3 R γ normal (SFP area)	EQ-QR-269 and WNA-TR-03149-GEN	Thermal aging & radiation aging verification summarized in Sections 5.2 and 5.3 of EQ-QR-269 and Sections 3 and 4 (entire system) of WNA-TR-03149-GEN	Passed	WCNOC has determined EQ-QR-269 and WNA-TR-03149-GEN to be acceptable for WCGS installation. See response to Item 4 above.

#	Topic	Parameter Summary	Westinghouse Reference Document #	Additional Comment	Test or Analysis Results	Licensee Evaluation
		1E7 R γ Beyond Design Basis Event (BDBE) (SFP area)	EQ-TP-354 (procedure) EQ-QR-269 (10 year thermal/radiation testing completed)	Additional thermal and radiation aging programs were completed under rest procedure EQ-TP-354. The results are captured in Sections 5.2 and 5.3 of EQ-QR-269 with additional clarification/explanation in Sections 3 and 4 of WNA-TR-03149-GEN and LTR-SFPIS-15-34.	Additional aging program was completed to achieve longer life – 10 years at maximum normal operating temperature of 140°F	Aging Tests – Westinghouse completed its aging qualification of SFPIS to 10 years. Westinghouse has provided an interim position regarding the aging qualification and the open item from Steris. WCNOC will complete the test report reviews when provided.
7	Basis for Dose Requirement	SFP Normal Conditions: 1E3 R γ TID (above pool) 1E9 R γ TID (1' above fuel rack) SFP BDBE Conditions: 1E7 R γ TID (above pool) < 1E7 R γ TID (1' above fuel rack)	LTR-SFPIS-13-35 and WNA-DS-02957-GEN See also Section 4.1.1 of WNA-TR-03149-GEN	LTR-SFPIS-13-35 contains the explanation of basis for radiation dose requirement (includes the clarification of production equivalency of electronics used for the seismic and electromagnetic capability (EMC) testing) The radiation dose basis has been incorporated into Section 4.1.1 WNA-TR-03149-GEN.	Passed for all conditions	WCNOC has determined the basis documents to be acceptable. The radiation analysis documented in WNA-TR-03149, Section 5.0, contains significant conservatism with the intention of bounding sites installing the system. With SFP water level at Level 3, the only components of the SFPIS that are exposed to high radiation are the stainless steel probe and the stainless steel anchor. The materials with which the probe and the anchor are manufactured are resistant to radiation effects. *The justification that the system* components are inherently resistant to radiation effects is provided in Section

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						5.1.1 of WNA-TR-03149-GEN. 10466-J-830 states that the TID basis for all electrical equipment and instrumentation outside of containment is 1E7 R. Section 5.3 of EQ-QR-269 demonstrates that the test specimens were subjected to a minimum TID of 11.00 Mrad. Section 5.1.1 of WNA-TR-03149-GEN states that "Westinghouse engineering evaluation saw no reasonable way to exceed 10 MR for the beyond design basis TID."
8	Seismic Qualification	Per spectra in WNA-DS-02957-GEN	EQ-QR-269	Section 5.4 of EQ-QR-269 summarizes the testing performed by Westinghouse	Passed	The spectra in Reference 5 for the pool-side mounting brackets bounds WCGS for meeting the requirements to withstand a SSE. Instrument panel mounting is qualified by Reference 5.
			WNA-TR-03149-GEN	Section 6 of WNA-TR-03149-GEN provides high level summary of the pool-side bracket analysis and optional Resistance Temperature Detector (RTD) in addition to the overall system and the various options for improved EMC performance.	Passed	

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			EQ-QR-269	Seismic pull test for new connectors documented in Section 4.4 of EQ-QR-269.	Passed	
9	Sloshing	N/A	LTR-SEE-II-13-47	Calculation to demonstrate that the probe will not be sloshed out of the SFP	Passed	WCNOC has determined WNA-TR-03149-GEN to be acceptable. Adequate sloshing forces (inclusive of vertical and horizontal impact forces, hydrodynamic forces) were accounted to calculate the overall sloshing forces. These forces were added to design the bracket anchorage, to ensure the probe will not be sloshed due to a BDB seismic event.
			WNA-TR-03149-GEN	Sloshing is also addressed in Section 7.2 of WNA-TR-03149-GEN with further clarification in LTR-SFPIS-14-70	Passed	
10	Spent Fuel Pool Instrumentation System Functionality Test Procedure	Acceptance Criteria for Performance during EQ Testing	WNA-TP-04613-GEN	Test procedure used to demonstrate that SFPIS meets its operational and accuracy requirements during Equipment Qualification Testing programs.	See applicable environmental qualification (EQ) test.	WCNOC has determined WNA-TP-00189-GEN "Integrated Functional Test Plan" to be acceptable.
11	Boron Build-up	Per Requirement in WNA-DS-02957-GEN	WNA-TR-03149-GEN	Section 7.4 of WNA-TR-03149-GEN Boron build up demonstrated through Integrated Functional Test (IFT)	Passed	WCNOC has determined WNA-TP-00189-GEN "Integrated Functional Test Plan" to be acceptable

#	Topic	Parameter Summary	Westinghouse Reference Document #	Additional Comment	Test or Analysis Results	Licensee Evaluation
12	Pool-side Bracket Seismic Analysis	N/A	CN-PEUS-13-32	Also includes hydrodynamic forces, as appropriate	Passed	WCGS seismic requirements to withstand a SSE are bounded by Reference 6 for the pool-side mounting brackets.
13	Additional Brackets (Sensor Electronics and Electronics Enclosure)	N/A	WNA-DS-02957-GEN	Weights provided to licensees for their own evaluation	N/A	WCGS has evaluated the seismic mounting requirements. Instrument panel mounting is qualified by Reference 6.
14	Shock & Vibration	WNA-DS-02957	WNA-TR-03149-GEN	Section 7 of WNA-TR-03149-GEN provides rational and summary of RTD	N/A	WCNOC has determined the Westinghouse evaluation of shock and vibration in WNA-TR-03149-GEN is acceptable.
15	Requirements Traceability Matrix (RTM)	Maps Requirements to Documentation / Evidence that Requirement is Met	WNA-VR-00408-GEN	The RTM maps the requirements of the NRC order, NEI guidance, and ISG to the applicable technical requirements in the SFPIS design specification and maps the design specification requirements to the documentation demonstrating the requirement is met.	Complete	WCNOC has reviewed the compliance matrix provided by Westinghouse.
16	Westinghouse Factory Acceptance Test, Including Testing	IFT Functional Requirements from WNA-DS-02957-GEN	WNA-TP-04752-GEN	The IFT demonstrates functionality of the full system for each customer's Factory Acceptance Test (FAT),	Pilot IFT executed/passed WCGS IFT	WCGS has reviewed the final test reports and found them to be acceptable.

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	of Dead-zones			which includes calibration of each channel.	executed/passed	
		12" Dead-zone at Top of Probe or 14" dead-zone at top of probe for cables > ~230 feet 4" Dead-zone at Bottom of Probe	WNA-TP-04752-GEN	Dead-zone tests are in Section 9.6.2 of WNA-TP-04752-GEN	N/A	
17	Channel Accuracy	± 3 inches per WNA-DS-02957-GEN	WNA-CN-00301-GEN	Channel accuracy from measurement to display Additional clarification provided in LTR-SFPIS-14-136, Rev. 1	Passed	WCGS has reviewed WNA-DS-02957-GEN and WNA-CN-00301-GEN and found that channel accuracy requirements are met. WCGS calculated channel accuracy is ± 3 inches.
18	Power Consumption	3 Day Battery Life (Minimum) 0.257 Amps Power Consumption	WNA-CN-00300-GEN	N/A	Passed	WCGS has reviewed WNA-CN-00300-GEN and concluded that battery life of > 72 hours is available for Westinghouse display enclosure and meets the Order requirements. The 0.257 Amps loading does not challenge the WCGS electrical distribution system.
19	Technical Manual	N/A	WNA-GO-00127-GEN	Information and instructions for operation, installation, use, etc. are included here.	N/A	WCGS will utilize WNA-GO-00127-GEN as input for procedure preparation.

#	Topic	Parameter Summary	Westinghouse Reference Document #	Additional Comment	Test or Analysis Results	Licensee Evaluation
20	Calibration	Routine Testing/Calibration Verification and Calibration Method	WNA-TP-04709-GEN	Includes preventative maintenance actions such as those for Boron buildup and cable probe inspection.	N/A	WCGS will utilize WNA-TP-04709-GEN as input for procedure preparation.
21	Failure Modes and Effects Analysis (FMEA)	N/A	WNA-AR-00377-GEN	Addresses mitigations for the potential failure modes of the system	N/A	WCGS will utilize WNA-AR-00377-GEN as input for procedure preparation.
22	Emissions Testing	Reg. Guide 1.180, Rev. 1 Test Conditions	WNA-TR-03149-GEN EQ-QR-269	Documented in Section 2 of WNA-TR-03149 and Section 5.6 of EQ-QR-269	Passed	WCNOC has reviewed the test report and found it meets requirements for radiated emissions limits and criterion B for susceptibility testing based on the modifications implemented.
23	Splash Testing / Submersion	Temporary With Option for Longer Submersion	WNA-TR-03149-GEN	Section 7.5 of WNA-TR-03149-GEN – Standard configuration withstands the temporary submersion. Option available for longer submersion.	Passed	WCGS has reviewed the final test reports and found them to be acceptable.

References:

1. Letter from E. J. Leeds and M. R. Johnson, USNRC, to M. W. Sunseri, WCNOC, "Issuance of Order to Modify Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation," March 12, 2012. ADAMS Accession No. ML12056A044.

2. NEI 12-02, "Industry Guidance for Compliance with NRC Order EA-12-051, 'To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation'," Revision 1, August 2012. ADAMS Accession No. ML122400399.

3. JLD-ISG-2012-03, "Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation," Revision 0, August 29, 2012. ADAMS Accession No. ML12221A339.

4. Wolf Creek Document EQSD-1, Revision 7, "Equipment Qualification Design Basis Document," August 21, 2014.

5. Westinghouse Proprietary Document CN-PEUS-13-32, Revision 1, "Seismic Analysis of the SFP Mounting Bracket for Wolf Creek Generating Station," November 13, 2014.

6. Westinghouse Proprietary Document WNA-VR-00408-GEN, Revision 2, "Spent Fuel Pool Instrumentation System Requirement Traceability Matrix," April 2015.

7. Westinghouse Proprietary Document WNA-DS-02957, Revision 4, "Spent Fuel Pool Instrumentation System (SFPIS) Standard Product System Design Specification," May 2014; Wolf Creek Document Number J-481A-00043.

8. Westinghouse Proprietary Document WNA-PT-00188-GEN, Revision 3, "Spent Fuel Pool Instrumentation System (SFPIS) Standard Product Test Strategy," May 2014; Wolf Creek Document Number J-481A-00047.

9. Westinghouse Proprietary Document EQ-QR-269, Revision 1, "Design Verification Testing Summary Report for the Spent Fuel Pool Instrumentation," April 2014; Wolf Creek Document Number J-481A-00032.

10. Westinghouse Proprietary Document WNA-TR-03149-GEN, Revision 1, "SFPIS Standard product Final Summary Design Verification Report," April 2014; Wolf Creek Document Number J-481A-00052.

11. Westinghouse Proprietary Document EQ-TP-351, Revision 2, "Environmental Qualification Test Procedure for the Spent Fuel Pool Instrumentation System Coaxial Cable and Connectors inside the Spent Fuel Pool Area," November 2014.

12. Westinghouse Proprietary Document EQ-TP-354, Revision 0, "Mechanical Preconditioning, Thermal Aging, and Radiation Aging Procedure for the Spent Fuel Pool Instrumentation System Coaxial Cables and Couplers," December 2013.

13. Wolf Creek Document 10466-J-830, Revision 2, "Technical Specification for Environmental Qualification Requirements for Safety-Related Control and Instrument Devices for the Standardized Nuclear Unit Power Plant System (SNUPPS)," November 23, 1977.

14. Westinghouse Proprietary Document LTR-SFPIS-13-35, Revision 1, "SFPIS: Basis for Dose Requirement and Clarification of Production Equivalency of Electronic Enclosure Used for Seismic Testing," March 1, 2014.

15. Westinghouse Proprietary Document LTR-SEE-II-13-47, Revision 0, "Determination if the Proposed Spent Fuel Pool Level Instrumentation can be Sloshed out of the Spent Fuel Pool during a Seismic Event," January 15, 2014.

16. Westinghouse Proprietary Document WNA-TP-04613-GEN, Revision 5, "Spent Fuel Pool Instrumentation System Functionality Test Procedure," November 2013.

17. Westinghouse Proprietary Document WNA-DC-00252-SAP, Revision 0, "Spent Fuel Pool Instrumentation System Compliance Matrix – Wolf Creek," June 2014; Wolf Creek Document Number J-481A-00042.

18. Westinghouse Proprietary Document WNA-TP-04752-GEN, Revision 2, "Spent Fuel Pool Instrumentation System Standard Product Integrated Functional Test Procedure," March 2014; Wolf Creek Document Number J-481A-00050.

19. Westinghouse Proprietary Document WNA-CN-00301-GEN, Revision 2, "Spent Fuel Pool Instrumentation System Channel Accuracy Analysis," June 2014; Wolf Creek Document Number J-841A-00041.

20. Westinghouse Proprietary Document WNA-CN-00300-GEN, Revision 0, "Spent Fuel Pool Instrumentation System Power Consumption Calculation," October 2013; Wolf Creek Document Number J-481A-00040.

21. Westinghouse Proprietary Document WNA-GO-00127-GEN, Revision 3, "Spent Fuel Pool Instrumentation System Standard Product Technical Manual," July 2014; Wolf Creek Document Number J-481A-00044.

22. Westinghouse Proprietary Document WNA-TP-04709-GEN, Revision 4, "Spent Fuel Pool Instrumentation System Calibration Procedure," March 2014; Wolf Creek Document Number J-481A-00049.

23. Westinghouse Proprietary Document WNA-AR-00377-GEN, Revision 4, "Spent Fuel Pool Instrumentation System Failure Modes and Effect Analysis," May 2014; Wolf Creek Document Number J-481A-00039.

24. Westinghouse Proprietary Document LTR-EQ-14-163, Revision 0, "Interim Position for Radiation Aging of the Spent Fuel Pool Instrumentation System," October 24, 2014.

25. Westinghouse Proprietary Document EQ-TP-353, Revision 0, "Static Pull Test Procedure for Spent Fuel Pool Instrumentation System Connector," December 2013.

26. Westinghouse Proprietary Document WNA-TP-00189, Revision 3, "Spent Fuel Pool Instrumentation System Standard Product Integrated Functional Test Plan," July 2014.