From:	Kalyanam, Kaly
To:	BICE, DAVID B (ANO); CLARK, ROBERT W
Cc:	Lent, Susan; Burkhardt, Janet
Subject:	RAI Regarding Overall Integrated Plan for Reliable SFP Instrumentation (Order No. EA-12-51) TAC Nos. MF0944 & MF0945
Date:	Tuesday, May 07, 2013 12:09:46 PM

Dave/Bob,

By letter dated February 28, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13063A012), Entergy Operations Inc. (Entergy, the licensee) submitted an Integrated Plan in response to the March 12, 2012, Commission Order modifying licenses with regard to requirements for Reliable Spent Fuel Pool (SFP) Instrumentation (Order Number EA-12-051) for Arkansas Nuclear One, Units 1 and 2 (ANO 1 and 2), Further, the staff endorsed Nuclear Energy Institute 12-02 "Industry Guidance for Compliance with the U. S. Nuclear Regulatory Commission (NRC) Order EA-12-051, to Modify Licenses with Regard to Reliable SFP Instrumentation," Revision 1, dated August 2012, with exceptions, as documented in Interim Staff Guidance (ISG) JLD-ISG-2012-03 "Compliance with Order EA-12-051, Reliable SFP Instrumentation," Revision 0, dated August 29, 2012.

Provided below are draft requests for additional information (RAIs) regarding the integrated plan associated with EA-12-051. The NRC is requesting responses to these RAIs within 30 days of receipt of this email. Please note that the Japan Lessons Learned Directorate generically communicated to industry of the need for licensees to respond to the RAI within 30 days, in order to support our review schedule of the integrated plans. Please contact me if you would like a clarifying call to discuss the RAIs and/or to discuss the schedule. I plan to issue the RAIs as a formal document within two weeks of this email.

Thanks,

N. Kalyanam
Project Manager, ANO 1 and 2

REQUEST FOR ADDITIONAL INFORMATION
OVERALL INTEGRATED PLAN IN RESPONSE TO THE COMMISION ORDER MODIFYING LICENSES WITH REGARD TO REQUIREMENTS FOR RELIABLE SPENT FUEL POOL INSTRUMENTATION (ORDER NUMBER EA-12-051)
ENTERGY OPERATIONS, INC.
ARKANSAS NUCLEAR STATION ONE, UNITS 1 AND 2
DOCKET NUMBERS 50-313 AND 50-368

1. INTRODUCTION

By letter dated February 28, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML130630012), Entergy Operations, Inc. submitted an Overall Integrated Plan (OIP) in response to the March 12, 2012, Commission Order

modifying licenses with regard to requirements for Reliable Spent Fuel Pool (SFP) Instrumentation (Order Number EA-12-051) for Arkansas Nuclear One (ANO), Units 1 and 2. Further, the staff endorsed NEI 12-02 "Industry Guidance for Compliance with NRC Order EA-12-051, To Modify Licenses with Regard to Reliable SFP Instrumentation," Revision 1, dated August 2012, with exceptions, as documented in Interim Staff Guidance (ISG) 2012-03 "Compliance with Order EA-12-051, Reliable SFP Instrumentation," Revision 0, dated August 29, 2012. The U. S. Nuclear Regulatory Commission (NRC) staff has reviewed the submittal and identified additional information that is needed to complete the Technical Review. Please provide a response to the following Request for Additional Information (RAI).

2. LEVELS OF REQUIRED MONITORING

Order EA-12-051 states, "All licensees identified in Attachment 1 to this Order shall have a reliable indication of the water level is 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, 2) level that is adequate to provide substantial radiation shielding for a person standing on the spent fuel operating deck, and 3) level where fuel remains covered and actions to implement make-up water addition should no longer be deferred."

NEI 12-02 states in part:

"Level 1 – level that is adequate to support operation of the normal fuel pool cooling system

A typical fuel pool cooling system design includes a combination of weirs and/or vacuum breakers that prevent siphoning of the pool water level, below a minimum level, in the event of a piping rupture that can affect the SFP level. Level 1 represents the HIGHER of the following two points:

- The level at which reliable suction loss occurs due to uncovering of the coolant inlet pipe, weir or vacuum breaker (depending on the design), or the level at which the water height, assuming saturated conditions, above the centerline of the cooling pump suction provides the required net positive suction head specified by the pump manufacturer or engineering analysis.

Level 2 – level that is adequate to provide substantial radiation shielding for a person standing on the spent fuel pool operating deck.

Level 2 represents the range of water level where any necessary operations in the vicinity of the spent fuel pool can be completed without significant dose consequences from direct gamma radiation from the stored spent fuel. Level 2 is based on either of the following:

- 10 feet (+/- 1 foot) above the highest point of any fuel rack seated in the spent fuel pools, or a designated level that provides adequate radiation shielding to maintain personnel radiological dose levels within acceptable limits while performing local operations in the vicinity of the pool. …

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

Level 3 corresponds nominally (i.e., +/- 1 foot) to the highest point of any fuel rack seated in the spent fuel pool. Level 3 is defined in this manner to provide the maximum range of information to operators, decision makers and emergency response personnel. Designation of this level should not be interpreted to imply that actions to initiate water make-up must or should be delayed until this level is reached."

RAI-1

Issue:

The OIP states in part:

"Level 1 is the level adequate to support operation of the normal fuel pool cooling system. It is the higher of the following two points:

> (1) the level at which reliable suction loss occurs due to uncovering the coolant inlet pipe or any weirs or vacuum breakers associated with suction loss. This level, (1), is established for Unit 1 based on nominal coolant inlet pipe elevation [as it does not incorporate a vacuum (or siphon breaker)] and is established for Unit 2 based on nominal vacuum (or siphon) breaker elevation. The elevation associated with this level is 397 feet 5.21 inches for Unit 1. The elevation associated with this level is 401 feet 0 inches for Unit 2.
>
> (2) the level at which the normal fuel pool cooling pumps lose required NPSH assuming saturated conditions in the pool. It can be demonstrated that this elevation is below the elevation that defines Level 1 per (1) above. Unit 1 SFP Cooling pumps are at elevation 337'-0" with a required NPSH of 14 FT for suction temperatures up to 200°F. Unit 2 SFP Cooling pumps are at elevation 336'-2.5" with a required NPSH of 20 FT for suction temperatures up to 200°F.
>
> The higher of the above points is (1). Therefore, LEVEL 1 is elevation 397 feet 5.21 inches for Unit 1 and LEVEL 1 is elevation 401 feet 0 inches for Unit 2.

Level 2 is the level adequate to provide substantial radiation shielding for a person standing on the spent fuel pool operating deck. Level 2 may be based on either of the following:

> (1) 10 feet ± 1 foot above the highest point of any fuel rack seated in the spent fuel pool. The elevation associated with this level is 385 feet 11.5675 inches ± 1 foot for Unit 1. The elevation associated with this level is 388 feet 3.3125 inches ± 1 foot for Unit 2.
>
> (2) A designated level that provides adequate radiation shielding to maintain personnel dose within acceptable limits while performing local operations in the vicinity of the pool. This level is based on plant-specific or appropriate generic shielding calculations. The elevation associated with this level is not calculated

since item (1) is used to establish Level 2.

In lieu of plant specific dose calculations required by (2), (1) is used as the conservative accepted level as suggested by NEI 12-02 Revision 1. Therefore, LEVEL 2 is elevation 385 feet 11.5675 inches ± 1 foot for Unit 1 and LEVEL 2 is elevation 388 feet 3.3125 inches ± 1 foot for Unit 2 (i.e. 10 ± 1 feet above Top of Fuel Rack).

Level 3 is the level where fuel remains covered. It is defined as the highest point of any fuel rack seated in the spent fuel pool (within ± 1 foot).

The highest point (nominal) of any fuel rack seated in the spent fuel pool is 375 feet 11.5675 inches for Unit 1 and 378 feet 3.3125 inches for Unit 2. Therefore, LEVEL 3 is elevation 375 feet 11.5675 inches ± 1 foot for Unit 1 and LEVEL 3 is elevation 378 feet 3.3125 inches ± 1 foot for Unit 2.

The SFP level instrument span will extend down to at least 3 inches below the upper limit of the range of LEVEL 3 to account for channel accuracy or instrument loop uncertainty. Therefore, the SFP level probe will extend down to at least elevation 376 feet 8.5675 inches for Unit 1 and 379 feet 0.3125 inches for Unit 2."

Provide responses to the following:

a) A clearly labeled sketch depicting the elevation view of the proposed typical mounting arrangement for the portions of instrument channel consisting of permanent measurement channel equipment (e.g., fixed level sensors and/or stilling wells, and

b) mounting brackets). Indicate on this sketch the datum values representing Level 1, Level 2, and Level 3 as well as the top of the fuel. Indicate on this sketch the portion of the level sensor measurement range that is sensitive to measurement of the fuel pool level, with respect to the Level 1, Level 2, and Level 3 datum points.

c) In the event any part of this information is not available with the submittal of your response to this RAI, provide the date this information will be submitted.

3. INSTRUMENTATION DESIGN FEATURES

3.2 Arrangement

Order EA-12-051 states, "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."

NEI 12-02 states in part, "The intent of the arrangement requirement is to specify reasonable separation and missile protection requirements for permanently installed instrumentation used to meet this order. Although additional missile barriers are not

required to be installed, separation and shielding can help minimize the probability that damage due to an explosion or extreme natural phenomena (e.g., falling or wind-driven missiles) will render fixed channels of SFP instrumentation unavailable. Installation of the SFP instrument channels shall be consistent with the plant-specific SFP design requirements and should not impair normal SFP function.

Similarly, cabling for power supplies and indications for each channel should be routed separately from cabling for the other channels."

RAI-2

Issue:

The OIP states in part, "Level instruments will be installed in the approximate locations shown on Figure 1 (Unit 1) and Figure 2 (Unit 2). Separation of the channels/probes reduces the potential for falling debris or missiles affecting both channels of instrumentation. This placement coupled with routing cables on the SFP floor in rigid conduit provides reasonable protection against falling debris and structural damage. Additional protection may also be afforded by objects in the vicinity which rise above the floor grade (e.g. SFP curbs and/or SFP Bridge tracks/rails)."

Provide responses to the following:

a) A clearly labeled sketch or marked-up plant drawing of the plan view of the SFP area, depicting the SFP inside dimensions, the planned locations/ placement of the primary and back-up SFP level sensor, and the proposed routing of the cables that will extend from the sensors toward the location of the read-out/display device.
b) In the event any part of this information is not available with the submittal of your response to this RAI, provide the date this information will be submitted.

3.3 Mounting

Order EA-12-051 states, "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."

NEI 12-02 states in part, "The mounting shall be designed consistent with the highest seismic or safety classification of the SFP. An evaluation of other hardware stored in the SFP shall be conducted to ensure it will not create adverse interaction with the fixed instrument location(s). The basis for the seismic design for mountings in the SFP shall be the plant seismic design basis at the time of submittal of the Integrated Plan for implementing NRC Order EA-12-051 (See Appendix A-2-2)."

RAI-3

Issue:

The OIP states, "Both the primary and backup system installation will incorporate seismic category I mounting to meet the NRC JLD-ISG-2012-03 and NEI 12-02 guidance requirements. Other hardware stored in the SFP will be evaluated to ensure that it does

not adversely interact with the SFP instrument probes during a seismic event."

Provide responses to the following:

a) The design criteria that will be used to estimate the total loading on the mounting device(s), including static weight loads and dynamic loads. Describe the methodology that will be used to estimate the total loading, inclusive of design basis maximum seismic loads and the hydrodynamic loads that could result from pool sloshing or other effects that could accompany such seismic forces.
b) A description of the manner in which the level sensor (and stilling well, if appropriate) will be attached to the refueling floor and/or other support structures for each planned point of attachment of the probe assembly. Indicate in a schematic the portions of the level sensor that will serve as points of attachment for mechanical/mounting or electrical connections.
c) A description of the manner by which the mechanical connections will attach the level instrument to permanent SFP structures so as to support the level sensor assembly.
d) In the event any part of this information is not available with the submittal of your response to this RAI, provide the date this information will be submitted.

3.4 Qualification

Order EA-12-051 states, "The level 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 the use of an augmented quality assurance process (e.g. a process similar to that applied to the site fire protection program)."

NEI 12-02 states in part, "The instrument channel reliability shall be demonstrated via an appropriate combination of design, analyses, operating experience, and/or testing of channel components for the following sets of parameters, as described in the paragraphs below:

- conditions in the area of instrument channel component use for all instrument components.
- effects of shock and vibration on instrument channel components used during any applicable event for only installed components, and seismic effects on instrument channel components used during and following a potential seismic event for only installed components."

The NEI guidance further states that for seismic effects on instrument channel components used after a potential seismic event for only installed components (with the exception of battery chargers and replaceable batteries), the following measures are acceptable to verify that the design and installation is adequate:

> "Applicable components of the instrument channels are rated by the manufacturer (or otherwise tested) for seismic effects at levels commensurate with those of postulated design basis event conditions in the area of instrument channel component use using one or more of the following methods:
>
> - instrument channel components use known operating principles, are supplied by manufacturers with commercial quality programs (such as ISO9001) with

seismic requirements included in the purchase specification and/or instrument design, and commercial design and testing for operation in environments where significant seismic effects are common;

- substantial history of operational reliability in environments with significant vibration, such as for portable hand-held devices or transportation applications;
- demonstration of seismic reliability using methods that predict the equipment's performance by
    - analysis,
    - testing of the equipment under simulated seismic conditions,
    - using a combination of test and analysis, or
    - the use of experience data.
- demonstration that proposed devices are substantially similar in design to models that have been previously tested for seismic effects in excess of the plant design basis at the location where the instrument is to be installed (g-levels and frequency ranges); or
- seismic qualification using seismic motion consistent with that of existing design basis loading at the installation location."

NRC Interim Staff Guidance, JLD-ISG-2012-03 further provides additional clarification for seismic qualification. The NRC guidance states in part:

> "The first bullet under the section "Seismic" makes a provision for "instrument channel components… supplied by manufacturers with commercial quality programs… with seismic requirements… and commercial design and testing for operation in environments where significant seismic effects are common." It is the NRC staff position that the guidance in this clause does not adequately address seismic levels and frequencies seen at the installation location or methods for demonstration. Demonstration of seismic motion consistent with that of existing design basis loads at the installed location is adequate. Quality programs are addressed in Appendix A-1 of NEI 12-02, Revision 1.
>
> The second bullet under the section "Seismic" makes a provision for demonstrating adequacy of design and installation to account for seismic effects which includes "substantial history of operational reliability in environments with significant vibration." Typically, vibration is an effect that occurs at higher frequency and lower amplitude than that of seismic motion. It is the NRC staff position that seismic design and installation adequacy cannot be reasonably demonstrated solely through operational history of performance of components when subjected to vibration, but that the effects of low frequency, high acceleration need to be included in any demonstration of seismic design adequacy. This clause is not appropriate without stating that such a vibration design envelope shall be inclusive of the effects of seismic motion imparted to the components proposed at the location of the proposed installation.
>
> The third bullet under the section "Seismic" lists four methods of demonstrating reliability. It is the NRC staff position that the adequacy of seismic design and installation should be demonstrated based on the guidance in Sections 7, 8, 9, and 10 of IEEE Standard 344-2004, "IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations," or a substantially similar industrial standard."

RAI-4

Issue:

The OIP states in part, “Components in the area of the SFP will be designed for the temperature, humidity, and radiation levels expected during normal, event, and post-event conditions for no fewer than seven days post-event or until off-site resources can be deployed by the mitigating strategies resulting from Order EA-1 2-049, Order Modifying Licenses With Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events. Examples of post event conditions that will be considered are:

- Radiological conditions for a normal refueling quantity of freshly discharged (100 hours) fuel with SFP water level with in 1 foot of the top of the SFP racks (Level 3),
- Temperature of 212 degrees F and 100% relative humidity environment,
- Boiling water and steam environment
- Concentrated borated water environment, and
- The impact of mitigating strategies developed in response to NEI 12-06, Diverse and Flexible Coping Strategies (FLEX).

Equipment located in the SFP will be qualified to withstand a total accumulated dose of expected lifetime at normal conditions plus accident dose received at post event conditions with SFP water level within 1 foot of the top of the fuel rack seated in the spent fuel pool (Level 3).

The metal probe and cable in the spent fuel pool area are robust components that are not adversely affected by expected radiation, temperature, or humidity. The areas selected for display/processor installation are considered mild environments, such that personnel access is not prohibited by radiation, temperature or humidity, and are readily accessible by operators during or after a BDBE event.”

Provide responses to the following:

a) A description of the specific method or combination of methods you intend to apply to demonstrate the reliability of the permanently installed equipment under beyond-design-basis ambient temperature, humidity, shock, vibration, and radiation conditions.
b) A description of the testing and/or analyses that will be conducted to provide assurance that the equipment will perform reliably under the worst-case credible design basis loading at the location where the equipment will be mounted. Include a discussion of this seismic reliability demonstration as it applies to a) the level sensor mounted in the SFP area, and b) any control boxes, electronics, or read-out and re-transmitting devices that will be employed to convey the level information from the level sensor to the plant operators or emergency responders.
c) In the event any part of this information is not available with the submittal of your response to this RAI, provide the date this information will be submitted.

3.6 Power Supplies

Order EA-12-051 states, “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."

NEI 12-02 states in part, "The portable generator or replaceable batteries should be accessible and have sufficient capacity to support reliable instrument channel operation until off-site resources can be deployed by the mitigating strategies resulting from Order EA-12-049."

RAI-5

Issue:

The OIP states, "The power supplies for the instrument channels are shown on Attachment 3 and arranged as follows:

> Each instrument channel is normally powered from 120VAC 60 Hz plant power to support continuous monitoring of SFP level. The primary channel receives power from a different 480V bus than the backup channel. Therefore, loss of any one 480V bus does not result in loss of normal 120VAC power for both instrument channels.
>
> - On loss of normal 120VAC power, each channel's UPS automatically transfers to a dedicated backup battery. If normal power is restored, the channel will automatically transfers back to the normal AC power.
> - The backup batteries are maintained in a charged state by commercial-grade uninterruptible power supplies. The batteries are sized to be capable of supporting intermittent monitoring for a minimum of 3 days of operation. This provides adequate time to allow the batteries to be replaced, or until off-site resources can be deployed by the mitigating strategies resulting from Order EA-12-049 Revision 0.
> - An external connection permits powering the system from any portable DC source.
> - Instrument accuracy and performance are not affected by restoration of power or restarting the processor."

Provide responses to the following:

a) The sample rate under intermittent monitoring conditions and explain if the sample rate is determined by the instrument, or by plant procedures.
b) The design criteria that will be applied to size the battery in a manner that ensures, with margin, that the channel will be available to run reliably and continuously following the onset of the beyond-design-basis event for the minimum duration needed, consistent with the plant FLEX Program plans.
c) In the event any part of this information is not available with the submittal of your response to this RAI, provide the date this information will be submitted.

3.7 Accuracy

Order EA-12-051 states, “The instrument channels shall maintain their designed accuracy following a power interruption or change in power source without recalibration.”

NEI 12-02 states, “The instrument channels shall maintain their designed accuracy following a power interruption or change in power source without recalibration. Accuracy should consider SFP conditions, e.g., saturated water, steam environment, or concentrated borated water. Additionally, instrument accuracy should be sufficient to allow trained personnel to determine when the actual level exceeds the specified lower level of each indicating range (levels 1, 2 and 3) without conflicting or ambiguous indication.”

RAI-6

Issue:

The OIP states in part, “Accuracy will be consistent with the guidelines of NRC JLD-ISG-2012-03 Revision 0 and NEI 12-02 Revision 1. Accuracy and indication features are as follows:

- Accuracy: The absolute system accuracy is equal or better than ± 3 inches. This accuracy is applicable for normal conditions and the temperature, humidity, chemistry, and radiation levels expected for BDBE event conditions.
- Trending: The display trends and retains data when powered from either normal or backup power.
- Restoration after Loss of Power: The system automatically swaps to available power (backup battery power or external DC source) when normal power is lost. Neither the source of power nor system restoration impact accuracy. Previously collected data is retained.
- Diagnostics: The system performs and displays the results of real-time information related to the integrity of the cable, probe, and instrument channel.

The above features ensure that trained personnel can easily determine when SFP level falls below each regulatory level (levels 1, 2 and 3) without conflicting or ambiguous indication.”

Provide responses to the following:

a) 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 and to technicians that the channel requires adjustment to within the normal condition design accuracy.
b) In the event any part of this information is not available with the submittal of your response to this RAI, provide the date this information will be submitted.

3.8 Testing

Order EA-12-051 states, “The instrument channel design shall provide for routine testing and calibration.”

NEI 12-02 states, “Static or non-active installed (fixed) sensors can be used and should be designed such that testing and /or calibration can be performed in-situ. For microprocessor

based channels the instrument channel design shall be capable of testing while mounted in the pool.

Back-up portable channels shall be designed such that calibration does not require the use of any additional test or reference equipment at the time of deployment, i.e., plug-and-play type technology.

Other testing and calibration requirements are located in Section 4.3. Existing work control processes may be used to control maintenance and testing. (e.g., PM Program, Surveillance Program, Vendor Contracts, or work orders)."

RAI- 7

Issue:

OIP states, "Testing and calibration will be consistent with the guidelines of NRC JLD-ISG-2012- 03 Revision 0 and NEI 12-02 Revision 1 and vendor recommendations.

The display/processor performs automatic in-situ calibration and automatically monitors for cable, connector, and probe faults using time domain reflectometry (TDR) technology. Channel degradation due to age or corrosion is not expected but associated testing, calibration, and monitoring provides reasonable opportunity for identification thereof.

Station procedures and preventive maintenance tasks will be developed as necessary (e.g. to perform required surveillance testing, calibration, backup battery maintenance, functional checks, and visual inspections of the probes)."

Provide responses to 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 SFP level instrumentation.
c) A description of how functional checks will be performed, and the frequency at which they will be conducted. Describe how calibration tests will be performed, and the frequency at which they will be conducted. Provide a discussion as to how these surveillances will be incorporated into the plant surveillance program.
d) A description of what preventative 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 the accurately and reliably perform their functions when needed.
e) In the event any part of this information is not available with the submittal of your response to this RAI, provide the date this information will be submitted.

4. PROGRAM FEATURES

4.2 Procedures

Order EA-12-051 states, “Procedures shall be established and maintained for the testing, calibration, and use of the primary and backup spent fuel pool instrument.”

NEI 12-02 states in part, “Procedures will be developed using guidelines and vendor instructions to address the maintenance, operation, and abnormal response issues associated with the new SFP instrumentation. For portable instruments, the procedures will also specify storage location and installation activities.”

RAI-8
Issue:

The OIP states, “Procedures for maintenance and testing will be developed using regulatory guidelines and vendor instructions.

BDBE event operations guidance will also address the following:

- A strategy to ensure SFP water addition is initiated at an appropriate time consistent with implementation of NEI 12-06 Revision 1.
- Restoration of non-functioning SFP level channels after an event. Restoration timing will be consistent with the emergency condition. After an event, commercially available components that may not meet all qualifications may be used to replace components to restore functionality.”

Provide responses to the following:

a) A description of the standards, guidelines and/or criteria that will be utilized to develop procedures for inspection, maintenance, repair, operation, abnormal response, and administrative controls associated with the SFP level instrumentation, as well as storage and installation of portable instruments.
b) In the event any part of this information is not available with the submittal of your response to this RAI, provide the date this information will be submitted.

4.3 Testing and Calibration

Order EA-12-051 states, “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.”

NEI 12-02 states in part, “Processes shall be established and maintained for scheduling and implementing necessary testing and calibration of the primary and backup SFP level instrument channels to maintain the instrument channels at the design accuracy.
The testing and calibration of the instrumentation shall be consistent with vendor recommendations or other documented basis. Calibration shall be specific to the mounted instrument and the monitor.

Surveillances or testing to validate functionality of an installed instrument channel shall be performed within 60 days of a planned refueling outage considering normal testing scheduling allowances (e.g., 25%). This is not required to be performed more than once per 12 months.

The primary or back-up instrument channel can be out of service for testing, maintenance and/or calibration for up to 90 days provided the other channel is functional. Additionally, compensatory actions must be taken if the instrumentation channel is not expected to be restored or is not restored within 90 days. If both channels become non-functioning then initiate actions within 24 hours to restore one of the channels of instrumentation and implement compensatory actions (e.g., use of alternate suitable equipment or supplemental personnel) within 72 hours."

RAI-9

Issue:

The OIP states in part, "Station procedures and preventive maintenance tasks will be developed as necessary (e.g. to perform required surveillance testing, calibration, backup battery maintenance, functional checks, and visual inspections of the probes).

…Testing and calibration processes will be developed consistent with the guidelines of NRC JLD-ISG-2012-03 Revision 0, NEI 12-02 Revision 1, and vendor instructions."

Provide responses to 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. Describe how the guidance in NEI 12-02 section 4.3 regarding compensatory actions for one or both non-functioning channels will be addressed. Describe what compensatory actions are planned in the event that one of the instrument channels cannot be restored to functional status within 90 days.
b) In the event any part of this information is not available with the submittal of your response to this RAI, provide the date this information will be submitted.