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John A Dent, Jr.  
Site Vice President

August 28, 2014

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

SUBJECT: Pilgrim Nuclear Power Station's Third Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)

Pilgrim Nuclear Power Station  
Docket No. 50-293  
License No. DPR-35

LETTER NUMBER 2.14.062

- REFERENCE:
1. NRC Order Number EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation", dated March 12, 2012 (PNPS Letter 1.12.015) (ADAMS Accession No. ML12054A679)
  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 (ADAMS Accession No. ML12221A339)
  3. Nuclear Energy Institute (NEI) 12-02, Revision 1, "Industry Guidance for Compliance with NRC Order EA-12-051, "To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation", dated August 2012 (ADAMS Accession No. ML12240A307)
  4. Pilgrim Nuclear Power Station Letter to NRC, "Initial Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)", dated October 29, 2012 (PNPS Letter 2.12.074) (ADAMS Accession No. ML12312A469)
  5. Pilgrim Nuclear Power Station Letter to NRC, "Overall Integrated Plan in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)", dated February 28, 2013 (PNPS Letter 2.13.014) (ADAMS Accession No. ML13063A097)

A001  
NRK

Dear Sir or Madam:

On March 12, 2012, the Nuclear Regulatory Commission ("NRC" or "Commission") issued an order (Reference 1) to Entergy. Reference 1 was immediately effective and directs Entergy to install reliable spent fuel pool level instrumentation. 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 pursuant to Section IV, Condition C. Reference 1 requires submission of a status report at six-month intervals following submittal of the overall integrated plan. Reference 3 provides direction regarding the content of the status reports. Reference 2 endorses industry guidance document NEI 12-02, Revision 1 (Reference 3) with clarifications and exceptions. Reference 4 provided the Pilgrim Station initial status report regarding spent fuel pool instrumentation. Reference 5 provided the Pilgrim Station Overall Integrated Plan. References 6 and 7 provide the first and second six-month status reports, respectively.

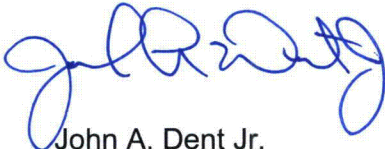
The purpose of this letter is to provide the third six-month status report pursuant to Section IV, Condition C.2, of Reference 1, that delineates progress made in implementing the requirements of Reference 1. The attached report provides an update of milestone accomplishments since the last status report, including any changes to the compliance method, schedule, or need for relief and the basis, if any.

Should you have any questions concerning the content of this letter, please contact Mr. Everett (Chip) Perkins Jr. at (508) 830-8323.

This letter contains no new regulatory commitments.

I declare under penalty of perjury that the foregoing is true and correct; executed on August 28, 2014.

Sincerely,

A handwritten signature in blue ink, appearing to read "John A. Dent Jr.", with a stylized flourish at the end.

John A. Dent Jr.  
JAD/rmb

Attachment: Pilgrim Nuclear Power Station's Third Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)

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**ATTACHMENT**

**To**

**PNPS Letter 2.14.062**

**PILGRIM NUCLEAR POWER STATION'S  
THIRD SIX-MONTH STATUS REPORT IN RESPONSE  
TO MARCH 12, 2012 COMMISSION ORDER MODIFYING  
LICENSES WITH REGARD TO  
RELIABLE SPENT FUEL POOL INSTRUMENTATION  
(ORDER NUMBER EA-12-051)**

## Attachment

### Pilgrim Nuclear Power Station's Third Six-Month Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)

#### 1 Introduction

PNPS developed an Overall Integrated Plan (Reference 1), documenting the requirements to install reliable spent fuel pool level instrumentation (SFPI), in response to Reference 2. This attachment provides an update of milestone accomplishments since the last status report, including any changes to the compliance method, schedule, or need for relief/relaxation and the basis, if any.

#### 2 Milestone Accomplishments

The following milestone(s) have been completed since January 31, 2014 and are current as of July 31, 2014.

None

#### 3 Milestone Schedule Status

The following provides an update to milestone schedule to support the Overall Integrated Plan. This section provides the activity status of each item, and the expected completion date noting any change. The dates are planning dates subject to change as design and implementation details are developed.

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Reliable SFPI Installed	Spring 2015 Refueling Outage	In Progress	N/A
NRC RAIs dated June 20, 2013 (Reference 5)	July 19, 2013	Submitted July 19, 2013	N/A
ISE RAIs dated December 5, 2013 (Reference 3)	September 30, 2014	In Progress	N/A

#### 4 Changes to Compliance Method

In Sections 6 and 7 of the Overall Integrated Plan (OIP), the OIP states that cables in the SFP area are routed in seismically mounted rigid metal conduit. However, the cable between the spent fuel pool and the west wall of the Reactor Building is routed on the concrete floor and protected with a low height metal cable protector. The remainder of the cable routing in the SFP area is contained in seismically mounted conduit. Refer to the response to RAI #1 in Section 9 for additional details regarding the arrangement of the SFPI probes and the separation between the two instrument channels.

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

PNPS expects to comply with the NRC Order implementation date and no relief/relaxation is required at this time.

## **6 Open Items from Overall Integrated Plan and Interim Staff Evaluation**

As discussed in Section 2, PNPS has received an Interim Staff Evaluation that includes 16 RAIs. Responses to the RAIs are due by September 30, 2014 and are provided in Section 9 of this six-month status report. The following table provides a status of any RAIs documented in the Interim Staff Evaluation.

<b>RAI #</b>	<b>Response Status</b>
1	See Section 9
2	See Section 9
3	See Section 9
4	See Section 9
5	See Section 9
6	See Section 9
7	See Section 9
8	See Section 9
9	See Section 9
10	See Section 9
11	See Section 9
12	See Section 9
13	See Section 9
14	See Section 9
15	See Section 9
16	See Section 9

## **7 Potential Interim Staff Evaluation Impacts**

There are no potential impacts to the Interim Staff Evaluation identified at this time except for those identified in Section 4 and Section 6.

PNPS's Third Six-Month Status Report for the Implementation of SFPI  
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## 8 References

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

1. "PNPS's Overall Integrated Plan in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)," dated February 28, 2013. (ADAMS Accession No. ML13063A097)
2. NRC Order Number EA-12-051, "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," dated March 12, 2012. (ADAMS Accession No. ML12054A679)
3. "Pilgrim Nuclear Power Station – Interim Staff Evaluation and Request for Additional Information Regarding the Overall Integrated Plan for Implementation of Order EA-12-051, "Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation" (TAC NO. MF0778)," dated December 5, 2013. (ADAMS Accession No. ML13333A910)
4. "November 26, 2013, Public Meeting Summary for the Discussion Between the NRC Staff and Industry Concerning Responses to Staff Interim Evaluations for Spent Fuel Pool Instrumentation," dated December 26, 2013. (ADAMS Accession No. ML13347B030)
5. "Pilgrim Nuclear Power Station – Request for Additional Information RE: Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation (Order EA-12-051)(TAC NO. MF0778)," dated June 20, 2013. (ADAMS Accession No. ML13165A276)



## 9 Responses to the Interim Staff Evaluation Requests for Additional Information

### RAI #1

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

Figure 1 shows the approximate locations of the SFPI probes, the inside dimensions of the SFP, and the proposed cable routing.

In Section 3.4 of the Interim Staff Evaluation (ISE), NRC staff stated that they have concerns with the proximity of the routing from the instrument probe to the instrument display location and whether this arrangement is in accordance with the guidance on channel separation, as described in NEI 12-02. The SFPI conduit is routed to exit the Refuel Floor, elevation 117 ft as soon as possible to minimize the possibility of physical damage to both loops from damage due to potential debris during a beyond design basis external event. The Channel A conduit will be installed on or very close to the floor at the west wall until it exits the refueling floor. The Channel B conduit will be installed at a higher elevation above the refueling floor in the southeast corner until it exits the refueling floor.

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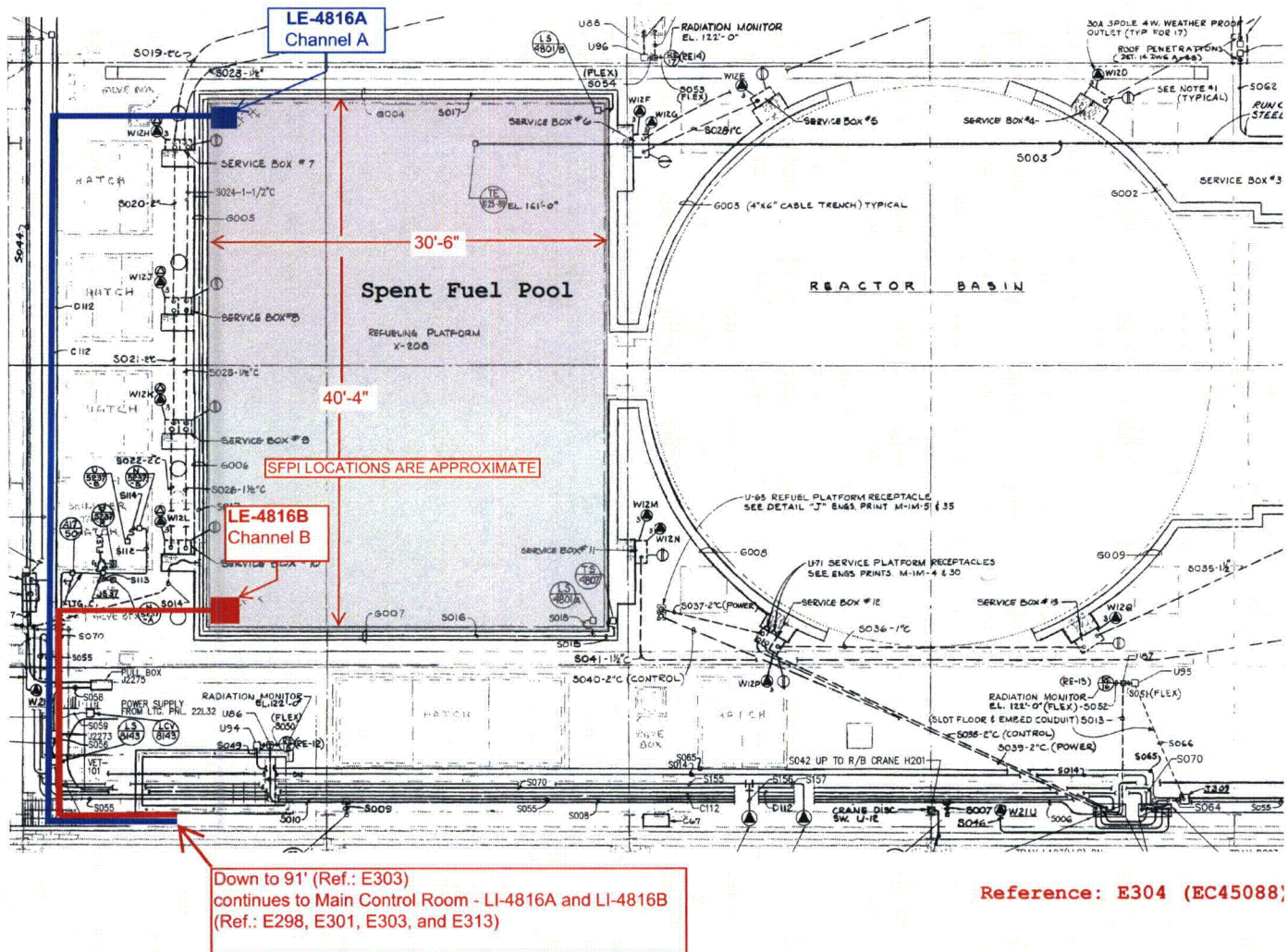


Figure 1: SFP Plan View

**RAI #2**

**Please provide the analysis verifying the seismic testing of the level probes, the mounting brackets, and the electronics units, and the analysis of the combined maximum seismic and hydrodynamic forces on the cantilevered portion of the assembly exposed to the potential sloshing effects. Show that the SFP instrument design configuration will be maintained during and following the maximum seismic ground motion considered in the design of the SFP structure.**

See PNPS Bridging Document Topic #s 8, 9, & 12 located on the ePortal. [Note: Preliminary responses are available in the draft bridging document. Awaiting issuance of NRC Audit Report for the SFPI vendor (MOHR).]

**RAI #3**

**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.**

See PNPS Bridging Document Topic #s 8, 9, 12, & 13 located on the ePortal. [Note: Preliminary responses are available in the draft bridging document. Awaiting issuance of NRC Audit Report for the SFPI vendor (MOHR).]

**RAI #4**

**Please provide analysis of the maximum expected radiological conditions, dose rate and total integrated dose, to which the sensor electronics will be exposed. Also, provide documentation indicating what is the maximum total integrated dose the sensor electronics can withstand and how it was determined. Please discuss the time period over which the analyzed total integrated dose was applied.**

Channel A and B displays containing the system electronics will be located in the Main Control Room. Radiation levels are not impacted by a reduction in Spent Fuel Pool water level. No analysis is necessary to evaluate the system electronics for exposure to radiation.

**RAI #5**

**Please provide information indicating what will be the maximum expected ambient temperature in the room in which the sensor electronics will be located under BDB conditions in which there is no ac power available to run heating ventilation and air conditioning (HVAC) systems, and whether the sensor electronics are capable of continuously performing required functions under this expected temperature condition.**

See PNPS Bridging Document Topic #3 located on the ePortal. [Note: Preliminary responses are available in the draft bridging document. Awaiting issuance of NRC Audit Report for the SFPI vendor (MOHR).]

**RAI #6**

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

See PNPS Bridging Document Topic #3 located on the ePortal. [Note: Preliminary responses are available in the draft bridging document. Awaiting issuance of NRC Audit Report for the SFPI vendor (MOHR).]

**RAI #7**

**Please provide a description of the specific method or combination of methods you intend to apply to demonstrate the reliability of the permanently installed equipment under BDB shock and vibration conditions. Identify the specific commercial and/or military standards that will be used to establish the testing requirements and the specific acceleration levels and frequencies that will be simulated.**

See PNPS Bridging Document Topic #14 located on the ePortal. [Note: Preliminary responses are available in the draft bridging document. Awaiting issuance of NRC Audit Report for the SFPI vendor (MOHR).]

**RAI #8**

**For RAI #7 above, please provide the results for the selected methods, tests, and analysis used to demonstrate the qualification and reliability of the installed equipment in accordance with the Order requirements.**

See PNPS Bridging Document Topic #14 located on the ePortal. [Note: Preliminary responses are available in the draft bridging document. Awaiting issuance of NRC Audit Report for the SFPI vendor (MOHR).]

**RAI #9**

**Please provide analysis of the vendor analysis and seismic testing results and show that the instrument performance reliability, following exposure to simulated seismic conditions representative of the environment anticipated for the SFP structures at Pilgrim, has been adequately demonstrated.**

See PNPS Bridging Document Topic # 8 located on the ePortal. [Note: Preliminary responses are available in the draft bridging document. Awaiting issuance of NRC Audit Report for the SFPI vendor (MOHR).]

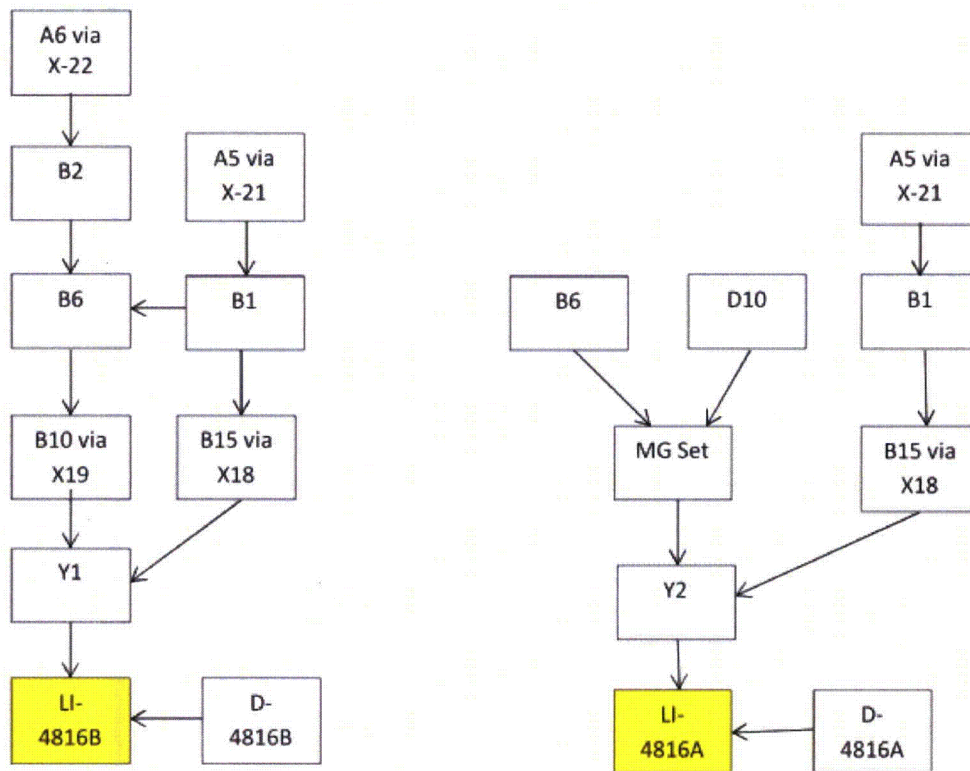
**RAI #10**

**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.**

Channel A will normally be powered from Y2 Breaker 1. Panel Y2 can be energized from either of two sources. The normal or preferred supply is the Vital MG set. Normally the motor-generator (MG) set is driven by the 480V AC motor. Upon loss of power center B6 or in the event that the 480V feeder Breaker 52-606 trips, the MG is automatically maintained in rotation by the backup 250V DC motor. The alternate or emergency source consists of 480V power center Breaker 52-1514 with its associated transformer X18. B15 is powered from A5 via B1.

Channel B will normally be powered from Y1 Breaker 1. Panel Y1 can be energized from either of two sources. The normal or preferred source is via transformer X19 and 480V breaker 52-1015 on power center B10. B10 is powered from A5 via B1 and B6 or from A6 via B2 and B6. Should the normal supply fail, Panel Y1 is transferred to the alternate source which is via transformer X18 and 480V breaker 52-1514 on power center B15. B15 is powered from A5 via B1. Figure 2 shows a simplified diagram that demonstrates the independence of the power supplies.

**SIMPLIFIED DIAGRAM SHOWING THE INDEPENDENT NORMAL POWER SUPPLIES AND THE INDEPENDENT BACKUP BATTERIES**



**Figure 2: SFPI Power Supply Diagram**

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**RAI #11**

**Please provide the results of the calculation depicting the battery backup duty cycle requirements and compatibility with the duration required for the plant mitigating strategy for assuring SFP level filling/cooling.**

See PNPS Bridging Document Topic #18 located on the ePortal. [Note: Preliminary responses are available in the draft bridging document. Awaiting issuance of NRC Audit Report for the SFPI vendor (MOHR).]

**RAI #12**

**Please provide analysis verifying that the proposed instrument performance is consistent with these estimated accuracy normal and BDB values. Please demonstrate that the channels will retain these accuracy performance values following a loss of power and subsequent restoration of power.**

See PNPS Bridging Document Topic #s 16, 17 and 18 located on the ePortal. [Note: Preliminary responses are available in the draft bridging document. Awaiting issuance of NRC Audit Report for the SFPI vendor (MOHR).]

**RAI #13**

**Please provide 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.**

In general relative to normal operating conditions, any applicable calibration procedure tolerances (or acceptance criterion) will be established based on the vendor manuals stated/recommended reference accuracy (or design accuracy). The methodology used will be based on the vendor manuals and captured in plant procedures and/or programs. See PNPS Bridging Document Topic #20 located on the ePortal. [Note: Preliminary responses are available in the draft bridging document. Awaiting issuance of NRC Audit Report for the SFPI vendor (MOHR).]

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**RAI #14**

**Please provide 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.**

The process will be captured in Entergy's procedures established based on manufacturer's recommendations. The instrument automatically monitors the integrity of its level measurement system using in-situ capability. Deviation of measured test parameters from manufactured or as-installed configuration beyond a configurable threshold prompts operator intervention. See PNPS Bridging Document Topic #20 located on the ePortal. [Note: Preliminary responses are available in the draft bridging document. Awaiting issuance of NRC Audit Report for the SFPI vendor (MOHR).]

**RAI #15**

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

The calibration and test procedure developed by MOHR is provided in the technical manual (see Bridging Document Topics #10, 19, & 20 located on the ePortal) [Note: Preliminary responses are available in the draft bridging document. Awaiting issuance of NRC Audit Report for the SFPI vendor (MOHR).]. The objectives are to measure system performance, determine if there is a deviation from normal tolerances, and return the system to normal tolerances.

Diagnostic procedures developed by MOHR are provided as automated and semi-automated routines in system software alerting the operator to abnormal deviation in selected system parameters such as battery voltage, 4-20 mA loop continuity, and TDR waveform of the transmission cable. The technical objective of the diagnostic procedures is to identify system conditions that require operator attention to ensure continued reliable liquid level measurement. Manual diagnostic procedures are also provided in the event that further workup is determined to be necessary.

Maintenance procedures are developed by MOHR and are provided in the technical manual. These allow a technician trained in EFP-IL system maintenance to ensure that system functionality is maintained.

An operation procedure will provide sufficient instructions for operation and use of the system. Entergy procedures will be developed in accordance with the vendor manuals provided by MOHR and Entergy procedures and processes.

FLEX Support Guidelines will provide sufficient instructions for use of the SFPI during a beyond design basis external event.

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**RAI #16**

**Please provide 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.**

SFPI channel/equipment maintenance/preventative maintenance and testing program requirements to ensure design and system readiness will be established in accordance with Entergy's processes and procedures and vendor recommendations. This will ensure that appropriate regular testing, channel checks, functional tests, periodic calibration, and maintenance is performed (and available for inspection and audit). See PNPS Bridging Document Topics # 10 and 20 located on the ePortal. [Note: Preliminary responses are available in the draft bridging document. Awaiting issuance of NRC Audit Report for the SFPI vendor (MOHR).]