WOLF CREEK
NUCLEAR OPERATING CORPORATION

John P. Broschak
Vice President Engineering

August 15, 2013

ET 13-0025

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

Reference: 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 Reliable Spent Fuel Pool Instrumentation"

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

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

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

Subject: Docket No. 50-482: 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)

Gentlemen:

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued an order (Reference 1) to Wolf Creek Nuclear Operating Corporation (WCNOC). Reference 1 was immediately effective and directed WCNOC to have a 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. Specific requirements are outlined in Attachment 2 of Reference 1.

Reference 1 required submission of an initial status report 60 days following issuance of final Interim Staff Guidance (ISG), and an Overall Integrated Plan (OIP) by February 28, 2013. WCNOC provided those responses in References 2 and 3.

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Reference 4 transmitted a Request for Additional Information (RAI) from the NRC to WCNOC and requested a response within 30 days from the date on that letter. The attachment to this letter provides the information requested by the RAI.

This letter contains no commitments. If you have any questions concerning this matter, please contact me at (620) 364-4085, or Mr. Michael J. Westman at (620) 364-4009.

Sincerely,

John P. Broschak

JPB/rlt

Attachment

cc: C. F. Lyon (NRC), w/a
N. F. O'Keefe (NRC), w/a
S. A. Reynolds (NRC), w/a
Senior Resident Inspector (NRC), w/a

STATE OF KANSAS)
) SS
COUNTY OF COFFEY)

John P. Broschak, 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 John P. Broschak
John P. Broschak
Vice President Engineering

SUBSCRIBED and sworn to before me this 15th day of August, 2013.

Gayle Shepheard
Notary Public

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

Expiration Date 7/24/2015

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued Order EA-12-051, "Reliable Spent Fuel Instrumentation." Reference 1 provided Wolf Creek Nuclear Operating Corporation's (WCNOC) Overall Integrated Plan (OIP) pursuant to Section IV, Condition C.1.a of Order EA-12-051. Reference 2 provided a NRC request for additional information (RAI) related to Reference 1. Provided below is WCNOC's response to the questions in the RAI.

RAI-1

The OIP states that:

Key spent fuel pool water levels:

1. **Level adequate to support operation of the normal SFP cooling system** – Indicated level on either the primary or backup instrument channel of 24 feet 10.75 inches above the top of the fuel storage racks plus the accuracy of the SFP level instrument channel, which is to be determined. This aligns with the normal SFP level as shown in the Wolf Creek Updated Safety Analysis Report (USAR) (Reference 5) Figure 1.2-21 and provides adequate margin to maintain fuel pool cooling pump suction.

2. **Level adequate to provide substantial radiation shielding for a person standing on the spent fuel pool operating deck** – Indicated level on either the primary or backup instrument channel of greater than 10 feet (+/- 1 foot) above the top of the fuel storage racks based on Reference 2 and Reference 3. This monitoring level ensures there is an adequate water level to provide substantial radiation shielding for a person standing on the spent fuel pool operating deck.

3. **Level where fuel remains covered** - Indicated level on either the primary or backup instrument channel of greater than 1 foot above the top of the fuel storage racks plus the accuracy of the SFP level instrument channel. This monitoring level assures that there is adequate water level to cover the stored fuel seated in the rack.

Please provide the following:

a) The specific elevations within the plant SFP corresponding to the three levels described in the guidance provided in NEI 12-02, Revision 1. For level 1, specify how the identified location represents the HIGHER of the two points described in the NEI 12-02 guidance for this level.

b) A clearly labeled sketch depicting the elevation view of the proposed typical mounting arrangement for the portions of the instrument channel consisting of permanent measurement channel equipment (e.g., fixed level sensors and/or stilling wells, and mounting brackets). Please indicate on this sketch the datum values representing Level 1, Level 2, and Level 3 as well as the top of the fuel racks. 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.

Response:

a) Nuclear Energy Institute (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, specified the higher of the two levels because either condition would compromise continued operation of the normal fuel pool cooling system, and the one reached first on a declining water level depends on plant-specific piping configurations and pump characteristics.

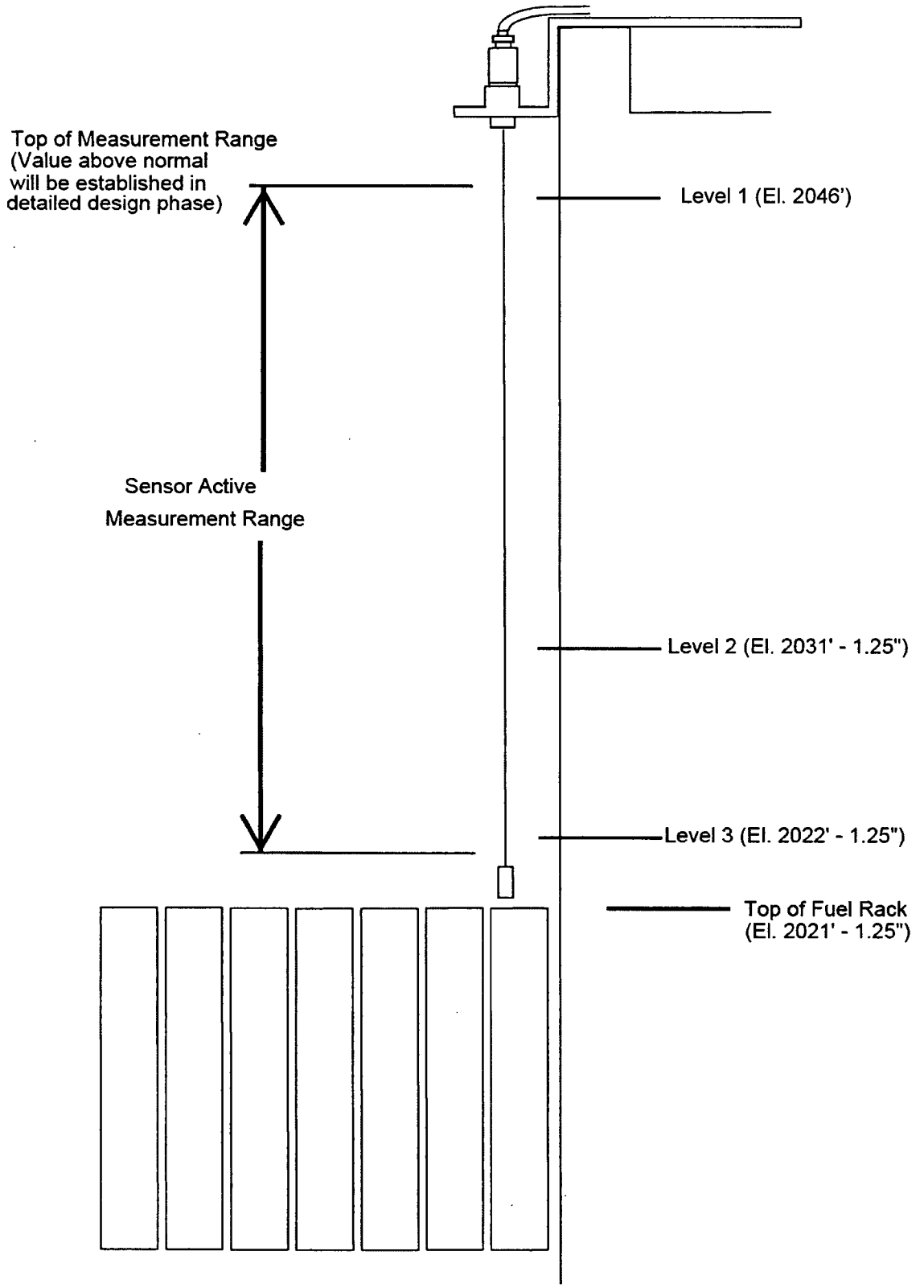
Level 1
WCNOC designated Level 1 to be Elevation 2046 ft (24 ft, 10.75 in. above the top of the fuel racks). This corresponds to the normal water level. This level is adequate to support operation of the normal fuel pool cooling system, as required by Order EA-12-051. It is a higher level than either of the pump-limiting conditions specified in NEI 12-02, section 2.3.1, and as such, is conservatively safe.

In selecting normal water level as Level 1, the need to define a specific operational action to be taken in response to reaching Level 1 is precluded.

Level 2
WCNOC designated Level 2 to be the water level 10 ft (± 1.0 ft) above the top of the fuel racks. This conforms to one of the two bases for designation specified in NEI 12-02, section 2.3.2. This Spent Fuel Pool (SFP) level is adequate to provide substantial radiation shielding for a person standing on the SFP operating deck at elevation 2047 ft.

Level 3
WCNOC designated Level 3 to be the water level "greater than 1 ft above the top of the fuel storage racks plus the accuracy of the SFP level instrument channel, which is to be determined." This is consistent with the "nominal" "highest point of any fuel rack..." characterization of NEI 12-02, section 2.3.3. Designation of this level as Level 3 is conservative; its selection assures that the fuel will remain covered, and at that point there would be no functional or operational reason to defer action to implement the addition of make-up water to the pool.

b) A clearly labeled sketch is provided below.


Top of Measurement Range
(Value above normal
will be established in
detailed design phase)
Level 1 (El. 2046')
Sensor Active
Measurement Range
Level 2 (El. 2031' - 1.25")
Level 3 (El. 2022' - 1.25")
Top of Fuel Rack
(El. 2021' - 1.25")

RAI-2

The OIP states, in part, that

The primary and backup instrument sensing components will be separated consistent with the guidelines of Reference 2 and Reference 3. Design of the mounting bracket will allow the fuel handling machine to pass over the bracket without interference.

A SFP walkdown identified preliminary locations for the primary and backup level sensing components. The preliminary location of the primary and backup instrument sensing components are at the plant northeast and northwest corners of the SFP. The design for the installation will include physical separation of the two sensors, separate extension cables from the electronics to the sensors, routing all cables in separate conduit / trays, separate UPS [uninterruptible power supply] power supplied from different ac [alternating current] sources, and seismically qualified mounting with physical separation of both the level sensing electronics and indications.

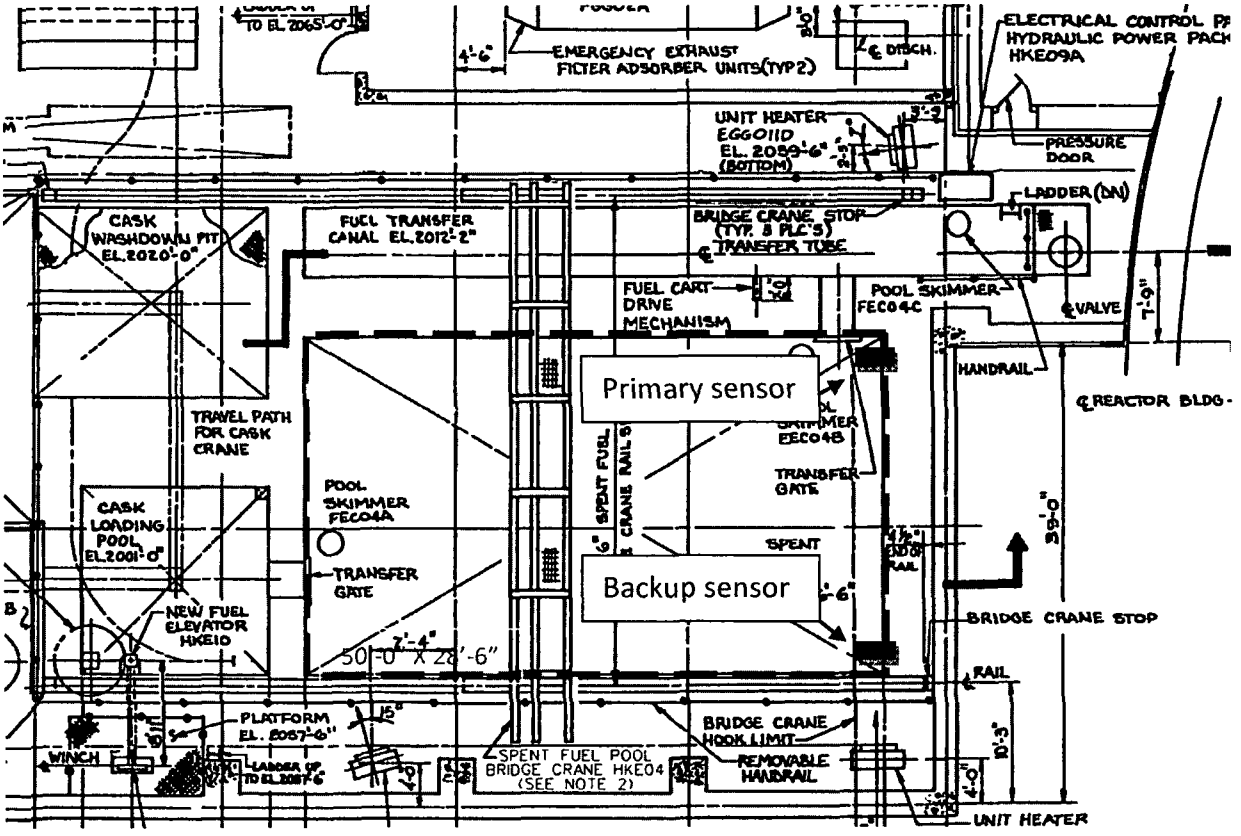
a) Please provide a clearly labeled sketch or marked-up plant drawing of the plan view of the SFP area, depicting the SFP inside dimensions, the planned locations/placement of the primary and backup SFP level sensor, and the proposed routing of the cables that will extend from the sensors toward the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

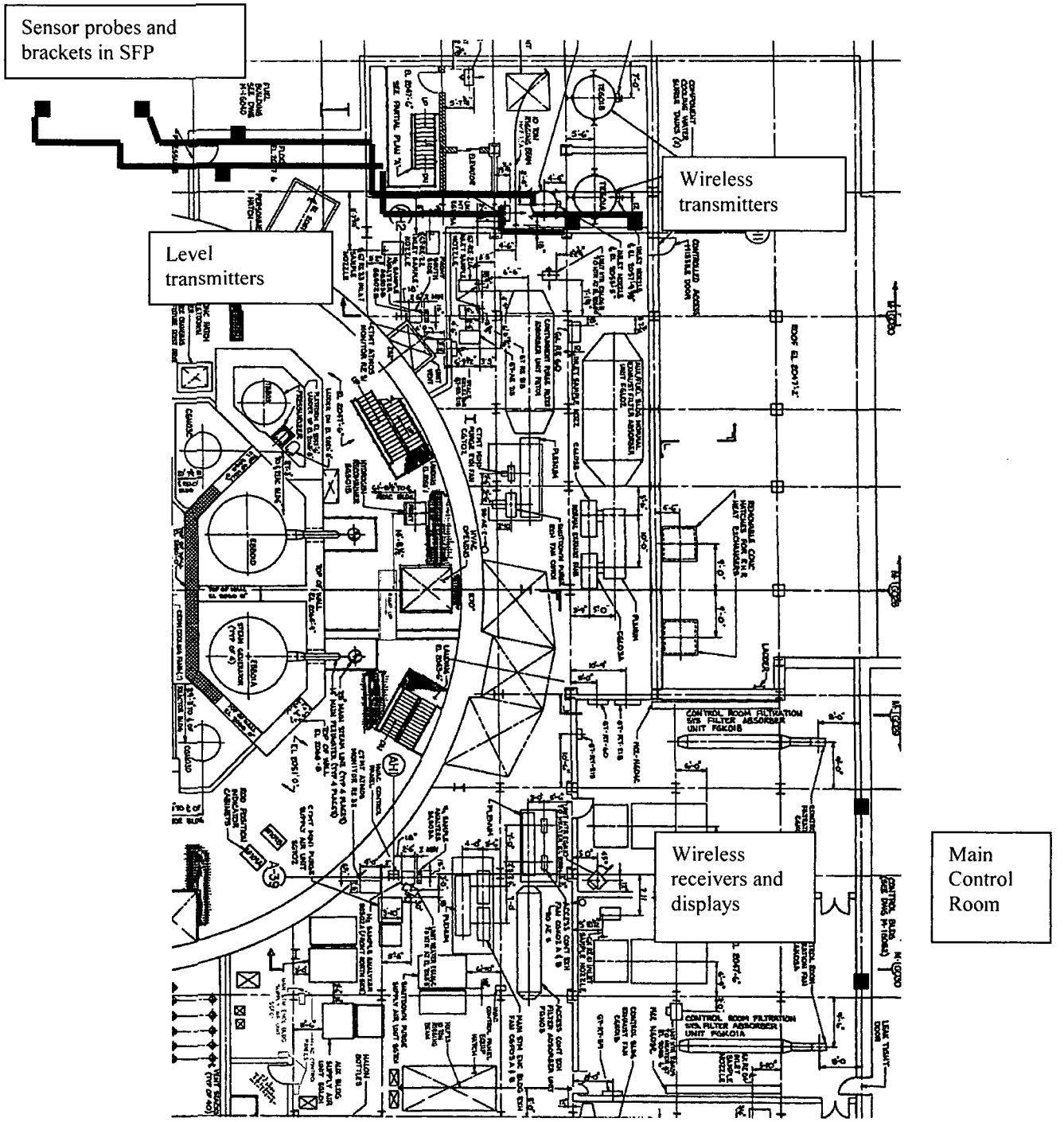
Response:

a) Below are excerpts from plant drawings being used as sketches that depict the conceptual locations of the two permanently mounted level probes (primary and backup) within the SFP area and the cable routing to locate the electronics to a non-harsh environment outside the SFP area.

   The inside dimensions of the SFP are 50 ft – 0 in. by 28 ft – 6 in.

   The recognized displays will be located in the Control Room A/C Unit and Filtration Units Rooms "A" and "B" which are adjacent to the control room. These rooms are accessible during and after an event occurs.


ELECTRICAL CONTROL P
HYDRAULIC POWER PACK
HKE09A
EMERGENCY EXHAUST
FILTER ADSORBER UNITS(TYP 2)
UNIT HEATER
EGG011D
EL. 2059'-6"
(BOTTOM)
PRESSURE
DOOR
LADDER (DN)
CASK
WASHDOWN PIT
EL. 2020'-0"
FUEL TRANSFER
CANAL EL. 2012'-2"
BRIDGE CRANE STOP
(TYP. 5 PLC'S)
TRANSFER TUBE
FUEL CART
DRIVE
MECHANISM
POOL SKIMMER
FEC04C
VALVE
HANDRAIL
REACTOR BLDG.
Primary sensor
TRAVEL PATH
FOR CASK
CRANE
POOL
SKIMMER
FEC04A
SPENT FUEL
CRANE RAILS
TRANSFER
GATE
CASK
LOADING
POOL
EL. 2001'-0"
TRANSFER
GATE
SPENT
Backup sensor
NEW FUEL
ELEVATOR
HKE10
50'-0" X 28'-6"
BRIDGE CRANE STOP
RAIL
PLATFORM
EL. 2057'-0"
WINCH
BRIDGE CRANE
HOOK LIMIT
SPENT FUEL POOL
BRIDGE CRANE HKE04
(SEE NOTE 2)
REMOVABLE
HANDRAIL
UNIT HEATER


Sensor probes and brackets in SFP
Wireless transmitters
Level transmitters
Wireless receivers and displays
Main Control Room

RAI-3

The OIP states, in part, that

> The mounting of both the primary and backup system will be installed to maintain its integrity during and following a design basis seismic event. All locations will be reviewed for two-over-one seismic interference.

Please provide the following:

a) The design criteria that will be used to estimate the total loading on the mounting device(s), including static weight loads and dynamic loads. Please 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. Please 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.

Response:

a) The mounting bracket for the sensing probe will be designed according to the plant design basis for Safe Shutdown Earthquake (SSE) seismic hazard curve at the appropriate plant elevation. Loads that will be 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 will be performed for the seismic evaluation of the mounting bracket using a Finite Element Analysis (FEA) software and using floor response spectrum at the operating deck elevation (2047 ft – 6 in.) in the Fuel Building (i.e., mounting floor elevation). Damping values will be according to SSE and consistent with the design basis of the station. The material properties that will be used for the bracket and its mounting will take into consideration the environmental conditions in the SFP area following an event. The design of the bracket and its mounting will maintain a design margin of 10% or more from the plant design basis criteria. Hydrodynamic effects on the mounting bracket will be evaluated using TID-7024, "Nuclear Reactors and Earthquakes," August 1963. Plant acceptance criteria and applicable codes will be used for the design of the bracket and its anchorage.

b) Figure 1 shows a top view of the pedestal (stainless steel tube welded to the base plate and the channel shown in the figure) that will attach to the refuel deck. The bracket will be attached to the refuel deck using installed anchors that will be designed according to the plant existing specification for design of concrete anchors. The pedestal will be

adjusted to the height of the poolside curb to ensure the SFP bracket extends over the pool horizontally level.

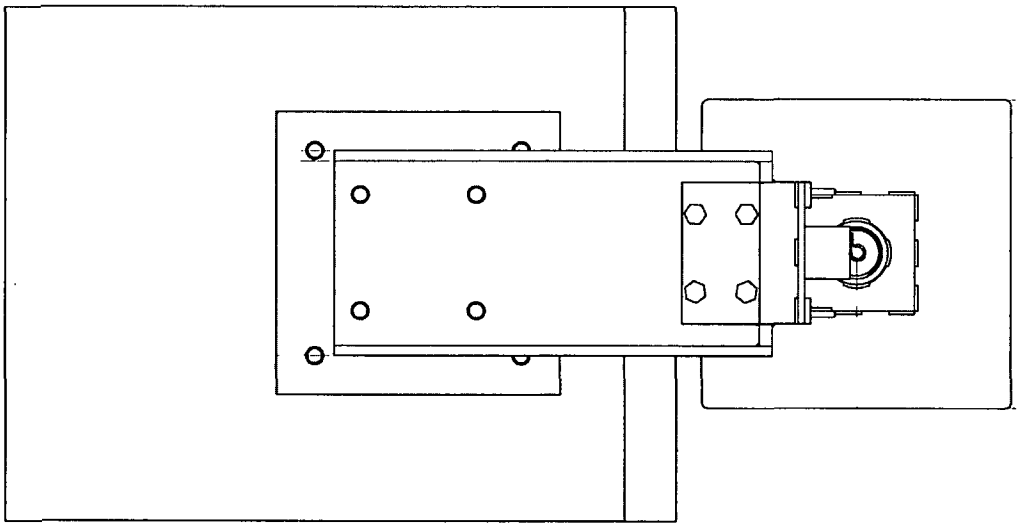


Figure 1: Top View of SFP Instrumentation pedestal

The probe attaches to the bracket via a 1½ in. National Pipe Thread Taper (NPT) connection. Figure 2 details the vertical portion of the bracket where the probe will thread into the bracket. All non-movable connections of parts will be welded during manufacturing.

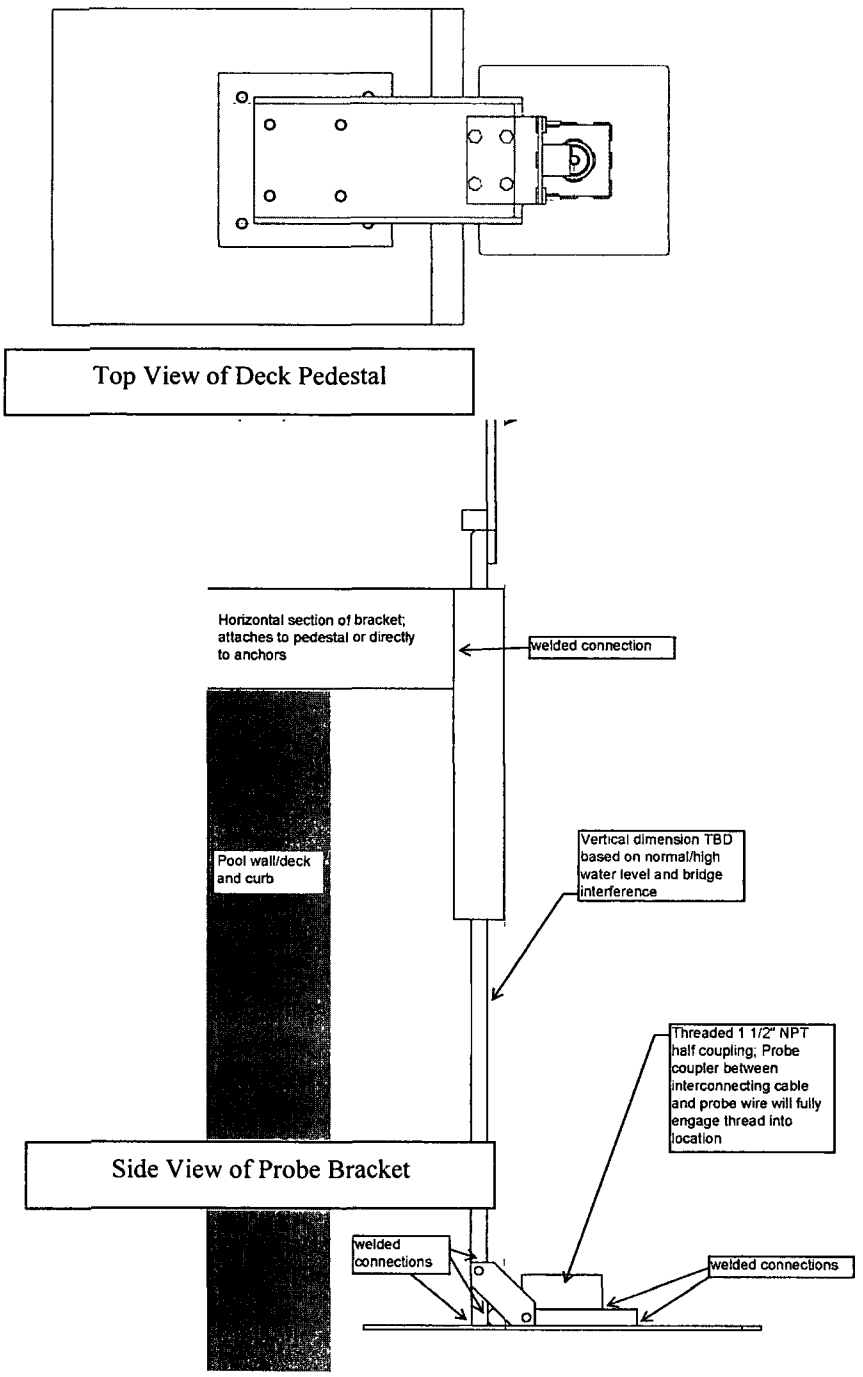


Figure 2 – Spent Fuel Pool Sensor Bracket Mounting Details

c) The attachment of the seismically qualified bracket to the refuel deck will be through permanently installed anchors that will be designed according to the plant existing specification for design of concrete anchors. With the permanently installed anchors, the pedestal will be secured to the refuel deck with adequate washers and bolts and the pedestal will attach to the bracket with adequate washers and bolts.

RAI-4

The OIP states, in part, that

Reliability of both instrument channels will be demonstrated via an appropriate combination of design, analyses, operating experience, and/or testing of channel components for the following sets of parameters:

(1) conditions in the area of instrument channel component used for all instrument components,
(2) effects of shock and vibration on instrument channel components used during and following any applicable event for installed components, and
(3) seismic effects on instrument channel components used during and following a potential seismic event for only installed components.

Please provide the following:

a) A description of the specific method or combination of methods the licensee intends to apply to demonstrate the reliability of the permanently installed equipment under Beyond-Design-Basis (BDB) 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. Please include a discussion of this seismic reliability demonstration as it applies to (1) the level sensor mounted in the SFP area, and (2) 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) A description of the specific method or combination of methods that will be used to confirm the reliability of the permanently installed equipment such that following a seismic event the instrument will maintain its required accuracy.

Response:

a) Demonstration of the reliability of the permanently installed spent fuel pool instrumentation system (SFPIS) equipment under the beyond-design-basis conditions will be by design, analysis, operating experience and testing by the system vendor and the equipment manufacturer(s), as described below for each of the identified conditions.

Temperature and Humidity

SFPIS materials and components were selected and specified by design to meet or exceed the temperature and humidity in the Fuel Building and other buildings during the extended loss of AC power event. The design of system components will be supplemented by analysis or testing as shown below.

System Component	Basis for Demonstration
Sensor Probe	By design and analysis. Stainless steel cable probe is inherently tolerant of the effects of the specified temperature and humidity.
Sensor Bracket	By design and analysis. Stainless steel bracket is inherently tolerant of the effects of the specified temperature and humidity.
Sensor Coupler	By design and analysis. The coupler is primarily stainless steel, and is specifically designed by the manufacturer for high temperature and humidity applications.
Coaxial Cable	By design and testing. Selected by design for conditions; tested for performance at 212 °F, saturated steam.
Sensor Electronics	By design and testing. Sensor electronics design temperature and humidity exceeds requirements for the sensor electronics mounting location. This component will be located in the Auxiliary Building.
System Electronics and Wireless Transmitter	By design and testing. Component design temperature and humidity exceeds requirements for equipment mounting locations; tested for performance under conditions of temperature and humidity cycling. This component will be located in the Auxiliary Building.
Wireless Receiver and Display	By design and testing. Component design temperature and humidity exceeds requirements for equipment mounting locations; tested for performance under conditions of temperature and humidity cycling. This component will be located in the Control Room A/C Unit & Filtration Units Room "A" in the Auxiliary Building.

Shock and Vibration

The components located within the SFP are passive components, inherently resistant to shock and vibration loadings. These include the stainless steel sensor cable probe, sensor bracket, coupler and interconnecting cable.

Active electronic components, located outside the SFP building, are permanently and rigidly attached to seismic racks or structural walls, and are not subject to significant shock and vibration loadings. However, assurance of reliability under conditions of shock and vibration is supported by manufacturer operating experience, which includes use of components in high vibration installations, such as compressed air systems and transportation industries.

Radiation

Components subject to significant radiation under beyond design basis conditions are those in the Fuel Building. These components include the sensor probe, bracket, coupler and interconnecting cable. The sensor probe and bracket are stainless steel and will not be affected by the anticipated radiation. The coupler and cable are selected by design for the beyond-design-basis radiation service. Supplemental radiation testing of the interconnecting cable will be completed to demonstrate operation for more than one week with SFP water at Level 3, and indefinitely at Level 2 or above (refer to RAI 1).

b) The sensor cable probe and supporting bracket are functionally passive components. Analysis will be used to demonstrate they will maintain their structural integrity and design configuration and to establish their reliability. The coupler and interconnecting cable are also passive components; however, they will be included in the seismic testing of the sensor electronics. The active system components, including sensor electronics,

system electronics, batteries, display and enclosures will be seismically tested based on rigid mounting conditions. Testing is tri-axial, using random multi-frequency inputs, in accordance with Institute of Electrical and Electronics Engineers (IEEE) 344–2004. Analyses and testing will envelope conditions at the equipment mounting locations resulting from the design basis maximum ground motion, plus margin.

c) The components except for the stainless steel sensor cable probe and the stainless steel bracket will be seismically tested in a rigidly mounted condition equivalent to their as-installed condition. The cable probe and bracket are passive components for which maintenance of structural or physical integrity is the only requirement. The active components of the SFPIS will be functionally tested before and after seismic simulation. Water level inputs to the system will be simulated by grounding the system probe at selected, repeatable positions. Acceptance will be based on a comparison of indicated levels before and after seismic testing, for the same simulated level inputs at the sensor probe.

RAI-5

The OIP states that

The backup instrument system will be redundant to and independent of the primary instrument system.

Independence of the two systems includes: location, mounting, power sources, power and signal wiring, and indications, to prevent any failure of one system from affecting the other system.

Provide responses to the following:

a) A description of how the two channels of the proposed level measurement system meet this requirement so that the potential for a common cause event to adversely affect both channels is minimized to the extent practicable.

b) Further information describing the design and installation of each level measurement system, consisting of level sensor electronics, cabling, and readout devices. Please address how independence of these components of the primary and backup channels is achieved through the application of independent power sources, physical and spatial separation, independence of signals sent to the location(s) of the readout devices, and the independence of the displays.

Response:

a) Within the SFP area, the brackets will be mounted as close to the Northwest (primary sensor) and Northeast (backup sensor) corners of the SFP, as permanent plant structures allow. Placing the brackets and probes in the corners allows for natural protection from a single event or missile from disabling both systems. The cabling within the SFP area will be routed in separate hard-pipe conduit. All conduit routing and location of system components will be selected such that there will not be any seismic 2 over 1 hazard.

b) Each system will be installed using completely independent cabling structures, including routing of the interconnecting cable within the SFP area in separate hard-pipe conduits. Power sources will be routed to the electronics enclosures from electrically separated sources ensuring the loss of one train or bus will not disable both channels. The system displays will be installed in separate qualified National Electrical Manufacturers Association (NEMA) 4X or better enclosures, with the primary display in the Control Room A/C Unit and Filtration Units Room "A" and the back-up in the Control Room A/C Unit and Filtration Units Room "B". Primary and backup systems will be completely independent of each other, having no shared components.

RAI-6

The OIP states that

> An ac source will be selected for each system's 24-Vdc [Volts direct current] UPS, with power cables routed separately through existing or new tray / conduit and presentations.
>
> Both channels will be powered by independent batteries following a loss-of-ac power. The minimum battery life will be 72 hours. The 72 hour battery life is sufficient amount of time for an alternate source of power to be provided by the plant-specific procedures to address Reference 6. Each channel will include an externally accessible bulkhead connector and a transfer switch for connection of an alternate power source.

Please provide the following:

a) A description of the electrical alternating current (AC) power sources and capacities for the primary and backup channels, demonstrating that the loss of one normal AC power supply will not affect both channels of level instrumentation.

b) Since both channels will be powered by independent batteries following a loss of AC power, please provide 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 BDB event for the minimum duration needed, consistent with the plant mitigation strategies for BDB external events (Order EA-12-049 [1]).

Response:

a) A description of the electrical AC power sources and capacities for the primary and backup channels will be developed as part of the detailed design and more information will be provided in the 6-month status update in February 2014.

b) Battery sizing is in accordance with IEEE 485-2010. Design criteria applied are: continuous system operation for 72 hours following loss of AC power. Calculation of system power consumption is based on the specified values listed in component manufacturer specifications. A 10% capacity margin is added to battery sizing calculations, following guidelines of IEEE 485-2010, Section 6.2.2. The time to restore AC power to the primary and backup channels will be within 72 hours, and will be established in the diverse and flexible coping strategies (FLEX) Support Guidelines.

RAI-7

The OIP states that

> Instrument channels will be designed such that they will maintain their specified accuracy without recalibration following a power interruption or change in power source.
>
> The accuracy will be within the resolution requirements of Reference 2, Figure 1.
>
> The instrument accuracy will be sufficient to allow personnel using plant procedures to determine when the water level reaches levels 1, 2, and 3 without conflicting or ambiguous indication.

Please provide the following:

a) An estimate of the expected instrument channel accuracy performance (e.g., in percent of span) 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 and to technicians that the channel requires adjustment to within the normal condition design accuracy.

Response:

a) The instrument channel accuracy will be established during the design phase. An estimate of the expected instrument channel accuracy under normal and beyond-design-basis conditions will be provided in the 6-month status update in February 2014.

b) The calibration procedure, and the methodology and basis for establishing both the criteria indicating the need for recalibration, and the acceptance criterion to be used with the procedure, will be established during the design phase. The methodology for defining these criteria will be provided in the 6-month status update in February 2014.

RAI-8

The OIP states that

> Instrument channel design will provide for routine testing and calibration consistent with Reference 2 and Reference 3.

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 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 accurately and reliably perform their functions when needed.

Response:

a) Details of the capabilities and provisions of the level instrumentation for periodic calibration and testing will be established during the design phase. A description of these features and the way they will support in-situ testing will be provided in the 6-month status update in February 2014.

b) A description of how the defined 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 will be provided in the 6-month status update in February 2014.

c) Details of functional checks and instrument channel calibrations will be determined during the design phase. A description of how functional checks and calibration tests will be performed, and the frequency at which they will be conducted, will be provided in the 6-month status update in February 2014. An explanation of how these surveillances will be incorporated into the plant surveillance program will be included.

d) The preventative maintenance tasks required to be performed during normal operation, and the planned surveillance intervals will be determined during the design phase. A description of these tasks and intervals will be provided in the 6-month status update in February 2014.

RAI-9

The OIP states that

The primary system indicator will be located in the vicinity of the control room. The backup system indicator will be located in an accessible location. The locations will allow for reading of the indicators following an event. The display will provide continuous indication of the SFP water level and will be consistent with the guidelines of Reference 2 and Reference 3.

Provide responses to the following:

a) The specific location for the primary and backup instrument channel display.

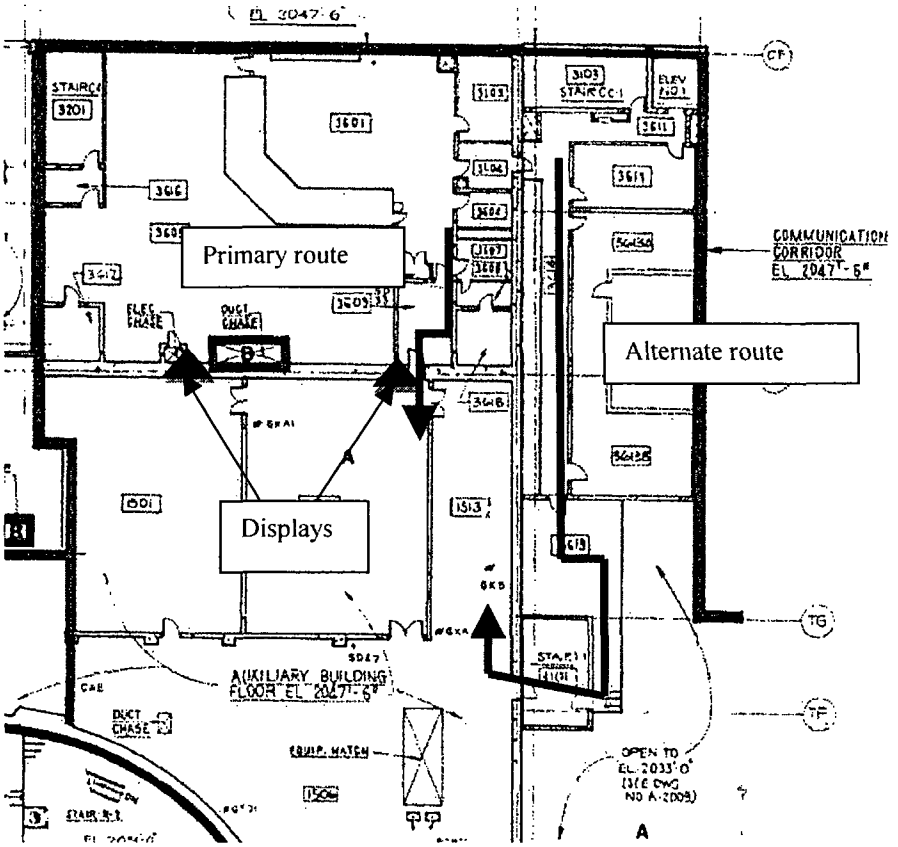
b) Since the licensee has not committed to place the primary and backup displays in the main control room, please provide a description of the location for the primary and backup display, including primary and alternate route evaluation, habitability at display location(s), continual resource availability for personnel responsible to promptly read displays, and provisions for communications with decision makers for the various SFP drain down scenarios and external events.

c) The reasons justifying why the locations selected will enable the information from these instruments to be considered "promptly accessible." Please include consideration of various drain-down scenarios.

Response:

a) The primary display will be located in the Control Room A/C Unit and Filtration Units Room "A", Room 1512 Elevation 2047 ft - 6 in., on the approximate centerline of the Plant West wall. The backup display will be located in the Control Room A/C Unit and Filtration Units Room "B", Room 1501 Elevation 2047 ft - 6 in., on the approximate centerline of the Plant West wall.

b) Below is an excerpt of a plant drawing being used as a sketch showing the locations of the displays and the control room. The displays are on the wall separating the control room from the Auxiliary Building, to the Plant East. The displays can be promptly viewed by control room staff due an access from the control room to the Control Room A/C Unit and Filtration Units Room "A". An alternate path can be utilized through the Communication Corridor, into the Auxiliary Building and into either the Control Room A/C Unit and Filtration Units Room "A" or "B". During and after an event, the area of the displays will be accessible by Operations personnel from the control room. The Control Room A/C Unit and Filtration Units Rooms "A" and "B" are located in the control room envelope. The control room envelope is isolated and pressurized during an accident involving the release of radioactive gases in the surrounding zones. Due to the close proximity between the control room and the display locations, use of wireless handheld radios or other equipment for communications will not be necessary.



c) During drain-down scenarios and external events the control room will be manned. With the displays just outside the control room they are considered "promptly accessible."

RAI-10

The OIP states, in part, that

> Procedures will be developed using guidelines and vendor instructions to address the maintenance, operation, and abnormal response issues associated with the new SFP level instrumentation

Please provide responses to the following:

a) A list of the operating (both normal and abnormal response) procedures, calibration/test procedures, maintenance procedures, and inspection procedures that will be developed for use of the SFP instrumentation in a manner that addresses the order requirements.

b) A brief description of the specific technical objectives to be achieved within each procedure. If the licensee's plan incorporates the use of portable spent fuel monitoring components, please include a description of the objectives to be achieved with regard to the storage location and provisions for installation of the portable components when needed.

Response:

a) Appropriate quality assurance measures will be selected for the SFPIS required by Order EA-12-051, consistent with Appendix A-1 of NEI 12-02 and similar to those imposed by Regulatory Guide 1.155. Site procedures will be developed for system inspection, calibration and test, maintenance, repair, operation and normal and abnormal responses, in accordance with WCNOC procedure controls.

b) Technical objectives to be achieved in each of the respective procedures are described below.

	Procedure	Objectives to be achieved
1)	System Inspection	To verify that system components are in place, complete, and in the correct configuration, and that the sensor probe is free of significant deposits of crystallized boric acid.
2)	Calibration and Test	To verify that the system is within the specified accuracy, is functioning as designed, and is appropriately indicating SFP water level.
3)	Maintenance	To establish and define scheduled and preventive maintenance requirements and activities necessary to minimize the possibility of system interruption.
4)	Repair	To specify troubleshooting steps and component repair and replacement activities in the event of system malfunction.
5)	Operation	To provide sufficient instructions for operation and use of the system by plant operation staff.
6)	Responses	To define the actions to be taken upon observation of system level indications, including actions to be taken at the levels defined in NEI 12-02.

There are no portable SFP monitoring components used in the WCNOC SFPIS.

RAI-11

The OIP states that

> Processes will 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. Testing and calibration of the instrumentation will be consistent with vendor recommendations and any other documented basis.

Please provide the following:

a) Further information describing the maintenance and testing program the licensee will establish and implement to ensure that regular testing and calibration is performed and verified by inspection and audit to demonstrate conformance with design and system readiness requirements. Please include a description of the licensee's 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 how the guidance in NEI 12-02 Section 4.3 regarding compensatory actions for one or both non-functioning channels will be addressed.

c) A description of the compensatory actions to be taken in the event that one of the instrument channels cannot be restored to functional status within 90 days.

Response:

a) Appropriate quality assurance measures will be applied to the SFPIS, consistent with NEI 12-02, Appendix A-1, which includes criteria for procedures, test control, corrective actions and audit functions. WCNOC will establish and implement procedures for control and scheduling of SFPIS maintenance and testing. The new procedure(s) will include requirements for the necessary tests to be performed, frequency of testing and, acceptance criteria. As these procedures are developed, information will be provided to the NRC in the 6-month status update in February 2014.

b) WCNOC will implement measures to minimize the possibility of either the primary or backup channel being out of service for any extended period. Sufficient spare components and materials will be maintained to enable timely repair or replacement of defective components. WCNOC will follow the NEI 12-02 guidance with regard to the time during which one or more channels may be out of service.

c) If a channel is non-functional, a corrective action document will be initiated and actions taken to correct the deficiency within 90 days as described in NEI 12-02. The technology selected for level instrumentation is easily replaceable, as components are passive and modular. Sufficient spares will be available on-site and the vendor can supply parts in a timely manner.

References:

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

2. Letter from C. F. Lyon, USNRC, to M. W. Sunseri, WCNOC, "Wolf Creek Generating Station - Request for Additional Information Regarding 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.