Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

February 28, 2013

10 CFR 2.202

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

Browns Ferry Nuclear Plant, Units 1, 2, and 3
Facility Operating License Nos. DPR-33, DPR-52, and DPR-68
NRC Docket Nos. 50-259, 50-260, and 50-296

Subject: **Tennessee Valley Authority (TVA) - Overall Integrated Plan in Response to the March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051) for Browns Ferry Nuclear Plant**

References:

1. NRC Order Number EA-12-051, "Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," dated March 12, 2012 (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 (ML12221A339)

3. NEI 12-02, "Industry Guidance for Compliance with NRC Order EA-12-051, 'To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation,'" Revision 1, dated August 2012 (ML12240A307)

4. Letter from TVA to NRC, "Tennessee Valley Authority (TVA) - Initial Status Report in Response to the March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Reliable Fuel Pool Instrumentation (Order Number EA-12-051)," dated October 29, 2012 (ML12307A105)

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On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued an immediately effective order (Order Number EA-12-051) entitled "Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation" to "All Power Reactor Licensees and Holders of Construction Permits in Active or Deferred Status" (Reference 1). The Order indicated that as a result of the NRC's evaluation of the lessons learned from the March 2011 accident at Fukushima Dai-ichi, the NRC determined that certain actions are required by nuclear power plant licensees and construction permit holders. Specifically, the NRC required additional defense-in-depth measures to address uncertainties associated with protection from beyond-design-basis events. With respect to this Order, the NRC determined that all power reactor licensees and construction permit holders must have "a reliable means of remotely monitoring wide-range spent fuel pool 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 to the Order.

The Order requires submission of an overall integrated plan, including a description of how compliance with the requirements described in Attachment 2 of the Order will be achieved. The Order requires the plan to be submitted to the NRC for review by February 28, 2013. In addition, the Order requires submission of an initial status report 60 days following issuance of the final interim staff guidance and at six month intervals following submittal of the overall integrated plan, which delineates progress in implementing the requirements of the Order. The interim staff guidance containing specific details on implementation of the requirements of the order was scheduled to be issued in August 2012. Finally, the order requires full implementation of its requirements no later than two refueling cycles after submittal of the overall integrated plan, or December 31, 2016, whichever comes first, or prior to issuance of an operating license for units under construction.

The NRC issued Interim Staff Guidance on August 29, 2012 (Reference 2) which endorses industry guidance document Nuclear Energy Institute (NEI) 12-02, Revision 1 (Reference 3), with clarifications and exceptions identified in Reference 2. Reference 3, Appendix A-2 contains the template for presenting the information to comply with the specific reporting requirements for the overall integrated plan.

By letter dated October 29, 2012 (Reference 4), TVA submitted an initial status report regarding reliable spent fuel pool instrumentation, as required by the Reference 1 Order.

The purpose of this letter is to provide the overall integrated plan pursuant to Section IV, Condition C.1.a, of the Reference 1 Order. This letter confirms TVA has received the Reference 2 interim staff guidance and has an overall integrated plan developed in accordance with the provided guidance for the purpose of ensuring reliable remote indication of the water levels in the Browns Ferry Nuclear Plant (BFN) spent fuel pools.

The information in the Enclosure to this letter provides the BFN overall integrated plan for reliable spent fuel pool instrumentation consistent with Reference 3. The integrated plan is based on conceptual design information. Final design details and associated procedure guidance, status of open items in Section XVI of the Enclosure, as well as any revisions to the information contained in the Enclosure, will be provided in the 6-month integrated plan updates required by the Reference 1 Order.

The Enclosure describes the plans that TVA will use to meet the regulatory requirements outlined in Attachment 2 of Reference 1, but does not identify any additional actions to be taken by TVA. Therefore, this letter contains no regulatory commitments.

If you have any questions regarding this submittal, please contact Kevin Casey at (423) 751-8523.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on the 28th day of February 2013.

Respectfully,

J. W. Shea
Vice President, Nuclear Licensing

Enclosure:

Browns Ferry Nuclear Plant, Integrated Plan with Regard to Reliable Spent Fuel Pool Instrumentation

cc (Enclosure):

NRR Director - NRC Headquarters
NRO Director - NRC Headquarters
NRC Regional Administrator - Region II
NRR Project Manager - Browns Ferry Nuclear Plant
NRC Senior Resident Inspector - Browns Ferry Nuclear Plant

ENCLOSURE

BROWNS FERRY NUCLEAR PLANT

INTEGRATED PLAN WITH REGARD TO RELIABLE SPENT FUEL POOL INSTRUMENTATION

Tennessee Valley Authority
Browns Ferry Nuclear Plant Integrated Plan with Regard to Reliable Spent Fuel Pool Instrumentation

I. Introduction

The Nuclear Regulatory Commission (NRC) issued Order EA-12-051, "Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation" (Reference 1) on March 12, 2012. The Order requires licensees to have a reliable indication of the water level in associated spent fuel storage pools capable of supporting identification of the following pool water level conditions by trained personnel: (1) level that is adequate to support operation of the normal fuel pool cooling system, (2) level that is adequate to provide substantial radiation shielding for a person standing on the spent fuel pool operating deck, and (3) level where fuel remains covered and actions to implement make-up water addition should no longer be deferred. The Order also requires that the Tennessee Valley Authority (TVA) submit an overall integrated plan that includes a description of how compliance with requirements in Attachment 2 of the Order will be achieved.

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," (Reference 3) provides an approach for complying with order EA-12-051. "NRC Interim Staff Guidance JLD-ISG-2012-03, Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation" (Reference 4) considers that the methodologies and guidance in conformance with the guidelines provided in NEI 12-02, Revision 1, subject to the clarifications and exceptions specific to Section 3.4, "Qualification," are an acceptable means of meeting the requirements of Order EA-12-051.

This integrated plan applies to the Browns Ferry Nuclear Plant (BFN) provides BFN's approach for complying with Order EA-12-051 using the methods described in NRC JLD-ISG-2012-03. The current revision of the BFN integrated plan is based on TVA's conceptual design information and will be revised as the detailed engineering design proceeds. The detailed engineering will include preparation of calculations necessary to support design assumptions. Consistent with the requirements of Order EA-12-051 and the guidance in NEI 12-02, six-month status reports will delineate progress made, any proposed changes in our compliance methods, updates to the schedule, and if needed, requests for relief and the bases.

II. Schedule

The installation of reliable level instrumentation for the spent fuel pool (SFP) associated with Unit 1 is scheduled for completion by November 15, 2016 which corresponds to the completion of the second refueling outage for Unit 1 that follows the submittal of this integrated plan.

The installation of reliable spent fuel pool level instrumentation for the SFP associated with Unit 2 is scheduled for completion by April 28, 2015 which corresponds to the completion of the second refueling outage for Unit 2 that follows the submittal of this integrated plan.

The installation of reliable spent fuel pool level instrumentation for the SFP associated with Unit 3 is scheduled for completion by April 12, 2016 which corresponds to the completion of the second refueling outage for Unit 3 that follows the submittal of this integrated plan.

The current milestones are:

• Unit 1 Commence Engineering and Design	3rd Qtr/2013
• Unit 1 Complete Engineering and Design	2nd Qtr/2014
• Unit 1 completion of first refueling outage	11/03/2014
• Unit 1 Complete Procurement of SFP Instruments	4th Qtr/2014
• Unit 1 Commence Installation of SFP Instruments	2nd Qtr/2015
• Unit 1 SFP Instruments available for plant use	11/15/2016
• Unit 1 Completion of second refueling outage	11/15/2016
• Unit 2 completion of first refueling outage	04/20/ 2013
• Unit 2 Commence Engineering and Design	2nd Qtr/2013
• Unit 2 Complete Engineering and Design	1st Qtr/2014
• Unit 2 Complete Procurement of SFP Instruments	2nd Qtr/2014
• Unit 2 Commence Installation of SFP Instruments	2nd Qtr/2014
• Unit 2 SFP Instruments available for plant use	04/28/2015
• Unit 2 Completion of second refueling outage	04/28/2015
• Unit 3 Commence Engineering and Design	3rd Qtr/2013
• Unit 3 Completion of first refueling outage	04/04/2014
• Unit 3 Complete Engineering and Design	2nd Qtr/2014
• Unit 3 Complete Procurement of SFP Instruments	4th Qtr/2014
• Unit 3 Commence Installation of SFP Instruments	2nd Qtr/2015
• Unit 3 SFP Instruments available for plant use	04/12/2016
• Unit 3 Completion of second refueling outage	04/12/2016

III. Identification of Spent Fuel Pool Water Levels

Key SFP water levels will be identified as follows:

- Level adequate to support operation of the normal fuel pool cooling system – Indicated level on either the primary or backup instrument channel of greater than 23.7 feet above the top of active fuel seated in the storage racks based on uncovering the weir that provides the flow path into the surge tank.

- Level adequate to provide substantial radiation shielding for a person standing on the SFP operating deck - Indicated level on either the primary or backup instrument channel of greater than 10 feet (+/- 1 foot) above the top of the stored fuel seated in the storage racks based on NEI 12-02 Section 2.3.2, bullet 1. This monitoring level ensures there is an adequate water level to provide substantial radiation shielding for a person standing on the SFP operating deck.

- Level where fuel remains covered - Indicated level on either the primary or backup instrument channel of greater than 0 feet above top of fuel storage rack. The primary and backup instrument channel sensing components are monitoring the fuel storage area. The design is not complete at this time, but TVA plans to scale instrument channels from full pool to top of fuel rack. The top of active fuel is 13 inches below the top of the rack. An instrument channel accuracy calculation, which includes all instrument channel components, is not complete at this time. However, TVA anticipates the instrument channel uncertainty to be less than the 12 inches [OI-1]. This monitoring level assures that there is adequate water level above the stored fuel seated in the rack.

IV. Instruments

The design of the instruments will be consistent with the guidelines of NRC JLD-ISG-2012-03 and NEI 12-02. Specifically, the channels will be designed as discussed below.

It is anticipated that both the primary and backup instrument channels will consist of fixed components. The current plan is for both channels to utilize Guided Wave Radar, which functions according to the principal of Time Domain Reflectometry (TDR) [OI-2]. A generated pulse of electromagnetic energy travels down the sensor and upon reaching the liquid surface the pulse is reflected. The level is inferred from the time delay of the returned reflected pulse.

Primary (fixed) instrument channel
The primary instrument channel will be located and permanently installed in each SFP. The primary instrument channel will provide a continuous level indication over a minimum range from the normal pool level (23.7 feet above the top of the active fuel or 22.6 feet above the top of the fuel storage racks) to the top of the fuel storage racks on each unit. The continuous indication will be provided by a Guided Wave Radar transmitter utilizing a remote sensor mounted above the SFP with a flexible cable extending down to top of fuel storage racks. TVA defines the top of the fuel storage rack to be the level within one foot above the rack.

Backup instrument channel
The backup instrument channel level sensing components will be located and permanently mounted in each SFP. The backup instrument channel will provide a continuous level indication over a minimum range from the normal pool level (23.7 feet above the top of active fuel or 22.6 feet above top of fuel storage racks) to the top of the fuel storage racks on each unit. The continuous indication will be provided by a Guided Wave Radar transmitter utilizing a remote sensor mounted above the SFP with a flexible cable extending down to top of fuel storage racks. TVA defines the top of the fuel storage rack to be the level within one foot above the rack.

Note that both channels will be permanently installed and are considered redundant. Primary and backup designations are used here in the context of compliance with order EA-12-051. The channels will be designated by instrument identifiers consistent with site procedures and will not be identified as either primary or backup in the plant.

Reliability:

Reliability of the primary and backup instrument channels will be assured by conformance with the guidelines of NRC JLD-ISG-2012-03 and NEI 12-02, as discussed in Section VII, "Qualification." Reliable level indication will be functional during all modes of operation. Reliability will be enhanced by routine testing as discussed in Section XI, "Testing."

Instrument Channel Design Criteria:

Instrument channel design criteria will be consistent with the guidelines of NRC JLD-ISG-2012-03 and NEI 12-02.

The sensing cable will consist of a small diameter stainless steel cable suspended from a mounting bracket above the SFP water level and extending to the top of the fuel racks. A small weight will be located at the bottom of the cable to keep it straight. The weight will not be provided with a lateral restraint. Failure of the cable is expected to result in it lying on the bottom of the SFP or across the top of the fuel storage rack, where it would not impact spent fuel or pool cooling. Interaction between the sensing cable and the SFP wall will be evaluated. Based on the light weight of the sensing cable assembly it is assumed that it would survive an impact with the SFP wall with little or no damage. Likewise the pool wall will not be damaged by any interaction with the sensing cable or the weight at the bottom of the sensing cable. This assumption will be confirmed by calculation or vendor analysis during the design phase [OI-3]. Level indication may be anomalous during a seismic event as a result of sensing cable movement, but will return to its design accuracy after the seismic event when the sensing cable returns to its normal position.

Level measurement span stops at the top of the small weight so the height of the weight will be kept small to allow measurement to within one foot of the top of the spent fuel rack.

V. Arrangement

Guided Wave Radar sensors will be mounted in the northwest corner and northeast corner to provide separation between channels. The sensor mount will be designed to suspend the sensing cable over the corner of the SFP at an elevation below the fuel handling machine traverse path which will add protection from missiles and debris in that it will be predominately below the operating deck around the SFP. A cable will be routed from each sensor to the transmitter that will be mounted in an area remote from the SFP environment. Channel separation between channels will be maintained for cable routing. The detailed engineering design has not been completed at this time, but, TVA expects that all components and cable routing will be contained within seismic structures such that the installation will comply with the reasonable protection guidance of NEI 12-06 [OI-4]. In addition, the two channel sensors and cable assemblies will be separated by approximately 30 feet which provides reasonable protection against missiles and debris impacting both channels. Indicators for both channels will be installed in areas remote from the SFP as discussed in Section XII, "Display."

VI. Mounting

Level transducers will be mounted to the SFP in accordance with Safety Related, Seismic Category I, requirements as defined in the BFN seismic design basis. The remaining channel components and cable routing shall be mounted in accordance with the BFN Seismic Category I design requirements.

VII. Qualification

Instrument channel reliability shall be established by use of an augmented quality assurance process. Qualification of equipment mounted in the proximity of the SFP will be evaluated to survive operation in the temperature, humidity, seismic, shock/vibration, and radiation levels anticipated for SFP operation, including the conditions encountered with SFP inventory at reduced levels for a minimum of seven (7) days post event. The NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide" (References 5 and 7) defines requirements for availability of FLEX equipment. FLEX equipment necessary to mitigate the event will be available on site, to ensure deployment can be accomplished in a timely manner.

Post-event temperature at sensors located above the SFP is assumed to be 212 degrees Fahrenheit ($^{\circ}$F). Post-event humidity in the Reactor Building near and above the SFP is assumed to be 100 percent with condensing steam. Level instrumentation will be qualified for expected conditions at the installed location assuming that normal power is unavailable and that the SFP has been at saturation for an extended period. Level instrumentation located in the vicinity of the SFP will be qualified to withstand peak and total integrated dose radiation levels for its installed location assuming that post event SFP water level is equal to the top of the active fuel for an extended period of time.

The sensor and cable mounted in the vicinity of the SFP are not sensitive to anticipated radiation, temperature and humidity. The associated transmitter (electronics package) will be mounted remote from the SFP to protect it from the radiation, temperature and humidity anticipated in the area around the SFP. The cable that connects the transducer to the transmitter will be qualified for the SFP area environment.

Instrument channel reliability will be demonstrated via an appropriate combination of design, analysis, operating experience, and/or testing of channel components for the following sets of parameters:

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

Augmented quality requirements, similar to those applied to fire protection, will be applied to this project.

Temperature, humidity and radiation levels consistent with conditions in the vicinity of the SFP and the area of use considering normal operational, 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-12-049 (Reference 2) will be addressed in the engineering design phase. Examples of post-event (beyond-design-basis) conditions that will be considered are:

- radiological conditions for a normal refueling quantity of freshly discharged (100 hours) fuel with the SFP water level at level 3 as described in this Order;
- temperatures of 212°F and 100 percent relative humidity environment;
- boiling water and/or steam environment; and
- the impact of FLEX mitigating strategies.

Components of the instrument channels will be qualified for shock and vibration using one or more of the following methods:

- components are supplied by manufacturers using commercial quality programs (such as ISO 9001, "Quality management systems – Requirements") with shock and vibration requirements included in the purchase specification at levels commensurate with portable hand-held device or transportation applications;
- components have a substantial history of operational reliability in environments with significant shock and vibration loading, such as portable hand-held device or transportation applications; or
- components are inherently resistant to shock and vibration loadings, such as cables.

For seismic effects on installed instrument channel components used after a potential seismic event (with the exception of battery chargers and replaceable batteries), the following measures will be used 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:

- demonstration of seismic motion will be consistent with that of existing design basis loads at the installed location;
- substantial history of operational reliability in environments with significant vibration, such as for portable hand-held devices or transportation applications (Such a vibration design envelope will be inclusive of the effects of seismic motion imparted to the components proposed at the location of the proposed installation);
- adequacy of seismic design and installation is demonstrated based on the guidance in Sections 7, 8, 9, and 10 of Institute of Electrical and Electronic Engineers (IEEE) Standard 344-2004, *IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations*, (Reference 8) or a substantially similar industrial standard;
- 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 (acceleration of gravity (g)-levels and frequency ranges); or
- seismic qualification using seismic motion consistent with that of two times existing Safe Shutdown Earthquake (SSE) loading at the installation location.

VIII. Independence

Electrical independence of the primary and backup channels of the permanently installed instrumentation is obtained by separating the channels to the extent practical. The primary and backup sensors will be mounted as close as practical to different corners of the spent fuel pool. The channels will be powered from batteries maintained in a charged state by station 120 Volt Alternating Current (Vac) which is derived from a reliable source. Each channel will be maintained in a charged condition from different alternating current (AC) sources.

IX. Power Supplies

The power supplies for the instrument channels on each unit are arranged as follows:

- The primary instrument channel components will be powered by batteries maintained in a charged state by station 120 Vac which is derived from a reliable source. Primary instrument channel battery size is anticipated to provide continuous indication for a period of at least 96 hours.

- The backup instrument channel components will be powered by batteries maintained in a charged state by station 120 Vac which is derived from a reliable source. A different station 120 Vac power source will be utilized than that chosen for the primary instrument channel. Secondary instrument channel battery size is anticipated to provide continuous indication for a period of at least 96 hours.

- Both the primary and backup channel on each unit will be designed to allow an alternate AC source to be readily connected. The alternate AC source routing and connection strategy will be defined as part of the SFP level channel design package, but, it is anticipated to utilize cabling that is independent of normal distribution of AC to the battery charger and be supplied from the FLEX 225 Kilo Volt-Ampere (kVA) diesel generator (D/G). The FLEX 225 kVA D/G and associated connections will be stored in accordance with reasonable protection guidance of NEI 12-06 as defined by NEI 12-02.

X. Accuracy

The accuracy will be consistent with the guidelines of NRC JLD-ISG-2012-03 and NEI 12-02.

The instrument channel will be scaled from the full pool to the top of the fuel rack. Top of active fuel is 13 inches below the top of the rack. The instrument channel accuracy calculation, which includes all of the instrument channel components, is not complete at this time; however, TVA anticipates the instrument channel uncertainty to be less than 12 inches [OI-1]. The primary and backup instrument channels will be designed to maintain their design accuracy following a power interruption or change in power source without recalibration.

XI. Testing

The instrument channel design will provide for routine testing and calibration consistent with the guidelines of NRC JLD-ISG-2012-03 and NEI 12-02.

The instrument channel design will include provisions for routine testing and calibration. The instrumentation will allow for in-situ testing and calibration to minimize calibration effort and instrument downtime.

Existing work control processes such as Calibration Surveillance Instructions (SIs), Preventative Maintenance procedures and Work Orders will be utilized to perform testing and maintenance on the instrument channels. The SIs or periodic instructions will validate the functionality of the installed instrument channels within 60 days of a planned refueling outage considering normal testing scheduling allowances (e.g., +/-25 percent), provided that the instruction has not been performed within the past 12 months. Allowable channel out of service times and associated actions will be consistent with the guidance provided in NEI 12-02.

XII. Display

The displays will be consistent with the guidelines of NRC JLD-ISG-2012-03 and NEI 12-02.

The detailed engineering design is not complete at this time. One instrument channel display for each unit will be located in the Main Control Room. The other instrument channel display for each unit is anticipated to be located in close proximity to the Backup Control Room. The specific locations will be determined during detailed design. Both indicator locations are promptly accessible to plant operations staff and do not require personnel to enter the area surrounding the SFP.

XIII. Instrument Channel Program Criteria

The primary and backup instrument channels will be installed utilizing current TVA design and modification processes. Training for operations and maintenance personnel is evaluated as part of the design process utilizing the Systematic Approach to Training (SAT). The SAT process will determine both the initial and continuing elements of training, if required. This program criterion is consistent with the guidelines of NRC JLD-ISG-2012-03 and NEI 12-02.

Procedures will be developed using guidelines and vendor instructions to address the maintenance and operation issues associated with the new SFP instrumentation. Procedures will address a strategy for ensuring SFP water level addition is initiated at an appropriate time consistent with implementation of NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide" (References 5 and 7).

Testing and calibration are discussed in Section XI, "Testing."

XIV. Need for Relief and Basis, if any

TVA does not anticipate a need for relief from the requirements identified in NRC JLD-ISG-2012-03 and NEI 12-02.

XV. References

1) EA-12-051, "Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," March 12, 2012
2) EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," March 12, 2012
3) NEI 12-02, "Industry Guidance for Compliance with NRC Order EA-12-051, 'To Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation,'" Revision 1, August 2012
4) NRC JLD-ISG-2012-03, "Compliance with Order EA-12-051, Reliable Spent Fuel Pool Instrumentation," Revision 0, August 29, 2012
5) NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," Revision 0, August 2012
6) Letter from TVA to NRC "Initial Status Report in Response to Commission Order Modifying Licenses with Regard to Requirements for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)," dated October 26, 2012,
7) Letter from TVA to NRC, "Initial Status Report in Response to Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)," dated October 26, 2012,
8) IEEE Standard 344-2004, "IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations"

9) TVA Browns Ferry Nuclear Power Plant Updated Final Safety Analysis Report, Unit 1 Amendment 24, Unit 2 Amendment 24, Unit 3 Amendment 24.

XVI. Open Items

OI-1) TVA will complete an instrument channel uncertainty calculation and document instrument channel accuracy and calibration requirements.

OI-2) TVA plans to utilize Guided Wave Radar technology. Confirm final technology selection after contracts are complete.

OI-3) Confirm that the sensor cable and light weight at the bottom of sensor cable will not damage the SFP liner from impact during seismic event.

OI-4) After detailed engineering design is complete, confirm that SFP level channel components and cable routing will be contained within seismic structures such that the installation will comply with the reasonable protection guidance of NEI 12-06.