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

CNL-15-112

June 5, 2015

10 CFR 50.90
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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Watts Bar Nuclear Plant, Unit 1
Facility Operating License NPF-90
NRC Docket No. 50-390

Subject: **Response to Draft RAI Regarding Watts Bar Nuclear Plant, Unit 1 Exigent Amendment**

References:

1. TVA Letter to NRC, "Watts Bar Nuclear Plant (WBN) Unit 1 -Technical Specification (TS) Change - Reactor Coolant Temperature Indicator Inoperable - Exigent Amendment (WBN-TS-2015-12)," dated May 29, 2015

2. Electronic mail from R. Kuntz (NRC) to G. Arent (TVA), "Clarification question for the WBN1 exigent amendment (MF6286)," dated June 02, 2015

3. Electronic mail from R. Kuntz (NRC) to G. Arent (TVA), "DRAFT RAI for the WBN1 exigent amendment (MF6286)," dated June 02, 2015

By letter dated May 29, 2015, Tennessee Valley Authority (TVA) submitted a license amendment request under exigent circumstances for a one time change to Table 3.3.4-1, Function 4a, "RCS Hot Leg Temperature Indication," of the Watts Bar Nuclear Plant (WBN) Unit 1 Technical Specifications. The purpose of the change is to permit the temperature indication for Reactor Coolant System (RCS) Loop 4 to be inoperable for the remainder of the current WBN Unit 1 operating cycle (Reference 1).

By means of electronic mail messages delivered on June 2, 2015, (References 2 and 3) and during teleconferences on June 2, 3 and 4, 2015, the NRC provided a draft Request for Additional Information (RAI) and clarification of the staff's questions.

The enclosure provides TVA's response to the NRC's draft RAI and additional staff questions regarding TVA's exigent license amendment request.

There are no new regulatory commitments associated with this submittal. Should you have questions or need additional information regarding this submittal, please contact Gordon Arent at (423) 365-2004 or garent@tva.gov.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 5th day of June 2015.

Respectfully,

J. W. Shea
Vice President, Nuclear Licensing

Enclosure:
Response to Request for Additional Information

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ENCLOSURE
Response to Request for Additional Information

Background

By letter dated May 29, 2015, Tennessee Valley Authority (TVA) submitted a license amendment request under exigent circumstances for a one time change to Table 3.3.4-1, Function 4a, "RCS Hot Leg Temperature Indication," of the Watts Bar Nuclear Plant (WBN) Unit 1 Technical Specifications. The purpose of the change is to permit the temperature indication for Reactor Coolant System (RCS) Loop 4 to be inoperable for the remainder of the current WBN Unit 1 operating cycle.

By means of electronic mail messages delivered on June 2, 2015, and during teleconferences on June 2, 3 and 4, 2015, the NRC provided a draft request for additional information and clarification of the staff's questions.

NRC Question 1

The Auxiliary Control Room would be needed in the event that a fire in the Control Building challenges operator control from the Main Control Room. Describe any enhancements or additional fire protection features that will be implemented in the Control Building for the duration of this technical specification revision to compensate for the reduction in safe shutdown monitoring. For example, describe any additional or enhanced compensatory measures that may be appropriate for out of service fire protection systems, additional limitations that may be appropriate for hot work in the Control Building, or a higher level of monitoring for transient combustibles in the Control Building.

TVA Response

Currently, TVA conducts weekly walkdowns of safety-related areas within the control building to preclude introduction of new transient combustibles. The Fire Operations staff reviews the transient combustibles log to confirm that if new transient combustibles have been introduced into safety-related areas within the control building, they have been appropriately evaluated.

The following will be implemented in addition to existing fire protection and operational program requirements.

a. Plant operations personnel will perform shiftly walkdowns of the control building to ensure new transient combustibles have been evaluated.

b. Operational and maintenance activities conducted within the safety-related areas of the control building that require "hot work" permits will be reviewed by a licensed operator to ensure unnecessary hot work is precluded, prior to commencement of the activity.

c. The power supplies for the other RCS hot leg temperature indicators are being protected to preclude loss of additional indication.

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NRC Question 2

Describe any enhanced or additional compensatory measures planned in the event that any other indication becomes unavailable in the Auxiliary Control Room during this period.

TVA Response

In the event that any other auxiliary control room (ACR) indication becomes unavailable, in addition to the Reactor Coolant System (RCS) loop 4 hot leg temperature indication ($T_{(hot)}$), control room operators can rely upon the remaining loop 1, 2 or 3 $T_{(hot)}$ indications to confirm natural circulation flow as well as cool down rates. Additionally, RCS $T_{(hot)}$ indication is only one of five parameters used to confirm decay heat removal via the steam generators (SGs). Other RCS parameters available in the ACR include Auxilary Feedwater (AFW) Controls, SG pressure indication and control, SG level indication, AFW flow indication and the means to calculate SG steam saturation temperature ($T_{(sat)}$). If one of the other parameters becomes unavailable, plant operators can continue to monitor RCS cooldown rate by confirming the indicated values through channel check verifications.

TVA has considered the impact of additional ACR temperature indicator failures during the period that the loop 4 $T_{(hot)}$ indicator is out of service. Should the temperature indicator for another hot leg loop fail while the loop 4 indicator is inoperable, TVA will evaluate the impact of the inoperable components in accordance with the TVA Corrective Action Program and enter the applicable Technical Specification (TS) Limiting Condition for Operation (LCO). The evaluation will provide site management with the information necessary to decide if the unit should be shutdown to implement the needed repairs, or whether the available ACR indications are sufficient for safe operation of the unit.

NRC Question 3

TVA submitted the exigent amendment request by their letter number CNL-15-108, dated May 29, 2015 for WBN1. On the second page of the cover letter TVA stated, "The problem has been isolated to components (modifier circuit or thermocouple) both located inside the Reactor Building Polar Crane Wall." The term "modifier circuit" is a non-specific term and its usage does not clarify its function. Please clarify the nature and function of this modifier circuit.

TVA Response

The "modifier circuit" is a module that is within the reactor building inside the polar crane wall. The module converts the millivolt direct current (mVDC) output from the RCS $T_{(hot)}$ thermocouple to a milliampere direct current (mADC) signal that is input to an indicator and recorder located in the ACR. The mVDC signal input ranges from -0.674 to 17.416 and the module conditions the signal output range from 10 to 50 mADC.

The inoperable RCS $T_{(hot)}$ indicator is only displayed in the ACR. It is not part of the Reactor Protection System (RPS) and does not provide input to any safety-related shutdown system. The only component adversely affected by the inoperable RCS $T_{(hot)}$ indicator is the corresponding recorder.

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NRC Question 4

Please compare, qualitatively, the safety significance of shutting down and completing the repair activity versus the safety significance of continuing to operate without the ACR $T_{(hot)}$ indication.

TVA Response

TVA has assessed that the safety impact of continued plant operation without the loop 4 $T_{(hot)}$ indication is qualitatively very low compared to the incremental risks associated with a plant downpower or shutdown. Large power maneuvers increase the likelihood of a transient which could initiate or require a plant trip or shutdown. Plant trips and shutdowns have the potential to challenge important safety systems such as the reactor protection system, the auxiliary feedwater system, and the residual heat removal system. Each of those systems has a small probability of failure. Therefore, performing a significant plant downpower or shutdown to effect repairs results in a very small safety impact, versus essentially no safety impact associated with continued operation with the loop 4 $T_{(hot)}$ indication unavailable. Therefore, continuing to operate with the loop 4 $T_{(hot)}$ indication unavailable until the upcoming refueling outage is not adverse to plant safety.

NRC Question 5

The dose estimations provided by TVA in section 3.1 on page E-5, appear to incorrectly calculate the estimated dose.

TVA Response

The corrected "Estimated Radiological Dose" dose table is provided below:

	Reactor Power Level				
Task	100%	90%	75%	50%	25%
Inside Polar Crane Wall Entry Transit	130	110	100	60	45
At Site @ 45 min*	675	540	360	270	180
Maintenance Tech 1	805	650	460	330	225
Maintenance Tech 2	805	650	460	330	225
Radiation Protection Tech	805	650	460	330	225
Radiation Protection Support	75	50	40	30	20
Totals*	**2490**	**2000**	**1420**	**1020**	**695**

*Dose values in millirem.