Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381-2000

APR 2 2 2003

WBN-TS-03-11

10 CFR 50.90
10 CFR 50.91(a)(6)

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

Gentlemen:

In the Matter of) Docket No.50-390
Tennessee Valley Authority)

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 - PROPOSED EXIGENT LICENSE AMENDMENT REQUEST CHANGE NO. WBN-TS-03-11 - EMERGENCY CORE COOLING SYSTEM (ECCS) - VENTING HOT LEG INJECTION LINES - RESPONSE TO NRC's QUESTIONS (TAC NO. MB 8382)

This letter provides additional information to address NRC's questions discussed in a teleconference call on April 10, 2003, with NRC Project Manager, K. Jabbour, the WBN Resident Inspector, J. Reece, and NRR Reviewers C. Long and W. Lyon. The list of questions and responses to those questions are provided in Enclosure 1. Enclosure 2 clarifies TVA's previous Regulatory Commitment associated with this amendment.

TVA appreciates the staff's expedited review concerning this request. If you have any questions about this matter, please contact me at (423) 365-1824.

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I declare under penalty of perjury that the foregoing is true and correct. Executed on this 22 day of April, 2003.

Sincerely,

P. L. Pace
Manager, Site Licensing
and Industry Affairs

Enclosures
cc (Enclosures):

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ENCLOSURE 1

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
EXIGENT TECHNICAL SPECIFICATION WBN-TS-03-11

RESPONSE TO NRC'S QUESTIONS

This letter provides TVA's response to NRC's questions from a teleconference call on April 10, 2003. TVA's response to each question is provided below:

1. Confirm that between the March 15, 2003 Ultrasonic Testing (UT) and March 24, 2003 beginning of the next scheduled surveillance of Emergency Core Cooling System (ECCS) pumps and discharge pipes venting [Surveillance Instruction 1-SI-63-10-A] that no maintenance, opening of valves, etc that could have potentially introduced gas into the system was performed.

   RESPONSE

   The Operations logs and work orders for the safety injection system components have been reviewed for the time period between March 13, 2003 and March 24, 2003. Based on that review, it is concluded that no maintenance or testing activities have occurred that could have reasonably introduced additional gas into those lines.

2. Clarify the difference between the March 13, 2003 date provided by the Resident Inspector to NRR and the March 15, 2003 date in the submittal.

   RESPONSE

   The actual UT and venting were performed on the day and night of March 13, 2003. The surveillance task sheet, documentation of the Level II Examiners test results, visual inspections of the piping, verification of area cleanliness, were accepted as completed on March 14, 2003 for the areas which the UT was performed. The work order package was not signed as completed until March 15, 2003. TVA conservatively uses the start date of the surveillance to calculate when the next performance of the surveillance is due.

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RESPONSE TO NRC'S QUESTIONS

3. What is the physical configuration of the high point vents with respect to the high point in the pipe.

RESPONSE

The safety injection hot leg vent valves are both located in an upright position on top of their associated injection header piping less than one foot from the top of the Fan Room. The injection header piping at these locations is configured in horizontal runs (approximately 50 feet long) before the piping curves downward. The vents are physically located at the high point of each of the horizontal piping segments.

4. Clarify TVA proposed actions regarding procedure changes for venting in the upcoming refueling outage.

RESPONSE

The Surveillance Instruction (1-SI-63-10-A) which verifies the piping is full of water every 31 days is also utilized to verify the lines are full of water at the end of the refueling outage following the filling process. In order to verify the pipe is full of water, the ECCS Pump and Discharge Pipe Venting procedure (1-SI-63-10-A) will include the following provisions:

1. Vent the safety injection hot leg at the conclusion of the refueling outage (currently in procedure).
2. When venting, have the operator note the duration of gas discharge and provide feedback to Engineering (added to procedure on November 5, 2002).
3. Perform an ultrasonic inspection following the filling and venting operation of the safety injection hot leg injection lines at the conclusion of the refueling outage to verify the line is filled (New commitment).

ENCLOSURE 1

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
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RESPONSE TO NRC'S QUESTIONS

5. Provide additional information on Probabilistic Risk Assessment (PRA) (e.g., quantitative information, description, quality and PRA update).

RESPONSE

Risk Evaluation

The safety injection hot leg injection lines are not modeled in the Probabilistic Safety Analysis (PSA). The PSA assumes that for large and medium loss-of-coolant-accident (LOCA) events, the reactor coolant system (RCS) will be depressurized at the time of swapover to hot leg recirculation and the residual heat removal (RHR) hot leg piping will be used. For small break LOCA events it is assumed that RCS temperature and pressure will be reduced before swapover to hot leg recirculation which is required at approximately nine hours for the current cycle. There is reasonable assurance the key function of core cooling during the hot leg injection phase is maintained and the water hammer is avoided since the lines have been re-vented. The gas volume that existed previously is expected to be conservative relative to any gas that might accumulate in the period remaining until the Fall 2003 refueling outage. Therefore, the risk of the surveillance extension would be risk neutral.

The RHR hot leg injection lines are modeled in the PSA. Included in this model is the area where the small gas pocket was found near 1-FCV-63-172. This valve is in the flow path into the reactor vessel through check valves 1-CKV-63-640 and 1-CKV-63-641 for Loop 1. An evaluation of the administrative control program for maintaining ECCS piping full showed that the amount of gas in the ECCS piping does not have unacceptable consequences for the functionality of the affected piping. With the functionality of the piping remaining acceptable there would not be an increase in risk, however, several sensitivity analyses were performed. These sensitivity analyses use the RHR hot leg injection model as a conservative surrogate for the safety injection hot leg injection lines since the safety injection hot leg injection lines are not modeled in the PSA. The extension of a surveillance requirement has the possibility of increasing the failure rate of the components involved. The sensitivity analyses were performed to determine the increase in core damage frequency

(CDF) if RHR hot leg injection line component failure rates were increased thereby preventing RHR hot leg injection.

The PSA model was developed using the RISKMAN computer code which is a system fault tree/large event tree model. A review of the cutsets for the RHR system fault tree shows that the most important cutset is the failure of valve 1-FCV-63-172 which impacts RHR hot leg injection. The failure of this valve contributes 78 percent of the failure probability to the all support available split fraction. Valve 1-FCV-63-172 is near the high point where one of the gas pockets was found. Therefore, the failure rate of this valve was evaluated in the sensitivity analyses. The WBN Revision 2 model WBNLERF which is the model of record for WBN was chosen as the model for this analysis. This model contains average annual maintenance frequencies for various components which would represent the conditions in the plant from now until the end of the current operating cycle.

The failure rate of 1-FCV-63-172 in the WBNLERF model is 4.3E-03. For the first sensitivity analysis, the failure rate of the motor-operated-valve (MOV) was doubled to 8.6E-03. For the second sensitivity case the failure rate of the MOV was increased by an order of magnitude to 4.3E-02. The results of these sensitivity analyses are presented in the table below:

Case:	Failure Rate for FCV	Split Fraction Value for RH1	Split Fraction Value for RH2	CDF	ΔCDF
Base Case	4.3E-03	5.57E-03	1.39E-02	4.4E-05	
FCV *2	8.6E-03	9.78E-03	1.79E-02	4.5E-05	1.0E-6 (2.3%)
FCV*10	4.3E-02	4.40E-02	5.21E-02	5.19E-05	7.9E-6 (18%)

The results of the sensitivity analyses show that increasing the failure rate of a component in the RHR hot leg injection line by a factor of ten, results in an 18 percent increase in CDF. However, the failure rate is not expected to increase. The gas volume that accumulated previously is expected to be conservative relative to any gas that might accumulate in the period remaining until the Fall 2003 refueling outage. Also, this surveillance extension will reduce the risk to plant personnel. Radiation exposure to plant personnel and unnecessary burden on plant personnel are discussed as adverse affects of surveillance testing in NUREG/CR-5775, "*Quantitative Evaluation of Surveillance Test Intervals Including Test-Caused Risks.*" It is noted that these risks are not quantifiable and can be considered qualitatively. With the reduction in risk to plant personnel the risk of the surveillance extension would be risk neutral.

PRA Quality

The WBN Individual Plant Examination (IPE) was submitted on September 1, 1992. The IPE was also independently reviewed by Dr. Ian Wall. WBN submitted Revision 1 to the IPE on May 2, 1994 and an NRC safety evaluation was received on October 5, 1994. Since that time the PSA has undergone an additional revision. Revision 2 to the WBN PSA was prepared for TVA by ERIN Engineering, Inc. The use of ERIN Engineering by TVA for Revision 2 also served as an independent check of the original model created by Pickard, Lowe, and Garrick, Inc. (PLG,Inc.) Revision 2 of the PSA was used by NRC during their review of the implementation of the requirements of the Maintenance Rule. Since that time ABS Consulting/PLG further developed the Revision 2 model so that large early release frequency (LERF) end states can be calculated. It is the WBNLERF model that is the basis for this analysis.

The PSA model is evaluated periodically for update. The general guidance for this activity is contained in administrative procedures. TVA has performed a self-assessment of the Revision 2 model. Items were identified in the model as affecting the electric power system and recovery and these items were included in a Revision 2a model which was the basis for WBN's Technical Specification change to the Diesel Generator Risk Informed Allowed Outage Time Extension which was approved by NRC as Amendment 39. WBN is in the process of completing an update that incorporates the remaining changes identified as a part of the self assessment and this draft model has undergone a Westinghouse Owners Group (WOG) Peer review.

ENCLOSURE 2

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
EXIGENT TECHNICAL SPECIFICATION WBN-TS-03-11

CLARIFICATION OF COMMITMENT

In order to verify the pipe is full of water, the ECCS Pump and Discharge Pipe Venting procedure (1-SI-63-10-A) will include the following provisions:

1. Vent the safety injection hot leg at the conclusion of the refueling outage (currently in procedure).

2. When venting, have the operator note the duration of gas discharge and provide feedback to Engineering (added to procedure on November 5, 2002).

3. Perform an ultrasonic inspection following the filling and venting operation of the safety injection hot leg injection lines at the conclusion of the refueling outage to verify the line is filled (New commitment).