November 12, 2008

TVA-WBN-TS-08-11 10 CFR 50.90

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

Gentlemen:

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

WATTS BAR NUCLEAR PLANT (WBN) - UNIT 1 - "LICENSE AMENDMENT REQUEST (LAR) TS-08-11 TO REVISE REACTOR COOLANT SYSTEM (RCS) LEAKAGE DETECTION SYSTEMS" - EXIGENT CHANGE REQUEST

Pursuant to 10 CFR 50.90, Tennessee Valley Authority (TVA) is submitting a request for an amendment (TS-08-11) to License NPF-90 for WBN. The amendment revises Technical Specification (TS) TS 3.4.15, "RCS Leakage Detection," to remove the requirement for one operable containment atmosphere gaseous radioactivity monitor. The leakage detection requirements remaining in the TSs will continue to provide adequate diverse RCS leakage detection. A corresponding change is being made to the TS Bases 3.4.15.

TVA has determined that there are no significant hazards considerations associated with the proposed change and that the TS change qualifies for categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9). Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and enclosure to the Tennessee State Department of Public Health.

TVA requests that NRC provide an exigent review of this license amendment request in accordance with 10 CFR 50.91(a)(6) and approval by November 28, 2008, in order to avoid a plant shutdown of Unit 1 per Limiting Condition of Operation (LCO) 3.4.15.C. WBN Unit 1 entered LCO 3.4.15 on October 29, 2008 because of a maintenance issue with the particulate radiation monitor, but chose to remain in the LCO after that was resolved because the NRC Resident Inspector had raised a question on October 31, 2008 as to whether the gaseous radiation monitor channel is inoperable because it is unable to detect a one gallon per minute RCS leak within an hour under current plant conditions.

LCO 3.4.15 Action B.2 allows operation to continue for up to 30 days provided that grab samples of the lower containment atmosphere are analyzed once per 24 hours, or Surveillance Requirement (SR) 3.4.13.1 (RCS water inventory balance) is performed once per 24 hours. The proposed change would resolve this condition.

Before the Resident Inspector questioned operability of the gaseous radiation channel, TVA's application of the licensing basis did not require the gaseous channel to be capable of detecting one gallon per minute (gpm) in one hour when RCS activity was lower than the design basis source term activity provided in the Final Safety Analysis Report (FSAR). On November 7, 2008, the NRC provided to WBN the perspective that the capability to detect one gpm in one hour is an explicit requirement for normal plant conditions regardless of the RCS activity level in order for the channel to be operable. TVA agreed to consider the channel inoperable and comply with the TS.

There are no regulatory commitments associated with this submittal. TVA will continue to monitor the NRC/Industry resolution of this issue and may request further amendments in the future.

The WBN Plant Operations Review Committee and the Nuclear Safety Review Board have reviewed this proposed change and determined that operation of WBN Unit 1 in accordance with the proposed change will not adversely affect the health and safety of the public.

If you have any questions about this change, please contact me at (423) 365-1742.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 12th day of November, 2008.

Sincerely,

Original signed by

Christopher J. Riedl
Manager, Site Licensing and
Industry Affairs (Acting)

Enclosure:
Evaluation of the Proposed Change

cc: See page 3

Enclosure
cc (Enclosure):

NRC Resident Inspector
Watts Bar Nuclear Plant
1260 Nuclear Plant Road
Spring City, Tennessee 37381

ATTN: John G. Lamb, Project Manager
U.S. Nuclear Regulatory Commission
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation
MS O-8 H4
Washington, DC 20555-0001

U.S. Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, Georgia 30303

Mr. Lawrence E. Nanny, Director
Division of Radiological Health
3rd Floor
L & C Annex
401 Church Street
Nashville, Tennessee 37243

ENCLOSURE

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1
LICENSE AMENDMENT REQUEST (LAR) TS-08-11
EVALUATION OF THE PROPOSED CHANGE

Subject: The proposed changes would modify Technical Specification (TS) 3.4.15, "Reactor Coolant System (RCS) Leakage Detection Systems," to specifically require only one containment radioactivity monitor (particulate channel) to be operable in Modes 1, 2, 3, and 4.

1.0 SUMMARY DESCRIPTION

This evaluation supports a license amendment request (LAR) to amend Operating License NPF-90 for WBN Unit 1.

This proposed amendment requests to remove the operability requirement for one of the three Reactor Coolant System (RCS) leakage detection systems currently required by TS. Specifically, the proposed amendment would remove credit for the gaseous radiation monitor for RCS leakage detection. Improvements in nuclear fuel reliability over time have resulted in the reduction of effectiveness of the gaseous monitors in detecting very small leaks and changes in leak rate. The proposed amendment request also addresses required changes to the actions and surveillance requirements as a result of the removal of the operability requirement for the gaseous radiation monitor.

2.0 DETAILED DESCRIPTION

The amendment revises TS 3.4.15, "RCS Leakage Detection Systems," by removing the operability requirement for the containment atmosphere gaseous radioactivity monitor, leaving the requirement for one containment atmosphere particulate radioactivity monitor and one containment pocket sump level monitor to be operable in Modes 1, 2, 3, and 4. Additionally, the proposed change includes modifications to existing TS 3.4.15 Action requirements.

Currently WBN Unit 1 TS 3.4.15 allows continued operation for up to 30 days when the gaseous radiation monitor channel is unavailable for Reactor Coolant System (RCS) leakage detection, provided that grab samples of the lower containment atmosphere are analyzed once per 24 hours, or Surveillance Requirement (SR) 3.4.13.1 (RCS water inventory balance) is performed once per 24 hours. While this monitor continues to provide leakage detection and trending capability, improvements in nuclear fuel reliability over time have resulted in baseline RCS coolant radioactivity being reduced to a level far below that used for original design specification for these monitors. The reduction in baseline activity limits the effectiveness of the monitor relative to detecting very small leaks or very small changes in the leakrate. Under these circumstances, it is prudent to remove credit for these monitors from TS.

WBN Unit 1 entered Limiting Condition of Operation (LCO) 3.4.15 on October 29, 2008 because of a maintenance issue with the particulate radiation monitor, but chose to remain in the LCO after that was resolved because the NRC Resident Inspector had raised a question on October 31, 2008 as to whether the gaseous radiation monitor channel is inoperable because it is unable to detect a one gallon per minute (gpm) RCS leak within an hour under current plant conditions. LCO 3.4.15 Action B.2 allows operation to continue for up to 30 days provided that grab samples of the lower

containment atmosphere are analyzed once per 24 hours, or SR 3.4.13.1 (RCS water inventory balance) is performed once per 24 hours. The proposed change would resolve this condition.

3.0 TECHNICAL EVALUATION

Final Safety Analysis Report (FSAR) Section 5.2.7.3.1 describes the Containment Building Upper and Lower Compartment Air Radiation Monitor and Containment Building Lower Compartment Air Radiation Monitor as follows:

> Containment Air Particulate Monitors and Containment Radioactive Gas Monitors
>
> The containment air from the lower compartment is sampled and monitored by a monitor assembly with backup monitoring capability provided by a separate monitor assembly which normally monitors containment air from the upper compartment . . .. These separate monitor assemblies are interconnected by stainless steel tubing to ensure containment monitoring may continue should one monitor assembly malfunction. The upper containment monitor assembly consists of a particulate, a gas, and an iodine detector channel. The lower containment monitor assembly consists of a particulate and a gas detector channel. Only the particulate and gas channels are used in leakage detection. In the case of both upper and lower compartments, a combined sample from two locations is taken by means of two sample lines which join upstream of the monitor assemblies. Each assembly has the capability of valving off either sample line, thus providing some minimum assistance in locating the general area of the abnormal leakage.
>
> These monitors are qualified to Seismic Category I requirements, and are powered from separate Class 1E power trains.
>
> The containment air particulate and gas radiation monitors are used in conjunction with the Reactor Building floor and equipment drain pocket sump level monitor to provide the three primary methods of RCS leak detection as required by Regulatory Guide 1.45 [Revision 0]. A direct correlation of these three methods is not technically possible (a non-radioactive leak will increase the sump rate of rise but not affect the radiation monitors, and an increase in RCS source term due to increased failed fuel will increase monitor count rate without affecting the sump rate of rise). However, an indirect correlation exists since all three methods are evaluated by Operations if an RCS leak is suspected, and an RCS mass balance is performed to confirm an RCS leak upon receipt of a radiation monitor alarm concurrent with an increasing rate of rise on the sump monitor, or an alarm on the sump monitor.
>
> When the RCS source terms are less than the design bases source terms provided in Table 11.1-7, the gas monitor may not detect a leak of 1 gpm within 1 hour. To account for this situation, the gas and particulate monitor setpoints are set as low as reasonable, but high enough to avoid spurious alarms. In addition, as indicated above, an RCS mass balance is performed if an alarm is received from the particulate or gas radiation monitor in conjunction with an increasing rate of rise on the pocket sump monitor, or an alarm is received from the pocket sump monitor. Further, as prescribed in Regulatory Guide 1.45 [Revision 0], other indirect methods of RCS leak detection such as a

humidity monitor and containment air temperature indication are also available to support detection of an RCS leak during times of low RCS source terms.

The proposed TS change would change the required RCS leakage instrumentation by removing reference to the containment atmosphere gaseous radioactivity monitor from TS LCO 3.4.15, "RCS Leakage Detection Instrumentation." The proposed change to WBN TS LCO 3.4.15 would continue to require the containment atmosphere particulate radioactivity monitor and the containment pocket sump level monitor to be operable in Modes 1, 2, 3, and 4. These proposed changes are consistent with the guidance of Regulatory Position C.2.3 of Regulatory Guide (RG) 1.45, Revision 1; and NUREG-1431, "Standard Technical Specifications -Westinghouse Plants," Revision 3, TS 3.4.15.

It should be noted that WBN intends to maintain the containment atmosphere gaseous radioactivity monitor functional and available in accordance with normal non-TS equipment practices.

The WBN reactor coolant pressure boundary leakage detection system continues to be based on a diverse set of leakage detection methods. As discussed in Section 5.2.7.3 of the Updated FSAR (UFSAR), these detection methods include containment particulate radiation monitors, containment radioactive gas monitors, humidity monitors, containment temperature monitors, and the reactor building floor and equipment drain sump level monitors. Section 5.2.7.4 identifies additional methods to detect intersystem leakage, including condenser vacuum pump radiation monitors, component cooling system radiation monitors, steam generator blowdown radiation monitors, charging pump operation and excessive makeup volume detection, and main steam line radiation monitors. The diversity and sensitivity of these detection systems were reviewed by NRC as part of the initial plant licensing basis. Based on the review of the overall leakage detection capability, NRC concluded in Section 5.2.5 of the plant safety evaluation report (NUREG-0847) that the WBN leakage detection system satisfied the overall requirements of General Design Criterion 30 and was acceptable.

In support of the licensing amendment which permitted the elimination of dynamic effects of postulated primary loop pipe ruptures from the design basis using the "leak-before-break" methodology of General Design Criterion No. 4, TVA indicated that the integrated leak detection system is capable of detecting a primary system leak rate of one gpm in approximately one hour. Even if the diversity of the leak detection system is reduced by lack of sufficient primary system activity to credit operation of the gaseous radiation monitors discussed in Section 5.2.7.3 of the FSAR, sufficient diversity and sensitivity exist in the remaining portions of the leak detection system to meet the design basis leak detection requirement (one gpm in approximately one hour). The ability to detect a leakage rate of one gpm in approximately one hour also creates a large margin to the minimum required sensitivity for the application of “leak before break” analysis methodology. The established capability of the WBN detection system is a factor of 10 more sensitive than required by the guidelines in NUREG-1061, Volume 3, "Report of the NRC Piping Review Committee, Evaluation of Potential Pipe Breaks".

Given: 1) the continued ability of the reactor coolant system leak detection system to detect a one gpm primary system leak in approximately one hour when no credit is taken for the gaseous radiation monitors and 2) the large margin afforded by the sensitivity of the system to minimum sensitivity requirements for the application of “leak-before-break” analysis methodology, the lack of gaseous radiation monitor detection associated with low RCS activity does not affect the WBN licensing basis for elimination of dynamic effects of primary loop pipe ruptures using “leak before break” methodology.

The required RCS leak detection systems will continue to provide diverse methods of leak detection that satisfy the intent of GDC 30. The leakage detection capability is adequate to support the application of the leak-before-break methodology at WBN. Therefore, the proposed deletion of the containment atmosphere gaseous radiation monitor from TS 3.4.15 is acceptable.

The Reason For The Exigent TS Change.

Before the Resident Inspector questioned operability of the gaseous radiation channel, TVA's application of the licensing basis did not require the gaseous channel to be capable of detecting one gallon per minute (gpm) in one hour when RCS activity was lower than the design basis source term activity provided in the FSAR. On November 7, 2008, the NRC provided to TVA the perspective that the capability to detect one gpm in one hour is an explicit requirement for normal plant conditions regardless of the RCS activity level in order for the channel to be operable. In order to expeditiously resolve this issue, TVA agreed to continue to consider the channel inoperable and remain in the appropriate TS action statements. Because there is insufficient activity in the RCS under desired operating conditions to enable a gaseous monitor to sense a one gpm leak within one hour, the TS must be changed to resolve this issue, and because TVA is currently in a 30-day TS action statement allowed outage time, this change must be processed as an exigent change in order to prevent an unnecessary plant shutdown.

Why The Need For The Requested Action Could Not Reasonably Have Been Identified Earlier.

Information Notice 2005-24 was written to inform licensees of the non-conservatisms in the leakage detection sensitivity. TVA had previously recognized the detection sensitivity limitations and took actions to clarify these in the TS Bases and FSAR. Based on TVA's understanding of the operability requirements for the gaseous channel (one gpm within one hour was based on the design basis source terms), no further actions were deemed necessary. TVA continued to monitor the pending resolution of the generic industry issue. A subsequent draft of the improved standard technical specification (ISTS) change has been initiated by the Pressurized Water Reactor (PWR) Owners Group (WOG-196) and is currently out for industry comment. TVA has operated in good faith in acting upon the information NRC provided to the industry. However, TVA did not recognize the NRC's position that the gaseous channel must meet the specific requirements of RG 1.45, Revision 0 for all plant conditions to be operable until November 7, 2008, when NRC provided to WBN the perspective that the capability to detect one gpm in one hour is an explicit requirement for normal plant conditions regardless of the RCS activity level in order for the channel to be operable.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

General Design Criterion (GDC) 30, "Quality of reactor coolant pressure boundary," of Appendix A to Title 10 of the *Code of Federal Regulations* Part 50 (10 CFR 50) addresses, in part, the means for providing, detecting, and to the extent practical, identifying the location of the source of reactor coolant leakage. RG 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems," describes acceptable methods of implementing GDC 30 with regard to the selection of leakage detection systems for the reactor coolant pressure boundary (RCPB). Position C.3 of RG 1.45, Revision 0, states that at least three different detection methods should be employed. Two of these methods should be sump level and flow

monitoring and airborne particulate radioactivity monitoring. The third method may involve either monitoring of condensate flow rate from air coolers or monitoring of gaseous radioactivity.

RG 1.45 recommended that the sensitivity and response time of each leakage detection system employed for unidentified leakage should be adequate to detect a leakage rate, or its equivalent, of one gallon per minute (gpm) in less than one hour.

In May 2008, the NRC staff issued Revision 1 to RG 1.45. Section B, "Discussion," which describes that the effectiveness of airborne gaseous radioactivity monitors depends primarily on the activity of the reactor coolant and also, in part, on the containment volume and the background activity level. Because of improvements in fuel integrity, many operating plants have reported experiencing very long gaseous radioactivity monitor response times to RCS leakage, considering realistic coolant activities. Accordingly, Position C.2.3 of RG 1.45, Revision 1, states that plant TSs should identify at least two independent and diverse methods and recommends considering the following leakage detection methods for incorporation in the TSs: monitoring containment sump level or flow; monitoring airborne particulate radioactivity; and monitoring condensate flow rate from air coolers. That position also recommended considering several other methods for supplemental detection of leakage, including containment gaseous radioactivity monitoring.

GDC 4 states that "...dynamic effects associated with postulated pipe ruptures in nuclear power units may be excluded from the design basis when analyses reviewed and approved by the Commission demonstrated that the probability of fluid system piping rupture is extremely low under conditions consistent with the design basis for the piping..." The NRC allows the application of leak-before-break (LBB) technology on the primary piping systems under the broad-scope revision to 10 CFR Part 50, Appendix A, GDC 4 (Volume 52 of the *Federal Register* pages 41288-41295, October 27, 1987). Specific guidance on LBB evaluation is discussed in Standard Review Plan (SRP) Section 3.6.3, "Leak-Before-Break Evaluation Procedures." Section 3.6.3 of the SRP specifies that leak detection systems be reliable, redundant, diverse, and sensitive, and that substantial margin exists to detect the leakage from the through-wall flaw used in the deterministic fracture mechanics evaluation.

The WBN reactor coolant pressure boundary leakage detection system is based on a diverse set of leakage detection methods. As discussed in Section 5.2.7 of the UFSAR, these detection methods can include containment particulate radiation monitors, containment radioactive gas monitors, humidity monitors, reactor vessel flange leak-off detectors, condenser vacuum pump radiation monitors, component cooling system radiation monitors, steam generator blowdown radiation monitors, charging pump operation and excessive makeup volume detection, main steam line radiation monitors, and the reactor building floor and equipment drain sump level monitors. The diversity and sensitivity of these detection systems were reviewed by NRC as part of the initial plant licensing basis. Based on the review of the overall leakage detection capability, NRC concluded in Section 5.2.5 of the plant safety evaluation report (NUREG-0847) that the WBN leakage detection system satisfied the overall requirements of GDC 30 and was acceptable.

In support of the licensing amendment that permitted the elimination of dynamic effects of postulated primary loop pipe ruptures from the design basis using the "leak-before-break" methodology of GDC 4, TVA indicated that the integrated leak detection system is capable of detecting a primary system leak rate of one gpm in approximately one hour. Even if the diversity of the leak detection system is reduced by lack of sufficient primary system activity to credit operation of the gaseous radiation monitors discussed in Section 5.2.7 of the UFSAR, sufficient diversity and sensitivity exist in the remaining portions of the leak detection system to meet the design basis leak detection requirement (one gpm in approximately one hour). The ability to detect a leakage rate of one gpm in approximately one hour also creates a large margin to the minimum required sensitivity for the application of “leak before break” analysis

methodology. The established capability of the WBN detection system is a factor of 10 more sensitive than required by the guidelines in NUREG-1061, Volume 3, "Report of the NRC Piping Review Committee, Evaluation of Potential Pipe Breaks."

Given 1) the continued ability of the RCS leak detection system to detect a one gpm primary system leak in approximately one hour when no credit is taken for the gaseous radiation monitor and 2) the large margin afforded by the sensitivity of the system to minimum sensitivity requirements for the application of “leak-before break” analysis methodology, the lack of gaseous radiation monitor detection associated with low RCS activity does not affect the WBN licensing basis for elimination of dynamic effects of primary loop pipe ruptures using “leak before break” methodology.

The required RCS leak detection systems will continue to provide diverse methods of leak detection that satisfy the intent of GDC 30. The required leakage detection capability is adequate to support the application of the leak-before-break methodology at WBN. Therefore, the proposed change to delete the containment atmosphere gaseous radiation monitor from TS 3.4.15 is acceptable.

4.2 Precedent

With respect to the removal of the containment atmosphere gaseous radioactivity monitor, the NRC approved similar license amendments for South Texas Project, Units 1 and 2, (TAC Nos. MC7258 and MC7259), on October 17, 2005, for Byron Station, Units 1 and 2 and Braidwood Station, Units 1 and 2, (TAC NOS. MC0509, MC0510, MC0507, and MC0508), on January 14, 2005, and for Millstone Power Station, Unit No. 2, and to Renewed Facility Operating License No. NPF-49 for the Millstone Power Station, Unit No. 3, respectively, on September 30, 2008 (TAC NOS. MD6640 and MD6641).

In review of the Dominion Nuclear Connecticut license amendment request (LAR) the NRC asked for additional information concerning the LAR. The NRC’s questions and TVA’s response are provided below.

NRC Question

1. Provide additional technical justification to support continued plant operation when all automatic leakage detection systems are inoperable.

TVA Response

TVA is electing to not pursue a change that would permit continued operation with all automatic detection systems inoperable at this time.

NRC Question

2. Provide additional technical and regulatory justification for the lack of any frequency in which the operator must monitor other alternate leakage detection systems when all leakage detection instrumentation is inoperable.

TVA Response

TVA is electing to not pursue a change that would permit continued operation with all automatic detection systems inoperable at this time.

NRC Question

3. Describe any current reference to the gaseous radiation monitors in the leak-before-break analysis assumptions and identify any impact the proposed amendment has on the analysis assumption for WBN. Also, identify the available leak detection systems with overall response times (i.e., response times that consider transport and holdup of the measured leakage constituents) adequate to support the leak-before-break analysis assumptions that are provided in addition to the gaseous radiation monitors.

TVA Response

The leak-before-break issue is discussed in Section 3.0 Technical Evaluation and Section 4.1 Applicable Regulatory Requirements/Criteria of this request, where it is noted that leakage detection capability is adequate to support the application of the leak-before-break methodology.

NRC Question

4. Explain how the proposed action statements affect the redundancy and minimal functionality of leak detection instrumentation necessary to support the leak-before-break analysis.

TVA Response

The leak-before-break issue is discussed in Section 3.0 Technical Evaluation and Section 4.1 Applicable Regulatory Requirements/Criteria of this request, where it is noted that the leakage detection capability is adequate to support application of the leak-before-break methodology.

4.3 Significant Hazards Consideration

WBN has evaluated whether a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

The proposed change has been evaluated and determined to not increase the probability or consequences of an accident previously evaluated. The proposed change does not make any hardware changes and does not alter the configuration of any plant system, structure or component (SSC). The containment atmosphere gaseous radioactivity monitor is not credited for use in the initiation of any automatic protective functions. The proposed change only removes the containment atmosphere gaseous radioactivity monitor for meeting the operability requirements for TS 3.4.15. Therefore, the probability of occurrence of an accident is not increased. The TS will continue to require diverse means of leakage detection equipment, thus ensuring that leakage due to cracks would continue to be identified prior to breakage and the plant shutdown accordingly. Therefore, the consequences of an accident are not increased.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The proposed change does not involve the use or installation of new equipment and the currently installed equipment will not be operated in a new or different manner. No new or different system interactions are created and no new processes are introduced. The proposed changes will not introduce any new failure mechanisms, malfunctions, or accident initiators not already considered in the design and licensing bases. The proposed change does not affect any SSC associated with an accident initiator. Based on this evaluation, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No

The proposed change does not make any alteration to any RCS leakage detection components. The proposed change removes the gaseous channel of the containment atmosphere radioactivity monitor from TS 3.4.15. The proposed amendment continues to require diverse means of leakage detection equipment with capability to promptly detect RCS leakage. Additional diverse means of leakage detection capability are available, although not provided in TS. Based on this evaluation, the proposed change does not involve a significant reduction in a margin of safety. Based on the above, TVA concludes that the proposed amendment involves no significant hazards consideration under the standards set forth in 10 CFR 50.92, and a finding of "no significant hazards consideration" is justified.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and there is no significant increase in individual or cumulative occupational radiation exposure. The amendment involves no significant hazards consideration. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 REFERENCES

The following documents were consulted:

a. WBN UFSAR 5.2.7 “RCPB Leakage Detection System”
b. WBN Plant Safety Evaluation Report, NUREG-0847
c. September 30, 2008 NRC Letter, “Millstone Power Station, Unit Nos. 2 and 3 - Issuance of Amendment Re: Technical Specifications Regarding Reactor Coolant System Leakage Detection Systems (TAC Nos. MD6640 and MD6641)”, as well as the related License Application Request and responses to request for additional information
d. NRC Information Notice 2005-24, *Nonconservatism in Leakage Detection Sensitivity*
e. NRC Administrative Letter 98-10, *Dispositioning of Technical Specifications that are Insufficient to Assure Plant Safety*
f. NRC Regulatory Guide 1.45, *Reactor Coolant Pressure Boundary Leakage Detection Systems,* Revision 0
g. NRC Regulatory Guide 1.45, *Guidance on Monitoring and Responding to Reactor Coolant System Leakage*, Revision 1

ATTACHMENTS

1. Technical Specifications Page Markups
2. Bases Page Markups

ATTACHMENT 1

TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT (WBN) UNIT 1

TECHNICAL SPECIFICATIONS PAGE MARKUPS

I. AFFECTED PAGE LIST

3.4-36
3.4-37
3.4-38

II. MARKED PAGES

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.15 RCS Leakage Detection Instrumentation

LCO 3.4.15 The following RCS leakage detection instrumentation shall be OPERABLE:

a. One containment pocket sump level monitor; and

b. One lower containment atmosphere particulate radioactivity monitor ~~(gaseous and particulate)~~.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required containment pocket sump level monitor inoperable.	A.1 Perform SR 3.4.13.1.	Once per 24 hours
	AND	
	A.2 Restore required containment pocket sump level monitor to OPERABLE status.	30 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required containment atmosphere radioactivity monitor inoperable.	B.1.1 Analyze grab samples of the containment atmosphere. OR B.1.2 Perform SR 3.4.13.1. AND B.2 Restore required containment atmosphere radioactivity monitor to OPERABLE status.	Once per 24 hours Once per 24 hours 30 days
C. Required Action and associated Completion Time not met.	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours
D. All required monitors inoperable.	D.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.15.1	Perform CHANNEL CHECK of the required containment atmosphere radioactivity monitor.	12 hours
SR 3.4.15.2	Perform COT of the required containment atmosphere radioactivity level monitor.	92 days
SR 3.4.15.3	Perform CHANNEL CALIBRATION of the required containment pocket sump level monitor.	18 months
SR 3.4.15.4	Perform CHANNEL CALIBRATION of the required containment atmosphere radioactivity monitor.	18 months

particulate

particulate

particulate

ATTACHMENT 2

TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT (WBN) UNIT 1

TECHNICAL SPECIFICATION BASES PAGE MARKUPS

I. AFFECTED PAGE LIST

B3.4-87
B3.4-89
B3.4-90
B3.4-91
B3.4-92

II. MARKED PAGES

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.15 RCS Leakage Detection Instrumentation

BASES

BACKGROUND

GDC 30 of Appendix A to 10 CFR 50 (Ref. 1) requires means for detecting and, to the extent practical, identifying the location of the source of RCS LEAKAGE. Regulatory Guide 1.45 (Ref. 2) describes acceptable methods for selecting leakage detection systems.

Leakage detection systems must have the capability to detect significant reactor coolant pressure boundary (RCPB) degradation as soon after occurrence as practical to minimize the potential for propagation to a gross failure. Thus, an early indication or warning signal is necessary to permit proper evaluation of all unidentified LEAKAGE.

Industry practice has shown that water flow changes of 0.5 to 1.0 gpm can be readily detected in contained volumes by monitoring changes in water level, in flow rate, or in the operating frequency of a pump. The containment pocket sump used to collect unidentified LEAKAGE is instrumented to alarm for increases of 0.5 to 1.0 gpm in the normal flow rates. This sensitivity is acceptable for detecting increases in unidentified LEAKAGE.

sensitivity of 10^{-9} µCi/cc radioactivity for particulate monitoring is practical for this leakage detection

The reactor coolant contains radioactivity that, when released to the containment, can be detected by radiation monitoring instrumentation. Reactor coolant radioactivity levels will be low during initial reactor startup and for a few weeks thereafter, until activated corrosion products have been formed and fission products appear from fuel element cladding contamination or cladding defects. Instrument ~~sensitivities of 10^{-9} µCi/cc radioactivity for particulate monitoring and of 10^{-6} µCi/cc radioactivity for gaseous monitoring are practical for these leakage detection systems. Radioactivity detection systems are included for monitoring both particulate and gaseous activities because of their sensitivityies and rapid responses to RCS LEAKAGE.~~

A radioactivity detection system is included for monitoring particulate activity because of its sensitivity and rapid response to RCS leakage.

The sample lines supplying the radioactivity monitoring instrumentation are heated (heat traced) to ensure that a representative sample can be obtained. During periods when the heat tracing is inoperable, the particulate channel of the radioactivity monitoring instrumentation is inoperable and grab samples for particulates may not be taken using the sample lines.

An atmospheric gaseous radioactivity monitor will provide a positive indication of leakage in the event that high levels of reactor coolant gaseous activity exist due to fuel cladding defects. The effectiveness of the atmospheric gaseous radioactivity monitors depends primarily on the activity of the reactor coolant and also, in part, on the containment volume and the background activity level. Shortly after startup and also during steady state operation with low levels of fuel defects, the level of radioactivity in the reactor coolant may be too low for the containment atmosphere gaseous radiation monitors to detect a reactor coolant leak of 1 gpm within one hour. Atmospheric gaseous radioactivity monitors are not required by this LCO.

(continued)

BASES (continued)

LCO

One method of protecting against large RCS leakage derives from the ability of instruments to rapidly detect extremely small leaks. This LCO requires instruments of diverse monitoring principles to be OPERABLE to provide a high degree of confidence that extremely small leaks are detected in time to allow actions to place the plant in a safe condition when RCS LEAKAGE indicates possible RCPB degradation.

The LCO is satisfied when monitors of diverse measurement means are available. Thus, the containment pocket sump level monitor, in combination with a ~~gaseous and~~ particulate radioactivity monitor provides an acceptable minimum.

The sample lines supplying the radioactivity monitoring instrumentation are heated (heat traced) to ensure that a representative sample can be obtained.

APPLICABILITY

Because of elevated RCS temperature and pressure in MODES 1, 2, 3, and 4, RCS leakage detection instrumentation is required to be OPERABLE.

In MODE 5 or 6, the temperature is to be $\leq$ 200°F and pressure is maintained low or at atmospheric pressure. Since the temperatures and pressures are far lower than those for MODES 1, 2, 3, and 4, the likelihood of leakage and crack propagation are much smaller. Therefore, the requirements of this LCO are not applicable in MODES 5 and 6.

(continued)

BASES (continued)

ACTIONS

A.1 and A.2

With the required containment pocket sump level monitor inoperable, no other form of sampling can provide the equivalent information; however, the containment atmosphere radioactivity monitor will provide indications of changes in leakage. Together with the atmosphere monitor, the periodic surveillance for RCS water inventory balance, SR 3.4.13.1, must be performed at an increased frequency of 24 hours to provide information that is adequate to detect leakage.

particulate

Restoration of the required containment pocket sump level monitor to OPERABLE status within a Completion Time of 30 days is required to regain the function after the monitor's failure. This time is acceptable, considering the Frequency and adequacy of the RCS water inventory balance required by Required Action A.1.

B.1.1, B.1.2, and B.2

With ~~either the gaseous or~~ the particulate containment atmosphere radioactivity monitoring instrumentation channel[s] inoperable, alternative action is required. Either grab samples of the containment atmosphere must be taken and analyzed or water inventory balances, in accordance with SR 3.4.13.1, must be performed to provide alternate periodic information.

During periods when the heat tracing is inoperable for the sample lines supplying the radioactivity monitoring instrumentation, the particulate channel of the instrumentation is inoperable and grab samples for particulates may not be taken using the sample lines.

With a sample obtained and analyzed or water inventory balance performed every 24 hours, the reactor may be operated for up to 30 days to allow restoration of the required containment atmosphere radioactivity monitor[s].

particulate

(continued)

BASES

ACTIONS

B.1.1, B.1.2, and B.2 (continued)

The 24 hour interval provides periodic information that is adequate to detect leakage. The 30 day Completion Time recognizes at least one other form of leakage detection is available.

C.1 and C.2

If a Required Action of Condition A or B cannot be met, the plant must be brought to a MODE in which the requirement does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

D.1

With all required monitors inoperable, no automatic means of monitoring leakage are available, and immediate plant shutdown in accordance with LCO 3.0.3 is required.

SURVEILLANCE REQUIREMENTS

SR 3.4.15.1

SR 3.4.15.1 requires the performance of a CHANNEL CHECK of the required containment atmosphere radioactivity monitor. The check gives reasonable confidence that the channel is operating properly. The Frequency of 12 hours is based on instrument reliability and is reasonable for detecting off normal conditions.

particulate

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

particulate

SR 3.4.15.2

SR 3.4.15.2 requires the performance of a COT on the required containment atmosphere radioactivity monitor. The test ensures that the monitor can perform its function in the desired manner. The test verifies the alarm setpoint and the relative accuracy of the instrument string. The Frequency of 92 days considers instrument reliability, and operating experience has shown that it is proper for detecting degradation.

SR 3.4.15.3 and SR 3.4.15.4

These SRs require the performance of a CHANNEL CALIBRATION for each of the RCS leakage detection instrumentation channels. The calibration verifies the accuracy of the instrument string, including the instruments located inside containment. The Frequency of 18 months is a typical refueling cycle and considers channel reliability. Again, operating experience has proven that this Frequency is acceptable.

REFERENCES

1. 10 CFR 50, Appendix A, General Design Criterion 30, "Quality of Reactor Coolant Pressure Boundary."

2. Regulatory Guide 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems," Revision 0, May 1973.

3. Watts Bar FSAR, Section 5.2.7, "RCPB Leakage Detection Systems."