



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

JUN 26 1998

TVA-WBN-TS-98-006

10 CFR 50.90

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 - TECHNICAL SPECIFICATION (TS) CHANGE NO. 98-006 - DELETION OF POWER RANGE NEUTRON FLUX HIGH NEGATIVE RATE REACTOR TRIP FUNCTION

In accordance with the provisions of 10 CFR 50.90, TVA is submitting a request for an amendment to WBN's license NPF-90 to change the TSs for Unit 1. The proposed amendment would revise the Watts Bar Nuclear Plant (WBN) TS and associated TS Bases to delete the power range neutron flux high negative rate reactor trip function based on the analysis provided in Westinghouse Electric Corporation WCAP-11394-P-A, "Methodology for the Analysis of the Dropped Rod Event."

TVA has reviewed the February 1998 multiple rod drop incident at McGuire Unit 1 as documented in Significant Event Notification (SEN) 181. One of the significant aspects for that event involved a failure to immediately initiate a manual reactor trip due in part to inadequate scram criteria within the station's abnormal operating procedure (AOP) for dropped rod events. The McGuire negative flux rate trip function had been deleted several years earlier without revising the AOP. The WBN procedure for responding to a dropped rod event, Abnormal Operating Instruction (AOI-2), "Malfunction of Reactor Control System," instructs the

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operator to manually trip the reactor for multiple dropped rods. In addition, assurance that other procedures potentially affected by the proposed license amendment are appropriately revised is provided by the performance of impact reviews required under the WBN design change and Technical Specification implementation processes.

TVA has determined that there are no significant hazards considerations associated with the proposed change and that the change is exempt from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9). The WBN Plant Operations Review Committee and the WBN 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 endanger the health and safety of the public.

Enclosure 1 to this letter provides the description and evaluation of the proposed change including TVA's determination that the proposed change does not involve a significant hazards consideration, and is exempt from environmental review. Enclosure 2 contains copies of the appropriate TS pages from Unit 1 marked-up to show the proposed change. Enclosure 3 forwards the revised TS pages for Unit 1 which incorporate the proposed change.

TVA requests that NRC approval be approximately 30 days prior to beginning WBN's refueling outage currently scheduled for early 1999, and that the revised TS be made effective within 30 days of NRC approval.

In accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and enclosures to the Tennessee State Department of Public Health.

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If you have any questions about this change, please contact me at (423) 365-1824.

Sincerely,



P. L. Pace
Site Licensing Manager

Enclosures
cc: See page 4

Subscribed and sworn to before me
on this 26th day of June, 1998.

E. Jeannette Long
Notary Public

My Commission Expires June 27, 2001

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cc (Enclosures):

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ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT (WBN)
UNIT 1
DOCKET NO. 50-390

PROPOSED TECHNICAL SPECIFICATION (TS) CHANGE TS-98-006
DESCRIPTION AND EVALUATION OF THE PROPOSED CHANGE

I. DESCRIPTION OF THE PROPOSED CHANGE

The proposed license amendment would revise the Watts Bar Nuclear Plant (WBN) Unit 1 Technical Specifications and associated TS Bases to delete the power range neutron flux high negative rate reactor trip function based on the analysis provided in Westinghouse WCAP 11394-P-A.

Specifically, the following changes are being proposed as illustrated by the markup provided in Enclosure 2:

1. LCO 3.3.1, Table 3.3.1-1, "Reactor Trip System Instrumentation," would be revised to delete function 3(b), "High Negative Rate."
2. The TS Bases for LCO 3.3.1 would be revised accordingly to delete the discussion and reference to the power range neutron flux high negative rate reactor trip function. In addition, a typographical error is corrected on page B 3.3-42 by changing "operable" to "inoperable."

II. REASON FOR THE PROPOSED CHANGE

The deletion of the power range neutron flux high negative rate reactor trip function in accordance with the proposed license amendment eliminates an unnecessary protective function and thereby reduces the potential for a transient which could challenge safe plant operation due to spurious trip signals. A 1982 evaluation prepared by Westinghouse entitled, "Dropped Rod Methodology for Negative Flux Rate Trip Plants," (WCAP-10297), determined that the negative flux rate trip was only required when a dropped rod (or bank) exceeded a specific reactivity worth threshold value. Any dropped rod or bank which had a worth below the threshold value would not require a reactor trip to maintain Departure From Nucleate Boiling (DNB) limits. An additional evaluation in 1987 was performed by Westinghouse entitled, "Methodology for the Analysis of the Dropped Rod Event," (WCAP-11394-P), which determined that sufficient margin existed for Westinghouse plant designs and fuel types without the negative flux rate trip regardless of the worth of the dropped rod (or bank), subject to a plant/cycle-specific analysis. The NRC has subsequently reviewed and approved the Westinghouse analysis and results and concluded that this was an acceptable procedure for analyzing the dropped rod event for which no credit is

taken for any direct reactor trip or automatic power reduction features. Therefore, the negative flux rate trip is not required to maintain existing DNB limits and may be deleted at Watts Bar.

III. SAFETY ANALYSIS

The original design basis for the negative flux rate trip function was to mitigate the consequences of a dropped rod(s) event. The intent was that, in the event of a dropped rod (or bank), the reactor protection system would detect the rapidly decreasing neutron flux (negative flux rate) due to the dropped rod and trip the reactor, thus ending the transient and assuring that DNB limits were maintained. In January 1982, Westinghouse submitted a topical report entitled, "Dropped Rod Methodology for Negative Flux Rate Trip Plants," (WCAP-10297), to the NRC, which documented a new methodology for this event and concluded that the negative flux rate trip function was only required when a dropped rod (or bank) exceeded a threshold value reactivity worth. The threshold value was dependent upon plant design (2, 3, or 4 loop) and fuel type. Any dropped rod (or bank), which had a worth below the threshold value, would not require a reactor trip to maintain DNB limits. In a letter to Westinghouse dated March 31, 1983, the NRC approved and concurred with this methodology.

Thereafter, a new topical report entitled, "Methodology for the Analysis of the Dropped Rod Event," (WCAP-11394-P), was submitted by the Westinghouse Owner's Group (WOG) to the NRC for their review and approval (letter dated May 22, 1987). The conclusion reached in the WCAP was that sufficient margin is expected with all Westinghouse plant designs and fuel types, such that the negative flux rate trip is not required regardless of the worth of the dropped rod (or bank). Use of this approach is required to be demonstrated using a plant/cycle-specific analysis. Subsequently, the NRC issued the results of their review of WCAP-11394-P in a letter to the WOG dated October 23, 1989. In that letter, the NRC confirmed that the staff had reviewed the new Westinghouse calculation process, the parameters used, and the results and had concluded that this was an acceptable analysis procedure. The NRC noted that further review by the staff (for each cycle) is not necessary, given the utility assertion that the analysis described in WCAP-11394-P-A has been performed and the required comparisons have been made with favorable results.

WCAP-11394-P-A (as approved by NRC) demonstrates that the DNB Design Basis is met during the course of the dropped Rod Cluster Control Assembly (RCCA) transient which considers one or more dropped rods. No credit is taken for any direct reactor trip due to the dropped RCCA(s) or for automatic power reduction due to dropped RCCA(s).

The following provides an evaluation of the proposed change with respect to the WBN safety analysis:

LOCA and LOCA-Related Evaluations

The power range negative flux rate trip is not modeled in the LOCA analyses. The following LOCA related analyses are not affected by the proposed activity: large and small break LOCA, reactor vessel and loop LOCA blowdown forces, post-LOCA long term core cooling subcriticality, post-LOCA long term core cooling minimum flow, and hot leg switchover to prevent boron precipitation. The proposed activity does not affect the normal plant operating parameters, accident mitigation capabilities important to a LOCA, the assumptions used in the LOCA-related accidents, or create conditions more limiting than those assumed in these analyses.

Non-LOCA Related Evaluation

Although the negative flux rate trip function is addressed in the WBN Safety Analysis, the current WBN non-LOCA safety analyses do not take credit for the power range negative flux rate trip function. Specifically, the dropped RCCA or RCCA Bank analysis utilized for WBN Cycle 2 does not rely on actuation of the negative flux rate trip function to mitigate the consequences of the accident. This analysis was performed following the approved methodology for the analysis of dropped rod events provided in WCAP-11394-P-A. The analysis statepoints consider dropped RCCA worths up to 800 pcm, and thereby, conservatively bound the postulated transient conditions. Historically, plant analyses only considered dropped RCCA worths up to 400 or 500 pcm since the negative flux rate trip function would actuate for larger reactivity insertions. The analysis assumptions and confirmation that the DNB design basis is met are further confirmed as part of the reload safety analysis for each core reload. Currently, the reload safety analysis limits for Unit 1 Cycle 2 includes dropped RCCA statepoints with a maximum drop worth of 800 pcm. Therefore, for the proposed license amendment which will credit the application of WCAP-11394-P-A, the conclusions presented in the FSAR remain valid.

Mechanical Components and Systems Evaluation

Elimination of the negative flux rate trip function as described would not affect the RCS component integrity or the ability of the system to perform its intended safety function. The modification would not affect the integrity of a plant systems or their ability to perform intended safety functions.

Containment Integrity Evaluation (Short Term/Long Term LOCA Release)

The negative flux rate trip is not credited in the containment analyses. The identified change does not adversely affect the short and long term LOCA mass and energy releases or the containment analyses. The change does not affect the normal plant operating parameters, system actuations, capabilities or assumptions important to the containment analyses, or create conditions more limiting than those assumed in these analyses. Therefore, the conclusions presented in the FSAR remain valid with respect to the containment.

Main Steamline Break (MSLB) Mass and Energy Release

The negative flux rate trip is not credited in the MSLB analyses. The identified modification neither adversely affects the MSLB mass and energy releases, either inside or outside containment, nor adversely affects the calculations for the steam mass release used as input to the radiological dose evaluation. The subject modification does not affect the normal plant operating parameters, input assumptions, results or conclusions of the MSLB mass and energy release analyses and steam release calculations. Also, conditions are not created which are more limiting than those enveloped by the current analyses and calculations. Therefore, the conclusions presented in the FSAR remain valid with respect to MSLB mass and energy release rates and steam mass release calculations.

Emergency Operating Procedures (EOP) Evaluation

The plant activity as described would not affect the EOPs. The negative flux rate trip is not covered as part of the EOP and therefore the change has no impact.

Safety Systems Setpoints Evaluation

The plant activity as described would not affect the reactor protection system (RPS) or the engineered safety feature actuation system (ESFAS) setpoints. This negative flux rate trip deletion does not change the current set point information for any other function shown in the Technical Specifications. Therefore, the negative flux rate trip deletion has no impact on the plant safety functions.

Steam Generator Tube Rupture (SGTR) Evaluation

The negative flux rate trip is not assumed in the SGTR analyses. The negative flux rate trip deletion does not affect the normal plant operating parameters, input assumptions, results, or conclusions of the SGTR thermal and hydraulic analyses. Also, conditions are not created which are more limiting than those enveloped by the current analysis break flow/steam release. Therefore, the

conclusions presented in the FSAR remain valid with respect to SGTR event.

Control Systems Evaluation

The plant activity as described has no impact on the control systems analysis. The deletion of the negative flux rate trip could increase plant availability because the change eliminates a potential source of inadvertent reactor trips.

IV. NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

TVA has concluded that operation of Watts Bar Nuclear Plant (WBN) Unit 1 in accordance with the proposed change to the Technical Specifications does not involve a significant hazards consideration. TVA's conclusion is based on its evaluation in accordance with 10 CFR 50.91(a)(1) of the three standards set forth in 10 CFR 50.92(c).

- A. The proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.**

The negative flux rate trip deletion does not increase the probability or consequences of core damage accidents resulting from dropped RCCA events previously analyzed. The safety functions of other safety related systems and components, which are related to accident mitigation, have not been altered. All other primary protection (reactor trip and ESF) functions are not impacted by the elimination of the negative flux rate trip function. The consequences of accidents previously evaluated in the FSAR are unaffected by this proposed change because no change to any equipment response or accident mitigation scenario has resulted. There are no additional challenges to fission product barrier integrity. No new radiological analyses are required. Therefore the proposed change will have no effect on the probability or consequences of accidents previously evaluated.

- B. The proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

The negative flux rate trip deletion does not create the possibility of a new or different kind of accident than any accident already evaluated in the FSAR. No new accident scenarios, failure mechanisms, or limiting single failures are introduced as a result of this proposed change. The proposed modification does not challenge the performance or integrity of any safety-related systems.

It has been demonstrated that the function of the negative flux rate trip can be eliminated by the approved methodology described in WCAP 11394-P-A. A Watts Bar specific analysis has confirmed that for the dropped RCCA and dropped RCCA bank event, no direct reactor trip or automatic power reduction is required to meet the DNB licensing basis for this Condition II event. The negative flux rate trip function is not credited as a backup for any other Chapter 15 event. Thus, this change does not create the possibility of a new or different kind of accident from any previously evaluated.

- C. The proposed amendment does not involve a significant reduction in a margin of safety.

The margin of safety associated with the acceptance criteria for any postulated WBN accident is unchanged. It has been demonstrated that the function of the negative flux rate trip can be eliminated by the approved methodology described in WCAP 11394-P-A. Watts Bar specific analysis has confirmed that the dropped RCCA and dropped RCCA bank acceptance criteria (DNB) continue to be met. Conformance to the regulatory criteria for plant operation with the negative flux rate trip deletion is demonstrated, and regulatory limits (DNB) are not exceeded. The modification will have no effect on the availability, operability, or performance of the safety-related systems and components. Therefore, the proposed license amendment does not involve a significant reduction in a margin of safety.

V. ENVIRONMENTAL IMPACT CONSIDERATION

The proposed change does not involve a significant hazards consideration, a significant change in the types of or significant increase in the amounts of any effluents that may be released offsite, or a significant increase in individual or cumulative occupational radiation exposure. Therefore, the proposed change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), an environmental assessment of the proposed change is not required.