

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

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SEP 17 1986

Director of Nuclear Reactor Regulation  
Attention: Mr. B. Youngblood, Project Director  
PWR Project Directorate No. 4  
Division of Pressurized Water  
Reactor (PWR) Licensing A  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Mr. Youngblood:

In the Matter of the Application of ) Docket Nos. 50-390  
Tennessee Valley Authority ) 50-391

By letter to Ms. E. Adensam dated September 19, 1985, TVA informed NRC of our intention not to install the upper head injection (UHI) system at the Watts Bar Nuclear Plant (WBN) unit 2. In addition to not installing UHI on unit 2, TVA now intends to remove the UHI system on unit 1 before initial fuel loading. This decision is based upon the advent of new computer codes, operational problems associated with UHI, and the recent licensing activities involving the removal of UHI at Duke Power Company's McGuire Nuclear Station.

The UHI system was originally added to Westinghouse ice condenser plant designs to provide additional core cooling beyond that supplied by the emergency core cooling system (ECCS) during a large break, loss of coolant accident (LOCA), and to provide greater plant operating flexibility by means of higher core power peaking limits. However, the potential of the UHI system benefits has been overshadowed by the frequent operational problems encountered by operating plants. These operational problems have included:

- Rupture or leakage of membrane in the gas crossover line separating the water and nitrogen accumulators and resultant violation of chemistry requirements (for water accumulator nitrogen entrainment and boron concentrations).
- Level switch/transmitter problems for volume delivery within tolerances (specifically accuracy of Barton level switches, installation error of sensing lines, and calibration procedures).
- Violation of system gas pressure requirements.
- Inadvertent closing of UHI isolation valves.

The impact of these UHI system operational problems has been:

- Forced operating mode changes resulting in loss of effective full power (EFP) days.

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- Startup delays associated with placing UHI in service (up to 10 hours per startup).
- Increased personnel requirements related to calibration, maintenance, and repair of UHI related equipment.
- Increased radiation exposure to personnel.

The decision not to install UHI at WBN results in additional benefits such as:

- Reduce thermal stress on upper head resulting from UHI actuation during non-LOCA transients.
- Standardize plant configuration with other Westinghouse four-loop plants.
- Eliminate the necessity to do separate analyses for UHI plants in owners group activities.

The approach for justifying removal of UHI relies on improved computer code technology arising from experimental work (LOFT, Semiscale, etc.). This allows for mechanical modeling of the fluid response during LOCA, injection, refill, and reflood. The improved computer code technology demonstrates that UHI is not required for maintaining acceptable emergency core cooling during a large break LOCA, while maintaining full operational flexibility. The codes do consider the penalties associated with NUREG-0630 guidelines and the effect on peak cladding temperature. The computer code which TVA plans to use to demonstrate that UHI is not required is BASH. If the BASH code does not receive final NRC approval in a timeframe to support WBN licensing, TVA will use the BART code. The revised BART code received NRC approval on August 25, 1986 and was the basis for the McGuire licensing submittal for UHI removal. The BASH code which allows a higher peaking factor and additional operating flexibility is the preferred code for the TVA licensing submittal. Based on discussions with the NRC staff, it is our understanding that the Safety Evaluation Report on BASH is in the NRC concurrence cycle and has no open issues.

The FSAR changes necessary to reflect removal of UHI from both units' design basis will be submitted to your staff by March 30, 1987. This reflects a change in the commitment from our September 30, 1985 letter to provide FSAR revisions to address removal of UHI on unit 2 by June 30, 1986. This change is to accommodate a single FSAR revision which will address the removal of UHI on both units.

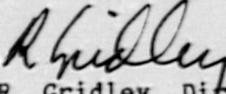
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If you have any questions concerning this matter, please get in touch with David Kulisek, (615) 365-8761.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

  
R. Gridley, Director  
Nuclear Safety and Licensing

cc: U.S. Nuclear Regulatory Commission  
Region II  
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