TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
400 Chestnut Street Tower II

March 21, 1980

Director of Nuclear Reactor Regulation
Attention: Mr. L. S. Rubenstein, Acting Chief
Light Water Reactors Branch No. 4
Division of Project Management
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Rubenstein:

In the Matter of the Application of	)	Docket Nos. 50-328
Tennessee Valley Authority	)	50-390
		50-391

In the enclosed letter from M. A. Siano to D. R. Patterson dated March 4, 1980, Westinghouse recommended that TVA perform the low pressure portion of the Upper Head Injection System (UHIS). Since this test verifies proper piping resistance and functionally verifies the operability of the UHIS isolation valves and level instrumentation, it is Westinghouse's position that the higher pressure blowdown test should not be performed.

TVA concurs with this position and requests that the NRC evaluate the Westinghouse recommendations. It is our understanding that the NRC Office of Inspection and Enforcement has requested that the NRC Office of Nuclear Reactor Regulation make a determination with respect to adequacy of the low pressure blowdown test for demonstrating value operability. Since the UHI preoperational test for Watts Bar Nuclear Plant unit 1 is now scheduled for April 18, 1980, we request resolution of this issue as quickly as possible.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills, Manager
Nuclear Regulation and Safety

Enclosure

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Westinghouse Electric Corporation
Water Reactor Divisions

PWR Systems Division
Box 355
Pittsburgh Pennsylvania 15230

March 4, 1980

TVA Contract No. 68C60-91934
71C70-54114-1

TVA-7735
WAT-D-3893

FSD/SS-TVA/WAT-700

S.O. Nos. TVA/TEN-280
WAT/WBT-280

Mr. D. R. Patterson Chief
Mechanical Engineering Branch
TENNESSEE VALLEY AUTHORITY
400 Commerce Avenue, W10 C126
Knoxville, Tennessee 37902

TENNESSEE VALLEY AUTHORITY
SEQUOYAH NUCLEAR PLANT - UNIT NUMBER 2
AND
WATTS BAR - UNIT NUMBERS 1 AND 2
UHI Pre-Operational Test

Dear Mr. Patterson:

Westinghouse, via this letter, recommends that Tennessee Valley Authority not perform the high pressure blowdown portion of the Sequoyah - Unit 2 and Watts Bar - Units 1 and 2 Upper Head Injection System (UHIS) pre-operational test. Provided below is Westinghouse's basis for this recommendation.

The Westinghouse UHIS pre-operational test program has consisted of both a low pressure blowdown (90 psig initial pressure) and a high pressure blowdown (1240 psig initial pressure). The low pressure blowdown portion of the test provides direct measurement of the relative resistance of the UHIS injection piping which with a specific UHIS hydraulic isolation valve (HIV) closure time establishes the water accumulator level instrument setpoint. The high pressure blowdown portion of the test was specified in order to: 1) verify the closing performance of the four hydraulic isolation valves (HIV's), and 2) verify that the water accumulator level instrumentation setpoint, as determined by the low pressure blowdown test, results in the delivery of the proper volume of water to the reactor vessel upper head. This high pressure blowdown test was utilized in order to provide fluid flow conditions that are more severe than the flow conditions expected during UHIS operation following the worst postulated loss of coolant accident. Thus, direct observations of the HIV operation and volume delivery could be made at conservatively high flowrates.

The high pressure UHIS blowdown test performed at Sequoyah - Unit 1 and other plants have indeed provided direct verification that the UHIS HIV's perform as expected. These tests have also verified the correlation between the piping resistance of the UHIS injection piping (determined by the low pressure UHIS blowdown test), the closing time of the UHIS HIV and the water accumulator level setpoint required to obtain the desired delivered water volume.

The complete UHIS test program including both the low and high pressure blowdowns have been performed on the Sequoyah - Unit 1 UHIS. The low pressure test has determined the piping resistance of the Unit 1 UHIS injection piping, the high pressure test has verified HIV valve closure and resultant water volume delivered. Since Sequoyah - Unit 2 and Watts Bar - Units 1 and 2 UHIS is mechanically and hydraulically identical to the Unit 1 UHIS, the same level setpoint will provide the same delivered volume provided the HIV closure time is set to be identical to Unit 1.

To provide actual verification of this similarty between Units 1 and 2, Westinghouse recommends that TVA perform the low pressure blowdown portion of the UHIS pre-operational test program on Sequoyah - Unit 2 and Watts Bar - Units 1 and 2. The results of this test are to show that: 1) the resistance of the Unit 2 UHIS injection piping and 2) the HIV closing times are identical to Unit 1's. (Westinghouse will provide test acceptance criteria for these parameters under separate cover.) By assuring that these criteria have been met and by utilizing the Unit 1 water level setpoint, TVA will be assured that the volume delivered by the Sequoyah - Unit 2 and Watts Bar - Units 1 and 2 UHIS will be the same as Unit 1 and will be within the delivered water volume band contained in the Appendix K ECCS analysis.

The benefits of not performing a high pressure UHIS blowdown test on these units would be twofold:

1. The time required for UHIS testing would be shortened and thus would reduce the amount of test personnel time required and also would make the reactor coolant system available for other necessary pre-operational work and testing.

2. The need for valve disk and seat repair or replacement after the test would be eliminated. Although all the UHIS isolation valves have been modified to minimize valve damage during the high pressure blowdown test, it is recognized that the UHIS isolation valves are subjected to very severe ΔP and flow conditions during the test. These test conditions far exceed that which the valves would see during the worst possible LOCA recovery situation. Thus, although the "post-test" valve leakage has been acceptable for system isolation following a LOCA, valve repair was required to reduce valve leakage for system isolation when the RCS was depressurized for refueling, etc.

In summary, Westinghouse recommends that TVA perform the low pressure UHIS test to verify proper piping resistance and to functionally verify the operability of the UHIS isolation valves and the level instrumentation, utilizing the low pressure test criteria, which will be provided under separate cover. The remaining portion of the UHIS normal operating pressure verification tests (surge tank pressure and alarms, etc.) can be performed during the initial full pressurization of the UHIS, prior to plant start-up. The implementation of this recommendation will result in reduced hardware repair costs, reduced nitrogen gas requirements and most significantly, reduced test personnel time and RCS access requirements.

Note that implementation of this recommendation will also require minor revisions to the current Sequoyah and Watts Bar FSAR's which refer to the Unit 2 high pressure blowdown test. Such a revision will require NRC approval before the above test revision can be made. Westinghouse offers its support, if required, in obtaining NRC approval. Please consider this recommendation and contact the undersigned if further assistance is required.

Very truly yours,

WESTINGHOUSE ELECTRIC CORPORATION

M. A. Siano, Manager
TVA Projects

LEConway/MA

cc: D. R. Patterson (TVA) 4L
R. E. Lyman (W Knoxville) 1L
F. E. Rolston (W Chattanooga) 1L
C. E. Brewer (TVA Chattanooga) 1L
L. M. Mills (TVA Chattanooga) 1L