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

JAN 1 0 1995

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

Gentlemen:

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

WATTS BAR NUCLEAR PLANT (WBN) - UNIT 1 - WATTS BAR SECOND HOT FUNCTIONAL TEST PROGRAM (HFT 2)

Reference 1 TVA letter to NRC, Response to NRC's September 15, 1994 Assessment of WBN Unit 1 HFT, November 2, 1994

Reference 2 NRC Letter to TVA, Response to TVA's Letter of November 2, 1994 on Hot Functional Testing, December 9, 1994

In Reference 1, TVA provided the staff with our retest plans for the equipment issues cited in NRC's September 15, 1994, analysis of the WBN Unit 1 Hot Functional Test Program conducted in the Spring of 1994. The staff provided several comments on TVA's response in Reference 2. The purpose of this letter is to respond (Enclosure 1) to the staff's comments made in Reference 2 and provide NRC with a summary scope of planned testing for the HFT 2 test sequence, expected to commence on April 2, 1995. This test summary is provided as an attachment to Enclosure 1. An HFT 2 Program Plan has been developed and is available for the staff review.

Detailed discussions pertaining to our HFT 2 test plans were held between TVA and Region II personnel at the WBN site during the week of December 19, 1994. These discussions were beneficial in providing a mutual understanding of the issues and, as discussed in a telecon with NRC Region II and NRR management on December 22, 1994, resulted in agreement in principle on the test scope and objectives for HFT 2. The HFT 2 overview provided below, together with the enclosed information, summarize the results of these discussions. In the event additional test issues are identified by TVA or NRC staff personnel, resolution will be pursued through normal site processes.

JAN 1 0 1995

The purpose of WBN HFT 2 is to resolve testing deficiencies from the previous (Spring 1994) Hot Functional Test (HFT) and to demonstrate the operational readiness of the plant and various organizations. The test will be in progress for approximately 21 days from the initial heatup to final cooldown with 12 days of testing at normal operating temperatures and pressures of approximately 557°F and 2250 psia. Heat generated by the Reactor Coolant pumps will be utilized to raise Reactor Coolant System temperature in a controlled manner to predetermined plateaus of temperature and pressure. Specified tests and inspections will be performed at each of the plateaus.

TVA has defined goals and objectives for HFT 2 in the HFT Program Plan. Primarily, these include safe completion of tests and demonstration of WBN operational readiness with a focus on overall plant "ownership" by the Operations Staff. Implementation of HFT 2 in this manner will demonstrate in-place use of operational standards and will strengthen the plant's transition to an operational mentality in support of fuel loading activities and subsequent power ascension testing.

HFT 2 will be administered by the plant manager with the Operations Department responsible for overall HFT 2 test conduct, control of the plant, and adherence to the HFT 2 test schedule. Plant Technical Support system engineers will direct the specific HFT 2 tests under the authority of a licensed senior reactor operator (SRO). Engineers from the Startup and Test Department will be utilized for test support as required to maintain test continuity with the previous HFT. Management oversight of HFT 2 will consist of on-shift involvement by representatives from Operations, Technical Support, Maintenance, Engineering, and Startup.

Training will be provided to affected departments on the HFT 2 goals and objectives, including expectations for operational readiness. Training will include the scope of testing and lessons learned from previous WBN milestones such as HFT 1, safeguards testing, and recent reviews conducted through the Operational Readiness Review (ORR) Program and INPO. Training for operators and test directors will be given for specific tests to be performed during HFT 2, and will include the use of the WBN Simulator. Operational Readiness Assessments, similar to those used during previous testing milestones, will be performed by each line organization to assess WBN performance against industry standards.

To ensure the plant will be ready to demonstrate operational readiness, the start date for HFT 2 has been scheduled to follow turnover of the plant's major systems. System Turnover ensures the systems are physically and procedurally ready for operation. In addition, plant rooms and areas (e.g., pump rooms, pipe corridors, general floor elevations, etc.), for which the Operations Department will maintain access control, will be identified.

JAN 10 1995

In summary, in addition to the safe resolution of outstanding test deficiencies under as close to actual operating conditions as possible, HFT 2 will be an important opportunity to demonstrate WBN operational readiness in key areas. Of primary significance, HFT 2 will demonstrate, in part, the proficiency of the Operations Department with a focus on plant ownership and execution of "command and control." HFT 2 will also provide valuable experience for other site departments as previous lessons learned are incorporated. TVA's implementation plan for HFT 2 provides for a comprehensive treatment of known open test issues and, given the proximity of the HFT 2 schedule to Unit 1 fuel load, provides for a high degree of personnel and plant system readiness as WBN begins fuel loading and power ascension test activities.

Enclosure 2 summarizes the new commitments made in this submittal. The administrative aspects of HFT 2 discussed above are addressed in the HFT 2 Program Plan.

If you should have any questions, contact Bruce S. Schofield at (615) 365-1857.

Sincerely,

Dwight E. Nunn
Vice President
New Plant Completion
Watts Bar Nuclear Plant

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ENCLOSURE 1

RESPONSE TO NRC COMMENTS
NRC LETTER DATED DECEMBER 9, 1994

The following provides a response to NRC's letter of December 9, 1994, which transmitted comments on TVA's November 2, 1994, letter. TVA and NRC staff personnel discussed these issues and others in detail at the Watts Bar Site during the week of December 19, 1994. The test scope for the WBN Unit 1 Hot Functional Test 2 Program is provided in the attachment to this Enclosure entitled, "HFT 2 Test Summary."

NRC COMMENT 1

NRC believes that both the turbine driven and motor driven auxiliary feedwater systems (TDAFW & MDAFW) should be retested during the next HFT. Your letter states that the TDAFW system will be tested, but only says the MDAFW Level Control Valves will be tested for control system response. NRC believes that both TDAFW and MDAFW should be tested as a system, over their full design range of performance, during the next HFT. Also your letter did not clearly specify the low steam pressure tests of the TDAFW to demonstrate operability at minimum steam pressure.

RESPONSE

TVA agrees. As discussed with the staff and summarized in the attached "HFT 2 Test Summary" (System 3B), testing of both the turbine driven and motor driven auxiliary feedwater systems will be performed over the design range of steam generator pressures, including low steam pressure.

NRC COMMENT 2

NRC is aware of the recurring failures that have occurred on the Residual Heat Removal (RHR) pumps, and the extensive efforts TVA has expended to find the root cause of the failures. Due to the uncertainty of the cause of the pump seizure, NRC believes that the RHR pumps should be put through several thermal cycles during HFT. Past pump failures have occurred only after multiple thermal cycles, so repetitive testing should be conducted to ensure the failure mechanism has been corrected.

RESPONSE

TVA agrees. This testing is reflected in the attached "HFT 2 Test Summary" for the Residual Heat Removal System (System 74).

NRC COMMENT 3

Your letter states that the pressurizer pressure control system will be observed during HFT. Due to the anomalous test results during the last HFT, NRC believes that the test should confirm proper operation of both pressurizer pressure and level control.

RESPONSE

TVA agrees. This testing is reflected in the attached "HFT 2 Test Summary" for the Reactor Coolant System (System 68).

NRC COMMENT 4

We concur in the prudence of confirming proper operation of the positive displacement charging pump, as you state in your letter. NRC is aware that TVA has done extensive modification to the 1-A centrifugal charging pump to eliminate vibration problems. It would seem prudent to run this pump extensively during HFT to confirm repairs are successful.

RESPONSE

TVA agrees that additional vibration monitoring of centrifugal charging pump CCP 1A-A during HFT 2 is prudent. As noted in TVA's letter of November 2, 1994, vibration testing was performed in October 1994 for CCP 1A-A with acceptable results, following the pump pedestal modifications. During HFT 2, when the positive displacement pump is not required to support testing, TVA intends to preferentially run charging pump CCP 1A-A over pump 1B-B and to periodically monitor the CCP 1A-A pump for vibration. This testing is reflected in the attached "HFT 2 Test Summary" for the Vibration Test.

NRC COMMENT 5

During the shutdown from outside the main control room test, problems were encountered with several instruments and controls in the auxiliary control room. NRC understands that TVA has taken actions to correct these equipment problems. We suggest that the corrected equipment be tested during HFT to confirm operability, as there will be limited opportunity to test it in the future.

RESPONSE

TVA agrees. As discussed with the staff and reflected in the attached "HFT 2 Test Summary" the following tests or retests are required: (1) Testing of the MDAFW System (System 3B) at low steam generator pressure conditions similar to that which occurred during the remote shutdown test, (2) retest of the RHR pump suction valve interlock (System 74), and (3) stroke test of the steam generator PORVs from the auxiliary control room (remote shutdown panel) to demonstrate proper PORV controller operation (System 1). The above testing will not require reperformance of the remote shutdown preop test (PTI-68-13).

NRC COMMENT 6

According to test records, the previous attempts at testing the Post Accident Sampling System were not successful. Through several conversations with your staff, we understand that TVA intends to do a complete demonstration of the PASS's ability to draw and transport a reactor coolant sample during HFT. TVA is currently negotiating with NRR on the scope and timing of PASS testing. NRC believes that a rigorous testing of PASS prior to the system becoming radioactively contaminated is a prudent course of action.

RESPONSE

TVA agrees. As committed in our letters of November 2, 1994, and January 5, 1995, comprehensive testing of the PASS prior to Unit 1 fuel load will be accomplished through (1) completion of preoperational testing under PTI-43-01, and (2) performance of a practical "test" scenario(s), using plant personnel and procedures, which demonstrate that PASS samples can be collected, transported, and analyzed within the required timeframes and dose limits committed by TVA's final responses to Item II.B.3 of NUREG-0737, dated September 20, 1993 and July 13, 1984. The practical NUREG-0737 demonstration will be performed during HFT 2, and will include demonstration of the PASS's ability to draw and transport a reactor coolant sample.

NRC COMMENT 7

Your letter states that the setting of Main Steam Safety Valve 1-SFV-001-0528 will be tested post fuel load. It is not clear to the NRC why this valve should not be tested during HFT.

RESPONSE

As discussed with NRC Region II personnel, the main steam safety valves require surveillance testing in accordance with Technical Specifications post-fuel load to assure proper setpoint and no leakage. During HFT 1, the subject valve performed properly after being set at the correct setpoint by the onsite vendor. However, the vendor's test was administratively deficient by "soaking" the valve for 7 minutes instead of 10 minutes before performing the final test. This deficiency will be resolved upon completion of the required T/S testing.

ATTACHMENT

HFT 2 TEST SUMMARY

HFT2 TEST SUMMARY

SYSTEM (NOTE 1)	TEST DESCRIPTION	TVA 11/2/94 LETTER (NOTE 2)
1	1. Perform stroke test time of S/G PORV 1-PCV-1-23.	N/A
	2. Stroke S/G PORVs from ACR to demonstrate proper controller calibration.	E2-2 14
	3. Perform PORV N_2 capacity retest at ambient prior to heatup.	N/A
3A	1. Retest S/G #4 LO-LO Level TTD Initiated annunciator.	N/A
	2. Retest S/G #1 LO-LO Level TTD Initiated annunciator.	N/A
	3. Retest S/G level trip signals.	N/A
	4. Retest #4 S/G 100% level indication.	N/A
3B	1. Perform retest of TDAFW System including: 48 hour pump endurance run, 5 quick pump starts, and testing to ensure the TDAFW LCVs and control system operate properly over the design range of steam generator pressures.	E2-2 1
	2. Retest full flow through MDAFW 2" LCVs using 400 pounds backpressure instead of previous 0 pounds.	N/A
	3. Retest TDAFW LCVs following correction of N_2 supply line valves.	E2-2/2
	4. Retest MDAFW System under conditions similar to the remote shutdown test, to ensure modification to LCV logic eliminates check valve chatter, flow and pressure control instabilities, and allows 4" LCV to close under high differential pressure. Testing will ensure the MDAFW System responds properly over the design range of steam generator pressures.	E2-2 6
15	1. Retest 8 S/G Blowdown isolation valves following their replacement.	E2-3 20

HFT2 TEST SUMMARY

SYSTEM (NOTE 1)	TEST DESCRIPTION	TVA 11/2/94 LETTER (NOTE 2)
43	1. Retest 1-SMV-68-538 due to previous leakage.	E2-2/15 E2-3/21 (See Note 3)
	2. PASS demonstration per NUREG 0737 (Section II.B.3) by Chemistry Department	Note 4
	3. Retest 1-SMV-68-578 due to previous leakage.	N/A
52	1. Resolve outstanding test deficiency on DPMD (Deliberate Plant Maneuver) inhibit circuitry.	N/A
62	1. Test boron concentration adjustment ability.	N/A
	2. Test Positive Displacement Pump including monitoring of vibration and accumulators.	E2-2/4
	3. Verify 1-FI-62-93C is indicating correctly. WO 94-13268-00 will perform PMT.	N/A
63	1. Retest 1-CKV-63-555 for leakage.	E2-2 16
68	1. Retest six thermocouples for RVLIS.	E2-2 11
	2. Reperform RTD cross calibration.	E2-2 12
	3. Perform functional test of PRZ Level and Pressure control systems.	E2-2 8
	4. Retest PZR PORV Temp Hi Annunciator.	N/A
	5. Reverify PRZ Level indication.	N/A

HFT2 TEST SUMMARY

SYSTEM (NOTE 1)	TEST DESCRIPTION	TVA 11/2/94 LETTER (NOTE 2)
	6. Monitor PRZ safeties and PORVSs for leakage.	E2-2 7
	7. Perform PD Pump level control test.	E2-2/4
	8. Manually cycle PRZ spray bypass valve to ensure it is free to operate.	N/A
	9. Monitor RCP vibration.	E2-2/9
	10. Monitor lead concentration in RCP oil.	E2-2/10
74	1. Retest ultrasonic level instrumentation.	N/A
	2. Perform B train HX test.	N/A
	3. Operate the 1A and 1B RHR Pumps through multiple thermal cycles. Testing will be performed under a normal operational alignment with pumps allowed to cool after each cycle.	E2-2 3
	4. Test the RHR suction valve interlock.	E2-2/13
90	1. Retest S/G BD Flash Tank Radiation Monitor.	N/A
92	1. Reperform backup S/R NI background noise test.	E2-1/12
Thermal Expansion	1. Inspect identified areas of piping insulation and support modifications.	N/A
Vibration	1. Measure vibration data on PDP.	E2-2/4
	2 Monitor vibration of CCP 1A-A.	N/A

HFT2 TEST SUMMARY

SYSTEM (NOTE 1)	TEST DESCRIPTION	TVA 11/2/94 LETTER (NOTE 2)
MOV DP TESTING	1. Main Steam System: 1-FCV-001-17, 18, 51	N/A
	2. Safety Injection System: 1-FCV-063-25, 26, 93, 172	N/A
	3. Residual Heat Removal System: 1-FCV-074-33, 35 (RHR cross-tie valves)	E2-3 17

NOTES:

(1) Systems:

1 - Main Steam
3A - Main Feedwater
3B - Auxiliary Feedwater
15 - Steam Generator Blow Down
43 - Sampling
52 - Loose Parts Monitoring
62 - Chemical Volume Control
68 - Reactor Coolant
74 - Residual Heat Removal
90 - Radiation Monitoring
92 - Nuclear Instrumentation

(2) Provides a cross-reference to the test commitment (page number/item number) in TVA's November 2, 1994 letter concerning HFT2.

(3) As discussed in TVA's November 2, 1994 letter, additional testing under PTI-43-01 including sampling of the containment atmosphere and containment sump (via RHR) and a cask/cart retest, will be performed prior to HFT 2. This additional testing does not require hot conditions as originally stated in that letter for Item 21, page E2-3.

(4) As noted in TVA's letter of January 5, 1995, the scenario objectives for this test will be provided to the staff by February 7, 1995.

ENCLOSURE 2

SUMMARY OF COMMITMENTS

1. Plant rooms and areas (e.g., pump rooms, pipe corridors, general floor elevations, etc.), for which the Operations Department will maintain access control during HFT 2, will be identified.

2. The specific test commitments for HFT 2 are defined in Enclosure 1 of this submittal and its attachment.