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AUG 19 1994

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) 50-391

WATTS BAR NUCLEAR PLANT (WBN) - FINAL SAFETY ANALYSIS REPORT (FSAR)
CHAPTER 14 "INITIAL TEST PROGRAM"

This letter supercedes in its entirety TVA's letter on the same subject dated July 20, 1994, and reflects agreements reached with the staff in a teleconference on August 10, 1994. This letter provides the staff with test summaries which have been deleted from FSAR Chapter 14 under Amendment 88. As recently discussed with NRC Region II and Nuclear Regulatory Regulation (NRR) staff personnel, TVA commits to use these test summaries for the development of appropriate tests for the systems, or portions thereof, listed in Table 1. In consideration of the safety significance of these systems and a graded approach to testing as described in FSAR Chapter 14 and Regulatory Guide (RG)-1.68, Revision 2 (1978), "Initial Test Programs for Water-Cooled Nuclear Power Plants," these systems/subsystems do not warrant performance of preoperational tests as originally planned under FSAR Chapter 14.

TVA considers that the planned method for testing these systems, in lieu of preoperational testing, complies with the requirements of RG-1.68 concerning a graded testing approach which places the greatest attention on the most important structures, systems, and components. The subject systems listed in Table 1 (except as noted) do not perform an active, primary safety function, i.e., are not required to ensure or maintain plant shutdown, the integrity of the Reactor Coolant System (RCS) pressure boundary, or prevent or mitigate the consequences of design basis accidents. As such, a graded approach to testing for these plant systems will provide assurance that the system will perform satisfactorily while, at the same time, the testing may be accomplished in a cost-effective and more expeditious manner.

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TABLE 1

TESTS OR TEST PORTIONS REMOVED FROM FSAR CHAPTER 14
(Refer to Enclosure 2 for Test Summaries)

Secondary Process Sampling
Refueling Water Purification (Note 1)
Solid Waste Processing (Note 2)
Communications System
Seismic Instrumentation
Fuel Handling and Vessel Servicing Equipment (Note 3)
Ice Condenser (Note 4)
Intake Pump Station Ventilation

Notes

- (1) Testing of the balance of the Spent Fuel Pool Cooling System is addressed under the power ascension phase of FSAR Chapter 14, Table 14.2-2.
- (2) As noted in FSAR Section 11.5, this system no longer processes dry active waste.
- (3) Equipment used for handling of spent fuel is tested under a preoperational test.
- (4) The Ice Condenser is a safety-related system which includes nonsafety features which are to be tested as described in Enclosure 2. The safety functions include doors and associated alarms, proper quantity and quality of ice, and the ice bed temperature and are tested under a preoperational test as described in FSAR Chapter 14.

Although the majority of these tests will be Acceptance Test Instructions (ATIs) or Component Tests (CTs), each of which is described in Chapter 14, several will be performed by procedures more appropriate for the installation as also recognized by Chapter 14. Enclosure 1 provides a description of each type of test to be used. These testing processes have been demonstrated to be rigorous and have been successfully implemented for numerous tests at WBN and are similar to that utilized for preoperational tests in many respects. They each require the use of: (1) qualified personnel, (2) appropriate design specifications from the engineering department, (3) controlled and approved documents and drawings, and (4) controlled processes for test instruction development, approval, changes, test conduct, handling of test deficiencies, review of test results, and processing of test records. TVA notes that each of these test processes in Enclosure 1 are subjected to routine surveillance and audit activities by Nuclear Assurance. This process provides a level of oversight during test conduct similar to that used during preoperational testing.

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Enclosure 2 provides the test summaries for the systems listed in Table 1. For each of these systems, TVA will perform appropriate system level or component level testing in accordance with the commitments specified herein and in FSAR Chapter 14. In cases where testing has already been performed, such as some component tests and process sampling, some of the commitments may not be applicable. The test methodologies and acceptance criteria described in these test summaries have been reviewed by NRC. TVA is not aware of any technical concerns over the information contained within these test summaries.

The tests described in Enclosure 2 will be performed during the preoperational phase of the initial test program, and as committed in Section 14.2 of the FSAR, are intended to be performed prior to commencing fuel load. Justification for any tests or portions thereof, which cannot be completed prior to fuel load, would be provided to NRC using the process described for preoperational tests in FSAR Section 14.2. The attachment to Enclosure 2 provides a cross-reference between the specific test methodologies and the type of test (acceptance, component, etc.) which will satisfy these methodologies. In some cases, this information reflects the actual test document number assigned. The Startup Test Commitment Matrix (controlled by Startup Manual Procedure (SMP)-15.0) was developed to provide this type of cross-reference for preoperational tests and will be updated to list test procedure cross-references for the test summaries in Enclosure 2. As discussed with the staff, where acceptance tests or special tests are utilized to satisfy the test summaries in Enclosure 2, TVA will provide an information copy of the test instruction to NRC prior to beginning test performance.

In summary, TVA considers that the planned level of testing for the systems listed in Table 1 will provide assurance that the systems have been installed correctly and operate in accordance with design requirements. The processes described in Enclosure 1 provide for an appropriate level of independent review of test procedures and test results and conduct of testing by qualified personnel in a manner which is consistent with the importance of these systems. TVA considers this philosophy to be consistent with the graded testing approach described by RG-1.68 as endorsed by FSAR Chapter 14.

Enclosure 3 summarizes the test commitments for this letter.

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

Enclosures
cc: See page 4

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ENCLOSURE 1
PROGRAM ELEMENTS TO BE USED DURING TESTING

The WBN FSAR, Chapter 14 describes the Initial Test Program (ITP) for WBNP. The ITP is divided into two phases, the preoperational phase and the power ascension phase. Preoperational phase testing will be performed prior to fuel load to verify design requirements of safety-related and selected nonsafety-related components, systems, and structures. As noted in Section 14.2, during the preoperational testing phase, three primary types of tests are performed: (1) component tests, (2) preoperational tests, and (3) acceptance tests. In addition, Section 14.2 also states that components and systems which are not tested in accordance with a preoperational or acceptance test procedure will be tested and/or placed into service in accordance with procedures which are appropriate for the installation.

The following discussion describes more fully the attributes of the ATI and CT procedures and other tests not specifically described in Chapter 14 which are intended to be used for the test summaries in Enclosure 2. In all cases, the requirements for format, personnel qualifications of the preparer and reviewers, test conduct, method of accomplishing procedure changes, the review process, and handling of test results and test records are detailed in Startup administrative instructions or other site administrative procedures. For the test summaries in Enclosure 2, the specific test document for each of the processes below will be referenced in the Startup Test Commitment Matrix (controlled by SMP-15.0), indicating each test summary requirement to be met using that test document.

Acceptance Test Instructions

As discussed in FSAR Section 14.2, acceptance tests are performed on components and systems which do not perform a safety-related function and are not required for safe shutdown and cooldown of the reactor under normal or upset conditions as described in the applicable sections of the FSAR. Technical information required for the preparation of acceptance tests is the same as for preoperational tests and is drawn from design drawings, and other technical documents which define the functional requirements and performance objectives for the system and components. Additional technical data may also be obtained from the various component vendors and other contractors as required. The procedure general format, requirements for test conduct, qualifications of both test preparers and reviewers, and handling of test records are identical to those for PTIs as discussed in FSAR Section 14.2. The test procedure and changes to it, as well as the test results receive the same review as for PTIs, except that the Joint Test Group is not in the review process. This process involves the performance of an independent technical review by qualified personnel prior to the approval by the Startup Manager. In addition, development of the test procedure involves a walkdown by the test preparer or reviewer.

Component Tests

As discussed in FSAR Section 14.2, component tests are performed on safety-related and nonsafety-related components and consist of generic processes such as instrument calibration, scheme checks, flushing, cleaning, and functional tests of individual components to demonstrate conformance with design requirements. Component testing will prepare individual components for system level testing and serve as the final test for those components which in themselves comprise a system, such as the Seismic Monitoring System, for which the calibration under the component test encompasses all the testing necessary.

Component tests are prepared and performed by personnel with qualifications identical to that for PTIs. The format of each component test is described in Startup administrative procedures. Technical information required for the preparation of component tests is the same as that described above for acceptance tests. Component test procedures and changes thereto are handled in the same manner as that described for acceptance test procedures with the exception of the walkdown. Test results are reviewed and approved by personnel with the highest level of certification (Level 3) within the Startup organization. Test records are handled in the same manner as PTIs.

Special Performance Test (SPTs)

SPTs are a hybrid document used when a system test requires more detailed instructions than contained in a generic component test, but not the level of detail contained in an ATI. As an example, SPTs have been used to prepare the diesel generator auxiliary systems for integrated diesel generator operation, and are planned for several fairly simple systems such as the Communications System.

The format of the SPTs is similar to that used for PTIs and ATIs as specified in Startup administrative procedures. SPTs and changes thereto, are handled in a similar manner as that described for acceptance test procedures. Test results are reviewed and approved by personnel with the highest level of certification (Level 3) within the Startup organization. Test records are handled in the same manner as PTIs. Special tests developed to satisfy the test summaries in Enclosure 2 will receive a walkdown, will be independently reviewed, and will be approved by the Startup Manager.

Work Orders (WOs)

WOs are used when the test activity is more of a maintenance task than a test, such as planned for performance of the static load testing of the Auxiliary Building Crane. The format and other requirements for WOs are described in Site Standard Practice 6.02, and are the normal method of performance of work on both safety related and nonsafety-related systems. The results of testing documented on WOs for the test summaries in Enclosure 2 will be independently reviewed and will be approved by the Startup Manager.

ENCLOSURE 2

TEST SUMMARIES

Secondary Process Sampling
Refueling Water Purification
Solid Waste Processing
Communications System
Seismic Instrumentation
Fuel Handling and Vessel Servicing Equipment
Ice Condenser
Intake Pump Station Ventilation

SECONDARY PROCESS SAMPLING SYSTEM
TEST SUMMARY

OBJECTIVE

To demonstrate the capability of the Process Sampling System to provide liquid and gas samples through the correct flow path from sample points in secondary systems.

PREREQUISITES

1. Plant conditions are established as necessary to facilitate drawing of liquid and gas samples from the required sampling locations.
2. Necessary tanks and sampling devices are available for receiving sample effluents and relief valve discharge.
3. Cooling water is available to sample coolers as required.
4. AC and DC electrical power supplies are available.
5. Required instruments and analyzers are calibrated.
6. Sample hood ventilation systems are operational.

TEST METHOD

1. Demonstrate proper system operation with regard to flow paths, flow capacity, and mechanical operability using grab samples and sample analyzers.
2. Verify the operation of the sample analyzers, sample coolers, sample selection valves, and pressure reducing and regulating equipment.
3. Verify operation of instrumentation, detectors, interlocks, and alarms.
4. Establish required purge times.
5. Demonstrate isolation valves operate properly on receipt of isolation signal.

ACCEPTANCE CRITERIA

1. Instrumentation and controls, including automatic isolation valves, interlocks, and alarms, operate properly in response to simulated or normal operating inputs as described in FSAR Section 9.3.2 and applicable design documents.
2. Samples from secondary systems can be satisfactorily collected from designated sample points described in FSAR Section 9.3.2.2.

REFUELING WATER PURIFICATION SYSTEM
TEST SUMMARY

OBJECTIVE

To demonstrate the capability of the Refueling Water Purification Subsystem of the Spent Fuel Pool Cooling System to provide required water flows to the refueling cavity, RWST, and transfer canal and verify proper operation of the purification loop.

PREREQUISITES

1. The refueling cavity, transfer canal, and RWST are filled with demineralized or borated water as required for portions of the test.
2. Spent fuel pool cooling demineralizer has been loaded as required for portions of the test.
3. Refueling water purification filters are installed as required for portions of the test.

TEST METHOD

1. Verify proper operation and actuation of pumps and valves in all operational modes and verify correct flows in the refueling water purification loops including:
 - the ability to transfer water to and from the transfer canal and refueling cavity.
 - the recirculation capabilities using the refueling water purification pumps and verify flow through the refueling water purification filters and spent fuel pit demineralizer.
2. Check operation of instrumentation, interlocks, and alarms for the Spent Fuel Pool Cooling System .
3. Verify no vortexing occurs during various modes of operation.
4. Install prefabricated spool pieces for the Spent Fuel Pool Cooling System as required for flood mode operation.

ACCEPTANCE CRITERIA

1. The hydraulic performance of the refueling water purification pumps meets or exceeds the design requirements as described in FSAR Section 9.1.3.
2. Automatic and manual controls, interlocks, and alarms operate in accordance with design documents.
3. All system flood mode preparations can be made in accordance with design requirements as described in FSAR Section 2.4.14.

SOLID WASTE PROCESSING SYSTEM
TEST SUMMARY

OBJECTIVE

To demonstrate the operability of the solid waste systems to collect and prepare disposable wet active wastes.

PREREQUISITES

1. All necessary supporting systems are operational.
2. Associated pumps, piping, and controls are operable.

TEST METHOD

1. Demonstrate the ability to receive, hold and transfer spent resins from their source to the bulk disposal outlet.
2. Verify proper operation of associated instrumentation, interlocks and alarms.

ACCEPTANCE CRITERIA

1. Wet active waste can be collected, transferred, and dewatered for shipment in accordance with design requirements as described in FSAR Section 11.5.
2. Automatic and manual controls, interlocks, and alarms operate in accordance with design drawings.

COMMUNICATIONS SYSTEM
TEST SUMMARY

OBJECTIVE

To demonstrate the capability of the Sound-Powered Telephone System and the Codes, Alarms and Paging (CAP) System to provide adequate communication coverage and audibility.

PREREQUISITES

1. Installation and construction testing of the Plant Communication and Evacuation Alarm Systems.
2. Plant equipment and systems are operating so as to create an ambient noise level that would be expected during normal plant operation.

TEST METHOD

1. Demonstrate proper functioning of the Sound-Powered Telephone System to provide intelligible reception and transmission of voice communications between assigned locations.
2. Verify proper functioning and audibility of the CAP System to provide paging and sound evacuation, fire, and medical alarms.

ACCEPTANCE CRITERIA

1. The codes, alarms, and paging system provides for audible paging and alarm signaling as described in FSAR Section 9.5.2.
2. The sound powered telephone system provides for audible communication between locations described in FSAR Section 9.5.2.
3. Evacuation, fire, and medical alarms, all clear signals and personnel pages are audible with normally expected background noise level.

SEISMIC INSTRUMENTATION
TEST SUMMARY

OBJECTIVE

To demonstrate the operability of installed seismic instrumentation and its capability to monitor and record.

PREREQUISITES

1. A calibrated seismic test signal is available as required by the vendor manuals.

TEST METHOD

1. Verify that the seismic test signal will activate the instrumentation as required at an acceptable level.
2. Demonstrate proper operation of seismic instrumentation components and alarms, including the triggering device, recording and playback system, and peak acceleration recorders.

ACCEPTANCE CRITERIA

1. The seismic instrumentation is capable of being aligned in accordance with the vendor technical manual.
2. The system instruments, including trip settings, demonstrate correct response and outputs in response to simulated input signals as described in FSAR Section 3.7.4.

FUEL HANDLING AND VESSEL SERVICING EQUIPMENT
TEST SUMMARY

OBJECTIVE

To demonstrate the operability of the fuel handling and vessel servicing equipment, polar crane, auxiliary building crane, and other miscellaneous equipment not associated with manipulation of spent fuel.

PREREQUISITES

1. The refueling cavity, refueling canal and spent fuel pool are clean and areas adjacent to the system equipment are clear.
2. Dummy assembly, test weights and test fixtures are available as required.
3. Load testing of the reactor head and internals lifting fixtures has been completed.

TEST METHOD

1. Verify operation of interlocks and proper setting of limit switches.
2. Demonstrate proper operation of crane and hoist controls including overspeed, overloads and travel limits, and warning devices.
3. Demonstrate hoist, bridge and trolley travel is acceptable.
4. Verify the operation of the hoist braking systems.
5. Perform a 125% static load test for the auxiliary hook of the 125 ton Auxiliary Building crane. Perform a full load operational test on the Reactor Building Polar Crane and the Auxiliary Building Overhead Crane.

ACCEPTANCE CRITERIA

1. Reactor Building polar crane and Auxiliary Building overhead crane controls and interlocks, and other miscellaneous controls and interlocks function in accordance with the appropriate design drawings and technical manuals.
2. Reactor Building Polar Crane and the Auxiliary Building Overhead Crane have been successfully load tested.

ICE CONDENSER SYSTEM
TEST SUMMARY

OBJECTIVE

To demonstrate the operability of the Ice Condenser associated air handling components, glycol circulation, refrigeration, floor cooling, and drain subsystems.

PREREQUISITES

1. All system components have been installed.
2. The Raw Cooling Water System and Demineralized Water System are available.
3. System relief valve setpoints have been verified.
4. Heat tracing is installed on Air Handling Unit drains and is available for use.
5. Air handling units, glycol circulation and refrigeration equipment is operable.

TEST METHOD

1. Demonstrate the proper operation of the refrigeration chiller packages, glycol circulation equipment, air handling units and the floor cooling and drain system.
2. Verify all system controls, interlocks, instrumentation, and alarms function properly to simulated or actual signals.

ACCEPTANCE CRITERIA

The Ice Condenser System components, controls, interlocks, instrumentation and alarms function in accordance with FSAR Section 6.7 and the appropriate design basis documents.

INTAKE PUMP STATION VENTILATION SYSTEM
TEST SUMMARY

OBJECTIVE

Demonstrate proper operation of the Intake Pump Station (IPS) ventilation equipment.

PREREQUISITES

1. System sufficiently complete to support testing.
2. AC electrical power supplies are available.

TEST METHOD

1. Demonstrate proper operation of the ventilation supply and exhaust fans, shutoff louvers, and dampers.
2. Verify all alarms and interlocks function properly.
3. Verify proper operation of the IPS unit and duct heaters.

ACCEPTANCE CRITERIA

Manual and automatic controls, interlocks, auto start features, and alarms function in accordance with design documents.

ENCLOSURE 2
ATTACHMENT

CROSS REFERENCE BETWEEN TEST SUMMARIES AND TEST PROCEDURE TYPE

Test Summary	Test Method Number					Acceptance Criteria Number		
	1	2	3	4	5	1	2	3
Process Sampling	ATI 43-03	ATI 43-03	ATI 43-03	ATI 43-03	ATI 43-03	ATI 43-03	ATI 43-03	---
Refueling Water Purification	SPT	SPT	SPT	WO	---	SPT	SPT	WO
Solid Waste Processing	ATI	ATI	---	---	---	ATI	ATI	---
Communications System	SPT	SPT	---	---	---	SPT	SPT	SPT
Seismic Instrumentation	CT	CT	---	---	---	CT	CT	---
Fuel Handling and Vessel Servicing	ATI	ATI	ATI	ATI	SPT/WO	ATI/SPT	WO	---
Ice Condenser	CT	CT	---	---	---	CT	---	---
Intake Pump Station	CT	CT	CT	---	---	CT	---	---

KEY

- ATI - Acceptance Test Instruction
- CT - Component Test Instruction
- SPT - Special Test Instruction
- WO - Work Order

ENCLOSURE 3

SUMMARY OF COMMITMENTS

1. TVA will develop and perform appropriate tests based on each of the test summaries provided in Enclosure 2 of this letter prior to fuel load. Justification for any tests, or portions thereof, which cannot be completed prior to fuel load will be provided to NRC using the process described for preoperational tests in FSAR Section 14.2.
2. Where acceptance tests or special tests are utilized to satisfy the test summaries in Enclosure 2, TVA will provide an information copy of the test instruction to NRC prior to beginning test performance.
3. The Startup and Test Commitment Matrix under SMP-15.0 will be updated to list test procedure cross references for the test summaries in Enclosure 2 by September 16, 1994.
4. Special tests developed to satisfy the test summaries in Enclosure 2 will receive a walk down, will be independently reviewed and will be approved by the Startup Manager.
5. The results of testing documented on WOs for the test summaries in Enclosure 2 will be independently reviewed and will be approved by the Startup Manager.

Items 1, 2, 4 and 5 will be completed prior to fuel load in accordance with the Startup Department Test schedule.