

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

5N 157B Lookout Place

APR 02 1990

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

Gentlemen:

In the Matter of the Application of) Docket No. 50-390
Tennessee Valley Authority)

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 - DESCRIPTION OF SYSTEM TESTING TO BE PERFORMED UNDER PRESTART TEST CORRECTIVE ACTION PROGRAM (CAP) PLAN

NRC's letter dated May 17, 1989, requested additional information regarding the WBN Prestart Test CAP Plan. TVA obtained clarification of the information requested during a discussion with NRC on February 22, 1990. Enclosed is the requested information.

Enclosure 1 provides a comparison between test objectives for Group 1 Prestart Program systems (Control Air, Essential Raw Cooling Water, Component Cooling Water) and test objectives for the Preoperational Test Program described in WBN's Final Safety Analysis Report (FSAR), Chapter 14, Table 14.2-1 for these same systems. Comparisons of test objectives for the remainder of prestart systems (Groups 2-6) will be provided by July 30, 1990.

Enclosure 2 provides a comparison between the Prestart Test Program and the Preoperational Test Program described in FSAR Chapter 14, Table 14.2-3 for regulatory guide compliance. In addition, any regulatory guide requirements identified during the above Groups 2-6 comparisons will be provided by July 30, 1990.

In the February 22, 1990 discussion, NRC requested that TVA provide assurance that plant operating and testing experience at other reactor facilities be included, as necessary, in the Prestart Test Program. TVA's Nuclear Experience Review (NER) Program ensures that experience at other nuclear facilities resulting in reports such as Institute of Nuclear Power Operations's (INPO) Significant Operating Experience Reports (SOERs) and Significant Event Reports (SERs), 10 CFR 21 reports, and NRC Information Notices is reviewed for applicability at WBN.

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This submittal contains no new commitments. If there are any questions, please contact R. J. Stevens at (615) 365-8650.

Very truly yours,

TENNESSEE VALLEY AUTHORITY


E. G. Wallace, Manager
Nuclear Licensing and
Regulatory Affairs

cc (Enclosures):

Ms. S. C. Black, Assistant Director
for Projects
TVA Projects Division
U.S. Nuclear Regulatory Commission
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852

Mr. B. A. Wilson, Assistant Director
for Inspection Programs
TVA Projects Division
U.S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

NRC Resident Inspector
Watts Bar Nuclear Plant
P.O. Box 700
Spring City, Tennessee 37381

Control Air System - System 32

FSAR Chapter 14 Associated Tests

Prestart Test Program

Title of Test No. TVA-26A
Compressed Air System
Excluding Control Air

Test Objectives
Summary of Testing
and Acceptance Criteria

This test verifies the operability per design requirements of the Compressed Air System, including associated Electrical and Control Systems. Check the station air compressor and associated components for compliance to design requirements. Specific checks on design temperature and pressures shall be conducted. Proper operation of the automatic cooling water isolation valves, service air isolation valves, and various alarms and indicators will be verified. The system extends from the air intake filters through the outlet of the control air header and the service air header.

In agreement.

Title of Test No. TVA-26B
Auxiliary Air Compressors

Test Objectives
Summary of Testing
and Acceptance Criteria

This test will verify the following items:

1. The air temperature.
2. The cooling water isolation valve function.
3. The air receiver relief valves design setpoints.
4. The auxiliary air compressor will start when the Control Air System pressure falls below 80 psig.
5. The proper operation of the annunciators and indicator lights.

In agreement except the air receiver relief valves design setpoints will not be tested. Relief valve testing and setpoint verification is included in the maintenance program. The auxiliary air compressor start setpoint will be as specified in the scoping document.

Refer to section 9.3.1 of FSAR.

Control Air System - System 32

FSAR Chapter 14 Associated Tests

Prestart Test Program

Title of Test No. TVA-27A
Control Air SystemTest Objectives
Summary of Testing
and Acceptance Criteria

This test verifies the operability of the Control Air System including components, instrumentation control equipment, applicable alarms, and setpoints. The control air dryers will be placed in service and capability to maintain dewpoint at -40°F at rated flow demonstrated. Actuation of the dewpoint alarm will be demonstrated. Control Air System cleanliness will be demonstrated with respect to oil, dryness, and particulate matter. Refer to section 9.3.1 of FSAR.

In agreement. Actuation of the moisture alarm will be demonstrated. There is no actual "dewpoint" alarm.

Control Air System - System 32

FSAR Chapter 14 Associated Tests

Prestart Test Program

Title of Test No. TVA-27B
Auxiliary Control Air System

Test Objectives
Summary of Testing
and Acceptance Criteria

This test will demonstrate the operability of the Auxiliary Control Air System including components, instrumentation, control equipment, applicable alarms and setpoints, and the ability of the auxiliary control air dryers to maintain the dewpoint at -40°F for rated flow. Compliance with Regulatory Guide 1.80 is demonstrated. The Control Air System piping will be visually inspected for abnormal vibration.

Closing of isolation valves between the two subsystems shall be verified when system pressure falls below 78 psig and upon loss of actuating air or electrical power. Proper operation of containment isolation valves in the control air lines is demonstrated.

The Auxiliary Control Air Subsystem supplies air only to safety-related devices. Check for correct load assignments and proper operation of all devices being supplied air from the Auxiliary Control Air Subsystem. Proper failure position of all devices being supplied air from the Auxiliary Control air Subsystem will be verified. Verify that a sample taken from any main control air header does not contain particulate matter which should ensure no liquid contaminants are present. Control Air System vibration is demonstrated to be within acceptable limits. Refer to section 9.3.1 of FSAR.

In agreement except section C.8.a of RG 1.80 will not be demonstrated. This is in agreement with the position stated in RG 1.68.3. C.8 and value/impact statement number 5.

In agreement. The subsystem isolation setpoint will be as specified in the scoping document.

In agreement. Correct load assignments and proper operation of all devices being supplied air from the Auxiliary Control air Subsystem will be checked as follows. Proper operation of all devices being supplied air from the auxiliary control air subsystem will be checked by the respective system prestart test. The output of the auxiliary control air compressors will be verified to meet the required flow as specified in the scoping document.

Essential Raw Cooling Water - System 67

FSAR Chapter 14 Associated Tests

Prestart Test Program

Title of Test No. TVA-18A
Essential Raw Cooling Water System

Test Objectives
Summary of Testing
and Acceptance Criteria

The test verifies the operability of the Essential Raw Cooling Water System including all components, instrumentation, control circuits, and applicable alarms and setpoints in the main supply and discharge headers. Other components located in piping connected to the main supply and discharge headers are included in preoperational test No. TVA-18B. Specifically, the test includes:

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| <p>1. Manual operation of ERCW pumps, strainers, and principal valves (motor and air operated) from both the control room and local panels.</p> <p>2. Automatic operation of ERCW pumps, strainers, and valves on applicable signals such as safety injection, loss of preferred power, and diesel generator startup.</p> <p>3. Flow tests to demonstrate acceptable ERCW supply header flow (one pump 11,300 gpm/two pumps 17,000 gpm).</p> <p>4. Manual and automatic operation of traveling screens and screen wash pumps.</p> | <p>1. In agreement except local (B) handswitches will not be tested. These switches do not meet the criteria for test as defined in the Prestart Corrective Action Plan Sections 4.1.1, 4.1.2, or 4.1.3. They are mainly used for operator convenience during local operations.</p> <p>2. In agreement.</p> <p>3. Individual pumps will be verified to meet flow requirements as specified in the scoping document.</p> <p>4. In agreement.</p> |
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Essential Raw Cooling Water - System 67

FSAR Chapter 14 Associated Tests

Prestart Test Program

Title of Test No. TVA-18A
Essential Raw Cooling Water System

Test Objectives
Summary of Testing
and Acceptance Criteria

5. System redundancy will be verified by checking the operation of each component from all control locations - Main Control Room, Auxiliary Control Room, and Local Panels - as applicable. Also, each component will be checked for proper operation with power supplied from both normal and emergency sources.
6. Pump and valve time response testing will confirm operating times for the component cooling heat exchanger C discharge valves do not exceed 60 seconds and will confirm ERCW pumps can achieve rated flows in 20.0 seconds.
5. In agreement except for local (B) handswitches - (Refer to Item 1 above).
6. Valve time responses will be verified to scoping document requirements. There is no individual pump time response requirement. System time response is verified by the engineered safeguards features actuation system testing.

System operation during the hot functional phase of the preoperational test program and subsequent startup testing will further demonstrate the capability of the ERCW System.

Essential Raw Cooling Water - System 67

FSAR Chapter 14 Associated Tests

Prestart Test Program

Title of Test No. TVA-18B
Essential Raw Cooling Water
Component Tests

Test Objectives,
Summary of Testing
and Acceptance Criteria

The ERCW valves, not required for flow tests in TVA-18A, will be functionally tested to demonstrate operation of the valves and their control circuits. This test will further demonstrate that opening and closing times of these valves do not exceed 60 seconds. Refer to section 9.2.1 of FSAR.

In agreement except for local (B) handswitches (refer to TVA-18A, Item 1).

Valve time response will be verified to scoping document requirements. Valves will not be tested in both directions unless it is a functional requirement as specified in the scoping document.

Title of Test No. TVA-18C
Essential Raw Cooling Water
Flow Balance

Test Objectives,
Summary of Testing
and Acceptance Criteria

The test verifies that ERCW flow can be balanced to provide flows required by components in the system. System instrumentation will be used, where available, to demonstrate minimum component design flows can be achieved. The test confirms the system can be operated without obvious undue vibration. The piping connected to the emergency gas treatment room coolers, auxiliary control air compressors, and upper containment vent coolers is checked for water hammer. ERCW pump baseline data is collected for the surveillance program. Refer to FSAR Section 9.2.1.2 for general description of system operation.

In agreement. Flow to various equipment will be demonstrated as specified in the scoping document.

Piping connected to the emergency gas treatment room coolers, auxiliary control air compressors, and upper containment vent coolers was checked and the water hammer issue resolved during preop testing. Since this is a one time test and there has been no piping modifications which would invalidate the results, no prestart testing is required.

Component Cooling System - System 70

FSAR Chapter 14 Associated Tests

Prestart Test Program

Title of Test No. TVA-20A
Component Cooling System
(Component Checkout)

Test Objectives
Summary of Testing
and Acceptance Criteria

The test verifies the operability of the Components Cooling System including components, instrumentation and control equipment, and applicable alarms and setpoints.

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| <p>1. Proper operation of system components including the component cooling pumps, surge tank, thermal barrier booster pumps, seal leakage return unit, and all motor and air-operated valves.</p> <p>2. Proper system response to simulated accident signals from either reactor unit.</p> <p>3. System motor-operated valves, excepting 1-FCV-70-207, 2-FCV-70-207, and 0-FCV-70-206 will be shown to open and to close in less than 60 seconds. The excepted valves will be shown to open and to close in less than 30 seconds.</p> <p>4. System redundancy will be verified by checking the operation of each component from all control locations - Main Control Room, Auxiliary Control Room, and Local Panels - as applicable. Also, each component will be checked for proper operation with power supplied from both normal and emergency sources. Refer to section 9.2.2 of FSAR.</p> | <p>1. In agreement.</p> <p>2. In agreement for unit 1 accident signals.</p> <p>3. In agreement. Valve time responses will be verified to scoping document requirements. Valves will not be tested in both directions unless it is a functional requirement as specified in the scoping document.</p> <p>4. In agreement except local (B) handswitches will not be tested. These switches do not meet the criteria for test as defined in the Prestart Corrective Action Plan section 4.1.1, 4.1.2, or 4.1.3. They are mainly used for operator convenience during local operations.</p> |
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Component Cooling System - System 70

FSAR Chapter 14 Associated Tests

Prestart Test Program

Title of Test No. TVA-20B
Component Cooling SystemTest Objectives
Summary of Testing
and Acceptance Criteria

System flow tests with Unit 1 trains A and B, Unit 2 trains A and B, or CCS pumps supplying Unit 1 equipment, will demonstrate minimum component design flows can be achieved during startup, normal operation, and shutdown modes of the plant operation. Automatic and manual operation of remote operated valves not tested in TVA-20A in component flow paths will be demonstrated. Valves will be shown to open and to close in less than 60 seconds. Manual and automatic operation of Component Cooling System thermal barrier booster pumps will be demonstrated. FSAR Section 9.2.2 describes the modes of operation which will be demonstrated. FSAR tables 9.2-3, 4, and 5 show the components which will receive cooling water and FSAR Table 9.2-6 shows minimum design flow rates.

In agreement.

System flow tests for Unit 2 trains A and B are excluded.

Automatic and manual operation of system valves required for Unit 1 operation will be verified from main and auxiliary station, as stated for TVA-20A.

Valve time responses will be verified to scoping document requirements. Valves will not be tested in both directions unless it is a functional requirement as specified in the scoping document.

Modes of operation and minimum flow requirements to various equipment will be demonstrated as specified in the scoping document.

PRESTART COMPARISON WITH PREOPERATIONAL TEST PROGRAM CONFORMANCE WITH REGULATORY GUIDES IDENTIFIED IN CHAPTER 14

PREOPERATIONAL TEST PROGRAM (Chapter 14)			PRESTART TEST PROGRAM
Regulatory Guide Number	Title	Section (s) Within Which Compliance Is Defined in FSAR	COMPARISON WITH CHAPTER 14
1.20	Comprehensive Vibration Assessment Program for Reactor Internals During Preoperational and Initial Startup Testing R2 (5/76)	Full compliance for non-prototype reactor internals see Sections 3.9.2.3, 3.9.2.4, 3.9.2.5, and 3.9.2.6	Excluded by the Corrective Action Program Plan (CAP) Exhibit A II.1.c because it is a one time test that was completed to satisfaction of the NSSS vendor. There have been no modifications that would warrant retest.
1.41	Preoperational Testing of Redundant Onsite Electric Power Systems to Verify Proper Load Group Assignments (3/16/73)	Section 8.1.5.3	In agreement
1.52	Design, Testing, and Maintenance Criteria for Post-Accident Engineered-Safety-Feature Atmosphere Cleanup System Air Filtration and Adsorption Units of Light-Water-Cooled Nuclear Power Plants R2 (3/78)	Tables 6.5-1, 6.5-2, 6.5-3, and 6.5-4	In agreement
1.68	Preoperational and Initial Startup Test Programs for Water-Cooled Power Reactors (11/73)	Full Compliance	In agreement except for the exclusions identified in the CAP Exhibit A

PRESTART COMPARISON WITH PREOPERATIONAL TEST PROGRAM CONFORMANCE WITH REGULATORY GUIDES IDENTIFIED IN CHAPTER 14

PREOPERATIONAL TEST PROGRAM (Chapter 14)			PRESTART TEST PROGRAM
Regulatory Guide Number	Title	Section (s) Within Which Compliance Is Defined in FSAR	COMPARISON WITH CHAPTER 14
1.79	Preoperational Testing of Emergency Core-Cooling System for Pressurized Water Reactors R1 (9/75)	Section 6.3.4.1	<p>Section C-1-b (2) as modified by FSAR section 6.3.4.1 will not be repeated. The ability to take suction from the sump was adequately demonstrated and no modifications have been made that would invalidate the test.</p> <p>Section C-1-c (2) and C-2-b (2) concerning valve operation at maximum differential pressure is covered by MOVATS, this is as addressed in the CAP Exhibit A III.A.1.c.</p> <p>Section C-2-c (5) concerning motor currents, pumps were previously tested under loaded conditions to ensure their capability to perform without load problems this is addressed in the CAP Exhibit A III.A.1.c.</p>
1.80	Preoperational Testing of Instrument Air Systems (6/74)	Section 9.3.1.4	In agreement except the requirement to conduct loss of air tests from positions other than normal per C.8.a will not be performed. This is in agreement with the Regulatory Position presented in 1.68.3 C.8 and value/impact statement number 5.

PRESTART COMPARISON WITH PREOPERATIONAL TEST PROGRAM CONFORMANCE WITH REGULATORY GUIDES IDENTIFIED IN CHAPTER 14

PREOPERATIONAL TEST PROGRAM (Chapter 14)			PRESTART TEST PROGRAM
Regulatory Guide Number	Title	Section (s) Within Which Compliance Is Defined in FSAR	COMPARISON WITH CHAPTER 14
1.108	Periodic testing of Diesel Generator units used as onsite Electrical Power Systems at Nuclear Plants	NA	In agreement
1.140	Design, Testing and Maintenance Criteria for Normal Ventilation Exhaust System Air Filtration and Absorption units of light water cooled Nuclear Power Plants	NA	In agreement