

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

October 21, 1985

Director of Nuclear Reactor Regulation
Attention: Ms. E. Adensam, Chief
Licensing Branch No. 4
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Ms. Adensam:

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

Enclosed are changes to the Watts Bar Nuclear Plant (WBN), units 1 and 2 Final Safety Analysis Report (FSAR) which are necessary as a result of TVA's verification that the as-built plant is in conformance with the description in the FSAR as amended. These changes include revisions to Table 14.2-1 concerning preoperational testing of the additional diesel generator. These changes will be included in the next amendment (56) to the WBN FSAR.

If there any questions, please get in touch with C. J. Riedl at FTS 858-2696.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. A. Domer

J. A. Domer, Chief
Nuclear Licensing Branch

Sworn to and subscribed before me
this 21st day of Oct. 1985

Paulette H. White
Notary Public
My Commission Expires 8-24-88

Enclosure

cc: U.S. Nuclear Regulatory Commission (Enclosure)
Region II
Attention: Dr. J. Nelson Grace, Regional Administrator
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

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LIST OF PREOPERATIONAL TESTS
(Sheet 216)

Title of Test No. TVA-71Test PrerequisitesTest Objectives Summary of Testing
and Acceptance Criteria

*Post Accident Radiation
Monitoring System

Verify that all equipment associated with the shield building vent, condenser vacuum pump exhaust, and steam generator discharge radiation monitors is installed and operational. Each monitor channel must be completely calibrated.

This preoperational test is to verify the operability of the subject radiation monitors.

The following applies to the shield building vent, condenser vacuum pump exhaust and steam generator discharge radiation monitors:

This preoperational test will demonstrate that

- A. Channel radioactivity measurements are available in the mcr and that the interrogative features of each monitor are operational.
- B. Monitor check sources are operable.
- C. Alarm setpoints may be set with the required accuracy over the monitor range.
- D. The high, high-high, and loss of counts (failure) alarms are operational.

Also, the preoperational test will demonstrate that the shield building vent and condenser vacuum pump exhaust monitors flow adjustment and air purging mechanisms are operational.

In addition, the preoperational test will verify that the sample air volume flow rate is automatically adjusted to maintain isokinetic conditions as the air volume flow rate in the effluent duct varies.

All procedures for taking grab samples from the shield building vent monitoring equipment will be tested to verify their adequacy.

*Preoperational test to be completed after fuel loading.

Revised by Amendment 55

Add - TVA Tests: 73A, 73B, 73C, 74A, 74B, 74C, 74D, 74E and 74F
for the additional ^{diesel} generator.

TABLE 14.2-1

LIST OF PREOPERATIONAL TESTS
(Sheet 217)

Title of Test No. IVA-73A

Test Prerequisites

Test Objectives Summary of Testing ..
and Acceptance Criteria

Additional
Fifth Diesel Generator - Onsite
AC Power Distribution System Test
(6.9kV Diesel Generator Board C-S,
480V Diesel Auxiliary Supply Board
C-S)

additional
The ~~fifth~~ diesel generator
standby ac power system
including the diesel
generator set and supporting
auxiliaries, the 120V vital
ac system and the 125V dc
control power system for
operation of control, protective
and instrumentation circuits
shall be operational. All
construction checks and
functional tests of all circuit
breakers, relays, and control
circuits shall have been completed.

The test for the 6.9kV diesel generator board
C-S and 480V diesel auxiliary supply board
C-S will verify the proper operation of the
protective relaying and that the interlocks
and transfer schemes perform under manual
and automatic conditions. The acceptance
criteria will be that the protective relaying and
all interlock and transfer schemes operate
properly.

TABLE 14.2-1.

LIST OF PREOPERATIONAL TESTS
(Sheet 218)

Title of Test No. TVA-73B

Test Prerequisites

Test Objectives Summary of Testing
and Acceptance Criteria

Additional
Fifth Diesel Generator - Onsite AC
Power Distribution System Test
(Diesel Generator Load Sequence)

additional
The fifth diesel generator standby ac power system including the diesel generator set and supporting auxiliaries the 120V vital ac system and the 125V dc control power system for operation of control, protective and instrumentation circuits shall be operational. All construction checks and functional tests of all circuit breakers, relays, and control circuits shall have been completed. The plant systems and components which are tripped from or sequence onto the heaviest loaded 6.9kV and 480V shutdown boards are available for operation. *additional* The fifth diesel shall be aligned to the heaviest loaded 6.9kV shutdown board.
Pre op test TVA 73C has been conducted

Confirm proper startup operation of the *additional* (C-S) diesel generator upon loss of all ac voltage. Demonstrate the *Additional* (C-S) diesel generator's capacity and capability while at full load temperature to supply power during the trained design accident loading sequence to design load requirements and verify that voltage and frequency are maintained within required limits. Demonstrate the ability to synchronize the diesel generator with offsite power while the unit is connected to the above design accident load. Transfer this load to offsite power, isolate the diesel generator unit, and restore it to standby status. The acceptance criteria will be that all of the above requirements are met in accordance with the design and regulatory commitments made in section 8.1 of the FSAR.

TABLE 14.2-1.

LIST OF PREOPERATIONAL TESTS

(Sheet 219)

Title of Test No. TVA-73C

Test Prerequisites

Test Objectives Summary of Testing
and Acceptance Criteria

Additional
Fifth Diesel Generator - Onsite AC Power
Distribution System Test (Interface,
Qualification)

Additional
The ~~fifth~~ diesel generator standby -
ac power system including the diesel
generator set and supporting auxiliaries
the 120V vital ac system and the
125V dc control power system for
operation of control, protective and
instrumentation circuits shall be
operational. All construction checks and
functional tests of all circuit breakers,
relays, and control circuits shall have
been completed. Preop tests TVA-73A,
74A, 74B, 74C, and 74D^{and 74F} are completed
except for those portions that may
be run concurrent with this test.
A unit 1 or unit 2 condensate system
shall be available for operation.

Demonstrate the diesel generator's capability
to carry its short time rating for two hours
Immediately following this 2-hour period
demonstrate the diesel generator to carry
its continuous rating for 22 hours.
Demonstrate the proper operation of the
diesel generator and its controls during
the load shedding of its largest single load
and total load. Demonstrate twice the ability
of the diesel generator and its controls to
accept a load that is 10 percent greater than
the most severe single step load without
experiencing instability. Perform 23 start
and load tests for the diesel generator unit

The following tests shall be performed with
the ~~additional~~ diesel generator as a
replacement for each of the trained diesel
generators:

Demonstrate that the capability of the
additional diesel generator unit is not
impaired during periodic testing. All
remote control, protective, and
annunciation circuits that are used to
interface the fifth diesel generator
to the onsite ac auxiliary power system shall
be demonstrated to be operative. Confirm
proper startup operation of the *additional*
diesel generator upon loss of all ac voltage.
While performing the loss of all ac voltage
starting tests, disconnect all other onsite
ac power sources not under test and verify an
absence of voltage at the other onsite buses

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TABLE 14.2-1.

LIST OF PREOPERATIONAL TESTS
(Sheet 220)

Title of Test No. TVA-73C

Test Prerequisites

Test Objectives Summary of Testing ..
and Acceptance Criteria

Verify the operability of the safety injection-diesel generator common start circuit. The operability of each of the trained diesel generators in their original positions shall be demonstrated. The acceptance criteria will be that all of the above requirements are met in accordance with the design and regulatory commitments made in section 8.1 of the FSAR.

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TABLE 14.2-1

LIST OF PREOPERATIONAL TESTS
(Sheet 221)

Title of Test No. TVA

Test Prerequisites

Test Objectives Summary of Testing and Acceptance Criteria

the Additional Diesel Generator Building

Additional

79A
Diesel Generator and Supporting Auxiliaries (Diesel Generator Fuel Oil System)

Construction testing and instrument calibration shall have been completed. System cleaning, flushing, and hydrostatic testing of fuel storage tanks and fuel oil piping shall have been completed. The flameproof vents have been installed and function properly. All oil filters in piping required for this test have been installed. ~~The Diesel Generator Building~~ Fire Protection System must be operable before performing Fuel Oil System tests.

ADDITIONAL

- 1 To demonstrate the ability of (ADGB) Fuel Oil Transfer pump to deliver fuel oil from 7-Day tank CS to 7-Day tank 1A-~~1A~~
~~at the rate of 200 gpm~~
- 2 To demonstrate the ability of Yard Fuel Oil Transfer Pump to deliver fuel oil from Yard Storage tank No. ONE to 7-Day tank CS.
- 3 To demonstrate the ability of skid mounted transfer pumps OC-1 and OC-2 to ~~del~~ day tanks 1 and 2 ~~at the rate of 100 gpm~~
ADGB
- 4 To demonstrate proper functioning of interlocks, automated control circuitry, alarms and annunciation associated with the above transfer capabilities. U

ACCEPTANCE CRITERIA FOR THE SYSTEM IS THE ABILITY TO PERFORM THE ABOVE AND IN ACCORDANCE WITH SECTION 9.5.4 OF THE FSAR.

TABLE 14.2-1

LIST OF PREOPERATIONAL TESTS
(Sheet 222)

Title of Test No. IVA- ^{74B} 242	Test Prerequisites	Test Objectives Summary of Testing and Acceptance Criteria
<p>ADDITIONAL Diesel Generators and Supporting Auxiliaries (Diesel Generator Starting Air System)</p>	<p>Construction testing and instrument calibration shall have been completed. System cleaning, flushing and hydrostatic testing of the air receivers and Starting Air System piping shall have been completed.</p>	<p>1 To verify the ability of the diesel starting air compressors to maintain air receiver pressure between 200 psig and ²⁴⁰250 psig and to annunciate when air pressure in the air receivers or downstream of the pressure reducer decreases below the alarm setpoint.</p> <p>2 To verify that the diesel generator air start system interlocks operate properly to cycle the engaging air for 3 cycles when no one pair of the air start motors engage on a start signal then lock out the diesel on a fail to start signal after 5 seconds, after initiation of start signal</p> <p>3 To verify that the air receivers can supply sufficient air to provide five diesel starts without recharging, then to verify that the air compressor can recharge one air receiver to ²⁴⁰250 psig within 30 minutes after the five unsuccessful starts.</p>

Acceptance criteria for system is the ability to perform the above requirements and in accordance with section 9.5.6 of PSAR.

WBNP
~~TABLE 14.2-1~~
TABLE 14.2-1

LIST OF PREOPERATIONAL TESTS

~~TABLE 14.2-1~~
(Sheet 223)

Title of Test No. TVA-74C
(ADG)

Additional Diesel Generator and
Supporting Auxiliaries
(ADG Building Heating
and Ventilating System)

Test Prerequisites

Construction testing and instrument
calibration shall have been completed.
Cleaning of the ADG Building Heating
Ventilating System shall have been
completed.

Test Objectives Summary of Testing
and Acceptance Criteria

Verify the capability of the engine room
ventilation fans and associated dampers
to start and operate on a diesel genera-
tor start signal.

Acceptable system performance will be
demonstrated if the ventilation system
maintains the engine room temperature
within design and manufacture limits
during any diesel testing and/or opera-
tion. Refer to section 9.4.5 of FSAR.

9.4.5.2

LIST OF PREOPERATIONAL TESTS

(Sheet 224)

74D
Title of Test No. TVA-140Test PrerequisitesTest Objectives Summary of Testing
and Acceptance CriteriaDiesel Generator and
Supporting Auxiliaries
(125V Control and Field
Flashing Batteries)

Construction testing and instrument calibration shall have been completed. The Diesel Generator Building Fire Protection system must be operable. The 120V ac lighting supplies to the wall receptacles shall have been completed. The showers and eye-wash facilities must be functional.

Additional

1. The battery will be tested in accordance with IEEE 450-1980. Acceptability will be per that standard.

2. Determine the battery's capacity as a percent of the manufacturer's rating. (100% or better is acceptable).

3. Verify that the charger will recharge the battery to its fully charged state while supplying ~~emergency and~~ normal loads. Determine the time required for the recharge.

4. Verify that the battery system's alarms and instrumentation perform as designed.

TABLE 14.2-1

LIST OF PREOPERATIONAL TESTS
(Sheet 225)

^{74E}
Title of Test No. TVA-74E
ADDITIONAL
Diesel Generator and
Supporting Auxiliaries
(Diesel Generator
Functional Tests)

Test Prerequisites

Construction testing and instrument
calibration shall have been completed.

Test Objectives Summary of Testing
and Acceptance Criteria

- 1 Preoperational Test Instruction TVA-74E is intended to verify proper functioning of the D.C. control circuitry for Diesel Generator C-S as depicted on TVA drawings 45W760-82-11 thru 16. Remote circuits will be tested by operating the remote control relays using temporary switches from the Additional Diesel Generator Building (ADGB) and verifying that subsequent functions perform as designed. Testing in ~~11~~ TVA-73C will complete the remote control verification by proving each set of remote switches will operate their remote control relays.
- 2 All alarm initiating devices for DG C-S will be operated (where practical) or jumpered to verify local annunciation. Additionally, continuity will be verified to the final local terminal block which sends closed contact signals to remote annunciation panels in the Main and Auxiliary Control Rooms, ~~23~~ TVA-73C will then jumper these same terminal block terminals (simulating previously proven continuity) and verify that remote annunciation is received at the remote panels.
- 3 Operation of the ^{test}ERCW valves and minimum flow thru each path will be verified in this ~~test~~. This will be the only interaction with any part of the unit ONE configuration as a result of this test.

System performance will be deemed acceptable if the diesel generator and supporting auxiliary parameters approach the ~~Brush~~ ^{Vendor} factory test data and per section 9.5.8.4 of FSAR.

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WBNP-

TABLE 14.2-1

LIST OF PREOPERATIONAL TESTS
(Sheet 22)

Title of Test No. TVA-74F

Test Prerequisites

System construction complete and construction testing of system components complete. All control circuits and instrumentation shall have been checked and calibrated. ~~Fire Protection System~~
~~operational in operation.~~
Cleaning, flushing, and hydrostatic testing of system piping is completed.

Additional Fire Protection Diesel Generator Building

Test Objectives Summary of Testing and Acceptance Criteria

The objective of this test is to verify the adequacy and reliability of the Fire Protection System. This test will

1) demonstrate the capability of the system to supply fire protection water or water-foam at adequate

all

pressures to ~~protected~~ areas of the ~~Building~~. 2) demonstrate system response to various fire actuation alarms.

3) verify that vibration of the system determined by ~~visual observation~~ is within acceptable limits.

The system will be tested in all design operational modes (i.e., automatic, manual-electric, and manual operations).

Testing will be conducted by measuring the ~~actual flow and~~ pressure of water through the system piping to specified fire hazard areas. Proper operation of applicable alarms and associated control equipment will be verified.

Physical installation and Construction testing of ventilation systems that utilize fire dampers must be complete. This includes verifying that fire dampers are properly installed in fire rated barriers.

To insure operability of the Ventilation System fire dampers, the following checks must be performed:

1. Manual actuation of all fire dampers.
2. Fusible link location in air streams.

Note: Additional Comment

Note: Additional Comment

Additional for the Diesel Generator Bldg
Additional Diesel Generator Bldg

TABLE 14.2-1
LIST OF PREOPERATIONAL TESTS
Sheet 227

COMPUTED DATE
CHECKED DATE
Title of Test No. TVA-74G

Test Prerequisites

Test Objectives Summary
of Testing and Acceptance
Criteria

Additional Diesel Generator
Building - Plant Communications
Systems

Installation, construction
testing of the com-
munications systems,
and Preoperational Tests
TVA-11A and TVA-11B
must be completed

This test will verify
the adequacy of the
Plant Emergency Sound
powered Telephone
Communications System
and the Plant Evacuation
Alarm System in the
Additional Diesel
Generator Building
per FSAR section
9.5.2.2.