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

November 16, 1981

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

Dear Ms. Adensam:

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

Enclosed are TVA responses (Enclosure 1) to NRC questions 212.118, 212.119, 112.39, 112.40, and 413.18 on Watts Bar Nuclear Plant. Enclosure 2 provides a comparison of specific Watts Bar and Sequoyah Nuclear Plants Preoperational and Startup Tests requested informally by the NRC on October 7, 1981.

If you have any questions concerning this matter, please get in touch with D. P. Ormsby at FTS 858-2682.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

L. M. Mills, Manager
Nuclear Regulation and Safety

Sworn to and subscribed before me
this 16th day of Nov. 1981

Bryant M. Lowery
Notary Public
My Commission Expires 4/4/82

Enclosures

B001
S/1

ENCLOSURE 1

WATTS BAR NUCLEAR PLANT

RESPONSES TO NRC QUESTIONS

212.118
212.119
112.39
112.40
413.18

212.118 Question:

Recently, concern has been raised about control of the charging pump suction during normal operation for PWRs. This concern postulates that a plant normally takes suction from the volume control tank (VCT), and that when high level is sensed in the VCT, letdown flow (from the RCS) is diverted to a hold up tank (instead of the VCT); whereas, if low level is sensed-in the VCT, charging pump suction is switched to the refueling water storage tank as the source. The concern is related to the level indication which is only control grade, and the consequences if this level instrumentation should fail giving a false 'high' indication. This could lead to damage of the charging pumps (due to loss of suction inventory and failure to make the protective suction switch) and thereby compromise both the capability to shut down the ECCS capability to respond to the full range of accidents. Discuss the status of the watts Bar design with respect to this issue.

Response

The control of the Watts Bar charging pumps suction has a design of the functional logic that is basically the same as the generic case reported by Westinghouse (reference Westinghouse letter NS-TMA-2451 dated May 21, 1981 from T. M. Anderson, Westinghouse, to V. Stello, NRC. The Watts Bar design is such that the operator has more time for corrective action than in the generic case analyzed for the report. Specific information on the Watts Bar design was provided in response to question 450.1 forwarded to the NRC by letter dated October 26, 1981 from L. M. Mills to E. Adensam.

212.119 Question:

For a postulated boron dilution event while shutting down the plant, the applicant relies on an alarm from the source range neutron flux detector. We require that the applicant provide procedures specifying a resetting schedule for the alarm which will assure that the operator will be alerted with at least 15 minutes from time of alarm for response.

Response:

Watts Bar Instrument Section will have a surveillance instruction (high flux adjustment after shutdown) that will require the high flux at shutdown alarm setting to be adjusted no higher than 1/2 decade above the count rate 30 minutes after plant shutdown. This procedure will be in place before fuel loading.

112.39 Question:

Due to a long history of problems dealing with inoperable and incorrectly installed snubbers and due to the potential safety significance of failed snubbers in safety-related systems and components, it is requested that maintenance records for snubbers be documented as follows:

Preservice Examination

A preservice examination should be made on all snubbers listed in tables 3.7-4a and 3.7-4b of standard technical specifications 3/4.7.9. This examination should be made after snubber installation but not more than six months prior to initial system preoperational testing and should as a minimum verify the following:

1. There are no visible signs of damage or impaired operability as a result of storage, handling, or installation.

2. The snubber location, orientation, position setting, and configuration (attachments, extensions, etc.) are according to design drawings and specifications.

3. Snubbers are not seized, frozen, or jammed.

4. Adequate swing clearance is provided to allow snubber movement.

5. If applicable, fluid is to the recommended level and is not leaking from the snubber system.

6. Structural connections such as pins, fasteners, and other connecting hardware such as lock nuts, tabs, wire, cotter pins are installed correctly.

If the period between the initial preservice examination and initial system preoperational test exceeds six months due to unexpected situations, reexamination of items 1, 4, and 5 shall be performed. Snubbers which are installed incorrectly or otherwise fail to meet the above requirements must be repaired or replaced and reexamined in accordance with the above criteria.

Preoperation Testing

During preoperational testing, snubber thermal movements for systems whose operating temperature exceeds 250°F should be verified as follows:

a. During initial system heatup and cooldown, at specified temperature intervals for any system which attains operating temperature, verify the snubber expected thermal movement.

b. For those systems which do not attain operating temperature, verify via observation and/or calculation that the snubber will accommodate the projected thermal movement.

c. Verify the snubber swing clearance at specified heatup and cooldown intervals. Any discrepencies or inconsistencies shall be evaluated for cause and corrected prior to proceeding to the next specified interval.

The above described operability program for snubbers should be included and documented by the preservice inspection and preoperational test programs.

The preservice inspection must be a prerequisite for the preoperational testing of snubber thermal motion. This test program should be specified in Chapter 14 of the FSAR.

Response:

The snubber preoperational test program will be included in the description of tests W-1.7, 'RCS Thermal Expansion' and TVA-23A, 'Thermal Expansion of Systems (Main Steam Piping).' Attached are revised sheets 6 and 83 of the table, making appropriate changes and additions. The details of the program will be contained in the test document, which in accordance with the FSAR, is to be available to NRC at least one month before performance of the test.

The preservice portion of the proposed NRC program is within the scope of the construction tests which are referenced from Chapter 14 to Chapter 17, Section 17.1. Table 17.1A-2, Section E, as Criterion XIV with reference to DEC-QAP-14.01, lists 'Inspection and Test Status.' The description includes, '(This procedure applies to those inspections and tests performed on quality assurance structures, systems, and components (items) during the construction phase of nuclear power plants.)' No specific procedure identifications are provided; however, the specific instruction has been identified to NRC in the response to question 112.39 at the meeting with NRC in Knoxville on May 28, 1981. TVA is evaluating the inspection instruction to ensure activities are being performed to protect the snubbers from damage after installation.

TABLE 14.2-1 (Continued)

LIST OF PREOPERATIONAL TESTS

Test No.	Title of Test	Test Prerequisites	Test Objectives Summary of Testing and Acceptance Criteria
W-1.7	RCS Thermal Expansion	Test prerequisites established by Heatup Test. Inspection of measurement areas complete and access provided. All pertinent supports, hangers, snubbers, and restraints installed and inspected.	Test objective is to measure the movement of the RCS piping and components due to thermal expansic to verify that no interferences occur and to determine whether a components return to their origina positions on cooling. Measurement are made at ambient temperature, at approximately 250, 350, 450, 540 [o] F and after cooldown in coordination with other hot functional tests. These measure-ments are conveniently made at the steady state temperature plateaus for instrumentation cross calibration and are made to the precision commensurate with the acceptance criteria. All piping will be observed for possible unanticipated interferenc Snubber movement will be measured and compared to defined acceptanc criteria.
W-1.8	*Reactor Coolant Flow Coastdown	Initial core loading completed and reactor plant at hot shutdown conditions with all control rod assemblies at bottom position. Rod drop time measurement test (W-5.3) complete and rod having the slowest drop time identified (this one rod will be used for test).	Test objectives are to measure the rate at which reactor coolant flow rate changes subsequent to various reactor coolant pump trips and to measure various delay times associated with the loss of flow accident. Measurements are made by tripping coolant pumps from various

*Preoperational test to be completed after core loading.

TABLE 14.2-1 (Continued)

LIST OF PREOPERATIONAL TESTS

Test No.	Title of Test	Test Prerequisites	Test Objectives Summary of Testing and Acceptance Criteria
TVA-23A	*Thermal Expansion of Systems (Main Steam Piping)	The main steam system must be sufficiently complete to receive and dump steam. All pertinent supports, hangers, snubbers, and restraints must be installed and inspected. Measurement instrumentation must be installed. The thermal expansion measurements should be made in conjunction with the RCS Heatup and RCS Thermal Expansion tests.	Test objective is to measure and observe the movement of the secondary system piping and components because of thermal expansion to verify that no interferences occur and to determine whether all components return to their original positions on cooling. Measurements are made at the steady state conditions and all piping will be observed for possible interferences. The final ambient temperature measurement will ensure no permanent deformation has occurred The movement of selected snubbers will be recorded and evaluated.
TVA-23B	*Thermal Expansion of Piping Systems (Feedwater Piping)	The feedwater system must be operational. All pertinent supports, hangers, snubbers, and restraints must be installed and inspected. Measurement instrumentation must be installed. Thermal expansion measurements should be made in conjunction with the RCS Heatup and RCS Thermal Expansion tests and/or power plateaus.	Test objective is to measure and observe the movement of the secondary system piping and components because of thermal expansion to verify that no interferences occur and to determine whether all components return to their original positions on coolir Measurements are made at the stead state conditions and all piping will be observed for possible interferences. The final ambient temperature measurements will ensu no permanent deformation has occurred. The movement of selecte snubbers will be recorded and evaluated.

*Preoperational test to be completed after fuel loading.

112.40 Question:

10 CFR 50.55a has recently been revised with respect to pump and valve inservice testing requirements (See October 9, 1979 Federal Register, pp. 57912-4).

Provide a program for initial 120 month inservice testing of pumps and valves, as required by 10 CFR 50.55a(g)(4)(i). The applicable code for this inspection interval which would be required by 10 CFR 50.55a(g)(4)(i) is the Code endorsed by 10 CFR 50.55a(b)(2) 12 months prior to the date of issuance of your OL. Effective November 1, 1979, 10 CFR 50.55a(b)(2) endorsed the 1977 Edition with all agenda through Summer 1978. We therefore recommend that your program be based on the 1977 Edition with all agenda through Summer 1978. Your program should indicate which code requirements are impractical to meet together with documentation for justification why relief is necessary.

Response:

The Watts Bar Nuclear Plant ASME Section XI Inservice Pump and Valve Test Program was submitted to the NRC by letter dated October 30, 1981 from L. M. Mills to E. Adensam.

413.18 Question:

Our review of recent licensee event reports disclosed that a significant number of reported events concerned the operability of hydraulic and mechanical snubbers. Provide a description of the inspections or tests that will be performed following system operation to assure yourself that the snubbers are operable. These inspections or tests should be performed preoperationally if system operation is accomplished prior to generation of nuclear heat.

Response:

See the response to Question 112.39.

ENCLOSURE 2

WATTS BAR NUCLEAR PLANT UNITS 1 AND 2

COMPARISON OF SPECIFIC WATTS BAR AND

SEQUOYAH NUCLEAR PLANT TESTS

RESPONSES:

TVA-2 Subsequent to the writing of the SNP ILRT, TVA updated its Type A test equipment to include more accurate sensors and a computer. Based on this new equipment, the customary test duration of 24 hours can be reduced to 8 hours because the increased instrument accuracy and the use of a computer to calculate the Type A leak rate allows a more accurate determination of the leak rate in a much shorter amount of time. Furthermore, since the computer gives a much shorter scantime, many more data points can be collected.

The technical basis for a reduced Type A test duration was officially submitted to the NRC for Browns Ferry Nuclear Plant in a letter from L. M. Mills to H. R. Denton dated April 15, 1980. The data and test method are likewise applicable to Watts Bar Nuclear Plant. Therefore, the WBNP ILRT was developed to reflect this same philosophy for Watts Bar.

For this reason, the WBN FSAR states that an 8-hour Type A test will be performed whereas the earlier SNP FSAR still refers to the customary 24-hour test duration.

TVA-3 Test Objective 4 - The airlock acceptable leak rate cannot exceed the value of 0.05 La as stated in WBNP Technical Specification 3.6.1.3. The WBNP FSAR is being modified to include this leak rate value. See attachment.

Test Objective 5 - The airlock door seal leak rate cannot exceed the value of 0.01 La at 6 psig as stated in Technical Specification 4.6.1.3. The pressure range of 15.0 to 16.8 psig as stated in the WBN FSAR is outdated. See attachment.

The discrepancy in pressures is the result of a permanent exemption from Appendix J to 10CFR50 granted by the NRC. The WBNP FSAR is presently being changed to reflect the new test pressure. Additionally, the WBNP FSAR is being modified to include the leak rate value.

W-7.1 This test was identified as TVA-7.1 in the question.

The neutron flux signal response time is measured in Watts Bar Preop Test W-7.1 in the same manner as it was measured at SNP. The test description in Table 14.2-1 was expanded to indicate the fact that the neutron detectors themselves are exempt from this test. There is only signal cable between the detectors and the neutron flux channel electronics and the delay time in this cable is insignificant with respect to the overall channel response time. A problem in this area would affect channel operation and would be detected during the channel checks required by the technical specification before a significant degradation in response time occurred.

TVA-9A
TVA-9B
TVA-9C Refer to TVA resonse to WBNP question 413.12-13, part ee.

TVA-11A This was a typographical error and will be corrected by a revision of the FSAR for WBNP. See attachment.

TVA-13B a. The TVA-13 series of tests will verify power train independence. The detail test number has not been assigned.

b. WBNP TVA-13B test addresses the same test objectives that SQN TVA-13B1 and TVA-13B2 do. See attachment.

TVA-13C See the latest revision for an updated test summary.

TVA-13D The diesel generator capacity during periodic testing is being verified in WBNP TVA-13C. Therefore, WBNP TVA-13D is not required.

TVA-14E An abstract of TVA-14E was included in Table 14.2-1, Sheet 47, Amendment 42. This abstract was incorrectly deleted and will be reinserted. See attachment.

TVA-18 The Auxiliary Essential Raw Cooling Water (AERCW) System is not included in this test because WBN does not have AERCW System.

TVA-26A
TVA-26B See the attached revised FSAR Table 14.2-1 test objectives for tests.

TVA-27B Vibration testing is included in this test, and the abstract will be modified accordingly.

TVA-29 The Test Instructions (TVA-29) for this sytem are basically the same for SNP and WBNP even though there are differences in the FSAR writeups. The test writeup in WBNP FSAR is more accurate and a better description of the tests performed on the SNP's Steam Generator Blowdown (SGB) System and the test to be performed on WBNP SGB System than the SNP description. The protective devices are referred to in the SNP FSAR, Table 14.1-1, are valves, which are covered by WBNP FSAR's testing criteria, "Proper operation of all valves and pumps will be verified."

TVA-43A The test abstracts will be modified to include testing

TVA-43B of each hoist brake to independently stop a rated load from fill, lowering speed within a distance of 6 inches.

TVA-45A
TVA-45B1
TVA-45B2
TVA-45C

The preoperational test instructions (PTIs) for SNP and WBNP are identical in philosophy and general format. The manual operation of valves is assured by verifying valve position. The SNP PTIs required observing and recording the pump discharge pressure for future reference only. Since the sumps covered by WBNP test 45-series are considered noncritical and also have high level alarms provided, the requirement to record pump discharge pressure was deleted from the PTIs.

TVA's position with respect to preoperational testing of the condenser circulating water cooling towers and associated equipment is stated in the response to Question 413.1, parts 7, 11, 12, 14, and 17.

W-1.2 SNP preop test W-1.3 (equivalent for WBN preop test W-1.2) recorded the temperature increases for the PRT. The initial temperature recorded was 100° F. After the blowdown transient, the PRT temperature had risen to 140° F. Since this is a slight increase in temperature for the PRT (design temperature of 340° F) it was decided to delete this step on WBNP W-1.2.

W-5.2 Both the WBNP test and the SNP test are required to be performed at hot shutdown conditions. The typographical error which states that WBNP test will be performed at cold shutdown conditions will be corrected.

W-8.5 Even though there are differences in the FSAR descriptions for the dynamic automatic steam dump control tests, there are no significant technical differences between WBNP W-8.5 and SNP W-10.5. The power levels used for the various controllers checked during the Sequoyah test and those power levels specified in the Watts Bar test instruction are the same. The Watts Bar FSAR dynamic automatic steam dump control test description is more detailed and accurate thatn the SNP description, and better reflects the actual tests performed at Sequoyah and the tests that will be performed at Watts Bar.

ATTACHMENT TO ENCLOSURE 2

WATTS BAR NUCLEAR PLANT

TABLE 14.2-1 (Continued)

LIST OF PREOPERATIONAL TESTS

Test No.	Title of Test	Test Prerequisites	Test Objectives Summary of Testing and Acceptance Criteria
TVA-3	Airlock Leakage and Operational Test	Overpressure tests by vendor on personnel locks and bare-blanked containment vessel completed. The permanent communications system between inside of the lock and outside must be installed. Clean, dry compressed air available. Permanently installed instrumentation checked and calibrated. Special test instruments available and calibrated.	This test will demonstrate the functional capability and leaktightness of the personnel airlocks. Specifically, it will be demonstrated that: 1) Communications system from inside the lock to the outside is operable. 2) Mechanical door interlock system functions properly. 3) Limit switches on doors for operating remote indicator lights are operable. 4) There is an acceptable leak rate of less than 0.05 La when the airlock is pressurized with air to between 15.0 and 16.8 psig. 5) There is an acceptable leak rate of less than 0.01 La when the spaces between double O-ring door seals are pressurized with air to 6.0 psig. Test for each door-seal volume will continue for a minimum of 15 minutes. Acceptance criteria are provided in TVA-2, Containment Vessel Pressure and Leak Test. This test will cover only the operability and leaktightness of the doors and door seals. Leaktightness of any electrical penetrations through the lock will be tested in preoperational test "Containment Vessel Pressure and Leak Test." Leaktightness of the seal between the lock and the shield building will be tested in preoperational test "Shield Building Inleakage."

TABLE 14.2-1 (Continued)

LIST OF PREOPERATIONAL TESTS

Test No.	Title of Test	Test Prerequisites	Test Objectives Summary of Testing and Acceptance Criteria
TVA-10 (Cont.)	Control Building Heating, Ventilating, and Air-Conditioning Systems (cont'd.)		be maintained at 1/8-inch positive static pressure relative to the outside environment; control room indicating lights operate properly; flow switches operate to automatically start redundant fans; all motor-operated dampers operate automatically and properly for normal and emergency conditions; and refrigerant compressors, air handling units, heaters, thermostat controls, and humidifiers operate properly. In place leak rate testing of the charcoal and HEPA Supply System fitters will be conducted in accordance with applicable sections of ANSI N510 - 1975, as referenced in Regulatory Guide 1.52. This testing will verify that filters are not damaged, that they are properly installed, that there are no leaks in the mounting frame or filter housing, and that the system contains no bypassing (such as channels through the charcoal absorber beds).
TVA-11A	Communications System (Emergency Sound-Powered Telephone System)	Installation and construction testing of the plant Communication System completed.	The test will verify the adequacy of the plant emergency sound-powered telephone Communications System. Intelligible reception and transmission of voice communications will be demonstrated. Particular emphasis will be placed on demonstrating that communications at all stations required for the initial fuel loading are functioning properly.

TABLE 14.2-1 (Continued)

LIST OF PREOPERATIONAL TESTS

Test No.	Title of Test	Test Prerequisites	Test Objectives Summary of Testing and Acceptance Criteria
TVA-13B	Onsite AC Distribution System (Diesel Generator Loading Logic)	The Standby AC Power System, including the diesel generator sets and supporting auxiliaries, the 120V Vital AC System, and the Vital 125V DC Control Power System for operation of control, protective, and instrumentation circuits shall be operational. All construction checks, and functional tests of circuit breakers, relays, and control circuits shall have been completed.	Confirm proper startup operation of the diesel generators upon loss of all AC voltage. Confirm proper operation of the design accident loading sequence. Confirm the capability of the diesel generator unit to supply emergency power within the required time is not impaired during periodic testing. Confirm the independence of redundant onsite sources and their load groups. Confirm that all of the generator breaker trip relays are disabled, with the exception of the differential and overspeed relays, when the unit is in the emergency mode. Confirm proper operation of the diesel generator units for an accident signal in absence of a substained loss of voltage. The status of the plants preferred electrical distirbution system shall be recorded. Acceptance criteria will be that all of the above requirements are met in accordance with Regulatory Guide 1.108 and that all vital buses operate within their design limits.
TVA-13C	Onsite AC Distribution System (Diesel Generation Qualification Tests)	The Standby AC Power System, including the diesel generator sets and supporting auxiliaries, the 120V Vital AC System, and the Vital 125V DC Control Power System for operation of control, protective, and instrumentation circuits shall be operational. All construction checks and functional tests of circuit breakers, relays, and control circuits shall have been completed.	Demonstrate full-load carrying capability of the diesel generator unit for 24 hours. Confirm the cooling system functions within design limits. Demonstrate proper operation during diesel generator load shedding. Demonstrate functional capability at full-load temperature conditions. Demonstrate the ability to a) synchronize the diesel generator with offsite power while the unit is connected to the emergency load, b) transfer this load to the offsite power, c) isolate the diesel generator unit, and d) restore it to standby status. Perform 23 start and load tests for each diesel generator unit. Acceptance criteria will be that the requirements listed above are met in accordance with Regulatory Guide 1.108.

TABLE 14.2-1 (Continued)

LIST OF PREOPERATIONAL TESTS

Test No.	Title of Test	Test Prerequisites	Test Objectives Summary of Testing and Acceptance Criteria
TVA-13C (Cont.)	Onsite AC Distribution System (Diesel Generation Qualification Tests)		During testing of TVA-13B and TVA-13C, the 6.9-kV vital buses will be tested at rated load (normal and accident). Acceptance criteria will be that the 6.9-kV buses operate within their design ratings.
TVA-14A	Diesel Generators 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 diesel generator building CO_2 Fire Protection System must be operable before performing Fuel Oil System tests.	Verify the capability of the Fuel Oil System to supply adequate quantities of fuel to the diesel generator day tanks and demonstrate that associated instrumentation and controls are functioning properly. Acceptable system performance will be determined by comparison of the data taken during this test with Manufacturer and Design Data.
TVA-14B	Diesel Generators and Supporting Auxiliaries (Diesel Generator Starting Air System)	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.	Verify the capability of the Starting Air System to supply compressed air at 200 psig to the air start motors in sufficient quantities to ensure five start attempts. Acceptance criteria for the system will be: 1) The air system must keep the air receivers charged and 2) The air receivers must contain a sufficient quantity of air to ensure five diesel generator start attempts.

TABLE 14.2-1 (Continued)

LIST OF PREOPERATIONAL TESTS

Test No.	Title of Test	Test Prerequisites	Test Objectives Summary of Testing and Acceptance Criteria
TVA-14C	Diesel Generators and Supporting Auxiliaries (D-G Building Heating and Ventilating System)	Construction testing and instrument calibration shall have been completed. Cleaning of the D-G building heating and entilating system shall have been completed.	Verify the capability of the engine room ventilation fans and associated dampers to start and operate on a diesel generator start signal and that control devices will start the designated backup fans upon failure of the primary operating fan. 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 operation.
TVA-14D	Diesel Generators and Supporting Auxiliaries (125-V Control and Field Flashing Batteries)	Construction testing and instrument calibration shall have been completed.	Verify the capability of diesel generator control and field flashing batteries to: 1) meet the manufacturer's capacity rating 2) supply power to actual loads, and 3) be recharged while supplying power to normal loads.
TVA-14E	Diesel Generators and Supporting Auxiliaries (Diesel Generator Functional Tests)	Construction testing and instrument calibration shall have been completed.	Obtain performance parameters for the diesel generators and supporting auxiliaries after field installation. The test should include: 1) D-G control panel dry run functional test, 2) Engine alarm tests, 3) Exciter regulator test, 4) Preheat system test, 5) Manual start and stop test, 6) Manual start and acceleration to rated speed test, 7) Exciter and generator tests at rated speed,

TABLE 14.2-1 (Continued)

LIST OF PREOPERATIONAL TESTS

Test No.	Title of Test	Test Prerequisites	Test Objectives Summary of Testing and Acceptance Criteria
TVA-14E (Cont.)	Diesel Generators and Supporting Auxiliaries (Diesel Generator Functional Tests) (cont'd.)		8) 24 hour integrated heat run and fuel consumption test, and 9) Automatic start and acceleration to rated speed and voltage test. System performance will be deemed acceptable if the diesel generator and supporting auxiliary parameters approach the Bruce GM Diesel factory test data.
TVA-15	Vital 120V AC Power System	System design, load assignments, and construction checks and tests of the system shall have been completed. Those construction tests of the 125V DC system and the 480V AC supplies should be completed before this test.	1) The test will confirm the ability of the 120V AC Vital Power System to automatically switch between the 480V AC and the 125V DC power sources while delivering the maximum demand load and maintaining output voltage at 120 volts AC ± 2 percent. While the system is loaded with an equivalent maximum demand load, the 480V AC power source will be disconnected and the 125V DC supply allowed to carry the load for at least 10 minutes. 2) Maintenance procedures will be tested to confirm the ability of the Inverter to revert to its internal clock without deforming the output waveform any more than ± 2%. 3) The UPS output frequency in parts 1 and 2 must be maintained at 60 Hz ± 1/2 Hz.

TABLE 14.2-1 (Continued)

LIST OF PREOPERATIONAL TESTS

Test No.	Title of Test	Test Prerequisites	Test Objectives Summary of Testing and Acceptance Criteria
TVA-26A	Compressed Air System-Excluding Control Air	Construction testing complete. Control circuits and instrumentation shall have been checked and calibrated.	This test verifies the operability 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 and various alarms will be verified. The system extends from the air intake filters through the outlet of the control air header and the service air header.
TVA-26B	Auxiliary Air Compressors	The Control Air System and Essential Raw Cooling Water System have been tested and are available for service. Construction testing has been completed and control circuits and instrumentation have been calibrated.	This test will demonstrate that the auxiliary air compressors and associated components are operable and will start when the control air system pressure falls below 80 psig. Compressor operation will be observed and air pressure and temperature measurements will be taken to evaluate system capabilities, this will include verifying the operation of air relief valves at design setpoints.

TABLE 14.2-1 (Continued)

LIST OF PREOPERATIONAL TESTS

Test No.	Title of Test	Test Prerequisites	Test Objectives Summary of Testing and Acceptance Criteria
W5.1 (Cont.)	*Control Rod Drive Mechanism Timing (cont'd.)		3) The maximum stepping rate of the control rod drive mechanism is 72 steps per minute, the minimum stepping rate rate is 8 steps per minute.
W5.2	*Rod Control System	Testing performed prior to initial criticality with all rods inserted at hot shutdown conditions. Nuclear Instrumentation System and Rod Position Indication Systems are operable.	The test demonstrates and documents that the full length Rod Control System satisfactorily performs the required control and indication functions. By ensuring that control room indicators respond properly, the control bank overlap function performs as aligned and verifying the proper response of the control rod insertion and deviation alarms. Each bank of shutdown rods and control rods will be operated individually in the withdraw and insert directions using the normal controls. Sufficient travel will demonstrate drive operability, position indication and other instrumentation without unduly increasing the count rate on any source channel above the established baseline rate. Rod bank starting and stopping positions will be compared with the control settings for verification. Acceptance criteria for the test are that the control and indication functions of the Full Length Rod Control System have been satisfactorily demonstrated in the steps of this procedure. The overall performance of the Full Length Rod Control System has satisfactorily demonstrated the design requirements of the 'Full Length Rod Control System' manual and the 'Rod Position Indication System Technical Manual.'

*Preopertional test to be completed after core loading.