TU ELECTRIC

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March 31, 1992

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U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES), UNIT 2
DOCKET NO. 50-446
ADVANCE FSAR SUBMITTAL CONCERNING CHANGES TO THE
UNIT 2 INITIAL STARTUP TEST PROGRAM

Gentlemen:

As a result of the experience gained in the performance of the Unit 1 Initial Startup (ISU) program, several changes are proposed for the conduct of the Unit 2 ISU program. These changes: 1) eliminate some testing at certain power levels when such testing would not provide meaningful information, or would be redundant to existing or previously conducted testing, 2) revise the power level at which certain tests will be conducted when testing at the new power levels provides more meaningful information, or 3) deletes portions of tests when it can be demonstrated that the intent of the test will be satisfied via alternate means.

The changes are provided in the form of an advance FSAR submittal which includes marked-up FSAR pages containing the specific changes as well as line-by-line description/justification for each change. These changes are expected to be included in a future FSAR amendment.

Sincerely,

William J. Cahill, Jr.

BSD/bsd
Attachments:

1. Summary of Changes
2. Detailed Description
3. Marked-up FSAR Pages

c - Mr. R. D. Martin, Region IV
Resident Inspectors, CPSES (2)
Mr. B. E. Holian, NRR

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ATTACHMENT 1 TO TXX-92146
SUMMARY OF CHANGES

SUMMARY OF CHANGES

The following changes to the Initial Startup Test (ISU) program are proposed:

- Perform the low power flux map prior to exceeding 30% power (see marked-up FSAR pages 1A(B)-43, 14.2-34, Table 14,2-3 Sheet 20 and Figure 14.2-4B).

- Change power plateaus for the 10% load swing tests to 50% and 75% (see marked-up FSAR pages 1A(B)-43 and Table 14.2-3 Sheet 23).

- Perform 50% load reduction at 100% power only (see marked-up FSAR pages 1A(B)-43 and Table 14.2-3 Sheet 23).

- Perform the remote shutdown test prior to fuel load (see marked-up FSAR pages 1A(B)-43, 1A(B)-44, Table 14.2-3 Sheets 27 and 27a, Figure 14.2-4B, Q&R 423-41 and Q&R 423-63).

- Perform the N-16 Transit Time Flow Meter (TTFM) RCS flow measurement at 75% and 100% power (see marked-up FSAR pages, Table 14.2-3 Sheet 2 and Figure 14.2-4B).

- Relocate the pressurizer heater effectiveness test to the pre-operational test phase (see marked-up FSAR pages, Table 14.2-3 Sheet 2 and Table 14.2-2 Sheet 56a).

ATTACHMENT 2 TO TXX-92146
DETAILED DESCRIPTION

DETAILED DESCRIPTION

FSAR Page (as amended)	Group	Description
1A(B)-43	2	Revises description of low power testing for Unit 2 to allow the low power flux distribution to be done anytime prior to exceeding 30% reactor power. Revision: Adds Unit 2 specific information to Item 20 that one flux map will be taken prior to exceeding 30% RTP as a fulfillment of RG-1.68, Appendix A, subparagraph 4.e. Taking the cycle's first flux map near 30% power has become a common practice of Westinghouse PWR's during reload testing and is explicitly allowed in ANSI/ANS-19.6.1-1985 (for reloads). It is implicitly allowed in R.G. 1.68,App A, subparagraph 4.e, because many reactor designs are unable to take flux maps at lower power levels. Indeed, at-power maps are historically more repeatable because of higher detector signal strength and the inherently more stable po er characteristics with doppler and moderator temperacure feedback mechanisms. In the past, larger than expected deviations in "zero power" flux maps from prediction invariably result in the decision to continue power ascension to approximately 30% RTP for another flux map. The low power flux map is intended to detect potential errors in: - Design predictions - Loading or enrichment of fuel elements - Manufacture or placement of poison elements - Positioning or coupling of control rods The standard reload allowance of obtaining this map prior to 30% RTP is acceptable since multiple quality and procedural controls in fuel manufacture, transport, transfer and loading are in place and have been proven through use. In addition, verification and video taping of the loaded core is required by procedure. Any gross, undetected errors should be discovered by rod worth or boron endpoint measurements during low power physics testing. FSAR Change Request Number: 92-622.2 Related SER Section: 14.0; SSER23 14.0 SER/SSER Impact: No
1A(B)-43	2	Adds description that the 30% power transient testing will not be performed on Unit 2. Revision: Adds Unit 2 specific information to Item 20 that no 30% power transient will be performed on Unit 2. See Description provided for 10% load swing transient testing on Sheet 23 of Table 14.2-3. FSAR Change Request Number: 92-622.3

DETAILED DESCRIPTION

FSAR Page (as amended)	Group	Description
		Related SER Section: 14.0; SSER23 14.0 SER/SSER Impact: No
1A(B)-43, 44	2	Revises Unit 2 schedule for performing the Remote Shutdown Test to prior to fuel load. Adds Unit 2 specific information for exception to RG-1.68, Appendix A, subparagraph 5.d.d (Item 21) and RG-1.68.2, Section B Section C, Items 1.a and 3. Revision: The remote shutdown demonstration is a post-TMI test which is designed to demonstrate: 1) Individual and integrated plant equipment design and performance to safely bring the plant to cold shutdown condition from outside the control room; and 2) The adequacy of procedural controls and operator training to give assurance of the plant operating staff's ability to safely bring the plant to a cold shutdown from outside the control room. During the Unit 1 ISU test, this demonstration was conducted in two parts. The first part during HFT included transfer to the remote shutdown panel, stabilization and cooldown from the panel, and transfer to RHR and continuation of the cooldown from the remote shutdown panel. The second part, conducted from power entailed a reactor trip from outside the control room, transfer of operational control to the remote shutdown panel, stabilization, and a small cooldown. On Unit 2 the demonstration during HFT will be a repeat of the Unit 1 demonstration with the additional requirement that transfer of operational control to the remote shutdown panel and initial stabilization will begin from normal operating temperature and pressure. Thus the planned demonstration will adequately span the temperature range from NOP/NOT to cooldown 50 degrees below the point of RHR transfer, via the remote shutdown panel. Since the plant's design and the administration aspects of operator training and procedural controls were successfully demonstrated on Unit 1, which is essentially identical in design and administration control to Unit 2, this portion of the demonstration is complete. The proposed integrated testing during HFT, which is in addition to component pre-operational testing, is adequate to determine any Unit 2 specific equipment malfunctions related to the remote shutdown panel since the plant's response to these control is unaffected by the presence of the essentially fresh fuel in the reactor vessel. (continued below) FSAR Change Request Number: 92-622.5 Related SER Section: 14.0; SSER23 14.0

DETAILED DESCRIPTION

FSAR Page (as amended)	Group	Description
		SER/SSER Impact: No
1A(B)-43, 44	2	Continuation of above justification for the remote shutdown panel testing. Revision: Plant transients, such as reactor trips from power operation, challenge plant equipment. Consequently, unnecessary plant trips should be avoided. The only plant equipment left untested during the proposed integrated remote shutdown demonstration is the mechanism for the reactor trip. At CPSES the actual reactor trip breakers are used for this activity since they are in close proximity to the remote shutdown panel. These breakers are extensively tested both during pre-operational testing and routinely as a surveillance required by technical specifications. Also proper plant trip response is tested during the trip from full power. Therefore plant performance will be adequately demonstrated by the proposed test. Precedence for this deletion exists for at least one other PWR since Palo Verde Unit 3 did not perform this test at power. FSAR Change Request Number: 92-622.5 Related SER Section: 14.0; SSER23 14.0 SER/SSER Impact: No
14.2-34	2	Revises description of low power testing for Unit 2 to allow the low power flux distribution to be done anytime prior to exceeding 30% reactor power. Revision: See Description for Table 14.2-3 Sheet 23 concerning the 10% load swing transient. FSAR Change Request Number: 92-622.2 Related SER Section: 14.0; SSER23 14.0 SER/SSER Impact: No
Table 14.2-2	3	See Sheet No(s):56a Relocates the pressurizer heater effectiveness test from the ISU program (Table 14.2-3 Sheet 2) to the Pre-operational Test program (Table 14.2-2 Sheet 56a). Revision: Amendment 78 relocated the pressurizer spray effectiveness test from the Preoperational Test program to the ISU program because pressurizer spray requires an in place core to provide sufficient differential pressure for adequate spray performance. That test as well as the pressurizer heater test were originally both part of item 12 Table 14.2-2 Sheet 56a. When the relocation of the spray test was performed the

DETAILED DESCRIPTION

FSAR Page (as amended)	Group	Description
		pressurizer heater test was inadvertantly moved also. The heater test is now relocated to correct this error. FSAR Change Request Number: 92-622.1 Related SER Section: 14.0; SSER23 14.0 SER/SSER Impact: No
Table 14.2-3	2	See Sheet No(s):02 Revises Reactor Coolant System Flow ISU Test Summary Test Method Item 1 to add Unit 2 specific criteria that the N-16 Transit Time Flow Meter (TTFM) and secondary calorimetric will be used at 75% and 100% power in lieu of 50% and 75% power as specified for Unit 1. Revision: The TTFM RCS measuring system is unique to CPSES. CPSES specific analysis based on Westinghouse input has determined that reactor power must be greater than 65% in order to meet the accuracy requirements for a valid surveillance of RCS flow. Power escalation prior to 50% power was justified by a flow calculation based on RCS elbow tap delta-P measurements. Westinghouse has analyzed power escalation to 75% and found the delta-P measurement to be adequate to support this. Westinghouse also recommends executing the flow measurements at higher power levels. Therefore, these flow measurements are planned for 75% and 100% to comply with the vendor recommendations. FSAR Change Request Number: 92-622.1 Related SER Section: 14.0; SSER23 14.0 SER/SSER Impact: No
Table 14.2-3	2	See Sheet No(s):20 Revises description of low power testing for Unit 2 to allow the low power flux distribution to be done anytime prior to exceeding 30% reactor power. Revision: See Description for page 1A(B)-43 (Item 20). FSAR Change Request Number: 92-622.2 Related SER Section: 14.0; SSER23 14.0 SER/SSER Impact: No
Table 14.2-3	2	See Sheet No(s):20 Revises definition of All Rods Out (ARO) by deleting the number of steps specified for banks A, B and C and replacing it with the statement "fully withdrawn". Revision: For Unit 1 the ARO definition for banks A, B and C was 228 steps withdrawn. Subsequently, to prevent fretting of the control rods, a program was initiated to periodically change the fully withdrawn position of

DETAILED DESCRIPTION

FSAR Page (as amended)	Group	Description
		those banks by a few steps. Thus it is no longer appropriate to specify the exact number of steps for those banks to be fully withdrawn. FSAR Change Request Number: 92-622.2 Related SER Section: 14.0; SSER23 14.0 SER/SSER Impact: No
Table 14.2-3	2	See Sheet No(s):23 Adds description that no 30% power transient testing will be performed on Unit 2. Also changes plateaus for 10% load swings to 50% and 75% RTP. Revision: The basis for executing 10% load swings, in conjuction with the large load reduction test, is to demonstrate that the dynamic response of the plant is in accordance with design. The proposed testing at 50% and 75%, in addition to successful testing on Unit 1 at 50%, 35% and 100%, and the Unit 1 and 2 large load reduction tests is adequate to meet this intent for the following reasons: -The 10% load swing from 50% power would adequately represent lower power levels, where only one Main Feedwater Pump will be in service. The 10% load swing from 75% power would adequately represent higher power levels, where both Main Feedwater Pumps will be in service. Test performances at other power levels, such as 35% and 100%, would not provide any additional useful data. In addition, the 50% load reduction from 100% power envelops any transient response due to a 10% load reduction at 100% power. -No setpoint changes were required on Unit 1 based on the performance of these load swing tests. -This change reduces the number of planned plant transients at power. The change therefore represents an associated reduction in approaches to trip setpoints, potential plant trips & challenges to plant equipment. Deletion of the 10% load swing from 100% power eliminates an additional concern of overshooting 100% reactor power (ie, the licensed power level) on the upswing. -Recent industry precedence exists for performing load swing tests at a wide variety of power levels. Examples of similar transient testing at PWR's vary from San Onofre Units 2 & 3 (load swings at 50%) to Diablo Canyon (load swings at 30%, 50%, 75% & only a down load swing at 100%). Numerous intermediate variations exist, which allow a plant specific determination of the testing required to meet the test's intent. FSAR Change Request Number: 92-622.3 Related SER Section: 14.0; SSER23 14.0 SER/SSER Impact: No

DETAILED DESCRIPTION

FSAR Page (as amended)	Group	Description
Table 14.2-3	2	See Sheet No(s):23 Adds Unit 2 specific information that the 50% load reduction test will not be performed at 75% power. Revision: The large load reduction (50% load change) at 75% power need not be performed for the following reasons: -The large load reduction test from 75% power is essentially identical to the test performed from 100% power in terms of expected plant response. -No setpoint changes were required from either large load reduction test performed on Unit 1. -This change reduces the number of planned plant transients at power. The change therefore represents an associated reduction in approaches to trip setpoints, potential plant trips and potential challenges to plant equipment. -Industry precedence exists. Vogtle Units 1 and 2 performed this test only at 75% power, while South Texas Unit 2, Bryon Unit 2 and Braidwood Units 1 and 2 performed this test only from 100% power. FSAR Change Request Number: 92-622.4 Related SER Section: 14.0; SSER23 14.0 SER/SSER Impact: No
Table 14.2-3	2	See Sheet No(s):27 and 27a Revises Unit 2 shedule for performing the Remote Shutdown Test to prior to fuel load. Adds Unit 2 specific information for exception to RG-1.68, Appendix A, subparagraph 5.d.d (Item 21) and RG-1.68.2, Section B Section C, Items 1.a and 3. Revision: See Description for pages 1A(B)-43 (Item 21) and -44. FSAR Change Request Number: 92-622.5 Related SER Section: 14.0; SSER23 14.0 SER/SSER Impact: No
Figure 14.2-4B	2	Revises Unit 2 Initial Startup Test schedule to reflect changes proposed to the Reactor Coolant Flow Test (T14.2-3 Sheet 2), the Flux Distribution Measurements (T14.2-3 Sheet 20) and the Remote Shutdown Test (Table 14.2-3 Sheets 27 and 27a). Revision: See Descriptions provided for the above changes to Table 14.2-3. Also editorially combines the Flux Distribution Measurements and the Core Performance Evaluation due to the overlap and similarity of the testing performed. FSAR Change Request Number: 92-622.5 Related SER Section: 14.0; SSER23 14.0

DETAILED DESCRIPTION

FSAR Page (as amended)	Group	Description
		SER/SSER Impact: No
Q&R 423-41, 63	2	Revises Unit 2 schedule for performing the Remote Shutdown Test to prior to fuel load. Adds Unit 2 specific information for exception to RG-1.68, Appendix A, subparagraph 5.d.d (Item 21) and RG-1.68.2, Section B Section C, Items 1.a and 3. Revision: See Description for pages 1A(B)-43 (Item 21) and -44. FSAR Change Request Number: 92-622.5 Related SER Section: 14.0; SSER23 14.0 SER/SSER Impact: No

ATTACHMENT 3 TO TXX-92146
MARKED-UP FSAR PAGES

The core performance data that could be obtained at 30% RTP is utilized for gross calibration adjustments of the Nuclear Instrumentation System (NIS) prior to power escalation to 50% RTP. This activity will be performed at 25-30% RTP as a hold prior to escalation to 50% RTP. The flux distribution measurement at 30% RTP will not be performed unless the peaking factors measured at low power do not support escalation to 70% RTP, the NIS trip setpoint for the 50% RTP testing plateau. This is per the direction of RG-1.68 Appendix C, paragraph 4.h. 76

Insert A → For Unit 1, the unit load transient at approximately 30% RTP will be performed following completion of 50% RTP plateau testing to assure proper control system response. 78

Insert B

The Automatic Reactor Coolant System test is intended as a precursor to the Unit Load Transient test and is performed at 30% RTP. It is designed to ensure that the automatic rod control system can restore the Reactor Coolant System (RCS) temperature to within a ±1.5 Deg-F deadband of the reference temperature. Prior to 50% RTP, proper operation of this function would be demonstrated by observation during the normal power escalation, where the control rods will be in automatic and already controlling the RCS temperature to within the deadband. 76

Insert C →

Regulatory Guide 1.60.1

Preoperational and Initial Startup Testing of Feedwater and Condensate Systems for Boiling Water Reactor Power Plants

Discussion

This regulatory guide is not applicable to the CPSES

Insert A

For Unit 2, one low power flux map will be taken prior to exceeding 30% RTP as a fulfillment of Regulatory Guide 1.68, Appendix A, subparagraph 4.e. At power, flux maps will be taken at 50%, 75% and 100% RTP to satisfy Regulatory Guide 1.68, Appendix A, subparagraph 5.b. Additional flux maps will be taken if required by Regulatory Guide 1.68, Appendix C, subparagraph 4.h.

Insert B

For Unit 2, the 30% RTP unit load transient will not be performed.

Insert C

21. Appendix A, subparagraph 5.d.d.

    For Unit 2, refer to discussion of Regulatory Guide 1.68.2.

Regulatory Guide 1.68.2

Initial Startup Test Program to Demonstrate Remote Shutdown Capability for Water Cooled Nuclear Power Plants

Q400.3
Q423.10
C

Discussion

For Unit 1,
The testing activities conducted as a part of the startup test program will comply with the applicable requirements of Revision 1 (7/78) of this regulatory guide.

Insert D

Also refer to Section 14.2.

77

Regulatory Guide 1.68.3

Q423.12
Q423.26

Preoperational Testing of Instrument Air Systems

77

Discussion

77

The CPSES Instrument Air System testing meets with the intent of the requirements of NRC Regulatory Guide 1.68.3, Regulatory Positions C.1 through C.11, as described below:

77

Position C.1: CPSES meets the intent of position C.1 by performing preoperational tests on those aspects of the system which are important to safety as described in Section 14.2. The balance of the Instrument Air System testing is performed under the acceptance testing program at CPSES.

77

Positions C.2 through C.6: CPSES meets the intent of positions C.2 through C.6 through acceptance testing of the Instrument Air System.

Insert D

For Unit 2, exceptions to this regulatory guide are given below:

1. Section B

   The Administrative items (i.e., procedure adequacy and number of personnel) of the final paragraph of Section B are not unit specific and have been demonstrated on Unit 1.

2. Section C, Items 1.a and 3

   The ability to open the reactor trip breakers from outside the control room will be demonstrated during the surveillance program and preoperational test program. In addition, plant response to a trip from power will be demonstrated elsewhere in the Initial Startup Test Program. Therefore, the remote shutdown demonstration on Unit 2 will start from normal operating RCS temperature and pressure and may be performed prior to fuel load (e.g., HFT).

Inverse count rate ratio monitoring, using data from the normal plant source range instrumentation, will be used as an indication of the proximity and rate of approach to criticality. Inverse count rate ratio data will be plotted as a function of rod bank position during rod motion and as a function of reactor makeup water addition during reactor coolant system boron concentration reduction.

14.2.10.3 Low Power Testing

Following initial criticality, a program of reactor physics measurements will be undertaken to verify that the basic static and kinetic characteristics of the core are as expected and that the values of the kinetic coefficients assumed in the safeguards analysis are conservative.

Procedures will specify the sequence of tests and measurements to be conducted and the conditions under which each is to be performed in order to ensure both safety of operation and the validity and consistency of the results obtained. If test results deviate significantly from design predictions, if unacceptable behavior is revealed, or if unexplained anomalies develop, the plant will be brought to a safe stable condition and the situation reviewed to determine the course of subsequent plant operation.

These measurements will be made at low power and primarily at or near
76 normal operating temperature and pressure. Measurements will be made in order to verify the calculated values of control rod bank reactivity worths, the isothermal temperature coefficient, differential boron concentration reactivity worth, and critical boron
78 concentrations. In addition, measurements of the relative power distributions will be made, ~~and~~ tests will be conducted on the instrumentation including power and intermediate range nuclear channels.

For Unit 1 these measurements are conducted prior to exceeding 5% power. For Unit 2 the corresponding measurements are conducted prior to exceeding 30% power. For Units 1 and 2

LIST OF FIGURES

provide charging water at rated flow against normal reactor coolant pressure, check letdown design flow rate for each applicable operating mode, and check response of the system changes in pressurizer level.

5. Demonstrate proper operation of the pressurizer relief valves, and verify proper operation of the Pressurizer Relief Tank.

6. Verify proper operation of steam generator instrumentation to changes in steam generator level. | 78

7. Demonstrate proper functioning of the Main Steam Isolation Valves under normal operating pressure and temperature conditions.

8. Operate the RC pumps for a minimum of 240 hours at full flow in order to achieve greater than one million cycles on vessel internals. Following hot functional testing, the internals are removed and inspected for vibration effects.

9. Perform periodic vibration measurements on RCS components as required.

10. Verify acceptability of the excess letdown and seal water flows.

11. Perform a controlled plant cooldown by using steam dump from the steam generators and operating the Residual Heat Removal System.

12. Demonstrate that the effectiveness of the pressurizer heaters is within acceptable limits. |

ACCEPTANCE CRITERIA | Q423.11 6

The systems and components checked during Hot Functional Testing function in accordance with design specifications and applicable FSAR requirements. Applicable Technical Specification requirements are satisfied.

INITIAL STARTUP TEST SUMMARIES

INDEX

CPSES/FSAR
Table 14.2-3
(Sheet 2)

REACTOR COOLANT SYSTEM FLOW TEST
TEST SUMMARY
CPSES

OBJECTIVE | 52

To verify predicted Reactor Coolant System cold leg volumetric flow rates at normal operating temperature and pressure with all reactor coolant pumps running in hot standby and during power ascension testing and demonstrate that pressurizer spray is within acceptable limits. | 78

PREREQUISITES | 52

1. The reactor is at the specified power level. | 52

2. The RCS is at the specified conditions. | 52

3. All reactor coolant pumps are operational. | 52

TEST METHOD | 52

1. During hot standby operation, measure and record loop elbow differential pressures and determine cold leg volumetric flow rates. At 50% and 75% power for Unit 2 and 75% and 100% power for Unit 2, use the N-16 Transit Time Flow Meter and a precision secondary calorimetric to determine loop cold leg volumetric flow rates. | 52

2. Verify that the reactor coolant system flow transmitters have been aligned for zero flow and 100 percent flow at normal operating conditions. | 52

3. Demonstrate that the effectiveness of the pressurizer spray ~~and pressurizer heaters~~ is within acceptable limits. | 78

ACCEPTANCE CRITERIA

The measured Reactor Coolant System flow is within design flow limits specified in FSAR Chapter 5, and the flow transmitters are satisfactorily aligned for zero flow and full flow conditions.	52
Pressurizer spray ~~and heaters are~~ 15 within acceptable limits.	78

FLUX DISTRIBUTION MEASUREMENTS
TEST SUMMARY
CPSES

OBJECTIVE

To determine the reactor core power distribution. | 76

PREREQUISITES

1. Incore instrumentation and process computer are operable for incore flux mapping.

2. Reactor is critical and power level is established as necessary.

TEST METHOD

Complete an incore flux map for the All Rods Out (ARO) control rod configurations with reactor power stablized below 5 percent for Unit 1 and below 30 percent for Unit 2. | 76 |

Note: ARO is defined for this measurement as Control Bank D above 190 steps withdrawn and all other banks ~~at 228 steps.~~ fully withdrawn. | 76 |

ACCEPTANCE CRITERIA

The core flux distributions indicated by the flux map are acceptable in accordance with plant Technical Specifications where applicable. | 76

UNIT LOAD TRANSIENTS
TEST SUMMARY
CPSES

OBJECTIVE

To demonstrate satisfactory plant transient response to various specified load changes and trips, to monitor the behavior of reactor control systems during these transients, and, if necessary, optimize the reactor control system setpoints.

PREREQUISITES

1. Reactor power level is established as necessary for each transient.

2. All reactor control systems are operational and their setpoints have been set to their recommended values.

TEST METHOD

1. Initiate a step change in power level of 10 percent and monitor Reactor Coolant System behavior in response to the transients. | 52

2. For Unit 1, this test will be performed at approximate power levels of 50 percent, 30 percent (following completion of 50 percent testing) and 100 percent. For Unit 2, this test will be performed at approximate power levels of 50 percent and 75 percent. | 78

3. Monitor plant response to a 50 percent load reduction, from power levels of approximately 75 percent and 100 percent. (Unit 1 only) | 78

4. Monitor plant response to a plant trip from power levels up to 100 percent. | 76

5. If necessary, adjust the reactor control system setpoints until optimal response is obtained during subsequent test performance.

ACCEPTANCE CRITERIA

Plant response to the unit load transients is acceptable in accordance with design specifications, and the Reactor Control System parameters reach steady state values without appreciable overshoot or oscillation subsequent to a step change.

REMOTE SHUTDOWN
TEST SUMMARY
CPSES
(UNIT 1)

OBJECTIVE

To demonstrate the capability of performing a safe plant shutdown, maintain the plant in a hot standby condition, and to demonstrate the ability to cooldown from hot standby to cold shutdown conditions from outside the control room, using the minimum shift crew. Verify that the Remote Shutdown Panel selector switches properly transfer control from the Control Room to the Remote Shutdown panel. Q423.16 6 52

PREREQUISITES 6

1. The equipment and instrumentation associated with the Remote Shutdown Panel are available for achieving and maintaining the plant in a hot standby condition. Q423.16 6

2. The plant is at a power level greater than 10% generator power but less than 25% reactor power, for the reactor trip portion of the test. Q423.16 76

3. For the cooldown portion, the plant is in a stable hot standby condition. Q423.16 76

TEST METHOD

1. With the generator at greater than 10 percent power, perform a safe shutdown of the plant from outside the Control Room using the minimum shift crew. 76

2. Check functioning of instrumentation, controls, interlocks and alarms. Credit may be taken for preop/prereq functional tests. 76

3. Demonstrate the capability to achieve and maintain the plant in a hot standby condition from the Remote shutdown panel for a minimum of 30 minutes. Q423.16 6

| Q423.16

4. Demonstrate the potential for cooldown to cold shutdown conditions by placing the residual heat removal system into service and reducing the reactor coolant temperature to approximately 300°F. | 6

ACCEPTANCE CRITERIA | Q423.11
| Q423.16

Transfer of control to outside the Control Room can be achieved in accordance with design requirements, remote shutdown instrumentation, controls, alarms and interlocks function properly. The potential ability to perform a safe shutdown, to achieve and maintain hot standby conditions from outside the Control Room has been demonstrated. The potential ability to cooldown to cold shutdown conditions from outside the control room has been demonstrated. | 6 | 52

REMOTE SHUTDOWN
TEST SUMMARY
CPSES
(Unit 2)

OBJECTIVE

To demonstrate the capability ~~of performing a safe plant shutdown,~~ to maintain the plant in a hot standby condition, and to demonstrate the ability to cooldown from hot standby to cold shutdown conditions from outside the control room, ~~using the minimum shift crew.~~ Verify that the Remote Shutdown Panel selector switches properly transfer control from the Control Room to the Remote Shutdown panel. Q423.16 6 52

PREREQUISITES 6 Q423.16

1. The equipment and instrumentation associated with the Remote Shutdown Panel are available for achieving and maintaining the plant in a hot standby condition. 6

Q423.16

~~2. The plant is at a power level greater than 10% generator power but less than 25% reactor power, for the reactor trip portion of the test.~~ 76

Q423.16

2. ~~3. For the cooldown portion,~~ The plant is ~~in a stable hot standby condition.~~ at normal operating temperature and pressure. 76

TEST METHOD

~~1. With the generator at greater than 10 percent power, perform a safe shutdown of the plant from outside the Control Room using the minimum shift crew.~~ 76

1. ~~1.~~ Check functioning of instrumentation, controls, interlocks and alarms. Credit may be taken for preop/prereq functional tests. 76

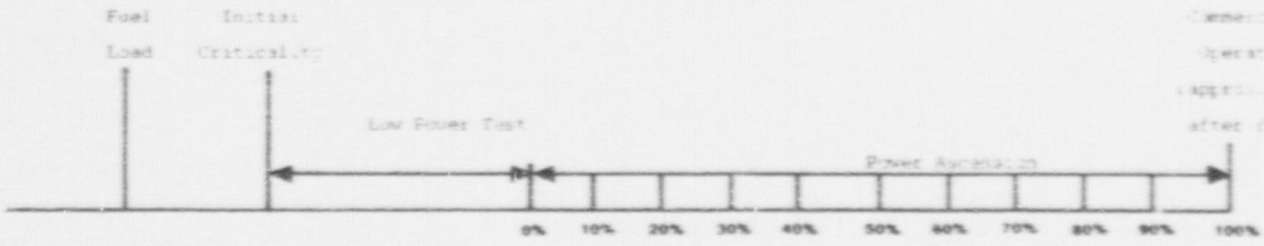
Q423.16

2. ~~2.~~ Demonstrate the capability to achieve and maintain the plant in a hot standby condition from the Remote shutdown panel for a minimum of 30 minutes. 6

3. Demonstrate the potential for cooldown to cold shutdown* conditions by placing the residual heat removal system into service and reducing the reactor coolant temperature to approximately 300°F.	Q423.16 6
ACCEPTANCE CRITERIA	Q423.11 Q423.16
Transfer of control to outside the Control Room can be achieved in accordance with design requirements, remote shutdown instrumentation, controls, alarms and interlocks function properly. The potential ability to perform a safe shutdown, to achieve and maintain hot standby* conditions from outside the Control Room has been demonstrated. The potential ability to cooldown to cold shutdown conditions from outside the control room has been demonstrated.	6 52

* Note: When such testing is performed prior to fuel load (e.g., hot functional testing) the terms "hot standby" and "cold shutdown" refer only to the temperature and pressure conditions of the RCS.

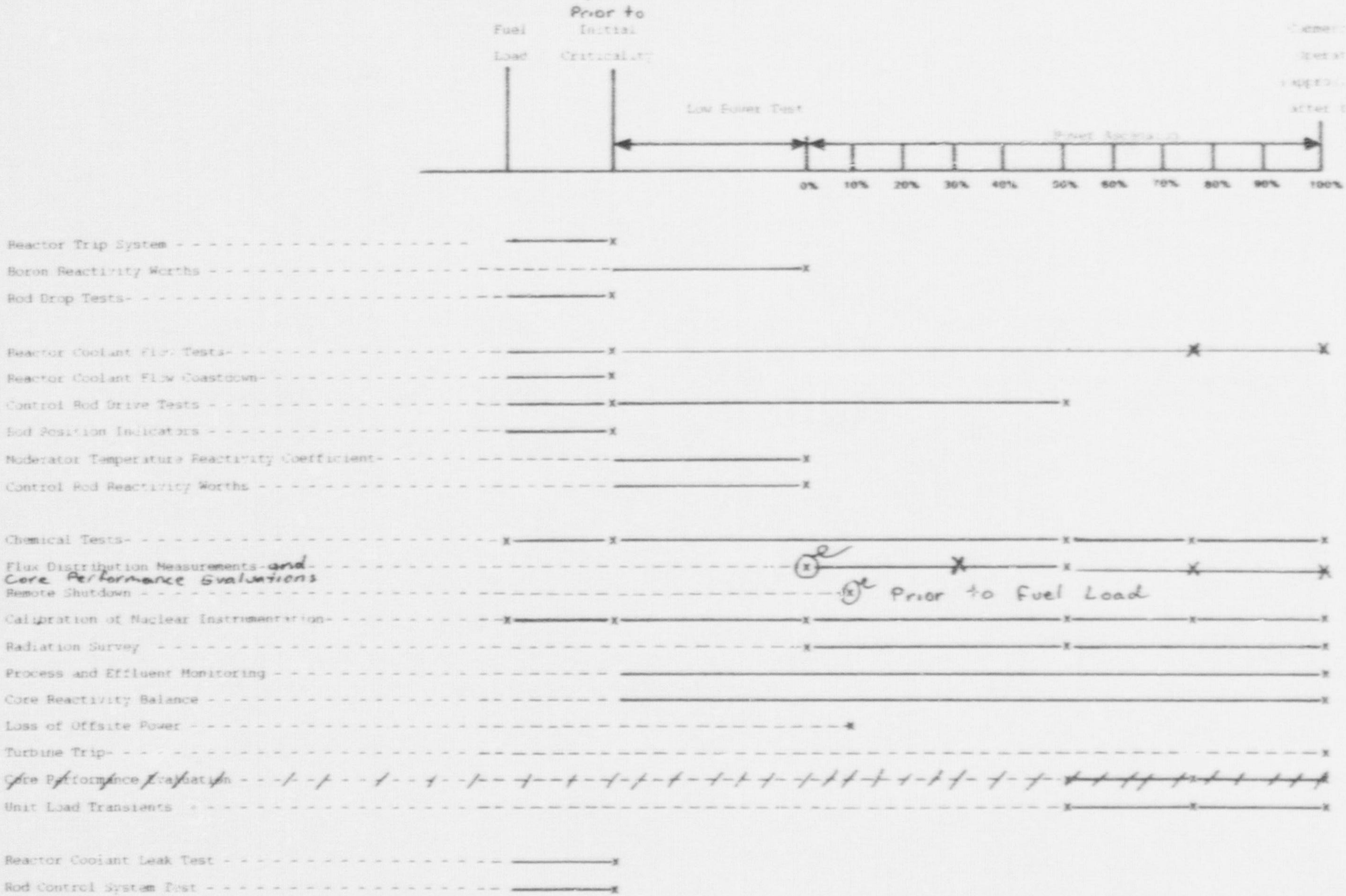
FIGURE 14.2-4A INITIAL STARTUP TEST SCHEDULE (UNIT 1)



	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Reactor Trip System	x										
Boron Reactivity Worths	x	x	x								
Rod Drop Tests	x										
Reactor Coolant Flow Tests	x										
Reactor Coolant Flow Coastdown	x										
Control Rod Drive Tests	x	x	x	x	x	x	x	x	x	x	x
Rod Position Indicators	x										
Moderator Temperature Reactivity Coefficient		x	x	x							
Control Rod Reactivity Worths		x	x	x							
Chemical Tests	x	x	x	x	x	x	x	x	x	x	x
Flux Distribution Measurements			x	x	x	x					
Remote Shutdown					x						
Calibration of Nuclear Instrumentation	x	x	x	x	x	x	x	x	x	x	x
Radiation Survey			x	x	x	x	x	x	x	x	x
Process and Effluent Monitoring				x	x	x	x	x	x	x	x
Core Reactivity Balance				x	x	x	x	x	x	x	x
Loss of Offsite Power						x					
Turbine Trip											x
Core Performance Evaluation						x	x	x	x	x	x
Unit Load Transients						x	x	x	x	x	x
Reactor Coolant Leak Test	x										
Rod Control System Test	x										

x - Test required to be performed at this power.

FIGURE 14.2-4B INITIAL STARTUP TEST SCHEDULE (UNIT 2)



X - Test required to be performed at this power.

For Information Only

Q423.16 We could not conclude from our review of the startup test summaries in Table 14.2-3 that all of the tests will be comprehensive. Therefore, clarify or expand the summaries to address the following:

1. Reactor Trip System Test - State your plans to demonstrate the proper operation of interlocks that prevent closing of both reactor trip breaker bypass breakers simultaneously.

2. Effluent Monitoring Test - State your plans to also demonstrate the proper performance of process and area radiation monitoring equipment under operating conditions. Describe the portions of the test performed at initial fuel load as shown in Figure 14.2-4.

3. Control Rod Reactivity Worths Test - State how you will determine which RCCA is most reactive. Clarify the test method to show that the worth of all RCCA banks will be measured.

4. Loss of Offsite Power Test - State your plans to initiate the transient from an initial condition of generator output of at least 10 percent power. The transient should be initiated by opening the generator output breakers in order to simulate a loss of offsite power. This test should demonstrate (for approximately 30 minutes) that the necessary equipment, controls, and indication are available following the station blackout to remove decay heat from the core using only emergency power supplies.

5. Rod Drop Tests - It appears that you do not intend to

conduct this test in accordance with Regulatory Guide 1.68 (November, 1973) which includes drop time measurements of each rod at cold no-flow, hot no-flow, cold full-flow, and hot full-flow. Modify your test summary to show that the test will be conducted in accordance with the regulatory guide or provide technical justification for any exceptions. Also describe the additional drop tests that will be required for the fastest and slowest dropped rods and state whether these requirements apply to the fastest and slowest rod at each test condition.

6. Flux Distribution Measurements Test - Specify the control rod configurations for which flux maps will be obtained.

7. Core performance Evaluation Test - Expand the test to include verification of calibration of flux and temperature instrumentation (Regulatory Guide 1.68, Nov. 1973, Appendix A, Section D.1.g).

8. Remote Shutdown Test - Expand the test abstract to show that the test will be performed in accordance with Regulatory Guide 1.68.2, Revision 1, July 1978.

9. Turbine Trip Test - The acceptance criteria for this test should be modified to 1) identify the parameters or variables to be monitored, 2) provide assurance that the transient results will be compared with predicted results for the actual test case, and 3) provide quantitative acceptance criteria and their bases for the required degree of convergence of actual test results with predicted results for the monitored variables and parameters.

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1. The Reactor Trip System Test Summary (Table 14.2-3, sheet 6) has been expanded to test the reactor trip bypass breaker interlocks.

2a. The performance of the process radiation monitoring equipment shall be demonstrated for CPSES Unit 1 by comparison of monitor indication with the results of radiochemical analysis. Refer to the Process and Effluent Radiation Monitoring Test Summary (T14.2-3, Sheet 13). For CPSES Unit 2, see Table 14.2-2 Sheet 24A and T14.2-3 Sheet 13A. 81

2b. The performance of area radiation monitors is satisfactorily demonstrated during the preoperational phase. The monitors are functionally checked and communications to the control terminal verified. The instrumentation is calibrated and operational source checks are performed as described in FSAR Section 12.3.4.2.3. These checks and calibrations provide sufficient testing of the area radiation monitors for operability assurance during power ascension. 76 78

2c. The Process and Effluent Monitoring test shall begin during the low power test phase to verify as early as possible and to the extent practical the response of the process and effluent radiation monitors. Refer to the revised Initial Startup Test Schedule, Figure 14.2-4.

3a. The NSSS vendor will determine which RCCA is the most reactive.

3b. The Control Rod Reactivity Worths Test Summary (Table 14.2-3, sheet 15 of 35), has been revised to state that the worth of the control and shutdown banks shall be verified by either bank exchange or by boron concentration exchange. | 77

4. The Loss of Offsite Power Test Summary (Table 14.2-3, sheet 18), has been revised to state that the generator output is at approximately 10%. | 77

The transient shall be initiated by a manual turbine trip and startup transformer isolation in order to simulate a loss of turbine generator coincident with a loss of all offsite power. | 77

5. The Rod Drop Test Summary (Table 14.2-3, sheet 19), has been revised to clarify the plant conditions at the time of the tests and to describe the additional testing for the fastest and slowest dropped rods. | 76

6. Flux Distribution Measurement Test:

A flux map shall be obtained at the all rods out (ARO) control rod configuration. | 76

7. The Core Performance Evaluation Test Summary, (Table 14.2-3, sheet 19 of 23), has been revised to include verification of calibration of flux and temperature instrumentation.

8. Remote Shutdown Test Summary (Table 14.2-3, sheets 25, 26, 27 and 27a ~~21 of 23~~), ~~has~~ have been revised to conform with Regulatory Guide 1.68.2, Revision 1, July 1978.

9. Turbine Trip Test Summary - Identification of variables to be monitored and quantitative acceptance criteria shall be specified in the detailed startup test procedures. Data obtained during the transient shall be analyzed and the results shall be compared with predicted results for the actual test case.

For Unit 2, credit is taken for the Unit 1 test for common aspects between the units. The cooldown portion of this test during hot functional testing will be conducted on Unit 2. The reactor shutdown from power will not be performed for Unit 2 as part of this test.

Q423.32 Your response to item 423.16, part 8, states that the test summary (sheet 21) has been expanded to show that the test will be in accordance with Regulatory Guide 1.68.2, Revision 1, July 1978. Modify the acceptance criteria to clarify that the ability to perform a safe shutdown and to achieve and maintain hot standby conditions from "outside" the control room will be demonstrated.

R423.32 The acceptance criteria of the Remote Shutdown Test Summary has been changed to achieve and maintain hot standby conditions from "outside" the control room.

For Unit 2, credit is taken for the Unit 1 test for common aspects between the units. The cooldown portion of this test during hot functional testing will be conducted on Unit 2. The reactor shutdown from power will not be performed for Unit 2 as part of this test.