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## 13. INITIAL TESTS AND OPERATION

### 13.1 TESTS PRIOR TO REACTOR FUELING

A comprehensive field testing program for the Rancho Seco Plant Unit 1 will be carried out to ensure that equipment and systems perform in accordance with design criteria.

The test program for the unit will begin nine months before reactor fueling. As the installation of individual components and systems is completed, they will be tested and evaluated. The testing program will be carried out according to detailed predetermined testing techniques and procedures. Field analysis and more detailed office analysis of test results will be made to verify that systems and components are performing satisfactorily or to recommend necessary corrective action.

In general, the types of tests will be classified as hydrostatic, operational, electrical, and functional.

Operational tests will involve actual operation of the system and equipment under design conditions, or simulated design conditions. Functional tests will verify that the system or equipment is capable of performing the function for which it is designed. The refueling test program is summarized in Table 13.1-1.

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Tests Prior to Reactor Fueling

TABLE 13.1-1  
 PREFUELING TEST PROGRAM

Component Tested	Type of Test			
	Hydro	Func-tional	Elec-trical	Opera-tional
1. Reactor Building and Penetrations Leak Rate Test		x		
2. Electrical Systems Continuity			x	
3. Control Rod Drives		x	x	x
4. Reactor Building Cooling System	x	x	x	
5. Component Cooling Water System	x	x	x	
6. Reactor Building Spray System	x	x	x	
7. Decay Heat Removal System	x	x	x	x
8. Pressurizer Relief Tank	x	x		
9. Reactor Coolant System Relief Valves		x	x	
10. Chemical Addition and Sampling System		x	x	x
11. Makeup and Purification System	x	x	x	x
12. Reactor Coolant Pumps		x	x	x
13. Nuclear Instrumentation Cable Tests			x	
14. Nuclear Instrumentation and Protection Systems		x	x	
15. Integrated Control System		x	x	
16. Reactor and Auxiliary System Non-nuclear Instrumentation		x	x	x
17. Reactor Coolant System	x			
18. Reactor Coolant System Hot Functional Test		x	x	x

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Tests Prior to Reactor Fueling

Table 13.1-1 continued

Component Tested	Type of Test			
	Hydro	Func-tional	Elec-trical	Opera-tional
19. Core Flooding System	x			
20. Reactor Building Fuel Handling System		x	x	x
21. Fuel Storage Building Fuel Handling System		x	x	x
22. Area Radiation Monitoring Systems		x	x	
23. Incore Monitoring System	x	x	x	
24. Waste Disposal System	x	x	x	
25. Spent Fuel Cooling System	x	x	x	
26. Emergency Power Systems Tests		x	x	x
27. Initial Fuel Loading				x
28. Nuclear Service Cooling Water System	x	x	x	x
29. Nuclear Service Raw Water System	x	x	x	x

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## 13.2 INITIAL CRITICALITY

Fuel loading will begin when all prerequisite unit tests and operations have been satisfactorily completed and the facility operating license has been obtained. Core components will be loaded in a predetermined sequence. Changes in core subcritical multiplication will be measured and evaluated; a detailed checkoff list will be followed; and periodic checks will be made to ensure proper status of all equipment, conditions, and core components. Initial criticality will take place by control rod withdrawal and core boron concentration adjustment.

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### 13.3 POSTCRITICALITY TESTS

A series of postcriticality tests will be conducted at ambient and hot zero power, and at various power levels. These tests will be used to evaluate temperature, pressure, power, and boron reactivity coefficients; control rod reactivity worths; and the reactivity worth of xenon-135. The reactor coolant system flow will be evaluated, and the external and incore nuclear instrumentation systems will be calibrated at various power levels. The unit response characteristics to step and ramp load changes will be evaluated, and the control systems will be adjusted as required. A complete biological shield survey will be conducted. Field analysis and a more detailed office analysis of test results will be made.

The postcriticality tests are summarized as follows.

- a. Initial Criticality and Excess Reactivity
- b. Reactivity Coefficients and Rod Worths
- c. Stuck Rod Margin Verification
- d. Power Coefficient and Power Defect
- e. Reactivity Coefficients at Power
- f. Xenon Reactivity Worths
- g. Reactor Coolant System Flow Tests
- h. Incore and External Nuclear Instrumentation Calibration
- i. Unit Load Steady State and Transient Tests
- j. Biological Shield Survey
- k. Unit Loss-of-Electrical-Load Tests

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