

RANCHO SECO UNIT 1
TECHNICAL SPECIFICATIONS

Limiting Conditions for Operation

3.4 STEAM AND POWER CONVERSION SYSTEM

Applicability

Applies to the operability of the turbine cycle during normal operation and for the removal of decay heat.

Objective

To specify minimum conditions of the turbine cycle equipment necessary to assure the required steam relief capacity during normal operation and the capability to remove decay heat from the reactor core.

Specification

- 3.4.1 The reactor shall not remain above 280F with irradiated fuel in the pressure vessel unless the following conditions are met.
- 3.4.1.1 Capability to supply feedwater to one steam generator at a process flow rate corresponding to a decay heat of 4-1/2 percent full reactor power from at least one of the following means.
- A. A condensate pump and a main feed pump, or
 - B. A condensate pump or
 - C. An auxiliary feedwater pump.

The required flow rates are:

Feedwater temperature, degrees F	Required flow, gpm
40	743
60	756
90	780

- 3.4.1.2 Two steam system safety valves are operable per steam generator.
- 3.4.1.3 The turbine bypass system to the condenser shall have one valve operable or the atmospheric dump system shall have a minimum of 1 of 3 valves operable per steam generator.
- 3.4.1.4 A minimum of 250,000 gallons of water shall be available in the condensate storage tank.
- 3.4.2 In addition to the requirements of 3.4.1, the reactor shall not remain critical unless the following conditions are met:
- 127> 3.4.2.1 No more than three main steam safety valves per steam generator may
◀ be inoperable.

Proposed Amendment No. 127

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- 3.4.2.2 When two independent 100% capacity auxiliary feedwater flow paths are not available, the capacity shall be restored within 72 hours or the plant shall be placed in a cooling mode which does not rely on steam generators for cooling within the next 12 hours.
- 3.4.2.3 When at least one 100% capacity auxiliary feedwater flow path is not available, the reactor shall be made subcritical within four hours and the facility placed in a shutdown cooling mode which does not rely on steam generators for cooling within next 12 hours.

Bases

The feedwater system and the turbine bypass system are normally used for decay heat removal and cooldown above 280 F. Feedwater makeup is supplied by operation of a condensate pump and main feedwater pump. In the event of complete loss of electrical power, feedwater is supplied by a turbine driven auxiliary feedwater pump which takes suction from the condensate storage tank. Steam relief would be through the system's atmospheric relief valves.

If neither main feed pump is available, feedwater can be supplied to the steam generators by an auxiliary feedwater pump and steam relief would be through the turbine bypass system to the condenser.

In order to heat the reactor coolant system above 280 F the maximum steam removal capability required is 4-1/2 percent of rated power. This is the maximum decay heat rate at 30 seconds after a reactor trip. The requirement for two steam system safety valves per steam generator provides a steam relief capability of over 10 percent per steam generator (1,341,938 lb/h). In addition, two turbine bypass valves to the condenser or two atmospheric dump valves will provide the necessary capacity.

The 250,000 gallons of water in the condensate storage tank is the amount needed for cooling water to the steam generators for a period in excess of one day following a complete loss of all unit ac power.⁽¹⁾

- 127> The minimum relief capacity of six steam safety valves is 4,550,184 lb/hr.⁽²⁾
This is sufficient capacity to provide the necessary overpressure protection for the secondary side of the steam generator under the design overpower condition of 112 percent.⁽³⁾
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REFERENCES

- (1) FSAR paragraph 14.1.2.8.4
- (2) FSAR paragraph 10.3.4
- 127> (3) B&W Document 86-1153322-00, "Rancho Seco: MSSV Analysis, Overpressure Protection Requirements for the Number of Main Steam Safety Valves for the Rancho Seco Unit," November 1984.
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