REACTOR COOLANT SYSTEM

SAFETY VALVES AND PILOT OPERATED RELIEF VALVE - OPERATING

LIMITING CONDITION FOR OPERATION

3.4.3 All pressurizer code safety valves shall be OPERABLE with a lift setting of ≤ 2575 ~~2525~~ psig.* When not isolated, the pressurizer pilot operated relief valve shall have a trip setpoint of ≥ 2435 psig and an allowable value of ≥2435 psig.**

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

With one pressurizer code safety valve inoperable, either restore the inoperable valve to OPERABLE status within 15 minutes or be in HOT SHUTDOWN within 12 hours.

SURVEILLANCE REQUIREMENTS

4.4.3 For the pressurizer code safety valves, there are no additional Surveillance Requirements other than those required by Specification 4.0.5. For the pressurizer pilot operated relief valve a CHANNEL CALIBRATION check shall be performed every 18 months.

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* The lift setting pressure shall correspond to ambient conditions of the valve at nominal operating temperature and pressure.

** Allowable value for CHANNEL CALIBRATION check.

BASES

3/4.4.1 REACTOR COOLANT LOOPS

The plant is designed to operate with both reactor coolant loops in operation, and maintain DNBR above the minimum allowable DNB ratio during all normal operations and anticipated transients. With one reactor coolant pump not in operation in one loop, THERMAL POWER is restricted by the Nuclear Overpower Based on RCS Flow and AXIAL POWER IMBALANCE, ensuring that the DNBR will be maintained above the minimum allowable DNB ratio at the maximum possible THERMAL POWER for the number of reactor coolant pumps in operation or the local quality at the point of minimum DNBR equal to the DNB correlation quality limit, whichever is more restrictive.

In MODE 3 when RCS pressure or temperature is higher than the decay heat removal system's design condition (i.e. 330 psig and 350°F), a single reactor coolant loop provides sufficient heat removal capability. The remainder of MODE 3 as well as in MODES 4 and 5 either a single reactor coolant loop or a DHR loop will be sufficient for decay heat removal; but single failure considerations require that at least two loops be OPERABLE. Thus, if the reactor coolant loops are not OPERABLE, this specification requires two DHR loops to be OPERABLE.

Natural circulation flow or the operation of one DHR pump provides adequate flow to ensure mixing, prevent stratification and produce gradual reactivity changes during boron concentration reductions in the Reactor Coolant System. The reactivity change rate associated with boron reduction will, therefore, be within the capacity of operator recognition and control.

3/4.4.2 and 3/4.4.3 SAFETY VALVES

The pressurizer code safety valves operate to prevent the RCS from being pressurized above its Safety Limit of 2750 psig. Each safety valve is designed to relieve 336,000 lbs per hour of saturated steam at the valve's setpoint.

The relief capacity of a single safety valve is adequate to relieve any overpressure condition which could occur during shutdown. In the event that no safety valves are OPERABLE, an operating DHR loop, connected to the RCS, provides overpressure relief capability and will prevent RCS overpressurization. During operation, all pressurizer code safety valves must be OPERABLE to prevent the RCS from being pressurized above its safety limit of 2750 psig. The combined relief capacity of all of these valves is greater than the maximum surge rate resulting from any transient.

The relief capacity of the decay heat removal system relief valve is adequate to relieve any overpressure condition which could occur during shutdown. In the event that this relief valve is not OPERABLE, reactor coolant system pressure, pressurizer level and make up water inventory is limited and the capability of the high pressure injection system to

inject water into the reactor coolant system is disabled to ensure operation within reactor coolant system pressure - temperature limits.

Demonstration of the safety valves' lift settings will occur only during shutdown and will be performed in accordance with the provisions of Section XI of the ASME Boiler and Pressure Code.

The pressurizer code safety valves must be set such that the peak Reactor Coolant System pressure does not exceed 110% of design system pressure (2500 psig) or, 2750 psig. The control rod group withdrawal accident will result in the most limiting high pressure in the RCS. The analysis assumes RPS high pressure trip at 2355 psig and the code safety valves open at 2500 psig. The tolerance on the RPS instrument accuracy is 30 psi and~~,~~ it is ~~+3% +1%~~ for the code safety valve settings. The analysis justifies a lift tolerance of up to +4.5% with one operating pressurizer code safety valve. However, the lift tolerance is limited to +3% for additional conservatism. The pressurizer pilot operated relief valve was assumed not to open for this transient. The resulting system peak pressure was calculated to be 2710 ~~2700~~ psig. Although the pressurizer code safety valves are considered OPERABLE with an as-found lift tolerance of ±3%, they are set to within ±1% after testing, in accordance with the ASME Boiler and Pressure Vessel Code. Therefore, the code safety valve setpoint is conservatively specified ~~set~~ at < 2575 ~~2525~~ psig, which is the nominal system ~~maximum~~ pressure of 2500 psig, ā ± 1% setting ~~for~~ tolerance, and a 2% allowance for setpoint drift throughout the operating cycle.

The pressurizer pilot operated relief valve should be set such that it will open before the code safety valves are opened. However, it should not open on any anticipated transients. BAW-1890, September 1985 identified that the turbine trip from full power would cause the largest overpressure transient. This report demonstrated that with a RPS high pressure trip setpoint of 2355 psig the resulting overshoot in RCS pressure would be limited to 50 psi. Consequently, the minimum PORV setpoint needs to accommodate both the RCS pressure overshoot and the RPS instrument string error of 30 psi.