SAFETY EVALUATION FOR THE REACTOR COOLANT SYSTEM OVERPRESSURE PROTECTION SYSTEM PROPOSED TECHNICAL SPECIFICATIONS

Background:

In a letter dated December 29, 1976, the NRC stated that Alabama Power Company (APCo) must provide a long term protection system for the Farley Nuclear Plant (FNP) against low temperature overpressurization of the reactor coolant system such that the pressure limitations imposed by Appendix G to 10CFR50 are not exceeded. APCo submitted its response to the NRC letter on September 6, 1978. This submittal proposed an Overpressurization Mitigating System (OMS) utilizing the two existing RHR suction line relief valves (8708A and 8708B). In letters dated November 9, 1978 and November 17, 1978, APCo provided additional information and responded to the subsequent NRC concerns. Recent discussions with the NRC have revealed that it is in the process of completing a review of the FNP's proposed OMS and that committing to the subject Technical Specifications is imperative to a favorable review.

References:

(1) NRC letter to APCo dated December 29, 1976.
(2) APCo's submittal to the NRC dated September 6, 1978.
(3) APCo's submittal to the NRC dated November 3, 1978.
(4) APCo's submittal to the NRC dated November 9, 1978.
(5) APCo's submittal to the NRC dated November 17, 1978.
(6) Proposed Technical Specification 3.4.9.3.
(7) Technical Specifications Bases Section 3/4.4.9.

Bases:

Attached is a copy of the Reactor Coolant System Overpressure Protection System proposed Technical Specification for the Farley Nuclear Plant. The NRC's Standard Technical Specification format was appropriately modified commensurate with the FNP's proposed OMS.

The proposed OMS is required to be operational whenever the RCS temperature is $\leq 310^{\circ}F$. The limiting Appendix G pressure for a 100° F/hr heatup rate (worst case) at $310^{\circ}F$ RCS temperature is approximately 2500 psia. Above $310^{\circ}F$ the RCS is protected against overpressurization transients by the pressurizer safety relief valves which have a set point of 2,485 psig. Since the proposed OMS utilizes the RHR suction line relief valves to relieve the RCS following an overpressurization transient, the operability of the RHR relief valves and proper alignment of the isolation valves (8701A, 8701B, 8702A, and 8702B) upstream of the relief valves must be assured.

The attached Technical Specification was required by the NRC to assure operability through augmented testing of the relief valves and to ensure proper alignment of the isolation valves upstream of the relief valves. Proper alignment of the isolation valves is necessary to ensure that these valves are always open when the OMS is operational. Since the OMS is required to be operational throughout the shutdown mode, this Technical Specification also provides for an alternate means of providing protection against overpressurization by requiring the RCS to be in a depressurized vented condition. The vent area of 2.85 $in.^2$ referenced in the Technical Specification corresponds to the nozzle area of one RHR relief valve.

Conclusion: 7901100298

The Technical Specification for RCS overpressure protection does not involve an unreviewed safety question as defined by 10CFR50.59.

REACTOR COOLANT SYSTEM

OVERPRESSURE PROTECTION SYSTEMS

LIMITING CONDITION FOR OPERATION

3.4.9.3 At least one of the following overpressure protection systems shall be OPERABLE:

a. Two RHR relief valves with a lift setting of $\leq$ 450 psig, or

b. A reactor coolant system vent of $\geq$ 2.85 square inches.

APPLICABILITY: When the temperature of one or more of the RCS cold legs is $\leq$ 310°F, except when the reactor vessel head is removed.

ACTION:

a. With one RHR relief valve inoperable, either restore the inoperable valve to OPERABLE status within 7 days or depressurize and vent the RCS through a $\geq$ 2.85 square inch vent within the next 8 hours; maintain the RCS in a vented condition until both RHR relief valves have been restored to OPERABLE status.

b. With both RHR relief valves inoperable, depressurize and vent the RCS through a $\geq$ 2.85 square inch vent within 8 hours; maintain the RCS in a vented condition until both RHR relief valves have been restored to OPERABLE status.

c. In the event a RHR relief valve or a RCS vent is used to mitigate a RCS pressure transient, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 30 days. The report shall describe the circumstances initiating the transient, the effect of the RHR relief valves or vent on the transient and any corrective action necessary to prevent recurrence.

d. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.4.9.3.1 Each RHR relief valve shall be demonstrated OPERABLE by:

a. Verifying the RHR relief valve isolation valves are open at least once per ~~12~~ 72 hours when the RHR relief valve is being used for overpressure protection.

b. Testing in accordance with the inservice test requirements for ASME Category C valves pursuant to Specification 4.0.5.

c. ~~In place~~ Verification of the RHR relief valve setpoint every refueling outage on a STAGGERED TEST BASIS.

4.4.9.3.2 The RCS vent shall be verified to be open at least once per 12 hours* when the vent is being used for overpressure protection.

*Except when the vent pathway is provided with a valve which is locked, sealed, or otherwise secured in the open position, then verify these valves open at least once per 31 days.

vessel inside radius are essentially identical, the measured transition shift for a sample can be applied with confidence to the adjacent section of the reactor vessel. The heatup and cooldown curves must be recalculated when the ΔRT_{NDT} determined from the surveillance capsule is different from the calculated ΔRT_{NDT} for the equivalent capsule radiation exposure.

The pressure-temperature limit lines shown on Figure 3.4-2 for reactor criticality and for inservice leak and hydrostatic testing have been provided to assure compliance with the minimum temperature requirements of Appendix G to 10 CFR 50.

The number of reactor vessel irradiation surveillance specimens and the frequencies for removing and testing these specimens are provided in Table 4.4-5 to assure compliance with the requirements of Appendix H to 10 CFR Part 50.

The limitations imposed on pressurizer heatup and cooldown and spray water temperature differential are provided to assure that the pressurizer is operated within the design criteria assumed for the fatigue analysis performed in accordance with the ASME Code requirements.

----------Insert*

3/4.4.10 STRUCTURAL INTEGRITY

The inspection programs for ASME Code Class 1, 2 and 3 components ensure that the structural integrity of these components will be maintained at an acceptable level throughout the life of the plant. To the extent applicable, the inspection program for these components is in compliance with Section XI of the ASME Boiler and Pressure Vessel Code.

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* The OPERABILITY of two RHR relief valves or an RCS vent opening of $\geq$ 2.85 $in.^2$ ensures that the RCS will be protected from pressure transients which could exceed the limits of Appendix G to 10 CFR Part 50 when one or more of the RCS cold legs are $\leq 310^{\circ}F$. Either RHR relief valve has adequate relieving capability to protect the RCS from overpressurization when the transient is limited to either (1) the start of an idle RCP with the secondary water temperature of the steam generator $\leq 50^{\circ}F$ above the RCS cold leg temperatures, or (2) the start of a charging pump and its injection into a water solid RCS.