



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 136 TO FACILITY OPERATING LICENSE NO. DPR-40
OMAHA PUBLIC POWER DISTRICT
FORT CALHOUN STATION, UNIT NO. 1
DOCKET NO. 50-285

1.0 INTRODUCTION

By letter dated June 28, 1990, as supplemented August 2 and November 15, 1990, Omaha Public Power District (the licensee) requested an amendment to the Technical Specifications (TS) for Fort Calhoun Station, Unit No. 1. The proposed TS changes would place restrictions on the containment spray (CS) system use as a backup for shutdown cooling and limitations on the availability of the CS pumps as shutdown cooling pumps in the refueling shutdown mode. The plant's CS pumps and suction header piping were not originally constructed for use as a backup to the Low Pressure Safety Injection (LPSI) system for shutdown cooling. However, the current TS Section 2.1.1 allows credit for use of the CS system as redundant to the LPSI system for shutdown cooling. TS Section 3.16 also requires pressure testing of the CS piping to a value which exceeds the original code allowed hydrostatic test pressure. These conditions were apparently the result of inadequate review of the design basis and safety implications for unrestricted use of containment spray system for shutdown cooling requirements. The licensee performed a safety evaluation after being made aware of this situation, from a 10 CFR 50.59 review, and proposed TS revisions to reflect use of the CS system within design parameters.

As a result of the staff's review, the licensee supplemented its initial application with submittals which the staff included in its original findings of no significant hazards consideration except for the November 15, 1990 submittal. This submittal omitted a general reference to the Updated Safety Analysis Report, Section 6.3, on page 3-85 of the Technical Specifications which does not support any specific statement in the Basis Section to Specification 3.16, and further avoided any confusion with this reference. The November 15 change was within the scope of the notice published in the Federal Register on September 5, 1990 (55 FR 36347), and did not affect the initial determination.

2.0 DISCUSSION

2.1 Change of the Decay Heat Removal Loops for Cold Shutdown Requirements

The licensee proposed a revision of the limiting conditions for operation (LCO) in TS 2.1.1.(3), which applies to cold shutdown between 210°F to 300°F, to require that the decay heat removal requirements in items (iii) and (iv) of TS 2.1.1.(3) be met only with the shutdown cooling (LPSI) pumps instead of "containment spray or LPSI pumps" as currently required. The plant's normal shutdown cooling operations utilize a LPSI pump. If a CS pump is to be used as redundant to the LPSI pump for shutdown cooling, suction to the CS pump can only be provided by opening a LPSI suction isolation valve and routing the reactor coolant through the class 151R SI/CS pumps' main suction header. The class 151R piping system was originally designed for 350°F and 66 psig, which indicated that the piping was not intended for unrestricted use as an alternate means of shutdown cooling with a pressure boundary of 250 psig. The proposed changes would ensure that the class 151R piping would not be operated as an alternate shutdown cooling means. Therefore, the staff finds the proposed TS 2.1.1.(3) acceptable.

The licensee's proposed change to TS 2.1.1(4) adds limitations for the availability of the containment spray pumps for shutdown cooling service in the refueling shutdown mode. These limitations are (1) the Reactor Coolant System temperature must be below 120°F and (2) The pressurizer manway is specified as the minimum vent area because the pressurizer surge line cross-sectional area (approximately 57 square inches) is more limiting, but still larger than 47 square inches required by the analysis. The 120°F RCS temperature limitation ensures that the SI/CS pumps' suction header piping is maintained within the temperature bounds of OPPD's current analysis of record for this piping. The RCS vent requirement precludes the occurrence of overpressurization of this piping in the event of a transient. The staff finds the proposed limitations on CS pumps' use for shutdown cooling service during refueling conditions acceptable.

The licensee added a basis for the proposed TS 2.1.1.(3) and 2.1.1.(4) to explain the restrictions on CS pumps' availability for decay heat removal in the cold shutdown and refueling modes. The basis was added to clarify the TS and is acceptable.

2.2 Change of Residual Heat Removal System Integrity Test Requirements

The licensee proposed a revision of the surveillance requirements in TS 3.16 to change the Residual Heat Removal (RHR) system test requirements as follows:

TS 3.16.(1)a was revised to extend the 250 psig pressure testing on the shutdown cooling system piping to the piping between the containment spray pump suction and discharge isolation valves. The change would ensure that the piping between the CS pumps and the suction isolation valves is tested at the same pressure as the piping between the LPSI pumps and their suction isolation valves. The staff finds that proposed TS 3.16.(1)a is acceptable since it ensures the containment spray pumps' discharge piping will be subjected to proper test pressure.

TS 3.16.(1)b was revised to require that the piping from valves HCV-383-3 and HCV-383-4 to the suction isolation valves of the LPSI pumps, the CS pumps, and the High Pressure Safety Injection (HPSI) pumps be examined for leakage at a pressure no less than 82 psig instead of "shall be hydrostatically tested at no less than 100 psig" as currently worded. The change would establish minimum test pressure for class 151R piping that is equal to approximately 1.25 times the design pressure of 66 psig. The licensee stated that the 100 psig minimum test pressure presently in TS 3.16.(1)b is a judgement value and it exceeds the original construction code hydrostatic test pressure for the class 151R piping. The licensee performed a preliminary analysis documented in Licensee Event Report 89024 to verify that the 100 psig test versus an original hydrostatic test of 88 psig has not damaged the piping. The staff finds the proposed TS 3.16.(1)b acceptable since it conforms with both the 151R piping design and ASME XI Inservice Testing requirements.

TS 3.16.(1)c was reworded and made into a new TS 3.16.(1)d. A new TS 3.16.(1)c was added to incorporate testing of the HPSI piping outside containment. The current TS 3.16.(1)b only requires testing of the HPSI discharge piping to the discharge isolation valves with a relatively low pressure. The proposed TS 3.16.(1)c adds requirements to test the HPSI piping outside containment and downstream of the HPSI pumps. The proposed test pressure for the HPSI piping is the discharge pressure generated by a HPSI pump operating in the minimum recirculation mode. The licensee stated that the HPSI pump curve is virtually flat in the 0-50 gpm region and each pump's minimum recirculation flow orifice is sized for 35 gpm. Therefore, operating a HPSI pump in the minimum recirculation mode will pressurize the downstream piping to a pressure very near the shutoff head of the pump. The licensee also calculated the projected leakages at 1500 psig, a pressure which exceeds the maximum expected post-accident HPSI pump's discharge pressure, based on the observed leakages in the tests multiplied by the square root of the ratio $1500/P$, where P is test pressure in psig for the HPSI pump discharge. Based on the manufacturer's certified pump curves, the HPSI pump shutoff total dynamic head (TDH) is about 3180 feet or 1380 psig and the expected maximum post-accident discharge pressure from a HPSI pump would be approximately 1435 psig. This analysis is based on an assumption that the leakage area does not change with increasing pressure. The staff finds that the licensee's analyses provide margin that bounds the highest expected post-accident HPSI pump discharge pressure and the proposed TS 3.16.(1)c is acceptable.

TS 3.16.(2)a was revised to require that the sum of leakage from (1)a, (1)b, and (1)c of T. 3.16 not exceed 1243 cc/hr. The allowable leakage of 1243 cc/hr is not changed. The staff finds the proposed TS 3.15(2)a acceptable since it clarifies the acceptance criteria.

The basis for TS 3.16 was revised accordingly to reflect the proposed changes and was found acceptable.

2.3 Other Changes

Other changes, including nomenclature of titles in TS 3.16, table of contents, Table 2.9, and deletion of a basis in TS 3.16, are editorial to clarify and update the TS, and are found acceptable.

2.4 Findings

The staff has completed its review of the licensee's submittal. Based on the review of Sections 2.1.1 and 3.16 of the TS, the staff finds that the proposed TS changes are acceptable on the basis that the changes are supported by the licensee's safety evaluation and also are part of the required corrective actions as noted in the License Event Report 89-024.

3.0 ENVIRONMENTAL CONSIDERATION

The amendment involves a change in a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes in surveillance requirements. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposures. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Section 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

4.0 CONCLUSION

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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