



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 72 TO LICENSE NO. DPR-46

NEBRASKA PUBLIC POWER DISTRICT

DOCKET NO. 50-298

COOPER NUCLEAR STATION

INTRODUCTION

Due to the recent heat wave and drought in the midwestern region of the country, the Missouri River, which is used for service water for the Cooper facility, has reached a high enough temperature so the suppression pool temperature cannot be maintained at 90°F by cooling from this water. This is significant because the suppression pool's maximum allowable temperature is limited to 90°F by the plant's Technical Specifications. The design basis for all plant transients assumes a maximum suppression pool temperature of 90°F. Any increase in river water temperature from existing levels will cause the torus water temperature to rise above 90°F. If this were to occur, the plant would have to shutdown.

By phone on July 16, 1981, and confirmed by letter dated July 16, 1981, the Nebraska Public Power District (NPPD) licensee requested an emergency Technical Specification change regarding maximum suppression pool temperatures. The licensee proposed that during periods when the river water temperature is sufficiently high that the suppression chamber water temperature cannot be maintained below 90°F, the maximum permitted water temperature in the suppression chamber may be increased to 95°F from the current 90°F Technical Specification limit.

Discussion

The Technical Specifications for the Cooper Nuclear Station plant require that: (1) the suppression pool temperature shall not exceed 90°F during normal plant operation; (2) during testing which adds heat to the suppression pool the water temperature shall not exceed 10°F above the normal power operation limit specified in condition 1 above. In connection with such testing, the pool temperature shall be reduced below the normal power operation limit specified in condition 1 within 24 hours or the plant shall be in a cold shutdown condition in the subsequent 24 hours; (3) in the event that the suppression pool temperature reaches 110°F, the reactor shall be scrammed and power operation shall not be resumed until the pool temperature is reduced below the power operation limit specified in condition 1; and (4) in the event that the suppression pool temperature reaches 120°F during reactor isolation conditions, the reactor shall be depressurized to less

than 200 psig at normal cooldown rates. These requirements stem from the initial conditions assumed in the containment response analyses for loss-of-coolant accident (LOCA) and safety-relief valve (SRV) discharge transients. In its request, NPPD requested that the 90°F limit be increased to 95°F and provided the results of analyses of the design basis LOCA and SRV discharge events which consider the revised limit.

Evaluation

With respect to LOCA transients, the principal considerations are (1) the containment design pressure and temperature, (2) the net positive suction head (NPSH) for the Emergency Core Cooling System (ECCS) pumps, and (3) the maximum suppression pool temperature for steam condensation. To address these considerations, NPPD has submitted the results of a General Electric analysis for Cooper, which used the 95°F initial condition. This analysis is being performed by General Electric so Cooper could request a permanent Technical Specification suppression pool temperature change. The results of this analysis showed that the suppression pool Technical Specification limit may be raised from 90 to 95°F without exceeding the 200°F Mark 1 temperature limit, LOCA considerations and ECCS pump NPSH requirements.

In a similar Technical Specification change issued for Peach Bottom on August 1, 1980, the original design basis LOCA for the Peach Bottom plant was predicated on maintaining the pool temperature below 170°F to assure complete condensation of the steam evolving from the postulated break and the subsequent removal of heat from the containment via the suppression pool and the Residual Heat Removal (RHR) system. The 170°F limit was based on data from the Bodega Bay and Humboldt Bay test facilities which formed the original basis for the containment design, as described in the plant's Final Safety Analysis Report (FSAR). The suppression pool temperature response in the licensee's submittal and the FSAR show a peak pool temperature of approximately 190°F at 10 hours after the postulated accident for minimum cooling capability. However, steaming from the break ends much earlier in the transient (i.e., within minutes) and subsequent heat removal from the core to the pool is via subcooled ECCS water. The pool temperature reached 170°F at approximately 1.1 hours for an initial pool temperature of 90°F and approximately 15 minutes sooner for an initial pool temperature of 95°F, still well after steaming has stopped. Further, recent tests in the Mark I Full Scale Test Facility (General Electric topical report NEDE-24539) have indicated condensation effectiveness at pool temperatures above 170°F. It was therefore, concluded that the proposed change would not adversely affect the condensation effectiveness or the heat removal capability of the containment system. Since Cooper and Peach Bottom have approximately the same ratio of torus water volume to core thermal power, the same original design basis 170°F pool temperature and since they reach approximately the same original peak suppression pool temperature (192 compared to 190°F) the above conclusion should be applicable for the proposed change to Cooper.

In a General Electric letter dated July 16, 1981 which was an attachment to the Nebraska Public Power District July 16, 1981 letter the results of the suppression pool temperature analysis assuming the initial suppression pool temperature was 95°F was provided. The results of this analysis showed the maximum bulk pool temperature did not exceed 179°F and the maximum local pool temperature did not exceed 199°F. Although the maximum bulk pool temperature is 9°F higher than the original design basis since that time Cooper has installed T-Quenchers which increase the condensation effectiveness of the suppression pool at maximum bulk pool temperatures higher than 170°F. The maximum local pool temperature of 199°F is below the present limit of 200°F specified in NUREG-0661. With regard to SRV discharge transients, the limiting event is a stuck-open valve. For the limiting event, the controlling parameter is the time of reactor scram. Since the Technical Specification requirement for reactor scram at a pool temperature of 110°F has not been changed, we conclude that the proposed change will not significantly affect the SRV discharge transients.

Summary

Based on the evaluation described above, we conclude that the proposed increase in the maximum suppression pool temperature during normal plant operation from 90°F to 95°F will not adversely affect the containment design basis and is, therefore, acceptable. This change is effective for 45 days commencing July 16, 1981.

ENVIRONMENTAL CONSIDERATIONS

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact, and pursuant to 10 CFR Section 51.5(d)(4) that an environmental impact statement, or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of the amendment.

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: July 23, 1981