ATTACHMENT

PROPOSED TECHNICAL SPECIFICATION CHANGES

LICENSE AMENDMENT REQUEST

IN THE MATTER OF AMENDING

LICENSE NO. NPF-6

ARKANSAS POWER & LIGHT COMPANY

ARKANSAS NUCLEAR ONE, UNIT 2

DOCKET NO. 50-368

DECEMBER 15, 1989

DESCRIPTION OF PROPOSED CHANGE

AP&L proposes to modify Surveillance Requirement (SR) 4.9.8.1 to reflect a lower minimum allowed shutdown cooling (SDC) loop flow of 2000 gpm. Technical Specification (TS) 3.9.8.1 requires at least one SDC loop be in operation in Mode 6 (refueling). The associated SR 4.9.8.1 requires periodic (once per 24 hours) verification of SDC loop operation with a presently specified minimum flow of 3000 gpm.

BACKGROUND

AP&L's 90-day response to Generic Letter (GL) 88-17 described our plans for addressing the six programmed enhancements recommended by the NRC concerning the loss of decay heat removal (DHR) issue. Item (5) of the GL 88-17 programmed enhancements recommended identification of technical specifications that restrict or limit the safety benefit of the actions identified in the GL, and submittal of appropriate changes. Our response identified that the minimum SDC loop flow (3000 gpm), required to be periodically verified by TS SR 4.9.8.1, was not always appropriate, and stated that we anticipated proposing a change to this requirement.

DISCUSSION

AP&L has determined that a reduction in the minimum SDC loop flow from 3000 to 2000 gpm is appropriate, and proposes to modify TS SR 4.9.8.1 accordingly. This change was determined to be acceptable by conservative evaluations of the SDC pump long term minimum flow requirements, and minimum flow requirements for RCS mixing as related to the ANO-2 Safety Analysis Report (SAR) RCS Boron Dilution Accident Analysis (Section 15.1.4.2.2.2). AP&L and the SDC pump vendor evaluated the long term minimum flow requirements for the SDC pump and determined that 2000 gpm was adequate to prevent abnormal pump wear. AP&L and Combustion Engineering evaluated the impact of a reduced SDC loop flow on the SAR Boron Dilution Accident Analysis and determined that the reduction in SDC loop flow to 2000 gpm did not impact the results of the analysis. The SDC flow rate affects the amount of reactor coolant circulating through the core during Mode 6 (refueling). This flow rate determines the amount of mixing which occurs in the RCS during a postulated boron dilution event. Adequate RCS mixing is provided by any flow rate which is significantly larger than the dilution flow (the maximum dilution flow analyzed is 132 gpm from all three charging pumps). Conservatively assuming no mixing due to turbulence or diffusion through the core, a reduced loop flow rate results in a larger step change in boron dilution with each loop transport cycle. However, the average rate of decrease in boron concentration is unaffected by SDC loop flow. Therefore, specific SDC flow is not an input parameter to this analysis. The 4000 gpm SDC flow suggested in the ANO-2 SAR comes from a generic Combustion Engineering presentation on the boron dilution accident and is not directly applicable to ANO-2. The proposed 2000 gpm minimum flow will continue to provide adequate RCS mixing and will maintain the acceptance criteria of the present boron dilution analysis.

The proposed reduced minimum flow will also continue to provide adequate flow for core cooling during refueling conditions, while providing the benefit of greater margin to SDC suction line vortexing and air entrainment during operation with lowered RCS levels, a concern discussed in GL 88-17. AP&L also performed a SDC system RCS level vortexing test during the past 2R7 refueling outage. This test verified that the proposed 2000 gpm was acceptable with a minimum of 10" RCS level (above the bottom of the hot leg). An RCS level of 19" is the procedurally required minimum for SDC operation.

DESCRIPTION OF PROPOSED NO SIGNIFICANT HAZARDS DETERMINATION

In accordance with 10CFR50.92, AP&L has evaluated whether the proposed change involves a significant safety hazards consideration. AP&L has concluded that the proposed change to reduce the minimum required SDC loop flow does not involve a significant hazards consideration because the operation of Arkansas Nuclear One, Unit 2 in accordance with this change would not:

(1) Involve a significant increase in the probability or consequences of an accident previously evaluated.

The SDC flow rate affects the amount of reactor coolant circulating through the core during Mode 6 (refueling). This flow rate determines the amount of mixing which occurs in the RCS during a postulated boron dilution event. The boron dilution accident analyses are well understood, and adequate mixing is provided by any flow rate which is significantly larger than the dilution flow (the maximum dilution flow analysed is 132 gpm from all three charging pumps). In fact, specific SDC flow is not an input parameter to these analyses. The proposed 2000 gpm minimum flow will continue to provide adequate RCS mixing and will maintain the acceptance criteria of the present analyses. Therefore, the accident mitigation features of the plant are not affected by the proposed change.

(2) Create the possibility of a new or different kind of accident from any previously evaluated.

No new possibility for an accident is introduced by the proposed reduction in the minimum SDC flow which must be periodically verified in accordance with TS SR 4.9.8.1. The reduced minimum flow requirement has been evaluated and determined acceptable for the SDC pump minimum continuous flow requirement, therefore, no greater possibility of a different kind of accident related to equipment failure is created. The reduced minimum flow requirement also continues to assure sufficient flow for adequate core cooling during Mode 6.

(3) Involve a significant reduction in the margin of safety.

The NRC evaluated various improvements in equipment and procedures related to DHR operation from a balanced risk perspective during preparation of GL 88-17. It was identified that during certain plant conditions, i.e., operation of SDC with a lowered RCS level during refueling maintenance activities, the potential for loss of DHR due to flow vortexing in the DHR (SDC) suction drop line was increased significantly at higher DHR (SDC) flow rates. When the criteria of adequate RCS mixing, pump minimum flow requirements, and core cooling requirements are all met, as in the proposed change, a reduction in required minimum SDC flow (that is higher than necessary) has been determined to significantly improve the margin of safety with respect to potential loss of DHR events.

The NRC has provided guidance concerning the application of these standards by providing examples of changes involving no significant hazards considerations. The proposed amendment does not closely match any of the examples. The proposed change reflects an improvement identified during industry (NRC and utility) response to, and resolution of, an emerging technical issue (loss of DHR).

Therefore, based on the evaluation discussed above, AP&L has concluded that the proposed change does not involve a significant hazards consideration.

ANO-2 TECHNICAL SPECIFICATION

PROPOSED CHANGE PAGES

REFUELING OPERATIONS

SHUTDOWN COOLING AND COOLANT CIRCULATION

SHUTDOWN COOLING - ONE LOOP

LIMITING CONDITION FOR OPERATION

3.9.8.1 At least one shutdown cooling loop shall be in operation.

APPLICABILITY: MODE 6.

ACTION:

a. With less than one shutdown cooling loop in operation, except as provided in b. below, suspend all operations involving an increase in the reactor decay heat load or a reduction in boron concentration of the Reactor Coolant System. Close all containment penetrations providing direct access from the containment atmosphere to the outside atmosphere within 4 hours.

b. The shutdown cooling loop may be removed from operation for up to 1 hour per 8 hour period during the performance of CORE ALTERATIONS.

c. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.8.1 A shutdown cooling loop shall be determined to be in operation and circulating reactor coolant at a flow rate of ≥ 2000 gpm at least once per 24 hours.