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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 5 TO LICENSE NO. DPR-51

AND

CHANGE NO. 5 TO THE TECHNICAL SPECIFICATIONS

ARKANSAS POWER AND LIGHT COMPANY

ARKANSAS NUCLEAR ONE - UNIT 1

DOCKET NO. 50-313

INTRODUCTION

By letter dated July 29, 1975, Arkansas Power & Light Company (AP&L) requested changes to the Radiological Technical Specifications appended to Facility Operating License No. DPR-51. The proposed changes would:

1. Revise the curves in Figure 2.1-2, "Core Protection Safety Limits," to reflect 100 Effective Full Power Days (EFPD) of fuel burnup. This revision involves extensions of the negative and positive imbalance portions of the curves from -17.5% to -24% imbalance and from +19% to +20% imbalance, respectively, and changes in the curve slopes and termination points.

2. Revise the curves in Figure 2.3-2, "Protective System Maximum Allowable Setpoints," to reflect 100 EFPD of fuel burnup. This revision involves extensions of the negative and positive imbalance portions of the curves from -3.98% to -14% imbalance and from +6.08% to +10% imbalance, respectively, and changes in the curve slopes and termination points.

3. Revise Figure 3.5.2-3, "Operational Power Imbalance Envelope," to conform with the extended negative imbalance portion of the proposed Figure 2.3-2.

EVALUATION

Items 1 and 2 described above are being proposed by AP&L to provide greater flexibility in reactor operation. The setpoints for the "overpower trip based on flow and imbalance" (hereafter called "power/flow/imbalance" trip) are established by the curves in Figure 2.3-2 which are, in turn, based

on the core protection safety limits established by the curves in Figure 2.1-2. The reactor protection system (RPS) is electronically adjusted to make the power/flow/imbalance trip settings conform with Figure 2.3-2. If this setpoint envelope is too restrictive, reactor operation with even small imbalances (±5%) may require a reduction in power level to assure that the reactor does not trip when large load changes occur. An expansion of the curves in Figure 2.3-2 would permit reliable reactor operation at 100% of rated power level.

The existing Figures 2.1-2 and 2.3-2 of the Appendix A Technical Specifications are based on beginning-of-life (BOL) power peaking as the "worst case" condition. The proposed changes would update Figures 2.1-2 and 2.3-2 to take credit for 100 effective full power days (EFPD) of operation. The present core exposure is greater than 150 EFPD. The effect of calculating new curves for Figures 2.1-2 and 2.3-2 based on 100 EFPD is to expand the negative and positive imbalance portions of those curves as well as to change the slopes and endpoints of the curves.

A representative case to be considered is the negative imbalance portion of the upper most curve in Figure 2.3-2. An increase of 10% (nominal) in the negative imbalance of a rodded plant such as Arkansas Nuclear One - Unit 1 will result in an increase in the peaking factor with a consequent increase in the maximum linear heat generation rate of approximately 1.2 kw/ft[1/]. However, as a result of the burnup of the core to 100 EFPD, the flux is flattened and the peaking factor is reduced. This results in a decrease in the maximum linear heat generation rate of approximately 1.8 kw/ft [2/]. The net result, considering the situation at 100 EFPD, is that the safety margin is increased by approximately 0.6 kw/ft over its value at BOL. The other proposed alterations in the curves lead to similar net increases in the maximum linear heat generation rate, and thus result in similar increases in the safety margin over those present at BOL. On this basis and the acceptability of the BOL safety margins in our review of the original Technical Specifications, we find that the proposed changes altering the imbalance curves of Figures 2.1-2 and 2.3-2 are acceptable.

1/ BAW-10079 (non-proprietary), "Operational Parameters for B&W Rodded Plants," October, 1973.

2/ BAW-B91 (proprietary), "Arkansas Nuclear One - Unit 1, Fuel Densification Report," June, 1973.

The third part of this proposed change would remove restrictions imposed by the existing Figure 2.3-2 and is consistent with the proposed changes to Figure 2.3-2 discussed above. Figure 3.5.2-3 was altered by Amendment 2 to DPR-51, dated May 9, 1975, from its original configuration which is based on loss-of-coolant accident (LOCA) calculations. The proposed change to Figure 3.5.2-3 would return it to its original configuration thereby reflecting the extended negative imbalance portion of the proposed Figure 2.3-2. Since the original Figure 3.5.2-3 (as it existed before Amendment 2 to DPR-51) previously has been found acceptable by the staff in reviewing the original Technical Specifications, we conclude that the proposed change to Figure 3.5.2-3 is acceptable.

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) because the change 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 change 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.

Date: SEP 15 1975