7590-01

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
ARKANSAS POWER AND LIGHT COMPANY	)	Docket No. 50-313
	)	
Arkansas Nuclear One - Unit No. 1	)	

ORDER FOR MODIFICATION OF LICENSE

I.

The Arkansas Power & Light Company (the licensee), is the holder of Facility Operating License No. DPR-51 which authorizes the operation of the nuclear power reactor known as Arkansas Nuclear One - Unit No. 1, (the facility or ANO-1) at steady reactor power levels not in excess of 2568 megawatts thermal (rated power). The facility consists of a Babcock and Wilcox Company designed pressurized reactor (PWR) located at the licensee's site in Pope County, Arkansas.

II.

On April 21, 1978, the Commission issued an Order, modifying License No. DPR-51, to require a limitation on operating power level and to require certain operating procedures. This Order was the result of the identification of certain errors in the Emergency Core Cooling System (ECCS) performance calculations submitted by the licensee in accordance with the requirements of the Commission's regulations, 10 CFR §50.46.

As noted in our Order of April 21, 1978, Babcock & Wilcox (B&W) the designer of the Nuclear Steam Supply System (NSSS) for this facility had performed certain calculations demonstrating that with the operating procedures required by our Order of April 21, 1978, ECCS performance would remain within the limits of 10 CFR §50.46(b), with operation at full power, 2568Mwt.

However, since the NRC staff had not had the opportunity to review these calculations, the NRC staff had recommended and the licensee agreed to limit power to 2311 Mwt.

The staff has now had the opportunity to review the B&W calculations which are contained in a document entitled "Analysis of Small Breaks in the Reactor Coolant Pump Discharge Piping for the B&W Lowered Loop 177 FA Plants," April 24, 1978 (the B&W Summary), which describes the methods used and the results obtained in the above analysis. The analysis models operator action by assuming a step increase in flow to the reactor vessel (with balanced flow in the three intact loops) ten minutes after the LOCA reactor protection system trip signal occurs.

By letter dated April 25, 1978, the licensee submitted by reference the B&W Summary for our review. In their submittal the licensee stated that based on the B&W Summary, they were convinced that ANO-1 can operate at 100% full power (2568 Mwt) and maintain a substantial

margin to the 10 CFR 50.46 limits. Accordingly, based on the above discussion, the licensee requested an amendment to Facility Operating License No. DPR-51 to authorize the facility to operate at steady state core power levels not in excess of 2568 Mwt.

By letter dated April 21, 1978, supplemented by letter dated April 27, 1978, the licensee stated that they have incorporated in their procedures necessary operator actions on a time scale consistent with that assumed in the analysis, and that they have verified from tests that the assumed operator response time was achievable. The licensee also committed to submit as appropriate a request for an amendment of the ANO-1 Technical Specifications to reflect adoption of these procedures and committed to submit a proposal for a permanent solution to this problem by July 21, 1978.

We have completed a preliminary review of the B&W Summary and as a result requested that B&W analyze additional breaks. B&W states that a .13 $ft.^2$ discharge line break, with operator actions consistent with that modeled in the analysis, is the most limiting case. To arrive at this conclusion, B&W has performed analyses at break sizes of .3, .2, .17, .15, .13, .1, and .04 $ft.^2$. (The .3 and .2 breaks were analyzed for 2772 Mwt, the others for 2568 Mwt.) The results,

which were obtained using an approved Appendix K model for blowdown, indicate core uncovery for about 300 seconds for the 0.13 ft.^{2} break. For this break size B&W has conservatively calculated the peak clad temperature to be approximately 1551 F; well below the limits of 10 CFR 50.46(b).

Based on review of the B&W Summary and subsequent analyses which were submitted by the licensee by letter dated April 28, 1978, we find that the calculations support the conclusion that a .13 ft.^{2} discharge line break is the most limiting case. However, the Summary does not demonstrate that the assumptions employed in supplying heat inputs to the FOAM portion of the calculations were conservative. We are also reviewing whether use of simplified input in the FOAM calculations satisfies the requirement for calculation using an approved model. Accordingly, we cannot conclude at this time that operation of ANO-1 at 100% of licensed power would be fully in conformance with 10 CFR 50.46. On the other hand, the range of calculations now available shows that for operation of this facility at power levels up to 100% of full power (2568 Mwt), ECCS performance calculations for the limiting small break indicate that this break has a very substantial margin on peak clad temperature below the limits of 10 CFR 50.46(b) if appropriate operator action is properly taken (as described above).

Therefore, until we have had the opportunity to fully assess the B&W calculations, supplemented by licensee letter dated April 28, 1978, the staff cannot determine that operation of ANO-1 at full power under the conditions of the revised calculations by B&W applicable to this facility conforms fully to the requirements of 10 CFR 50.46. However, operation of ANO-1 at power levels of up to 2568 Mwt and in accordance with appropriate operating procedures will ensure that the ECCS will conform to the performance criteria of 10 CFR 50.46. Therefore, while B&W calculations applicable to this facility are completed to achieve full compliance with 10 CFR 50.46, operation of the facility at the full power level up to 2568 Mwt with appropriate operating procedures specified herein will not endanger life or property or the common defense and security, and the limitations imposed by Order of April 21, 1978, may be modified accordingly.

III.

Copies of the following documents are available for inspection at the Commission's Public Document Room at 1717 H Street, Washington,

D.C. 20555, and are being placed in the Commission's local public document room at the Arkansas Polytechnic College, Russellville, Arkansas.

1. Letter from Mr. Daniel H. Williams to Mr. R. W. Reid, Chief, Operating Reactors Branch #4, dated April 17, 1978.

2. Letter from Mr. William Cavanaugh, III to Mr. R. W. Reid, Chief, Operating Reactors Branch #4, dated April 25, 1978.

3. Letters from Mr. Donald A. Rueter to Mr. R. W. Reid, Chief, Operating Reactors Branch #4, dated April 21, 27, and 28, 1978.

IV.

Accordingly, pursuant to the Atomic Energy Act of 1954, as amended, and the Commission's Rules and Regulations in 10 CFR Parts 2 and 50, IT IS ORDERED THAT Facility Operating License No. DPR-51 is hereby amended by adding the following provisions in lieu of the provisions of our Order of April 21, 1978:

(1) As soon as possible, the licensee shall submit a reevaluation wholly in conformance with 10 CFR 50.46 of ECCS cooling performance calculated in accordance with the B&W Evaluation Model for operation with operating procedures described in its letters of April 17, 1978, April 21, 1978, and April 28, 1978,

(2) The power level shall not exceed 2568 Mwt, and

(3) Until further authorization by the Commission, the licensee shall operate in accordance with the procedures described in its letter of April 21, 1978, supplemented by letters dated April 27, 1978.

FOR THE NUCLEAR REGULATORY COMMISSION

Victor Stello, Jr., Director
Division of Operating Reactors
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland,
this 28th day of April 1978.