

FRANK LINDER  
General Manager

June 1, 1981

In reply, please  
refer to LAC-7572

DOCKET NO. 50-409

Director of Nuclear Reactor Regulation  
ATTN: Mr. Dennis M. Crutchfield  
Operating Reactors Branch #5  
Division of Operating Reactors  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

SUBJECT: DAIRYLAND POWER COOPERATIVE  
LA CROSSE BOILING WATER REACTOR (LACBWR)  
PROVISIONAL OPERATING LICENSE NO. DPR-45  
APPLICATION FOR AMENDMENT TO LICENSE



- References:
- (1) 10CFR50, Section 50.90.
  - (2) LACBWR Technical Specifications.
  - (3) NRC Letter, Reid to Madgett,  
dated March 3, 1978.
  - (4) 10CFR170, Section 170.22.

Gentlemen:

In accordance with the provisions of Reference (1), an application to amend Provisional Operating License No. DPR-45 for the La Crosse Boiling Water Reactor is hereby filed with three (3) signed original applications, together with thirty-seven (37) copies. Also please find enclosed for your information Dairyland Power Cooperative report LAC-TR-096, "LACBWR Cycle 6 Fuel Performance and Finalized Refueling Plan for Cycle 7".

The license change requested would delete the maximum fuel exposure limitation from the LACBWR Technical Specifications. The basis for this request is the demonstrated reliable performance of the redesigned Type III (Exxon) fuel as discussed below.

The performance of the LACBWR fuel during Fuel Cycle 6 was greatly improved over that experienced during previous LACBWR fuel cycles. Throughout the cycle, the off-gas activity and primary coolant gross  $\beta/\gamma$ ,  $\alpha$ , I-131 and Dose Equivalent I-131 activities exhibited relatively constant, low values indicating very little, if any, fuel clad degradation. See Figure 2 of LAC-TR-096 for a complete history of LACBWR power operation and off-gas and primary coolant activities during Fuel Cycle 6 and Table I of LAC-TR-096 for a comparison of end-of-cycle (EOC) conditions with those of previous cycles. At the EOC-6, the

Mr. Dennis M. Crutchfield  
Operating Reactors Branch #5

LAC-7572  
June 1, 1981

core average exposure was 11,542 MWD/MTU and the peak assembly average exposure was 16,688 MWD/MTU. Figure 1 of LAC-TR-096 shows the exposure distribution in the fuel in the LACBWR at the EOC-6.

During the refueling outage which began on November 9, 1980, each fuel assembly was removed from the core and examined by direct viewing and by CCTV viewing. No fuel deformation or clad defects were observed. All assemblies that had been in the reactor for more than one fuel cycle plus the 2 Type I (A-C) assemblies were examined for fission gas release by dry sipping. Of the 46 assemblies sipped, only one (a Type II (A-C) assembly) was identified as a possible leaker and it produced only a relatively weak indication, approximately 28 times background compared to indications several hundred times background observed after previous fuel cycles.

A detailed summary of the condition of LACBWR fuel at the end of each fuel cycle for the life of the plant is presented in Table I of LAC-TR-096. The one "probable" defective fuel assembly at EOC-6 is a very significant improvement over the 10 to 26 defective assemblies identified at the end of previous cycles. We believe that the improved fuel performance is mainly attributable to the design improvements in the Type III (Exxon) fuel. The restrictions on rate of power escalation and rate of control rod withdrawal (as listed in Table I of LAC-TR-096) and judicious reload planning to limit power density increases in the fuel, also contribute to good fuel performance.

The LACBWR core configuration for Fuel Cycle 7 consists of 24 fresh Type III (Exxon) assemblies intermixed with 46 previously exposed Type III assemblies and 2 previously exposed Type I (A-C) assemblies as shown in Figure 3 of LAC-TR-096. The core average exposure at BOC-7 was 6528 MWD/MTU. Cycle 7 began at 0041 hrs. on January 11, 1981, when initial criticality was achieved, but power escalation was delayed until January 30 because of problems with a primary coolant recirculation pump.

As of the end of May, the incremental core average exposure for Cycle 7 will be approximately 1925 MWD/MTU and the core average exposure will be approximately 8453 MWD/MTU. The performance of the LACBWR fuel continues to be extremely good with off-gas activity and primary coolant gross  $\beta/\gamma$ ,  $\alpha$ , I-131 and Dose Equivalent I-131 activities all significantly less than exhibited during Cycle 6. Continuous plots of these parameters for Cycle 7 along with the reactor power histogram are presented in Enclosure 2 to this letter.

Mr. Dennis M. Crutchfield  
Operating Reactors Branch #5

LAC-7572  
June 1, 1981

In light of the high integrity exhibited by the Type III (Exxon) LACBWR fuel, it would appear that Cycle 7 will be unnecessarily limited by LACBWR Technical Specification 4.2.4.2.5 which states that "The maximum average exposure of any fuel assembly not on the periphery of the core shall be limited to 15,600 MWD/MTU". This limit will be encountered when the Cycle 7 core average exposure is approximately 10,889 MWD/MTU and could be reached as early as the first week in October 1981. The expected fuel exposure distribution in the LACBWR core near this limit is shown in Figure 4 of LAC-TR-096. If the exposure of the fuel was not specifically limited, Fuel Cycle 7 could be extended by at least 2 or 3 months. The expected exposure distribution in the LACBWR core at 12,228 MWD/MTU average exposure, corresponding to all rods out and coast down to approximately 80% of rated power, is shown in Enclosure 3 to this letter. At that time, the peak assembly average exposure would be 16,868 MWD/MTU. The average exposure of the 24 highest exposed assemblies would be 16,392 MWD/MTU, approaching, but still less than, the design goal of an average batch discharge exposure of 16,800 MWD/MTU.

Therefore, on the basis of the demonstrated high integrity of the Type III (Exxon) fuel, Dairyland Power Cooperative requests that LACBWR Technical Specification 4.2.4.2.5 and the associated Surveillance Specification 5.2.17.5 (Reference 2) be deleted. We do not believe that precipitous deterioration of the fuel condition will occur during operation to higher fuel exposures. Any deterioration that might occur is expected to develop slowly and would be apparent at an early stage from increases in the reactor coolant and off-gas radioactivity. The current Technical Specification limits for these activities provide assurance that LACBWR fuel assemblies will not exhibit unacceptable degradation during future operation. In Paragraph 3.4.3 of the NRC Safety Evaluation, re: Fuel Performance which accompanied the issuance of these Technical Specifications (Reference 3), the NRC staff states "On the basis of the foregoing, we conclude that the Technical Specifications, as modified, would provide a program which would serve as an early indication of fuel failures and through the action statements provided, would require shutdown of the facility before the extent of fuel damage would impact on public health and safety."

Approval of this requested change would reduce LACBWR fuel costs, improve reactor operating efficiency, and reduce personnel radiation exposure by lengthening operating periods, thereby reducing refueling outage time.

Please find attached as Enclosure 4 to this letter, proposed revised pages to the LACBWR Technical Specifications. These proposed revisions include changes to the Bases for Sections 4.2.4.2 and 5.2.17.



