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April 6, 1979

Division of Operating Reactors
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Mr. Robert L. Ferguson
Plant Systems Branch

Dear Bob:

Subject: Fire Protection in Operating Nuclear Power Stations - LaCrosse Boiling Water Reactor (LACBWR) Safety Evaluation Report Review

The Safety Evaluation Report, as developed jointly by the NRC staff and Brookhaven National Laboratory, (BNL), adequately reflects the concerns and recommendations of the consultants. Throughout the reevaluation of LACBWR there has been general agreement between the NRC staff and the BNL consultants. Based on present data, the proposed fire protection, as set forth in the SER, will give reasonable assurance that the health and safety of the public is not endangered. The following exception represents a differing engineering point of view that should be evaluated by the NRC staff.

Valve Supervision

SER item 4.3.1.3 indicates that valves controlling water flow into sprinkler systems, sectional valves on the underground loop main, and valves controlling fire pump discharge locked open and checked weekly. The success of valve position control programs depends on ongoing administrative controls that are subject to human failure. Analysis of data from a Factory Mutual System study indicates that valves which are not electrically supervised are 5 or 6 times more likely to be found closed (when they should be open) than those valves which are electrically supervised. It is recommended that electrical supervision be extended to all sectional valves and valves controlling the supply of water for fire protection.

Ventilation

SER item 4.4.1 indicates that portable smoke ejectors and flexible ducting will be provided to aid in manual smoke removal activities in the plant in addition to the installed ventilating systems which serve many plant areas, and that these measures constitute acceptable provisions for smoke removal during fires. Reevaluation of this aspect of nuclear power plant fire protection has produced additional concerns on my part.

Effective smoke removal is essentially the transporting of smoke from the fire area at a rate which will limit its effects on property and personnel to tolerable levels. Estimating the rate of generation of the smoke, and its character, are necessary first steps in evaluating the effectiveness of a smoke removal plan. The rate of generation of smoke depends on the rate of burning, which has not been estimated by the licensee. The character of the smoke depends on the material being burned and the nature of the burning, neither of which have been adequately quantified by the licensee. Installed systems may have to be significantly altered to provide effective smoke removal in all plant areas. I would recommend that a complete evaluation of smoke generation potential and smoke removal methods be made by the licensee so that conclusions drawn by the NRC staff will have a firm technical basis.

Hose Testing

SER item 3.1.1 calls for testing of exterior hoses, but no pressure for testing is stipulated. Our consultant recommends that the exterior hoses be tested at 200 psi.

The preceding statements are based on a detailed reevaluation of the fire protection program as implemented by the Dairyland Power Cooperative at the LACBWR Nuclear Power Station. The analysis covered a review of the fire prevention, detection and suppression capabilities of the plant as interfaced with the nuclear systems requirements. This was accomplished by utilizing a review team concept with members from Brookhaven National Laboratory (BNL) and the Nuclear Regulatory Commission Division of Operating Reactors staff.

The fire protection evaluation for the LACBWR Plant is based on an analysis of documents submitted by the Dairyland Power Cooperative to the Nuclear Regulatory Commission and a site visit. The site visit was conducted by Mr. T. Lee and Mr. M. Virgillio of the NRC; Mr. E. MacDougall of BNL; Mr. J. Klevan of Rolf Jensen and Associates, Inc. who is under contract to BNL; and Mr. J. Riopelle, consultant to BNL. Mr. Riopelle was under contract to BNL to review the manual fire fighting capabilities of the station along with administrative controls.

Milestone Dates

1. On February 14, 1977, Dairyland Power Cooperative provided a Fire Hazard Analysis and comparison of the LaCrosse Boiling Water Reactor fire protection program to the guidelines presented in Standard Review Plan 9.5-1, Branch Technical Position APCSB 9.5-1, and Appendix A to APCSB 9.5-1, in response to the NRC request of May 11, 1976.

2. By letter of April 13, 1978, Dairyland Power Cooperative was provided NRC staff requests for additional information and staff positions pertaining to fire protection at LaCrosse Boiling Water Reactor.

3. On October 18, 1978, Dairyland Power Cooperative provided responses to NRC staff requests of April 13, 1978.

4. On October 31 - November 2, 1978 the NRC fire protection review team visited the LaCrosse Boiling Water Reactor facility. On November 2, 1978, a meeting was held in Dairyland Power Cooperative headquarters in LaCrosse at which the review team presented numerous staff positions. Dairyland Power Cooperative adopted most of these staff positions.

5. By letter of November 15, 1978, Dairyland Power Cooperative was requested to provide (1) the schedule for implementing the staff's positions which he agreed at the November 2 meeting to adopt, and (2) responses to the remaining staff positions which were identified, but not agreed on, during the November 2 meeting.

6. On December 19, 1978, Dairyland Power Cooperative provided responses to the staff requests of November 15, 1978.

7. On March 2, 1979, the draft Safety Evaluation Report was transmitted from the Chief, Plant System Branch to the Chief, Operating Reactors Branch #2.

Review Documents

The following documents were used in the LaCrosse Boiling Water Reactor Fire Protection Reevaluation.

1. NRC Branch Technical Position APCSB 9.5-1, Appendix A, dated August 23, 1976.

2. LaCrosse Boiling Water Reactor Fire Hazards Analysis and Comparison to Branch Technical Position APCSB 9.5-1 and Appendix A to Branch Technical Position APCSB 9.5-1, dated February 14, 1977.

3. Dairyland Power Cooperative responses of October 18 and December 19, 1978 to NRC positions and requests for additional information.

4. Various engineering drawings and other documents provided informally by Dairyland Power Cooperative.

5. March 2, 1979 draft Safety Evaluation Report.

The LACBWR review has been conducted under the direction of Mr. E.A. MacDougall and myself of Reactor Engineering Analysis Group at BNL.

We have reviewed the analyses submitted by the licensee and have visited the facility to examine the relationship of safety-related components, systems and structures with both combustibles and the associated fire detection and suppression systems. Our review has been limited to the aspects of fire protection related to the protection of the public from the standpoint of

radiological health and safety. We have not considered aspects of fire protection associated with life safety of onsite personnel and with property protection, unless they impact the health and safety of the public due to the release of radioactive material. The proposed modifications represent a significant increase in the level of protection against serious fire associated hazards.

Respectfully yours,

Robert E. Hall

Robert E. Hall, Group Leader
Reactor Engineering Analysis

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