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Department of Nuclear Energy

July 23, 1980

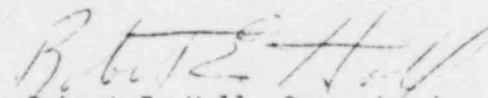
Mr. Robert L. Ferguson
Chemical Engineering
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

RE: La Crosse BWR, Fire Protection Review, Items 3.1.27 and 3.2.2

Dear Bob:

Attached is the Brookhaven National Laboratory input to the licensee's submittal on Items 3.1.27 and 3.2.2, Water Demand Analysis, for the La Crosse Boiling Water Reactor.

Respectfully yours,


Robert E. Hall, Group Leader
Reactor Engineering Analysis

REH:EAM:sd
attachment

cc.: V. Benaroya wo/att.
W. Kato "
M. Levine "
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La Crosse Boiling Water Reactor

Fire Protection Review

Items 3.1.27 and 3.2.2 - Water Demand Analysis

SER Section 3.2.2 indicates that the licensee will provide the results of a study of the arrangement of the fire pumps and the yard main piping which will assure that a sufficient number of pumps are available to meet the fire water demand at all times, taking into account the possibility of a fire involving both diesel driven fire pumps, failure of a fire pump, or failure of a section of the fire water piping system. The study will include consideration for (1) separate pump feeds to the yard main, (2) additional sectional valves, and (3) interconnection with the fire water system at adjacent fossil units.

SER Section 3.1.27 indicates that the licensee will provide the results of an analysis to demonstrate that the combined water demand for fire fighting and for safety-related functions can be satisfied under any fire emergency or accident.

By letter dated March 11, 1980, the licensee provided the results of a study entitled "Fire Protection System Combined Water Demand Analysis." This analysis concludes that:

1. The worse case fire would be expected to occur in the turbine lube oil tank area.
2. The existing high pressure service water system is capable of meeting the combined fire protection and safety-related water demands even if only one of the diesel engine-driven fire pumps is available.

The licensee has proposed to install a barrier between the diesel engine-driven fire pumps to prevent the loss of both pumps as a result of a single fire in the crib house.

The licensee's analysis underestimates the water demand for the sprinkler system at the turbine lube oil tank area. They have evaluated the water demand as follows:

Shutdown Condenser	69 gpm
Sprinklers	161 gpm
Hose Streams	<u>472</u> gpm
Total demand	702 gpm

The design demand for this sprinkler system is 503 gpm at 66.2 psi at the connection to the 6 inch high pressure service water main, according to a February 15, 1978 letter from Factory Mutual Engineering to the licensee. The letter also indicates that additional 500 gpm must be allowed for hose streams.

Our re-evaluation of the existing water system indicates that the approximate quantities of water available to the major components of the system would be:

Shutdown Condenser	62 gpm
Sprinklers	280 gpm
Hose Streams	<u>450 gpm</u>
Total demand	792 gpm

Our concern is that there is insufficient supply of fire water for the turbine lube oil tank sprinkler systems with other concurrent demands.

The licensee's analysis postulates that installation of an oil impingement barrier will preserve the operability of the redundant diesel engine-driven fire pumps, but does not provide any technical basis for this assumption. The question of the lack of fire rating was referred to the NRC in order to get a licensee response. Since we have not as yet heard the answer, this must remain an open item.

In addition, the licensee's analysis has not addressed the adequacy of the water supply for safety systems in event of a major fire in the crib house. There is a possibility that a fire there which is large enough to involve both fire pumps would also involve both low pressure service water pumps. The motor-driven high pressure service water pump in the turbine building takes suction from the low pressure service water system. The licensee has not discussed the ability of this pump to supply water to safety systems in event of loss of the low pressure service water pumps. For the above reasons, we recommend that the staff not accept the analysis as submitted.

We recommend that the NRC staff request the licensee to modify the high pressure service water/fire protection water system to provide an adequate water supply for both fire protection and safe shutdown in event of a fire at the turbine lube oil tank.