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Department of Nuclear Energy

March 26, 1980

Mr. Robert L. Ferguson  
Plant Systems Branch  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

RE: Point Beach, Fire Protection Review, Items 3.1.17, 3.1.25, 3.2.2, and  
3.2.6.

Dear Bob:

Attached is the Brookhaven National Laboratory input to the Point Beach  
items on which we presently have information.

Please note Items 3.1.2 and 3.1.23 were mailed to you on November 30,  
1979, and Items 3.1.12 and 3.2.5 were mailed to you on February 1, 1980.

Respectfully yours,

Robert E. Hall, Group Leader  
Reactor Engineering Analysis

REH:EAM:sd  
attachment

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## POINT BEACH

### Fire Protection Review

#### Item 3.1.17 - Hydrogen Hazard Fire Protection

Item 3.1.17 of the Point Beach SER requires the licensee to submit design information pertaining to their proposed modification for improving the fire protection of the plant hydrogen systems. The licensee has proposed to:

1. Install excess flow and manual isolation valves in the auxiliary building hydrogen supply header at its point of entry into the auxiliary building.
2. Install fire barriers between the hydrogen lines and adjacent safety-related cables and equipment in the auxiliary building and
3. The hydrogen header will be rerouted in the turbine building to avoid passing over the turbine lube oil reservoir.

By letter dated September 26, 1979, Wisconsin Electric Power Company submitted design information pertaining to this item. Their submittal included a sketch (HH-1) showing the new routing of the hydrogen header and the technical specifications (PB-82), covering the hydrogen header rerouting work.

The submittal by the licensee indicates clearly the provision of excess flow and manual isolation valves as the proposed. The sketch also shows the routing of the pipe including dimension, changes in direction and elevation changes. It is logical to assume that this rerouting of the hydrogen header avoids passing over the turbine lube oil reservoir as was indicated in the proposed modification but neither the sketch nor the specifications indicate this. The submittal also does not address the portion of the modification calling for fire barriers between the hydrogen lines and the adjacent safety-related cables and equipment in the auxiliary building.

Based on our review of the licensee's submittal we find it to be only partially acceptable. The provision of excess flow and manual isolation valves as described in portion (1) of the modification is acceptable. The rerouting of the hydrogen header (3) is considered conditionally acceptable pending verification from the licensee that the new routing avoids passing over the lube oil reservoir. The portion of the commitment calling for fire barriers between the hydrogen lines and safety related cables was not addressed and therefore we recommend that the staff request the licensee to supply the needed information.

#### Item 3.1.25 - Ventilation Duct Penetration Seals

Item 3.1.25 of the Point Beach SER indicates the licensee's proposal to upgrade the ventilation duct penetrations passing through the walls of the switchgear room to provide a 2-hour fire rating.

On September 26, 1979 Wisconsin Electric Power Company submitted design information on this proposed modification. This submittal consisted of an American Warming and Ventilating, Inc. catalog sheet describing their U.L. listed, 3-hour fire damper, No. 475M-475L.

As this fire damper is U.L. listed, and has a fire rating greater than 2-hours, it meets the requirements for a 2-hour ventilation duct seal and therefore is satisfactory. We recommend that the staff accept this item.

#### Item 3.2.2 - Circulating Water Pumphouse Fire Protection

Item 3.2.2 of the Point Beach SER indicates that the licensee has proposed modifications for the improvement of fire protection in the circulating water pumphouse. The SER goes on to state that a review is required to evaluate the adequacy of the proposed modifications to assure function of the motor driven fire pump and a sufficient number of service water pumps to support safe hot and cold shutdown in the event of a fuel oil fire at the diesel driven fire pump.

These modifications were submitted by Wisconsin Electric Power Company on December 29, 1978. The company's submittal of these modifications was made prior to issuance of the SER in response to NRC's list of positions sent to the licensee on August 14, 1978. The NRC position concerning the circulating water pumphouse fire protection included the following:

- A. The licensee should provide an automatically-actuated sprinkler system to suppress a fire in the area of the diesel fire pump.
- B. The licensee should justify the lack of sprinkler protection for the service water pumps or install barriers between the pumps to prevent loss of redundant service water pumps in the event of a service water or screen wash pump lube oil fire.
- C. The licensee should verify the capability of the proposed metal wall around the pump area to prevent damage to the service water and fire pumps in the event of a fire involving combustibles stored in the pumphouse.

The licensee's response to these positions as indicated in the SER as requiring evaluation, consisted of the following:

#### Response to Position A.

The licensee will install a sprinkler system to suppress a fire in the area of the diesel fire pump. We have evaluated the diesel fire pump installation and have determined that suitable deflectors can be installed to contain spilled oil a minimum distance of 7 feet from any service water pump. We have also determined that curbing to contain 250 gallons of fuel oil and a 10 minute discharge of fire suppression water would cause access difficulties and be impractical to install. Therefore, we propose to install a small curbed area and a floor drain routed to the circulating water pump pit area. This area having a floor elevation of -11'9" is separated from the safety-related pump area by 2 foot thick reinforced concrete walls. Therefore, the severity of a potential oil fire in the safety-related pump area would be significantly reduced. The service water pumps would be shielded from this fire by the diesel engine and its foundation. The pumphouse arrangement is shown on Figure 46-1. The previously proposed barrier wall would provide no added functional shielding and will not be installed.

#### Response to Position B.

The licensee will install sprinkler protection for the service water pumps.

#### Response to Position C.

The storage of combustibles within the pumphouse is minimized. Fuel required for the outboard motor and the vehicle, which are stored within the pumphouse, is contained within the boat and the vehicle. These combustibles are separated from the service water and fire pumps by distance of 50 feet and the metal security wall which is a physical barrier. While the security wall is not constructed to qualify for an approved fire rating, a rating of at least 30 minutes can be expected without testing. For a postulated fire contained at the boat or the vehicle, the security wall and distance separation are considered adequate to prevent damage to the service water or fire pumps. The boat and vehicle locations within the pumphouse are such that the missile barrier wall adjacent to the circulating water pumps would protect the service water and fire pumps from a postulated fuel tank rupture or explosion. If it were postulated that the entire contents of the vehicle fuel tank would spread across the pumphouse floor without evaporation or leakage through floor penetrations prior to ignition, the maximum fuel depth would be .001 inches without contacting the security wall. A fire at this time would be of very short duration and the security wall would effectively shield the service water and fire pumps from radiant heat flux.

In summary, the licensee has proposed to provide sprinkler protection for the areas containing the diesel fire pump and the service water pumps. They will install deflectors to contain spilled fuel oil, and a floor drain within a small curbed area surrounding the fire pump area. The licensee also claims that their previously proposed installation of a metal security wall around the pump area is sufficient to shield the fire pumps and service water pumps from a fire involving the combustibles stored in the building.

The 25' x 40' area in the circulating water pumphouse containing the electric motor driven and diesel engine driven fire pumps also contain the pump controllers, cabling, screen wash pumps and six safety-related service water pumps. A fire in this area involving diesel fuel could affect both fire pumps and the six service water pumps. The licensee's proposal to install sprinklers and containment measures for the fuel oil does not provide complete assurance that a fire involving diesel fuel could not affect the operational capability of the redundant fire pumps and the safety related service water pumps. Therefore, we recommend that the staff does not accept the licensee's proposal for improving the fire protection in the circulating water pumphouse indicated to their response to part A & B of the position. Their response to part C of the position concerning storage of combustibles is satisfactory and we recommend that the staff accept it. In order to assure that the redundant fire and safety-related service water pumps would not be affected by a diesel fuel fire, we recommend that the staff require that the licensee separate the diesel engine driven fire pump from the other pumps by a 3-hour fire rated enclosure or relocate this fire pump out of this area. Since this recommendation requires considerable work and could have several possible locations (for relocating the diesel driven fire pump) we recommend that the staff request the licensee to submit drawings for staff review and approval.

### Item 3.2.6 - Reactor Coolant Pump Lube Oil Collection

Item 3.2.6 of the Point Beach SER indicates that the licensee has proposed to add curbs and drain piping to the existing oil deflector cones on the reactor coolant pumps. The SER goes on to state that a review of this design is required before it is judged adequate to prevent a large reactor coolant pump lube oil fire within containment. The position requires that the present oil diverting system be modified to provide the capability to collect lube oil from all potential pressurized and unpressurized leakage sites in the reactor coolant pumps lube oil systems and to drain the oil to an enclosed container.

Wisconsin Electric Power Company has described their proposed modification to the RCP oil collection system in their response to NRC's position PF-45 which they submitted on December 29, 1978. This description states that the existing oil deflector cones will be fitted with curbs and drain piping installed in a manner which will allow oil leakage to be collected in four 55 gallon capacity drums located on elevation 10'-0" of the containment. The drum containers will be connected in parallel, will have closed tops and will be provided with vents. The licensee's response also states that the external high pressure lift pump is utilized for a short time during reactor coolant pump start-up and is not covered by the RCP oil collecting system. The licensee claims that extensive modifications to provide suitable oil collection capability during these infrequent start-up periods would impair RCP ventilation, inspection and maintenance.

The licensee's response to this item is only partially satisfactory. The provision of the drain piping and four interconnected 55 gallon capacity oil storage drums is acceptable. The proposed modification of fitting the existing deflector cones with curbs and drain piping to collect the oil is unclear. The position also requires that the lift pump and piping be similarly protected. The response by the licensee does not indicate that the proposed modification will provide the capability to collect lube oil from all pressurized and unpressurized leakage sites and it excludes the external high pressure lift pump from this modification.

Based on these points, the licensee's proposed modification for improving the RCP oil collection system is considered only partially acceptable. In order to conform with the requirements of the position, we recommend that the staff request that the licensee insure that the upgraded oil collection system will cover all potential pressurized and unpressurized leak sites including the external lift pump and associated piping.