9.10 FIRE PROTECTION SYSTEM (FP)

9.10.1 Design Basis

The fire protection program is outlined in the Fire Protection Evaluation Report (FPER). The purpose of the FP system is to provide assurance, through defense-in-depth design, that a fire will not prevent the performance of necessary safe shutdown functions or significantly increase the risk of radioactive release to the environment during a postulated fire. The FP program consists of fire detection, extinguishing systems and equipment, administrative controls and procedures, and trained personnel.

Criterion: A reactor facility shall be designed to ensure that the probability of events such as fires and explosions and the potential consequences of such events will not result in undue risk to the health and safety of the public. Noncombustible and fire resistant materials shall be used throughout the facility wherever necessary to preclude such risk, particularly in areas containing critical portions of the facility such as containment, control room, and components of engineered safety features. (GDC 3)

9.10.2 System Design and Operation

Point Beach is designed on the basis of limiting the use of combustible materials in construction and of using fire-resistant materials to the greatest extent possible. Plant fire prevention is enhanced by structural and component designs which minimize the exposure of combustible materials and maintain unavoidable exposed combustible materials below their ignition temperature in the design atmosphere. Plant fire control is enhanced by providing fixed or portable fire fighting equipment of capacities proportional to the energy that might be released by a credible fire.

Section 50.48 of 10 CFR Part 50 requires that Point Beach have a fire protection plan that satisfies General Design Criterion (GDC) 3 of Appendix A to 10 CFR 50. Section 50.48 also requires that Point Beach satisfy the requirements of Section III.G, III.J, and III.O of Appendix R to 10 CFR 50, and any other provisions not previously accepted by the NRC as satisfying the provisions of Appendix A to Branch Technical Position APCSB 9.5-1. These other provisions are reflected in NRC safety evaluation reports issued prior to February 17, 1981.

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Point Beach's compliance with Sections III.G, III.J and III.O of Appendix R to 10 CFR 50 is described in reports submitted to the NRC in June 1982 and October 26, 1983. Point Beach, however, does deviate from some Appendix R requirements. These deviations were approved by the NRC in response to several exemption requests made in accordance with 10 CFR 50.12.

In order to meet the requirements of the facility operating license, Wisconsin Electric implements and maintains in effect all provisions of the approved fire protection program as described in the Point Beach Fire Protection Evaluation Report (FPER). Additional commitments are contained in Wisconsin Electric to NRC submittals dated November 1, 1976, June 20, 1977, November 7, 1977, January 13, 1978, February 1, 1978, February 14, 1978, March 15, 1978, September 22, 1978, December 29, 1978, September 26, 1979, December 20, 1979, June 23, 1980, October 13, 1980, February 7, 1986, and February 29, 1988. These submittals were approved in an NRC safety evaluation report dated August 2, 1979 and its supplements dated October 21, 1980, January 22, 1981, and July 27, 1988, and July 18, 1995.

The FPER describes the overall fire protection program for Point Beach Nuclear Plant. It identifies the various positions within the Point Beach organization that are responsible for the program, states the authority delegated to each of these positions, and includes the plant fire hazards analysis that outlines the plans for fire protection, fire detection, and fire suppression. The FPER also describes plant features necessary to implement the program such as administrative controls, personnel requirements for fire prevention and manual fire suppression activities, automatic and manually-operated fire detection and suppression systems, and the means to limit fire damage to structures, systems, or components required for plant shutdown.

In accordance with guidelines contained in NRC Generic Letter 86-10, "Implementation of Fire Protection Requirements," Wisconsin Electric may make changes to the approved fire protection program without prior NRC approval if those changes will not adversely affect Point Beach's ability to achieve and maintain safe shutdown in the event of a fire. In such cases, an evaluation must be performed in accordance with 10 CFR 50.59 to determine if an unreviewed safety question is involved. This evaluation must include a fire hazards analysis and an assessment of the change's impact on the existing fire protection program. The assessment must also include a review of the effects on combustible loading and distribution and the consideration of whether circuits or components, including associated circuits, for a

train of equipment needed for safe shutdown are being affected. If the evaluation finds that the change could result in Point Beach not being in conformance with Appendix R or some other aspect of the approved fire protection program, or being outside the basis for an existing exemption, Wisconsin Electric must make modifications to achieve conformance or justify and request an exemption from the NRC in accordance with 10 CFR 50.12.

The following describes the various components and aspects of the Fire Protection system; this is only a partial description of the defense-in-depth design concept. For a complete description see the Fire Protection Evaluation Report (FPER).

Water Supply and Piping System

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Fixed Suppression Systems

Automatic fire suppression is achieved by various sprinkler systems. General areas with a high combustible loading or significant fire hazards are protected by wet pipe, dry pipe, preaction or deluge type sprinkler systems. Gaseous suppression systems using Halon 1301 provide fire suppression in the Auxiliary Feedwater Pump Room, Cable Spreading Room, Computer Room, Instrument Rack Room, 4.16KV Vital Switchgear Room and record storage vault.

Fire Hose Stations

Readily accessible 1 inch rubber covered hose lines and 1½ inch collapsible hose on reels and in cabinets are distributed throughout the plant so that areas in the turbine building, auxiliary building, service building, and offices are within 30 feet of a nozzle when attached to not more than 100 foot lengths (nominal) of hose. Fog nozzles are installed in areas where there is a potential electrical hazard. The fire hoses located inside containment are hydrostatically tested on a refueling interval. The remaining interior fire hoses are hydrostatically tested every three years. Exterior fire hoses are hydrostatically tested annually.

Seismic Classification

The service water pump, safety injection pump, component cooling pump, diesel generator, motor control center 1B32 and 2B32 room sprinkler systems, and supply piping to the containment hose reel stations are seismically supported. The G-01 and G-02 diesel generator room sprinkler systems and the containment hose reel stations are supplied from the service water system. The hose reel stations and sprinkler systems within the auxiliary building and the diesel generator building are supplied from the fire water system. Failure of any Class III portion of the fire protection system would not damage any Class I structures or components.

Portable Fire Extinguishers

Dry chemical, carbon dioxide and pressurized water fire extinguishers are distributed throughout the plant in accordance with the guidance of National Fire Protection Association Standard 10. Additional fire extinguishers are located at the battery rooms, control room, and switchgear rooms.

Automatic Fire Detection and Signaling Systems

A fire detection and signaling system is provided in various portions of the plant which transmits alarm and supervisory signals to the control room where they are annunciated at the fire panel (or C01). In addition to transmitting fire detector signals, the system transmits indications of water flow from the sprinkler and deluge extinguishing systems, and the status of the fire protection water systems including, fire pump running, fire pump trouble, and low fire water system pressure. Zone indicating units are provided in areas monitored by fire detectors and are arranged to alarm audibly and visually upon actuation of a detector. The system conforms to those provisions of the National Fire Protection Association Standard NFPA 72D or superseding standard as described in the Fire Protection Evaluation Report (FPER).

Fire Brigade and Training

A site fire brigade trained and properly equipped to ensure manual fire fighting capabilities is on site at all times. Training is periodically held in the form of classroom instructions, practice, and in-plant drills to ensure that competence in fire prevention and fire fighting techniques is maintained by brigade members.

Fire Barrier Cable Penetration Seals

Fire barrier cable penetration seals are silicon foam rated for three hours. The cable penetration seals are tested and qualify as rated fire stops as discussed in the Fire Protection Evaluation Report.

Cable and Raceway Fire Barriers

In the case of cables required for safe shutdown, train separation in conduit and cable trays is generally achieved by either 20 foot physical separation with no intervening combustibles between train conduits/cable trays or by wrapping a train's conduit or cable tray with special materials to qualify as a fire barrier. Refer to the FPER for further discussion of this criterion and any exemptions from it.

Fire Barriers and Fire Doors

Adequate fire barriers and fire doors are located throughout the plant to contain fires and to provide adequate ingress and egress in the event of a fire.

Reactor Coolant Pump Bearing Oil System

Each reactor coolant pump is equipped with a seismically designed oil deflection and collecting system which is designed to collect oil from possible leakage sites in the lube oil system. This minimizes the potential for fire by oil ignition upon contact with any hot pump or piping surfaces.

9.10.3 Correspondence / Commitments

1. Refer to FPER for a historical summary of commitments and other correspondence related to fire protection.

9.10.4 References

1. Point Beach Nuclear Plant, Fire Protection Evaluation Report (FPER)