

March 12, 2002

EA-02-038

Mr. M. Warner
Site Vice President
Kewaunee and Point Beach Nuclear Plants
Nuclear Management Company, LLC
6610 Nuclear Road
Two Rivers, WI 54241

SUBJECT: POINT BEACH NUCLEAR PLANT
NRC INSPECTION REPORT 50-266/01-12(DRS); 50-301/01-12(DRS)

Dear Mr. Warner:

This refers to the letter from Mr. Mark E. Reddemann, dated January 14, 2001, denying the Non-Cited Violation of 10 CFR Part 50, Appendix R, Section III.G.2 associated with the Halon suppression system for the auxiliary feedwater pump room. After consideration of your response, we have concluded that the violation of 10 CFR Part 50, Appendix R, Section III.G.2 remains valid. The reasons for our conclusion are stated in the enclosed evaluation.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/NRC/ADAMS/index.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

James L. Caldwell
Deputy Regional Administrator

Docket Nos. 50-266; 50-301
License Nos. DPR-24; DPR-27

Enclosure: As stated

See Attached Distribution

Distribution

cc w/encl:

- R. Grigg, President and Chief
Operating Officer, WEPCo
- R. Anderson, Executive Vice President
and Chief Nuclear Officer
- T. Webb, Licensing Manager
- D. Weaver, Nuclear Asset Manager
- T. Taylor, Plant Manager
- A. Cayia, Site Director
- J. O'Neill, Jr., Shaw, Pittman,
Potts & Trowbridge
- K. Duveneck, Town Chairman
Town of Two Creeks
- D. Graham, Director
Bureau of Field Operations
- A. Bie, Chairperson, Wisconsin
Public Service Commission
- S. Jenkins, Electric Division
Wisconsin Public Service Commission
State Liaison Officer

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*** OE concurrence from C. Nolan on on 3/7/02 via telephone call.

Distribution

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EVALUATION OF NUCLEAR MANAGEMENT COMPANY'S DENIAL OF
NON-CITED VIOLATION 50-266/01-12-02; 50-301/01-12-02

Restatement of Non-Cited Violation 50-266/01-12-02; 50-301/01-12-02

On November 13, 2001, Inspection Report 50-266/01-12; 50-301/01-12 was issued. The inspection report included the following Non-Cited Violation in the Summary of Findings:

Green. The inspectors identified that the automatic fire suppression system for the auxiliary feedwater pump room was not adequate. The installed fire suppression system was only designed for surface fires and was not designed to provide the necessary soak time for deep-seated fires. However, deep-seated fire hazards had been introduced to the room. The failure to have an adequate automatic suppression system is a violation of 10 CFR Part 50, Appendix R, Section III.G.2.

The finding was determined to be greater than minor because the finding involved automatic suppression, a fire protection defense-in-depth element. The finding was determined to be of very low safety significance (Green) because the inspectors were not able to postulate a fire scenario which could sustain a deep-seated fire and damage redundant trains of equipment. Because the finding was of very low safety significance, and the finding was captured in the licensee's corrective action system, this finding is being treated as a NCV consistent with Section VI.A.1 of the NRC Enforcement Policy (Section 1R05.10.b).

The NRC notes that 10 CFR 50.48(a)(1) requires, in part, that each operating nuclear power plant have a fire protection plan that satisfies Criterion 3 of Appendix A to Part 50. Criterion 3 of Appendix A to Part 50 states that fire detection and fighting systems of appropriate capacity and capability shall be provided and designed to minimize the adverse effects of fires on structures, systems, and components. 10 CFR 50.48(b) provides that Appendix R to Part 50 establishes fire protection features required to satisfy Criterion 3. 10 CFR 50.48(b)(2) requires, in part, that all nuclear power plants licensed to operate before January 1, 1979, must satisfy the applicable requirements of Appendix R to this part, including specifically the requirements of Sections III.G, III.J, and III.O. The Point Beach Plant was licensed to operate prior to January 1, 1979. 10 CFR Part 50, Appendix R, Section III.G.2 requires, in part, where cables or equipment, including associated non-safety circuits that could prevent operation or cause maloperation of redundant trains of systems necessary to achieve and maintain hot shutdown conditions, are located within the same fire area outside of primary containment, the cables and equipment and associated non-safety circuits of redundant trains be separated by a fire barrier having a three-hour rating, or be separated by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards, or one redundant train be enclosed in a fire barrier having a one-hour rating. In addition, 10 CFR Appendix R, Section III.G.2 requires, in part, that for where redundant trains are protected utilizing a horizontal separation of more than 20 feet or by enclosure of one redundant train in a fire barrier having a one-hour rating, fire detectors and an automatic fire suppression system shall be installed in the fire area.

The auxiliary feed pump room for the Point Beach Nuclear Plant had fire areas where redundant trains were protected by a separation of a horizontal distance of more than 20 feet or by enclosure of one redundant train in a fire barrier having a one-hour rating. However, the

automatic fire suppression system for the auxiliary feedwater pump room was not adequate in that it was not of appropriate capacity and capability to suppress the deep-seated fire hazards present in the room.

Summary of Licensee's Response to Non-Cited Violation 50-266/01-12-02; 50-301/01-12-02

The licensee believed that there was no violation of NRC requirements. The significant points of the licensee's basis for this conclusion are outlined below with the NRC response for each point.

a. Alternative Testing for Soak Times

The licensee noted that the 15 minute soak time for Institute of Electrical and Electronics Engineers (IEEE) 383 qualified cables was established without testing alternative soak times.

NRC Response: In response to this issue, the NRC references the applicable code requirements as they apply to deep-seated fires. Section 2-4.3.2 of National Fire Protection Association (NFPA) code 12A, 1980 edition, the code of record for the system, states:

Where the solid material is in such a form that a deep-seated fire can be established before a flame extinguishing concentration has been achieved, provision shall be made to the satisfaction of the authority having jurisdiction for means to effect complete extinguishment of the fire.

Section A-2-4 of NFPA-12A provides a discussion of fires in solid materials. The section states:

For the purposes of this standard, smoldering fires are divided into two classes: (1) where the smoldering is not "deep-seated," and (2) deep-seated fires. The difference is only a matter of degree, and the distinction is a functional one: if a 5 percent concentration of Halon 1301 will not extinguish it within 10 minutes of application, it is considered to be deep seated.

Based on cable fire testing which has been performed, the NRC considers cable fires, especially those involving IEEE-383 qualified cables to be deep-seated. NUREG/CR-3656, "Evaluation of Suppression Methods for Electrical Cable Fires," dated October 1986, on page 40, discusses tests involving fully developed cable fires:

In most cases, the qualified cable continued to smolder but did not reignite, demonstrating that Halon is capable of dousing the flame of qualified cable fires but not preventing smoldering combustion which might lead to reignition of the cables or further damage.

The fully developed cable fire test referred to above used a soak time of 15 minutes. The fact that cables used in fire tests above were still smoldering demonstrated that cables burned in a deep-seated manner and that the cable fire was not extinguished. Additionally, in comparing test results involving IEEE-383 qualified cable versus unqualified cable, the following was noted on page 38 of NUREG/CR-3656:

The temperature profiles for trays 3 and 5 look much the same as in Test 86 (Figure 18) [unqualified cables], except the temperatures are higher, indicating the qualified cable burned hotter. Also there was not as noticeable a decrease in temperature in the trays when the Halon was discharged. The cables in tray 5 were probably still burning after the Halon discharge as indicated by the continued climb in the cable surface temperature (Figure 19). Obviously, the Halon discharge does not have as significant an effect on the hotter burning qualified cable, because the cable temperatures did not decrease as quickly as they did in Test 86 with unqualified cable. One minute after ventilation was restarted, all the cable temperatures began to drop rapidly, signaling end of combustion probably because there was no fuel left to burn.

The soak times listed on Table 9 of NUREG/CR-3656 are the minimum soaks times that the NRC, as the authority having jurisdiction (AHJ), will consider acceptable. The NRC notes that for qualified cable, the 15 minute soak time was demonstrated to be marginal based on the test results referenced above. As such, the NRC does not consider there to be a need for alternative testing as suggested by the licensee.

b. Design Basis Fire for the Auxiliary Feedwater Pump Room

The licensee stated that the cables located in the auxiliary feedwater room are not considered part of the design basis fire for the facility. In making this argument, the licensee referenced a November 24, 1980, letter which identified a concern relating to the auxiliary feedwater pump room "due to a fire of a combustible transient fire load (exposure fire) as well as interaction of this fire on installed combustibles in the area."

NRC Response: The NRC acknowledges that combustible transient fire loads, as identified by the referenced correspondence, were a concern for the auxiliary feedwater room. However, the NRC disagrees with the licensee's assertion that the expected fire hazard is limited to the combustible transient fire loads and does not include the in situ cables located in the room. The NRC considers the design basis fire to be based on the hazards and fire loads present in the room. Specifically, the NRC considers the cables (including IEEE-383 qualified cables) located in the room to form part of the expected fire hazard along with other fire loads. The NRC notes that by letter VPMPD-94-119, NRC-94-082, dated October 31, 1994, the licensee informed the NRC that there was approximately 184,000 feet of cable representing 553×10^6 British Thermal Unit's (BTUs) of combustible cable jacketing material in the auxiliary feedwater pump room. This information was provided in response to a request by the NRC for an evaluation of the actual combustible loading that could present exposure hazards to the redundant trains of safe shutdown equipment and cabling. As such, the NRC considers the cables to form an explicit part of the design basis as described in licensing correspondence.

c. NUREG/CR-3656 Endorsed Soak Times

The licensee noted that Table 6 of NUREG/CR-3656 documented that exposure fires in cable trays containing IEEE-383 qualified cables were extinguished with a soak time of 10 minutes.

NRC Response: The NRC notes that the Table 6 referred to in NUREG/CR-3656 applies to what was considered “exposure fires” for the purposes of the report. Section 3.2 (which included Table 6) described the “exposure fire” test series as testing involving two cable trays. However, the NUREG also documents tests of suppression systems on larger fires. The NRC considers the test program for fully developed cable fires (described in Section 3.3 of NUREG/CR-3656) to be applicable because of the longer pre-burn times used in the tests. The NRC notes that cable fires can also be initiated internally. As such, cable fires can be burning for a period of time prior to detection and actuation of the suppression system. Additionally, the test program for fully developed cable fires used five cable trays and, as such, is more representative of the cable tray configurations in the auxiliary feedwater pump room. The NRC notes that the auxiliary feedwater pump room has cable tray runs with stacks of four and five cable trays. Section 3.3.2 of NUREG/CR-3656 states:

The five-tray fully developed fires resulted in a much more deep-seated fire (a fire that is in the conductor insulation of the cable, not just burning the jacket), particularly in the qualified cable, and thus were more difficult to suppress.

As such, the NRC does not consider it appropriate to use the results of the less demanding test program described in Section 3.2 and Table 6 of NUREG/CR-3656 for determining appropriate soak times.

NRC Conclusion

NRC review of the licensee’s denial of the Non-Cited Violation determined the bases for denial to not be valid. Specifically, the NRC considers the test program discussed in NUREG/CR-3656 Section 3.3 sufficient to establish a 15 minute soak time as being the minimum necessary for assuring suppression of IEEE-383 qualified cable. The NRC considers the cables located in the auxiliary feedwater pump room to be part of the design basis fire hazard. The NRC does not consider it appropriate to use the results of Section 3.2 and Table 6 of NUREG/CR-3656 for determining appropriate soak times. Therefore, the NRC concludes that the Non-Cited Violation remains valid.