

October 12, 1995

MEMORANDUM TO: Geoffrey Grant, Director
 Division of Reactor Safety

FROM: Brian E. Holian, Acting Director
 Project Directorate III-1 ORIGINAL SIGNED BY
 Division of Reactor Projects - III/IV

SUBJECT: REGION III TECHNICAL ASSISTANCE REQUEST, PALISADES FIRE
 BARRIER (TAC NO. M92936)

By memorandum dated July 14, 1995, Region III requested technical assistance from the Office of Nuclear Reactor Regulation regarding the acceptability of certain turbine building walls at the Palisades Plant. Our response is attached. This completes our efforts on TAC No. M92936. If you have any questions regarding this response, please contact Marsha Gamberoni at (301) 415-3024.

Docket No.: 50-255

Attachment: As stated

cc w/att: J. T. Wiggins, RI
 A. F. Gibson, RII
 T. P. Gwynn, RIV

DISTRIBUTION:
 Docket File
 PD# 3-1 Reading
 S. Varga
 J. Roe
 J. Zwolinski
 E. Adensam (e)
 J. Holmes
 S. West
 M. Parker
 W. Kropp, RIII
 A. Chaffee

PDR

DOCUMENT NAME: G:\WPDOCS\PALISADE\PAL92936.MEM

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	LA:PD31	E	PM:PD31	E	(A)D:PD31	E
NAME	CJamerson <i>CJ</i>		MGamberoni <i>MG</i>		BHolian <i>BH</i>	
DATE	10/11/95		10/11/95		10/12/95	

OFFICIAL RECORD COPY

06000.

RF01
'11

(9510200169) XIA 11-7-95

RESPONSE TO REGION III REQUEST FOR TECHNICAL ASSISTANCE
BY THE OFFICE OF NUCLEAR REACTOR REGULATION
DIVISION OF SYSTEMS SAFETY AND ANALYSIS
PLANT SYSTEMS BRANCH
PALISADES NUCLEAR GENERATING STATION
DOCKET NO. 50-255

1. INTRODUCTION

During a Region III inspection at Palisades Nuclear Generating Station (Palisades), which was documented in U.S. Nuclear Regulatory Commission (NRC) Inspection Report No. 50-255/95004, the inspectors noted apparent discrepancies with respect to certain turbine building walls and the post-fire safe shutdown analysis. By memorandum dated July 14, 1995, Region III requested technical assistance from the Office of Nuclear Reactor Regulation in determining: (1) whether or not it is acceptable for the west wall of the turbine lube oil storage room to be non-fire-rated and (2) whether or not it is acceptable for a 10-foot by 12-foot opening to exist between the turbine building and the component cooling water room in the auxiliary building.

The staff reviewed the memorandum of July 14, 1995, NRC Inspection Report 50-255/95004, and a Consumers Power Company (the licensee) submittal of October 26, 1989, which provided its updated response to Appendix A to Branch Technical Position (BTP) APCS 9.5-1. The staff also considered the licensee's undated calculation MI0589-0003A-F006, entitled "Analysis, Pipe Tunnel Between Turbine Building and Feedwater Purity Building and Associated Openings," and pages 58 and 59 of the licensee's fire hazards analysis (Document number PR0388-0026A-TP21), entitled "Fire Area 22," which the Region III inspector provided.

2. TURBINE LUBE OIL STORAGE ROOM

Section F.8, "Turbine Lubrication and Control Oil Storage and Use Areas," of Appendix A to BTP APCS 9.5-1 states that a blank fire wall having a minimum fire resistance rating of 3 hours should separate all areas containing safety-related systems and equipment from the turbine oil system. When a blank wall is not present, open head deluge protection should be provided for the turbine oil hazards and automatic open head water curtain protection should be provided for wall openings.

In its response to Section F.8 of Appendix A to BTP APCS 9.5-1, the licensee stated that the turbine lube oil storage area is completely separated in an interior structure inside the turbine building, is sprinklered, and is enclosed by 3-hour fire walls except the west wall.

The west wall of the turbine lube oil storage room, located on the 590-foot elevation, is sheet metal with fiberglass insulation. The wall is not fire-rated. As originally constructed, the west wall of the turbine lube oil storage room was an exterior wall. In this configuration, the 3-hour fire-rated interior walls would prevent fire, hot gases, and smoke from spreading from the turbine lube oil storage room into the turbine building. If the west wall of the oil storage room succumbed, which would be likely given the

intensity and severity of oil fires, the heat and smoke would vent directly to the atmosphere and, therefore, would not present a significant fire exposure to the turbine building.

After the staff reviewed and approved the licensee's fire protection program, the licensee constructed an addition to the west side of the turbine building as part of the feedwater purity modification. Under the modified plant configuration, the feedwater purity building and pipe tunnel became the west wall of the turbine building and the west wall of the turbine lube oil storage room became an interior wall. In this configuration, flames and high temperatures from a storage room oil fire would cause rapid failure of the west wall of the oil storage room. In this scenario, the heat and smoke would not vent to the outside, but would spread into the feedwater purity building and the pipe tunnel. Such a fire would damage the equipment in the feedwater purity building and the pipe tunnel. The fire would propagate through the tunnel and expose the turbine building. The memorandum of July 14, 1995, indicated that safety-related equipment is located in the turbine building in this vicinity. Under this scenario, the high temperatures and smoke could damage the safety-related equipment and could adversely impact the safe shutdown capability.

In its updated response to Appendix A to BTP APCS 9.5-1, the licensee identified the west wall as an exception with a margin bar. However, the staff noted that the licensee did not address the addition of the feedwater purity building and pipe tunnel, including its significance and potential influence on the Palisades fire protection program and safe shutdown analysis, in either the updated response or the fire hazards analysis for fire area 22. The staff also noted that calculation MI0589-003A-F006 did not provide technical bases for the licensee's conclusion that the oil storage room does not provide an exposure fire hazard to the turbine building. For example, the licensee's assertions that it would take fifty (50) hours for a fire to propagate the length of the tunnel and that the non-fire-rated metal wall of the oil storage room would prevent a fire from entering the tunnel lack technical merit.

On the basis of its review and the fire postulated for the current plant configuration, the staff concluded that turbine oil storage room does not meet the guidance of Section F.8 of Appendix A to BTP APCS 9.5-1. In addition, the staff concluded that the licensee has not performed adequate fire hazards and safe shutdown analyses for the oil storage room and surrounding areas. Replacement of the west wall of the oil storage room with a blank 3-hour fire-rated barrier is one method of meeting the guidance of Appendix A to BTP APCS 9.5-1. As stated above, the guidance of Section F.8 of Appendix A to BTP APCS 9.5-1 specifies other alternatives. In addition, the licensee could consider still other alternatives that preserve fire protection defense in depth and provide an equivalent level of safety to that provided by meeting Appendix A to BTP APCS 9.5-1.

3. COMPONENT COOLING WATER ROOM AUXILIARY BUILDING OPENING

The component cooling water (CCW) room is located in the auxiliary building. During the Region III inspection, the inspectors found a 10-foot by 12-foot opening between the turbine building and the CCW room on the 590-foot elevation near the turbine lube oil storage room. Negative pressure is maintained in the CCW room, relative to the turbine building, by the ventilation system. As documented in the inspection report, an undated and unsigned evaluation performed by the licensee stated that the fire loading in the vicinity of the opening is not sufficient to allow a fire to propagate between the turbine building and the auxiliary building. The inspectors found that the evaluation did not include a quantitative assessment of the fire load and the licensee had no controls to prevent transient combustibles from being stored in the area. According to the inspectors, the licensee's safe shutdown analysis addressed the turbine building and the CCW room separately. It did not address the effects on safe shutdown of a fire in both rooms, such as a fire originating in the turbine building which could propagate to the CCW room.

Appendix A to BTP APCS 9.5-1 provides guidance that applies to this situation. For example Section D.1 states that safety-related systems should be isolated from unacceptable fire hazards, and floors, walls and ceiling enclosing separate fire areas should have minimum fire rating of 3 hours. In addition, Interpretation 4, "Fire Area Boundaries," of Generic Letter 86-10, "Implementation of Fire Protection Requirements," states, in part:

The term "fire area" as used in Appendix R means an area sufficiently bounded to withstand the hazards associated with the area and, as necessary, to protect important equipment within the area from a fire outside the area. In order to meet the regulation, fire area boundaries need not be completely sealed floor-to-ceiling, wall-to-wall boundaries. However, all unsealed openings should be identified and considered [in] evaluating the effectiveness of the overall barrier. Where fire area boundaries are not wall-to-wall, floor-to-ceiling boundaries with all penetrations sealed to the fire rating required of the boundaries, licensees must perform an evaluation to assess the adequacy of fire [area] boundaries in their plants to determine if the boundaries will withstand the hazards associated with the area.

In accordance with this guidance, the licensee should have evaluated the unprotected opening between the turbine building and the CCW room.

Section 9.5.1, "Fire Protection Program," of NUREG-0800, "Standard Review Plan," also provides guidance that is useful for evaluating the licensee's evaluation of the CCW room opening. Section C.7.h, "Turbine Building," states, in part:

The turbine building should be separated from adjacent structures containing safety-related equipment by a fire barrier with a minimum rating of 3 hours.... Openings and penetrations in the fire barrier should be minimized and should not be located where

the turbine oil system or generator hydrogen cooling system creates a direct fire exposure hazard to the barrier. Considering the severity of the fire hazards, defense in depth may dictate additional protection to ensure barrier integrity.

On the basis of the information provided in the memorandum of July 14, 1995, and Inspection Report 50-255/95004, the staff cannot determine if the opening should be protected with 3-hour fire-rated barrier. However, on the basis of this information, and considering the staff guidance, it is the staff's opinion that the licensee did not perform an adequate fire hazards analysis and evaluation of the opening. Therefore, the licensee could not have adequately addressed the affects of a fire in both rooms (such as turbine building fire that propagates to the CCW room) on the post-fire safe shutdown capability. In view of the large size of the opening and the significant fire hazards in the area of the opening (such as that described in Section 2, above), it appears that the licensee may need to provide additional fire protection for this area.

Principal contributors: Jeff Holmes and Steven West