



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATING TO EXEMPTION REQUEST FROM APPENDIX R TO 10 CFR 50

FACILITY OPERATING LICENSE NO. DPR-59

POWER AUTHORITY OF THE STATE OF NEW YORK

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

DOCKET NO. 50-333

Introduction

By letter dated April 12, 1985, the licensee requested approval for an exemption from the technical requirements of Section III.G.2 of Appendix R to 10 CFR 50.

Section III.G.2 of Appendix R requires that one train of cables and equipment necessary to achieve and maintain safe shutdown be maintained free of fire damage by one of the following means:

- a. Separation of cables and equipment and associated non-safety circuits of redundant trains by a fire barrier having a 3-hour rating. Structural steel forming a part of or supporting such fire barriers shall be protected to provide a fire resistance equivalent to that required of the barrier;
- b. Separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area, and;
- c. Enclosure of cables and equipment and associated non-safety circuits of one redundant train in a fire barrier having a 1-hour rating. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area.

If these conditions are not met, Section III.G.3 requires an alternative shutdown capability independent of the fire area of concern. It also requires that a fixed suppression system be installed in the fire area of concern if it contains a large concentration of cables or other combustibles. These alternative requirements are not deemed to be equivalent. However, they provide equivalent protection for those configurations in which they are accepted.

Because it is not possible to predict the specific conditions under which fires may occur and propagate, the design basis protective features are specified in the rule rather than the design basis fire. Plant specific features may require protection different than the measures specified in Section III.G. In such a case, the licensee must demonstrate, by means of a detailed fire hazards analysis, that existing protection or existing protection in conjunction with proposed modifications will provide a level of safety equivalent to the technical requirements of Section III.G of Appendix R.

In summary, Section III.G is related to fire protection features for ensuring that systems and associated circuits used to achieve and maintain safe shutdown are free of fire damage. Fire protection configurations must either meet the specific requirements of Section III.G, or an alternative fire protection configuration must be justified by a fire hazard analysis.

Our general criteria for accepting an alternative fire protection configuration are the following:

- ° The alternative assures that one train of equipment necessary to achieve hot shutdown from either the control room or emergency control stations is free of fire damage.
- ° The alternative assures that fire damage to at least one train of equipment necessary to achieve cold shutdown is limited such that it can be repaired within a reasonable time (minor repairs with components stored on-site).
- ° Modifications required to meet Section III.G would not enhance fire protection safety above that provided by either existing or proposed alternatives.
- ° Modifications required to meet Section III.G would be detrimental to overall facility safety.

Exemption Requested

The licensee requested an exemption from the Technical Requirement of Section III.G.2 to the extent that they require that redundant shutdown-related systems be separated by either 1 or 3-hour fire-rated barriers with ventilation openings protected by fire dampers.

Discussion

As part of an independent assessment conducted of the plant fire protection program, the licensee identified seventeen fire dampers for HVAC-related penetrations of fire barriers that the licensee concludes are not required because "...they will not enhance fire protection...". The location of these dampers are stipulated in the April 12, 1985 letter.

The licensee's basis for concluding that the dampers are not required can be categorized as one or more of the following: (1) the damper would be installed in a fire-rated wall or barrier which has been derated based upon low combustible fire loading and resulting low fire severity; (2) fire dampers are not required in one hour barriers; or, (3) fire-rated barriers separating fire areas that contain components of the same division are not required.

Evaluation (Screen House and Safety-Related Pump Houses)

We had two concerns with the absence of fire dampers between the screen house and the two safety-related pump houses. The first was that an effective fire barrier had not been provided to isolate safety-related systems from significant fire hazards in accordance with the guidelines contained in Appendix A to BTP APCS 9.5-1. However, the fire hazard in each of these locations is minimal, as described in the above-referenced letter. Therefore,

a fire damper in these barriers is not necessary to satisfy our fire protection guidelines.

Our second concern was that in the event of a fire in any of these areas, smoke and hot gases would propagate beyond the room of origin and damage redundant shutdown-related systems in adjoining areas. However, the licensee has indicated that for this scenario to occur, it would be necessary for fire to propagate vertically downward from the screenwell house. Because smoke and heat from a fire tend to rise and spread laterally, we do not expect this to happen. Due to the absence of fire dampers in the floor/ceiling assembly between each of the pump houses and the screenwell house, products of combustion might spread upward into the screenwell house. However, safe shutdown could still be achieved using undamaged systems in the redundant pump house which shares no unprotected common boundaries. Similarly, if a fire occurs in the screenwell house, shutdown could be achieved using systems in either pump house. On these bases we conclude that fire dampers are not necessary in the floor/ceiling assemblies.

Conclusion (Screen House and Safety-Related Pump House)

Based on our evaluation, we conclude that the licensee's alternate fire protection configuration achieves an acceptable level of safety, equivalent to that attained by compliance with Section III.G. Therefore, the licensee's request for exemption from the requirement for three fire dampers in the floor/ceiling assembly between the screenwell house and safety-related pump rooms should be granted.

Evaluation (Several Plant Locations)

With regard to the remaining fourteen fire dampers identified in the April 12, 1985 exemption request, we were also concerned that the absence of dampers in fire barriers would have an adverse effect on the ability to maintain one safe shutdown division free of fire damage which would conflict with our fire protection guidelines.

For two dampers located in fire barriers which define the perimeter of the cable tunnels, the licensee has indicated that since systems located on both sides of the barrier are of the same shutdown division, fire propagation through the barrier will have no effect on safe shutdown capability. However, the cable tunnels represent a significant fire hazard to the plant because of the presence of cables with combustible cable insulation. Therefore, fire dampers are necessary to satisfy Section D.1(a) of Appendix A to BTP APCSB 9.5-1 which requires that safety systems be isolated from unacceptable fire hazards.

With regard to the remaining twelve dampers, the licensee's approach is based on "down grading" existing multi-hour fire barriers and justifying the absence of fire dampers on the basis of test results and that the National Fire Protection Association does not require fire dampers in 1-hour fire-rated walls. However, this approach negates the basis by which we accepted the fire protection program at Fitzpatrick during our review of the program to the guidelines of Appendix A to BTP APCSB 9.5-1. In addition, since these barriers, as designed, possess a fire rating in excess of 2-hours, NFPA Standard No. 90A requires that fire dampers be installed where HVAC penetrations exist.

Fire tests on 1-hour rated walls with unprotected HVAC duct penetrations were conducted with continuous ducts without air registers. The licensee has not established that the configuration of ducts at Fitzpatrick reflect the tested configuration. Therefore, the results of these tests may not be applicable to this issue.

If fire dampers were not installed in these barriers we would not have reasonable assurance that a fire, if one should occur, would be confined to the room of origin. Because the areas on both sides of the barriers contain redundant shutdown systems, fire may result in damage such that safe shutdown could not be achieved and maintained.

Conclusion (Several Plant Areas)

Based on our evaluation, we conclude that the licensee's alternate fire protection configuration does not achieve an equivalent level of safety to that attained by complying with Section III.G. Therefore, the licensee's request for exemption from the requirement to install fourteen fire dampers should be denied.

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Dated: April 30, 1986