



**ENTERGY**

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W3F1-91-0233  
A4.05  
QA

May 24, 1991

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555

Subject: Waterford 3 SES  
Docket No. 50-382  
License No. NPF-38  
10 CFR 50 Appendix R Relief Request

Gentlemen:

Entergy Operations, Inc. is hereby requesting NRC reaffirmation of approval of a portion of an earlier submitted request for relief from 10 CFR 50 Appendix R requirements in light of discrepancies identified in the justification for the original approval.

On March 26, 1984, Louisiana Power & Light (LP&L) submitted a request (Letter W3P84-0709) for relief from certain technical requirements of Appendix R to 10 CFR 50. Specifically, the submittal included requested relief from Section III, G.2 of Appendix R, which encompasses fire protection of safe shutdown capability. Subparagraph "a." of Appendix R, Section III, G.2 requires, in part, separation of cables and equipment and associated non-safety circuits of redundant trains by a fire barrier having a 3-hour rating. The March, 1984 submittal identified two 3-hour rated fire boundaries between a vestibule (211) and Fire Areas 8B and 8C that are penetrated by a HVAC duct with no fire dampers at the wall penetrations. The walls involved are the east fire boundary wall of Fire Area 8B and the north fire boundary wall of fire area 8C (near Column Line Coordinates J'A and K). The duct passes through the vestibule from the Fire Area 8B boundary wall to the Fire Area 8C boundary wall. Because the duct does not contain fire dampers having fire resistance equivalent to that of the 3-hour-fire boundaries, letter W3P84-0709 requested relief from the 10 CFR 50 Section III, G.2.a. requirement to provide a continuous 3-hour barrier. The fire boundary walls and vestibule described above are located on the east side of the Reactor Auxiliary Building (RAB) on the +21 elevation. No safe shutdown equipment or associated

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equipment is located in the vestibule. Safe shutdown equipment/systems are located in Fire Areas 8B (Switchgear Room B) and 8C (Switchgear Room A/B).

As you know, Entergy Operations is in a major fire protection assessment and modification effort at Waterford 3. As part of this effort, Fire Protection & Safety personnel identified discrepancies between the plant configuration as described in the justification for the requested relief and the actual plant configuration.

The discrepancies are contained within the justification statements associated with the March, 1984 relief request. The justification provided consisted of three statements. The first statement said that "there is negligible fire loading in the adjacent corridor". This statement is accurate in that the adjacent corridor is a vestibule (211), with minimal installed and/or housed items. The second basis statement said that "detection and suppression systems exist on both sides of the duct penetrations". This statement is inaccurate since detection and suppression systems exist on one side (Switchgear Room side) of each of the two fire boundary walls involved. No detection and suppression systems are installed on the vestibule side of these walls. The third basis statement said that "fire severity of areas adjacent to each damper are less than the fire rating of subject damper". This statement does not apply to this situation since there are no dampers installed at the two duct penetrations involved.

Our Engineering organization has evaluated the discrepancies and have assessed that the existing plant configuration is adequate for fire protection of safe shutdown capability, which is the objective of 10 CFR 50 Appendix R, Section III.G.2. The justification for this conclusion is attached.

The above described plant configuration was discussed with the NRC during an inspection conducted during the period July 16 through September 4, 1990. It was acknowledged in Inspection Report 50-382/90-19 that the discrepancy had been identified by the plant staff and that an internal document change request had been submitted. However, since the identified discrepancies could have affected the conclusions reached by the NRC in the December 1984 Supplemental Safety Evaluation Report (SSER) 8, Waterford 3 elected to request reaffirmation of NRC approval of the affected portion of the March 26, 1984 relief request. Processing of the Licensing Document Change Request (LDCR) will be completed pending NRC approval.

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Should you have any questions or need additional information, please don't hesitate to contact me at 739-6774 or Larry Laughlin at 739-6331.

Very truly yours,



RFB/OPP/dc

Attachment

cc: Messrs. R.D. Martin, NRC Region IV  
D.L. Wigginton, NRC-NRR  
E.L. Blake  
R.B. McGehee  
NRC Resident Inspectors Office

ATTACHMENT  
REVISED JUSTIFICATION  
FOR  
10 CFR 50 APPENDIX R  
RELIEF REQUEST

APPENDIX R REQUIREMENT

10 CFR 50 Appendix R, Section III, G.2.

Except as provided for in paragraph G.3 of Section III, where cables or equipment, including associated non-safety circuits that could prevent redundant trains of systems necessary to achieve and maintain hot shutdown conditions are located within the same fire area outside of primary containment, one of the following means of ensuring that one of the redundant trains is free of fire damage shall be provided:

- 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 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 combustible or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area; or
- c. Enclosure of cable 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.

[Note: Remaining d.) through f.) paragraphs are relevant to inside noninerted containments, which is not applicable in case being evaluated.]

## PLANT CONFIGURATION INVOLVED

The plant configuration involved constitutes the non-existence of fire dampers for the following duct penetrations in 3-hour rated fire boundaries:

| <u>Duct Penetration Location</u> | <u>Duct Size (Inches)</u> | <u>Fire Damper</u> | <u>Adjacent Area</u> | <u>Adjacent Area Fire Severity (Min.Approx.)</u> |
|----------------------------------|---------------------------|--------------------|----------------------|--|
| East Wall (8B)                   | 24 x 16                   | No                 | Corridor             | Negligible                                       |
| North Wall (8C)                  | 24 x 16                   | No                 | Corridor             | Negligible                                       |

The above listed 3-hour fire boundary walls are located on the east side of the Reactor Auxiliary Building (RAB), on the +21 elevation. The walls are penetrated by a single duct with one 12" x 6" air register opening, that passes through a vestibule (211). The air register is approximately two feet from the north wall in Fire Area 8C (near column line coordinates 11A and K) and approximately nine feet from the east wall in Fire Area 8B. The vestibule contains no equipment/systems required for safe shutdown of the plant. The fire areas (8B and 8C) on the opposing sides of the two walls do contain equipment/systems required for safe shutdown. The fire areas involved, 8B and 8C, are Switchgear Rooms B and A/B respectively.

## Relief Requested

Energy Operations is hereby requesting relief from Appendix R, Section III.G.2.a. The specific requirement requires a 3-hour rating throughout the fire boundary walls described above. Relief is sought because the configuration discussed above does not contain fire dampers at the wall penetrations of the HVAC duct penetrating the walls. However, as discussed below, the configuration and administrative controls will provide protection equal to that intended in Appendix R, Section III.G.2.a.

## Justification for Relief

The following constitutes justification for the above requested relief:

- a. The air duct is continuous throughout the vestibule with only one (12" x 6" Supply register) opening. This configuration can be accredited with a 1 hour fire rating, substantiated by a report of testing of a comparable configuration by Underwriters Laboratories (UL), Inc. (Fact-Finding Report on Air Duct Penetrations Through One Hour Fire Resistive Wall Assemblies, dated March 22, 1984).

Discussion:

The differences between the UL tested configuration and the Waterford 3 configuration are that the UL tested configuration did not have an air register or air flow in the tested duct. The Waterford 3 configuration has a 12" x 6" air register opening that is approximately 2 feet from the 3-hour fire boundary wall separating the vestibule from Fire Area RAB 8C and approximately 9 feet from the 3-hour boundary wall separating the vestibule from Fire Area RAB 8B. The Waterford 3 duct is Safety Related and airflow is continuous in the duct for a fire originating in the vestibule. Design airflow (180 cfm) through the 12" x 6" supply register (2,060 cfm upstream of the air register) effectively eliminates transmission of negligible heat or propagation of flames from a fire in the vestibule to adjacent fire areas. The air register represents only .6 percent of the total surface area of the duct in the vestibule. Waterford 3's Engineering Staff has evaluated that cooling effects of air in the duct in combination with the small percentage of duct surface area constituting the air register opening and 9 foot distance from Fire Area 8B fire wall represents equivalence between the UL tested configuration and the Waterford 3 configuration.

The east fire boundary wall of Fire Area 8B and north fire boundary wall of Fire Area 8C (near column line coordinates 11A and K) will provide 3-hour fire barrier protection except at the 24-inch x 16 inch duct penetrations. If a fire were to occur in the vestibule area, the duct would provide a 1-hour fire barrier between the vestibule and Fire Areas 8B and 8C. The 1-hour rating accreditation to the duct is widely recognized by the industry and is substantiated by Underwriters Laboratories (UL), Inc. which has tested configurations comparable to the subject arrangement.

- b. The combustible loading in the vestibule is negligible and the fire severity is substantially lower than one hour.

### Discussion

The fire loading in the vestibule is minimal. This means that, should a fire start in the vestibule area, it would not exceed the 1-hour protection afforded by the subject HVAC duct passing through the vestibule. Additionally, the fire loading is substantially lower than the 3-hour rating for the fire barrier required in Appendix R, Section III, G.2.a. Utilizing the methodology from the combustible loading calculation, the fire severity is approximately 2 minutes. This assumes that all of the combustibles available to burn in the vestibule would be simultaneously involved in a fire in the vestibule. The assumption is conservative since the small quantity of combustibles in the vestibule are distributed in such a way that simultaneous involvement would not be likely.

Permanent plant design modification packages that could potentially change the vestibule configuration would undergo a fire protection safe shutdown evaluation in accordance with existing procedure.

Plant Procedure FP-001-017, "Transient Combustibles and Designated Storage Areas" requires the approval of the Fire Protection and Safety (FP&S) Department prior to designating areas as combustible or non-combustible materials staging areas. This will provide administrative controls over use of the vestibule as a combustible material staging area.

- c. Fire detection and suppression exist in RAB Fire Areas 8B and 8C.

### Discussion:

Therefore, in the highly unlikely event that a fire in the vestibule were to penetrate Fire Area 8B and/or 8C fire boundary walls at the duct penetration, it would be detected and suppressed in Fire Areas 8B and/or 8C. (Also see "d." below)

- d. The vestibule is the main ingress and egress for the RAB. Therefore, the area is highly traveled.

### Discussion:

This means that, should a fire start in the vestibule, the probability is very good that it would be detected by plant personnel passing through the vestibule. Plant personnel are trained in General Employee Training to report a detected fire to the Control Room via a designated emergency phone extension. The plant fire brigade would be called into action by an

overriding plant page from the Control Room or Technical Support Center (TSC). The fire brigade consists of five personnel on each shift and they are equipped in accordance with Section I of Appendix R to 10 CFR 50.

In conclusion, the plant configuration and administrative controls discussed above are adequate to ensure equivalent fire protection to that required by Appendix R, Section III, G.2.a.