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Docket Nos. 50-259
 and 50-260
 and 50-296

T Wambach
 V. Benaroya
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JHeltemes-AEOD Gray EXTRA-5

Mr. Hugh G. Parris
 Manager of Power
 Tennessee Valley Authority
 500 A Chestnut Street, Tower II
 Chattanooga, Tennessee 37401

FEB 4 1983

Dear Mr. Parris:

SUBJECT: EXEMPTION REQUESTS - 10 CFR 50.48 FIRE PROTECTION AND APPENDIX R
 TO 10 CFR PART 50

Re: Browns Ferry Nuclear Plant, Units 1, 2, and 3

The Commission has issued the enclosed Exemption to certain requirements of Section 50.48 and Appendix R to 10 CFR Part 50, in response to your letter dated June 30, 1982. Your letter of June 30, 1982 submitted a safe shutdown analysis and evaluation of the Browns Ferry Nuclear Plant, Units 1, 2 and 3, for compliance with Section III.G. of Appendix R to 10 CFR Part 50. In Attachment 7 of your submittal you requested exemptions to 1) the technical requirement of Section III.G.2 for a three-hour rated fire barrier between the three redundant battery and battery board room complexes and 2) the technical requirement of Section III.G.3 for a fixed fire suppression system in the main control rooms.

Based on our evaluation, we find that the level of protection provided for the battery and battery board room complexes provides a level of fire protection equivalent to Section III.G.2 and therefore, exemption from the requirements of Section III.G.2 is granted. We also find that the level of protection provided for the control rooms provides a level of protection equivalent to section III.G.3 and therefore, exemption from the requirements of Section III.G.3 is granted. Attachment 7 of your submittal also requested an exemption to the schedular requirements of 10 CFR 50.48(c) for completing the modifications required by Section III.G. of Appendix R. This request is being considered separately.

A copy of the Exemption is being filed with the Office of the Federal Register for publication.

Sincerely,

Original signed by
 D. B. Vassallo

Domenic B. Vassallo, Chief
 Operating Reactors Branch #2
 Division of Licensing

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OFFICE	Enclosure:	Exemption					
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DATE	See next page	SNorris 1/24/83	RClark:pop/mc 1/12/83	DVassallo 1/14/83	GLainas 1/10/83	RPurple 1/1/83	DEISE 2/1/83

Mr. Hugh G. Parris

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of
TENNESSEE VALLEY AUTHORITY
(Browns Ferry Nuclear Plant,
Units 1, 2 and 3

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Docket Nos. 50-259, 50-260, 50-296

EXEMPTION

I.

The Tennessee Valley Authority (the licensee) is the holder of Facility Operating License Nos. DPR-33, DPR-52 and DPR-68 which authorize the operation of the Browns Ferry Nuclear Plant, Units 1, 2 and 3 at steady-state power levels not in excess of 3293 megawatts thermal. The facility consists of three boiling water reactors located at the licensee's site in Limestone County, Alabama. The licenses provide, among other things, that they are subject to all rules, regulations and Orders of the Commission now or hereafter in effect.

II.

On November 19, 1980, the Commission published a revised Section 10 CFR 50.48 and a new Appendix R to 10 CFR 50 regarding fire protection features of nuclear power plants (45 FR 76602). The revised Section 50.48(c) and Appendix R became effective on February 17, 1981. Section 50.48(c) established the schedules for satisfying the provisions of Appendix R. Section III of Appendix R contains 15 subsections, lettered A through O, each of which specifies requirements for a particular aspect of the fire protection features at a nuclear power plant. One of these 15 subsections, III.G, is the subject of this Exemption. Subsection III.G. specifies detailed requirements

for fire protection of the equipment used for safe shutdown by means of separation and barriers (III.G.2). If the requirements for separation and barriers could not be met in an area, alternative safe shutdown capability, independent of that area and equipment in that area, was required (III.G.3).

By letter dated June 30, 1982, the licensee requested two technical exemptions from Section III.G of Appendix R to 10 CFR 50.

Section III.G.2 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 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 fire area.

If these conditions are not met, alternative shutdown capability is required and a fixed suppression system 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 adequate 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 from 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:

- o 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.

- o 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).
- o Fire retardant coatings are not used as fire barriers.
- o Modifications required to meet Section III.G would not enhance fire protection safety above that provided by either existing or proposed alternatives.
- o Modifications required to meet Section III.G would be detrimental to overall facility safety.

In Attachment 7 of TVA's letter of June 30, 1982, the licensee requested two technical exemptions to the requirements of 10 CFR 50.48 and Section III.G of Appendix R. One request pertained to the requirement for a 3-hour fire rated barrier in one specific location of the plant- namely, between the three redundant battery and battery board room complexes located on elevation 593 of the control building. The present walls around each complex will meet the requirements for at least a 1 1/2 hour fire barrier but not a full 3 hours.

The three redundant battery and battery board room complexes are located on the 593 foot level of the control building. This elevation of the control building is separated from the remainder of the plant by 3-hour rated fire barriers. The battery rooms and battery board rooms are separate rooms enclosed by 1-1/2 hour rated fire barriers. Each battery room is separated from its redundant counterpart by approximately 90 feet, and several intervening rooms. The combustible loading in the Unit 1 battery room is the highest of the three battery rooms and is approximately 26,000 BTU's/ft². This amount, if totally consumed, would represent an equivalent fire severity on the ASTM E-119 standard time-temperature curve of roughly 25 minutes.

All of the rooms are provided with smoke detection systems. Manually actuated suppression systems are installed in each battery room and battery board room. Total flooding carbon dioxide systems are installed in the intervening rooms between the battery rooms.

The battery and battery board rooms do not comply with Section III.G requirements because their boundary walls are 1-1/2-hour rated instead of the required 3-hour rated barriers. However, the combustible loading in these rooms is appreciably lower than one-half the fire resistance rating of the boundary walls. In addition, manual suppression is provided in each room and automatic total flooding CO₂ systems are installed in the rooms which are located between the redundant battery rooms. This protection, in conjunction with the separation distance of approximately 90 feet between redundant battery rooms provides reasonable assurance that

one train of components needed for safe shutdown will be maintained free of fire damage, and compensates for the lack of a 3-hour rated fire barrier. The level of existing protection provides a level of fire protection equivalent to Section III.G.2 and therefore is acceptable.

Based on the above evaluation, we conclude that the level of protection for the battery rooms and battery board rooms provides a level of fire protection equivalent to the technical requirements of Section III.G.2 of Appendix R to 10 CFR 50, and therefore the licensee's request for an exemption should be granted.

The second exemption requested by TVA pertains to the requirement of Section III.G.3 of Appendix R that alternative shutdown capability, fire detection and fixed fire suppression be provided for the main control rooms. The control rooms will meet the first two requirements but do not have fixed fire suppression systems. TVA has requested an exemption to the requirement for a fixed suppression system in the control rooms.

The control rooms have a fire detection system, hose station, and fire extinguishers. An alternate safe shutdown system is also available for the control rooms. The rooms are continuously manned and the fire load in the control rooms is low.

Because the fire hazard is light, and the control room continuously manned, there is reasonable assurance that a fire would be promptly extinguished.

Based on our evaluation, we conclude that the installation of a fixed fire suppression system will not significantly increase the level of fire protection in the control rooms. Therefore, the exemption should be granted.

III.

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12, an exemption is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest and hereby grants the following exemptions with respect to the requirements of Sections III.G.2 and Section III.G.3 of Appendix R to 10 CFR Part 50:

The licensee is exempted from the requirement of Section III.G.2 to provide a 3-hour rated fire barrier between the three battery and battery board rooms located on the 593 foot elevation of the Browns Ferry Nuclear Plant, Units 1, 2, and 3.

The licensee is exempted from the requirement of Section III.G.3 to have a fixed fire suppression system in the main control rooms of the Browns Ferry Nuclear Plant.

The NRC staff has determined that the granting of these Exemptions will not result in any significant environmental impact and that pursuant to 10 CFR 51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with this action.

FOR THE NUCLEAR REGULATORY COMMISSION



Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland
this 4th day of February 1983.