

May 5, 2003

MEMORANDUM TO: James W. Clifford, Chief, Section 2  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

FROM: Eric Weiss, Chief/**RA**/  
Fire Protection Engineering and Special Projects Section  
Plant System Branch  
Division of System Safety and Analysis  
Office of Nuclear Reactor Regulation

SUBJECT: PLANT SYSTEMS BRANCH SAFETY EVALUATION OF SALEM UNIT 1  
AND 2 REQUEST FOR DEVIATION FROM APPENDIX R TO 10 CFR  
PART 50 (TAC NO. MB5052 and MB5053)

Plant Name: Salem Nuclear Generating Station Units 1 and 2  
Licensee: PSEG Nuclear.  
Reviewer: Phil Qualls  
Review Status: Complete

By letter dated May 1, 2002, PSEG Nuclear, the licensee for Salem Units 1 and 2, requested exemptions from certain technical requirements of Section III.G and III. L of Appendix R to Part 50 of Title 10 of the Code of Federal Regulations (10 CFR Part 50). 10 CFR 50.48 required that nuclear power plants licensed to operate prior to January 1, 1979 meet III.G of Appendix R. Plants licensed to operate after January 1, 1979 incorporated these requirements into the operating license. Salem Unit 1 was licensed to operate on August 13, 1976 while Unit 2 was licensed to operate on May 20, 1981. Therefore the staff reviewed the licensee's exemption request as an exemption request for Unit 1 and as a deviation request for Unit 2.

We have reviewed the licensee's request and found it acceptable. We recommend, therefore, that the license's exemption request for Salem Unit 1 and deviation request from a commitment to meet Section III.G of Appendix R to 10 CFR Part 50, for Salem Unit 2 as described in the attached safety evaluation, be granted.

Docket Nos.: 50-272 and 50-311

Attachment: As stated

CONTACT: P. Qualls  
415-1849

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See previous concurrence\*

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DATE	05/2/03	05/5/03	05/ /03	05/ /03

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
PLANT SYSTEMS BRANCH  
DIVISION OF SYSTEMS SAFETY AND ANALYSIS  
LICENSEE REQUEST FOR EXEMPTION FROM  
SECTION 111.G OF APPENDIX R TO 10 CFR PART 50  
SALEM GENERATING STATION, UNITS 1 AND 2  
DOCKET Nos.: 50-272 AND 50-311

1.0 INTRODUCTION

10 CFR Part 50.48(a) requires that each operating nuclear power plant have a fire protection plan which satisfies Criterion 3 of Appendix A to Part 50. 10 CFR Part 50.48(b) required nuclear power plants licensed to operate prior to January 1, 1979 to implement Section III.G of Appendix R. Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," to Title 10 of the Code of Federal Regulations (10CFR) Part 50, establishes fire protection features required to satisfy General Design Criterion 3, "Fire protection," of Appendix A to 10 CFR Part 50 with respect to certain generic issues for nuclear power plants licensed to operate prior to January 1, 1979. For plants licensed after January 1, 1979 the applicable requirements were incorporated into the operating license for the facility. By letter dated May 1, 2002 PSEG Nuclear, the licensee for Salem Generating Station, Units 1 and 2, requested an exemption from certain technical requirements of Appendix R. Salem Unit 1 received its license to operate in 1976. Unit 2 received its operating license in 1981. Therefor the staff reviewed the request for an exemption to the Appendix R requirements for Unit 1 and a Deviation from the operating license condition for Unit 2.

Section III.G.2 of Appendix R to 10 CFR Part 50, requires that when a licensee cannot meet the separation criteria of III.G.2 of Appendix R, when redundant trains of safe shutdown cables or equipment are in the same fire area, that the licensee implement the Alternative Shutdown requirements of Section III.G.3 of Appendix R. Section III.G.3 requires that licensees have a shutdown capability independent of the area where redundant trains are located, and further requires that the area with redundant trains have an automatic fire detection and fixed fire suppression system. A Federal court decision has held that when a licensee implements the requirements of Section III.G.3, then the licensee must also comply with Section III.L of Appendix R. Section III.L of Appendix R requires that the licensee assume that offsite power is lost for a fire in a fire area crediting Section III.G.3, Alternative shutdown.

The licensee requested that for:

Fire Area 1(2)-FA-AB-64B an exemption from the fixed suppression requirement of Section III.G.3 and the loss of offsite power requirement of Section III.L of Appendix R.

Fire Area 1(2)-FA-AB-84C and exemption from the fixed suppression requirement of Section III.G.3 of Appendix R.

Fire Area 1(2)-FA-AB-84B an exemption from the loss of offsite power requirement of Section III.L of Appendix R.

## 2. REGULATORY EVALUATION

### Fire Area 1(2)-FA-AB-64B - Reactor Plant Auxiliary Equipment Area (elevation 64') of the Auxiliary Building

The licensee requested an exemption from the fixed suppression requirement of Section III.G.3 and the loss of offsite power requirement of Section III.L of Appendix R. This area contains waste gas compressors, waste gas tanks, storage tank recirculation pumps, laundry pump (Unit 1), chemical drain tank pump (Unit 1), and holdup tanks and pumps.

The fire area consists of multiple concrete rooms. Each room contains either a single component or groups of similar components. The area boundaries consist of reinforced concrete. The in-situ combustibles in the area consist of lubricating oil in pumps and motors, paper, electrical cabinet internals, and cable insulation. A fire detection system is installed throughout the area except in the Holdup Tank Rooms, No. 1 Pump Waste Monitor Hold-up Tank Pump Room, the Waste Evaporator Feed Pump Room, and an unused space. These rooms are separated from the remainder of the area by concrete walls.

Manual fire alarm stations are provided in the area. Detectors and manual fire alarm stations alarm in the Control Room. Manual fire suppression capability is provided in the form of portable fire extinguishers and manual hose stations. The NRC approved an exemption for the lack of a suppression system on July 20, 1989.

This fire area has a low in situ combustible loading and few ignition sources. A fire in this area has the potential to result in a loss of the emergency diesel generators. However, the licensee has evaluated offsite power, and offsite power would not be affected by a fire in the area and would be available to support safe shutdown activities. Alternative shutdown capability, independent of the fire area, is provided to ensure post-fire safe shutdown.

### Fire Area 1(2)-FA-AB-84C - Component Cooling Water 11 (21) Pump and Heat Exchanger Area (elevation 84') of the Auxiliary Building

The licensee requested an exemption from the fixed suppression requirement of Section III.G.3 of Appendix R. This area contains the Component Cooling Water (CCW) Pump and Heat Exchanger.

The fire area boundaries consist of reinforced concrete. The area has a low combustible material loading consisting of lubricating oil for the CCW pump and motor and cable insulation. The area contains few fixed ignition sources.

An area wide fire detection system is installed in the area. A manual fire alarm station is provided in the corridor outside of the room. Both systems alarm in the Control Room. Manual fire suppression capability is provided by portable fire extinguishers and manual hose stations located in the corridor outside of the fire area. A fire in this area could affect several systems required for redundant safe shutdown. Alternative shutdown capability, independent of the fire area, is provided to ensure post-fire safe shutdown.

Fire Area 1(2)-FA-AB-84B - Reactor Plant Auxiliary Equipment Area (Elevation 84') of the Auxiliary Building

The licensee requested an exemption from the loss of offsite power requirement of Section III.L of Appendix R. The fire area contains pumps, heat exchangers, tanks and control centers for the chemical and volume control, component cooling, safety injection, containment spray, auxiliary feedwater, waste disposal, and spent pool cooling systems.

The fire area boundaries consist of reinforced concrete. The fire area consists of many concrete rooms. Each room contains either a single component or groups of similar components. The in situ combustibles in the area consist of lubricating oil in pumps and motors, flammable liquids stored in cabinets, and cable insulation. The area contains few ignition sources and few paths for fire propagation.

NRC Safety Evaluation Report dated July 20, 1989, accepted the partial fire detection system. Fire suppression is provided for the auxiliary feedwater pumps by automatically actuated preaction sprinkler systems. Fire suppression is provided for the charging pump area by a wet pipe sprinkler system.

A fire in this area has the potential to result in a loss of the emergency diesel generators. However, the license has evaluated offsite power, and offsite power not be affected by a fire in the area. Offsite power would be available to support required safe shutdown activities for a fire in this area. Alternative shutdown capability, independent of the fire area, is provided to ensure post-fire safe shutdown.

### 3.0 EVALUATION

#### Fire Area 1(2)-FA-AB-64B

The licensee does not meet the technical requirements of 10 CFR Part 50 Appendix R in that Fire Area 1(2)-FA-AB-64B credits alternative shutdown capability, but does not have a fixed suppression system and that the area requires offsite power to accomplish safe shutdown.

The area consists of several rooms with concrete walls. Areas containing significant amounts of combustible materials contain a fire detection system. The low combustible loadings and the limited propagation pathways for fire would result in a fire of limited size. In the event of a fire in the area, the fire detectors would alarm and the fire brigade would extinguish the fire using manual equipment. The staff agrees that an automatic fire suppression system is not necessary to control a fire in this configuration in this fire area and that the Control Room operators could detect a fire and that the station fire brigade would rapidly respond and extinguish a fire in this area.

The fire area contains no cables or equipment that could cause the station to lose offsite power. Based on the licensee's submittal the staff agrees that the licensee should be able to accomplish required safe shutdown activities for a fire in this fire area using offsite power.

#### Fire Area 1(2)-FA-AB-84C

The licensee does not meet the technical requirements of 10 CFR Part 50 Appendix R in that Fire Area 1(2)-FA-AB-84C , credits alternative shutdown capability, but does not have a fixed fire suppression system.

The fire area boundaries consist of reinforced concrete. Alternative shutdown capability exists independent of the fire area to ensure that the plant can be safely shutdown for a fire in this area. The low combustible loadings, principally electrical cable insulation, would result in a fire of limited size with slow growth characteristics. In the event of a fire in the area, the fire detectors would alarm and the fire brigade would extinguish the fire using manual equipment. The staff agrees that an automatic fire suppression system is not necessary to control a fire in this configuration in this fire area and that the Control Room operators could detect a fire and that the station fire brigade would rapidly respond and extinguish a fire in this area.

#### Fire Area 1(2)-FA-AB-84B

The licensee does not meet the technical requirements of 10 CFR Part 50 Appendix R in that Fire Area 1(2)-FA-AB-84B, credits alternative shutdown capability, which requires that offsite power be available to accomplish safe shutdown. A fire in this area would not result in the loss of offsite power.

The licensee has evaluated offsite power. For a fire in this area offsite power would not be affected. In the event of a fire in this area, the licensee could accomplish safe shutdown activities using power supplied from offsite and alternative shutdown capability independent of this fire area.

### 4.0 CONCLUSION

On the basis of its review, the staff concluded that the licensees request for an exemption from 1) a fixed suppression system and loss of offsite power requirements in Fire Area 1(2)-FA-AB-64B 2) a fixed suppression system in Fire Area Fire Area 1(2)-FA-AB-84C and 3) loss of offsite power requirements for Fire Area 1(2)-FA-AB-84C meet the requirements of 50.12 in that the underlying purpose in the rule is met and that the licensee would be able to accomplish safe shutdown. The staff recommends that the exemption (Unit 1) and Deviation (Unit 2) therefore be approved.