

March 7, 1985

Docket No. 50-261

Mr. E. E. Utley, Executive Vice President  
Power Supply and Engineering & Construction  
Carolina Power and Light Company  
Post Office Box 1551  
Raleigh, North Carolina 27602

<u>Distribution</u>	Docket file
NRC PDR	Local PDR
ORB#1 RDG	HThompson
ORAB	CParrish
GRequa	OELD
EJordan	BGrimes
JPartlow	TBarnhart (4)
ACRS (10)	OPA,CMiles
SECY	RDiggs
ORB#1 Gray file	

Dear Mr. Utley:

The Commission has issued the enclosed Exemption to certain requirements of Appendix R to 10 CFR Part 50 in response to your letter dated January 19, 1981, as supplemented by letters dated July 30, 1982, January 7, 1983, June 7 and 23, 1983 and October 5, 1983. Additional information was supplied by letters dated November 16 and 26, 1980.

Specifically you are exempt from Section III.0. of Appendix R to 10 CFR Part 50 to the extent that it requires reactor coolant pump oil collection systems. We have also enclosed the staff's Safety Evaluation.

The exemption is conditioned on your implementing fire protection modification in this area as proposed. These modifications must be completed in accordance with the provisions of 10 CFR 50.48(c).

A copy of the Exemption is being forwarded to the Office of the Federal Register for publication.

Sincerely,

/s/SAVarga

Steven A. Varga, Chief  
Operating Reactors Branch #1  
Division of Licensing

Enclosures:

1. Exemption
2. Safety Evaluation

cc w/enclosures:

See next page

\* SEE PREVIOUS WHITE FOR CONCURRENCE

ORB#1:DL *CP*  
CParrish  
02/26/85

ORB#1:DL *bl*  
GRequa/ts  
02/26/85

ORB#5:DL\*  
TWambach  
02/12/85

BC-ORB#1:DL\*  
*SV*  
02/17/85

OELD *W*  
*W. Shields*  
02/26/85

AD:OR:DL  
GLafinas  
02/26/85

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Division of Licensing

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Exemption

cc w/enclosure:  
See next page

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02/12/85

BC-ORB#1:DL  
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GLainas  
02/ /85

Mr. E. E. Utley  
Carolina Power and Light Company

H. B. Robinson Steam Electric  
Plant 2

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Darlington, South Carolina 29535

State Clearinghouse  
Division of Policy Development  
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General Manager  
H. B. Robinson Steam Electric Plant  
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Hartsville, South Carolina 29550

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of

CAROLINA POWER AND LIGHT  
COMPANY

(H. B. Robinson Unit No. 2)

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)

Docket No. 50-261

EXEMPTION

I.

The Carolina Power and Light Company (the licensee) is the holder of Facility Operating License No. DPR-23 which authorizes operation of the H. B. Robinson Plant, Unit No. 2. This license provides, among other things, that it is subject to all rules, regulations and Orders of the Commission now or hereafter in effect.

The facility is a pressurized water reactor at the licensee's site located in Darlington County, South Carolina.

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 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 fifteen 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 fifteen subsections III.0 is the subject of this exemption request. III.0 specifies detailed requirements for oil collection system for reactor coolant pumps.

### III.

By letter dated November 16, 1980, the licensee informed the staff that installation of a fixed fire suppression system had been completed in each reactor coolant pump bay. The system was based on proposed NRC requirements set forth in Section III.P of a proposed Appendix R notice in the Federal Register on May 29, 1980. Additional information was provided by letter dated November 26, 1980. By letter dated January 19, 1981, the licensee requested an exemption from the requirements of Section III.0 of Appendix R to 10 CFR 50. The request was supplemented by letters dated January 7, 1983, July 30, 1982, June 7, 1983, June 29, 1983 and October 5, 1983. The June 7, 1983, and October 5, 1983 letters proposed modifications for additional fire suppression as alternatives. This does not meet the technical requirements of Appendix R because oil collection systems for the reactor coolant pumps are not provided. The acceptability of the alternative measures are discussed below.

### IV.

The containment contains three reactor coolant pumps (A, B and C). These are located in bays (A, B and C). These bays also contain safety related cabling for the reactor coolant loop instrumentation. Bays A and B share a common ceiling; Bay C is isolated from Bays A & B to some extent. The bays are covered by removable concrete blocks. These blocks will cause the plume from an unmitigated fire to be diverted through the steam generator area. This area contains safety related steam flow instrumentation sensing lines.

Oil spilled in Bay A, will be confined to Bay A; however, oil spilled in Bays B and C can flow to adjacent areas. The foundation for the reactor

coolant pumps is at the 237.000' level. The foundation for the steam generators is at the 238.33' level. The reactor coolant pump is located between the pressurized portion of the oil system and the steam generator supports, and serves to shield the steam generator supports in the event of an oil system rupture.

The major combustible in each bay is the 200 gallons of oil in each reactor coolant pump.

The existing fire detection system in each reactor coolant pump bay is a two-zone detection system. One zone consists of a single infrared flame detector; the other zone consists of a 325°F fixed-temperature heat detector. Activation of one zone of detection sends an alarm to the control room; activation of the second zone of detection alarms in the control room and also opens the preaction water deluge valve to the bay. Both detectors are wall mounted.

The existing fire suppression system for each bay, is a preaction sprinkler system. Each bay has its own deluge valve, supply header, and a ring header that encircles the reactor coolant pumps at elevation 239 feet 4 inches. Each of the five risers off the ring header have three 220°F closed head side wall sprinklers at approximately 240 feet, 245 feet and 252 feet elevations. These systems are design to meet the minimum residual pressure and flow requirements of NFPA-Std-15.

The suppression system ring header piping in Bay A is designed to withstand an SSE, while Bays B and C are designed such that a seismic event would not impact safety related equipment due to suppression system rupture. The risers are restrained to withstand the nozzle reaction forces. These forces are greater than those anticipated from a seismic event.

The existing containment spray system would be used as an emergency back-up to the bay suppression system if necessary to cool the operating level and containment annulus outside of the RCP bays.

By letter dated June 7, 1983, the licensee proposed to:

- (1) Provide additional ceiling mounted heat detectors to meet the spacing and location requirements of NFPA-STD-72E, "Standard on Automatic Fire Detectors.
- (2) Replace existing closed head sprinklers with special open water spray nozzles and manual actuation from the control room.
- (3) Construct 6 inch dikes at the 231 feet elevation in Bay B and Bay C.
- (4) Revise operating procedures for the containment spray system to allow its operation as a back up fire suppression system with the sodium hydroxide valves out.

By letter dated October 5, 1983, the licensee committed to maintain an automatically actuated closed-head preaction system in lieu of a manually actuated open-head system.

We have evaluated the fire protection for the reactor coolant pump lube oil system and conclude that the effects of a fire in an RCP Bay will not prevent safe shutdown capability. There are no components within the RCP Bay that are required for safe shutdown. The effects of any fire within an RCP Bay will be prevented from affecting the safe shutdown equipment outside the RCP Bay by the suppression system inside the RCP Bay and the Containment Spray System outside the Bay.

It is the staff's conclusion that: 1) installation of a reactor coolant pump oil collection system in this facility would not significantly enhance fire safety, and 2) the existing fire protection system in the Reactor Coolant

Pump Bays with the addition of the proposed modifications provides an acceptable level of safety to that achieved by compliance with the requirements of Section III.0 of Appendix R to 10 CFR 50. Therefore, the licensee's request for an exemption should be granted.

V.

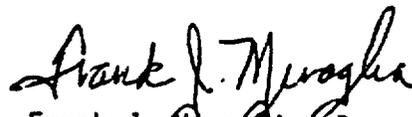
Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12, the exemption requested by licensee's letters as referenced and discussed in III. and IV. above is authorized by law, will not endanger life or property or the common defense and security, is otherwise in the public interest, and is hereby granted.

Pursuant to 10 CFR 51.32, the Commission has determined that the issuance of the exemption will have no significant impact on the environment (50 FR 10124, March 13, 1985).

A copy of the Safety Evaluation dated March 7, 1985, related to this action is available for public inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C. and at the local public document room located at the Hartsville Memorial Library, Home and Fifth Avenues, Hartsville, South Carolina 29535. A copy may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Director, Division of Licensing.

This Exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Frank J. Mraglia, Deputy Director  
Division of Licensing  
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland  
this 20th day of March, 1985

## Enclosure 2

Chemical Engineering Branch/Fire Protection Section  
Exemption Request  
H. B. Robinson, Unit No. 2  
Docket No. 50-261

### Introduction

By letter dated November 16, 1980, the licensee informed the staff that installation of a fixed fire suppression system had been completed in each reactor coolant pump bay. The system was based on proposed NRC requirements set forth in Section III.P of a proposed Appendix R notice in the Federal Register on May 29, 1980. By letter dated January 19, 1981, the licensee requested an exemption from the requirements of Section III.O of Appendix R to 10 CFR 50.

Additional information was provided by letters dated November 26, 1980, January 7, 1983, July 30, 1982, June 7, 1983, June 29, 1983 and October 5, 1983.

### Exemption Requested

The licensee requests an exemption from Section III.O of Appendix R to 10 CFR 50 to the extent it requires an oil collection system for the reactor coolant pumps.

### Discussion

The containment contains three reactor coolant pumps (A, B and C). These are located in bays (A, B and C). These bays also contain safety related cabling for the reactor coolant loop instrumentation. Bays A and B share a common ceiling; Bay C is isolated from Bays A & B to some extent. The bays are covered by removable concrete blocks. These blocks will cause the plume from an unmitigated fire to be diverted through the steam generator area. This area contains safety related steam flow instrumentation sensing lines.

Oil spilled in Bay A, will be confined to Bay A; however, oil spilled in Bays B and C can flow to adjacent areas. The foundation for the reactor coolant pumps is at the 237.000' level. The foundation for the steam generators is at the 238.33' level. The reactor coolant pump is located between the pressurized portion of the oil system and the steam generator supports, and serves to shield the steam generator supports in the event of an oil system rupture.

The major combustible in each bay is the 200 gallons of oil in each reactor coolant pump.

The existing fire detection system in each reactor coolant pump bay is a two-zone detection system. One zone consists of a single infrared flame detector; the other zone consists of a 325°F fixed-temperature heat detector. Activation of one zone of detection sends an alarm to the control room; activation of the second zone of detection alarms in the control room and also opens the pre-action water deluge valve to the bay. Both detectors are wall mounted.

The existing fire suppression system for each bay, is a preaction sprinkler system. Each bay has its own deluge valve, supply header, and a ring header that encircles the reactor coolant pumps at elevation 239 ft. 4 in. Each of the five risers off the ring header have three 220°F closed head side wall sprinklers at approximately 240 ft., 245 ft. and 252 ft. elevations. These systems are design to meet the minimum residual pressure and flow requirements of NFPA-Std-15.

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The existing containment spray system would be used as an emergency back-up to the bay suppression system if necessary to cool the operating level and containment annulus outside of the RCP bays.

By letter dated June 7, 1983, the licensee proposed to:

- (1) Provide additional ceiling mounted heat detectors to meet the spacing and location requirements of NFPA-STD-72E, "Standard on Automatic Fire Detectors.
- (2) Replace existing closed head sprinklers with special open water spray nozzles and manual actuation from the control room.
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- (4) Revise operating procedures for the containment spray system to allow its operation as a back up fire suppression system with the sodium hydroxide valved out.

By letter dated October 5, 1983, the licensee committed to maintain an automatically actuated closed-head preaction system in lieu of a manually actuated open-head system.

The licensee has provided the results of analyses of several fire scenarios without the benefit of the fire suppression system and an analysis of the reactor coolant lube oil systems capability to withstand an SSE.

The applicant states that the installation of a reactor coolant system would cost about 517 man-rem.

#### Evaluation

The technical requirements of Section III.0 of Appendix R are not met because the licensee has not provided a reactor coolant pump oil collection systems.

The licensee has provided several analyses to show that an unmitigated oil fire within one reactor coolant pump bay would not affect components located outside the bay. Our consultant Brookhaven National Laboratory, has reviewed these analyses and concluded that "the analyses are not sufficient, nor extensive enough to support their original thesis. In particular, the pool fire area and the quantity of spilled oil assumed in the scenarios may not bound all possible conditions." We agree. The results of any calculation will depend upon the assumed area of the fire and its duration. There is no way to set these parameters definitively.

In our opinion, the RCP Bay suppression system should be capable of maintaining temperatures within the Bay to reasonable levels if a fire should occur. Therefore, the fire effects should be confined to one Bay. In addition, the containment spray should be capable of maintaining reasonable temperatures outside of the reactor coolant bays.

The components within each Bay are not necessary for maintaining safe shutdown conditions. Components outside of a Bay should not be damaged.

The seismic analysis shows that it is unlikely that a seismic event would rupture the lube oil piping.

In our opinion, installation of a reactor coolant pump oil collection system in this facility would not significantly enhance fire safety.

### Conclusion

Based on our evaluation, we conclude that the existing fire protection system in the Reactor Coolant Pump Bays provides an acceptable level of safety to that achieved by compliance with the requirements of Section III.0 of Appendix R to 10 CFR 50. Therefore, the licensee's request for an exemption should be granted.

Dated: March 7, 1985

Principal Contributor:

J. Stang