

September 12, 1995

Mr. J. P. O'Hanlon  
Senior Vice President - Nuclear  
Virginia Electric and Power Company  
Innsbrook Technical Center  
5000 Dominion Boulevard  
Glen Allen, Virginia 23060

SUBJECT: EXEMPTION AMENDMENT FROM CERTAIN TECHNICAL REQUIREMENTS OF APPENDIX R TO 10 CFR PART 50 - NORTH ANNA POWER STATION, UNITS NO. 1 AND NO. 2 (NA-1&2) (TAC NOS. M89192 AND M89193)

Dear Mr. O'Hanlon:

The Nuclear Regulatory Commission has granted the enclosed Exemption amendment to revise Exemption 1 to account for non-fire-rated penetration seals and unprotected openings located in the south wall of the charging pump cubicles. The Exemption amendment was granted in response to your letter dated December 11, 1992.

Also enclosed is a Safety Evaluation supporting granting of the Exemption amendment.

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

Sincerely,

(Original Signed By B. Buckley for)

Leon B. Engle, Project Manager  
Project Directorate II-1  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Docket Nos. 50-338 and  
50-339

Enclosures:

- 1. Exemption Amendment
- 2. Safety Evaluation

cc w/enclosures: See next page

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

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*Bart C. Buckley for*

Leon B. Engle, Project Manager  
Project Directorate II-1  
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Docket Nos. 50-338 and  
50-339

Enclosures:

1. Exemption Amendment
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cc w/enclosures: See next page

Mr. J. P. O'Hanlon  
Virginia Electric & Power Company

North Anna Power Station  
Units 1 and 2

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## UNITED STATES NUCLEAR REGULATORY COMMISSION

In the matter of )

VIRGINIA ELECTRIC )  
AND POWER COMPANY )North Anna Power Station )  
Units 1 and 2 )Docket Nos. 50-338 and  
50-339EXEMPTION AMENDMENT

## I.

The Virginia Electric and Power Company (VEPCO, the licensee) is the holder of Operating License No. NPF-4 which authorizes operation of North Anna Power Station Unit 1 and Operating License No. NPF-7 which authorizes operation of Unit 2. These operating licenses provide, among other things, that the North Anna Power Station is subject to all rules, regulations, and Orders of the Commission now or hereafter in effect.

The station comprises two pressurized water reactors at the Licensee's site located in Louisa County, Virginia.

## II.

By letter to the licensee dated November 6, 1986, Exemption 1 (among others) was approved by the NRC. Exemption 1 was from the technical requirements of Section III.G.3 of Appendix R to 10 CFR Part 50 to the extent that fire detection and fixed suppression systems were not installed throughout the Auxiliary, Fuel, and Decontamination Building (Fire Area 11). The original Safety Evaluation supporting Exemption 1 stated the charging pump cubicles had 3-hour fire-rated walls, and that the penetrations in these walls were sealed to a rating of 3 hours. By letter dated December 11, 1992, the licensee requested an addendum (exemption amendment) which revises the

original Exemption 1 to account for non-fire-rated penetration seals and unprotected openings located in the south wall of the charging pump cubicles. The lack of penetration seals was identified in an NRC Inspection Report 50-338, 339/92-18 dated October 19, 1992.

The Commission's staff has evaluated the information provided by the licensee to support the addendum to Exemption 1. The Commission's Safety Evaluation relating to an Addendum to Exemption 1 From Certain Requirements of Appendix R to 10 CFR Part 50 is being issued concurrently with this exemption amendment. The Safety Evaluation concludes that the lack of fire-rated penetration seals in the south wall of the pump cubicles does not present an undue risk to the public health and safety and that special circumstances are present in that application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule.

### III.

The underlying purpose of Section III.G.3 of Appendix R to 10 CFR Part 50 is to ensure that safe shutdown capability is maintained. Notwithstanding the lack of three hour rated penetration seals, the circumstances, as fully described in the Safety Evaluation, are such that the installation of fire detection and fixed suppression systems throughout Fire Area 11 is not necessary to provide reasonable assurance that safe shutdown capability is maintained.

Therefore, the staff concludes that "special circumstances" exist for the licensee's requested exemption amendment in that application of the regulation in these particular circumstances is not necessary to achieve the underlying purposes of Section III.G.3 of Appendix R to 10 CFR Part 50. The

Commission hereby grants an amendment to Exemption 1 granted November 6, 1986, and authorizes the subject addendum (attached) to revise Exemption 1 to account for non-fire-rated penetrations in the south wall of the charging pump cubicles.

IV.

Accordingly, the Commission has determined that, pursuant to 10 CFR Part 50.12(a), (1) the exemption amendment as described in Section II is authorized by law and will not present an undue risk to the public health and safety and is consistent with common defense and security, and (2) special circumstances are present for the exemption amendment in that application of the regulation in this particular circumstance is not necessary to achieve the underlying purposes of Appendix R to 10 CFR Part 50.

Pursuant to 10 CFR 51.32, the Commission has determined that the issuance of the exemption amendment will have no significant impact on the environment (60 FR 45747).

This exemption amendment is effective upon its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Ledyard B. Marsh, Acting Director  
Division of Reactor Projects - I/II  
Office of Nuclear Reactor Regulation

Attachment: Addendum

Dated at Rockville, Maryland  
this 12th day of September 1995

ADDENDUM TO EXEMPTION REQUEST # 1  
APPENDIX R REPORT  
NORTH ANNA POWER STATION

The following changes are being made to Exemption Request # 1, Auxiliary Building - Partial Area Fire Suppression and Detection.

1. On page 1-7, the first and second paragraph are replaced with the following three paragraphs:

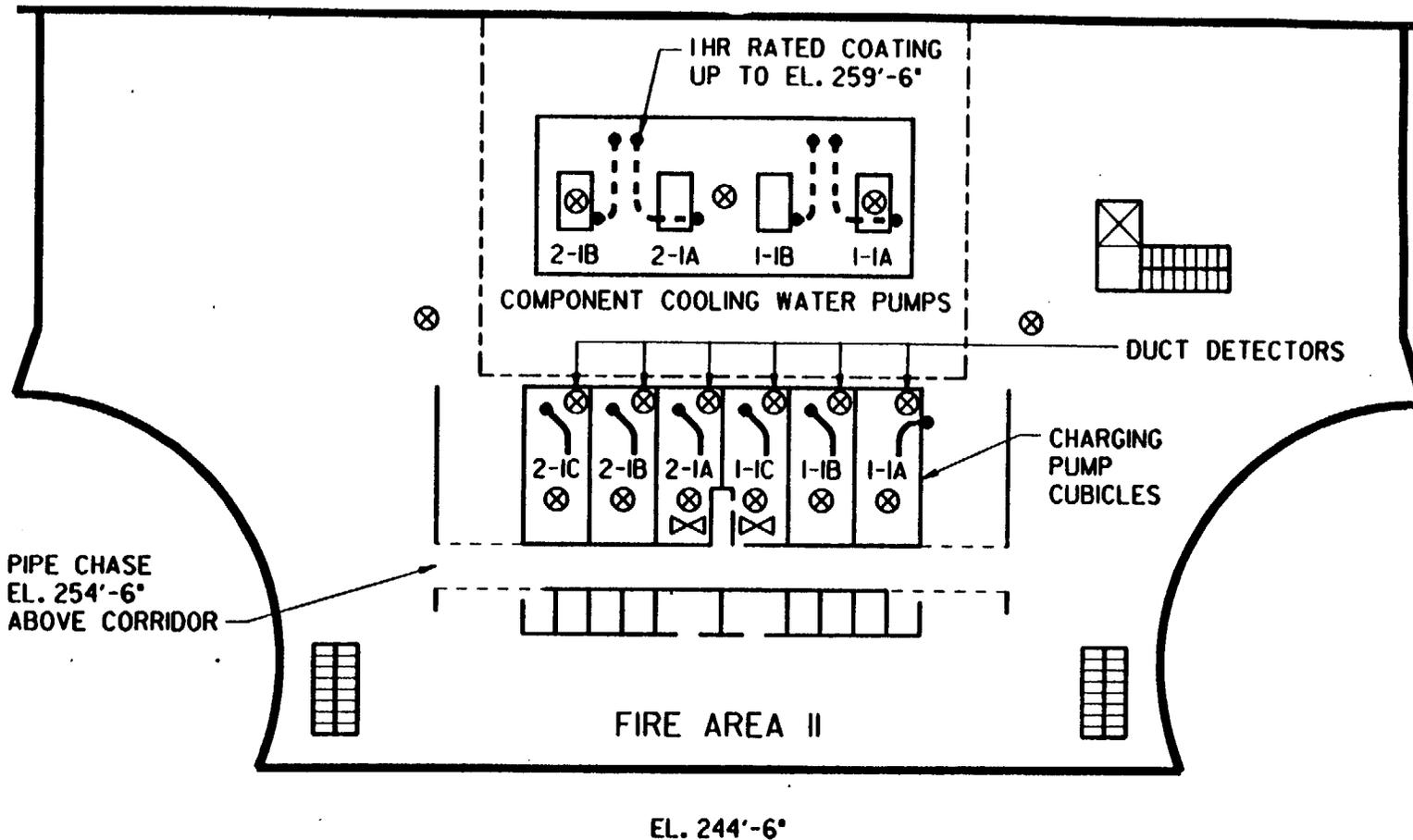
"three on the east end are for Unit 1, and the remaining three are for Unit 2. The cubicles are constructed of heavy concrete walls on three sides, and the fourth side is a removable wall made of concrete beams. These walls have an inherent fire rating in excess of 3 hours (see Exemption Request 7 concerning the removable wall). The charging pump cubicle walls extend from floor to ceiling on Elevation 244 ft-6 in. Openings at the floor of the 259 ft-6 in. elevation for each cubicle are diked and include a hatch for personnel entry, ventilation ducts, cable trays, and conduit. The walls extend from floor to ceiling on elevation 244 ft.-6 in., and penetrations through the walls are sealed to a rating of 3 hours. In the south wall of the charging pump cubicles there are some openings that are not sealed to a 3 hour fire rating. These openings lead to the corridor and the horizontal pipe chase adjacent to the south wall of the cubicles. The openings into the corridor consist of valve stems (with valve handles located in the corridor) covered with metal plates. The pipe penetrations into the pipe chase are covered with metal plates and 1 inch thick panels of Thermo-Lag. Cubicle 1-1C also has, on the south wall and at the southwest corner of the ceiling, unsealed blockouts with pipes leading into the horizontal and vertical pipe chases. Except for the unsealed openings in cubicle 1-1C, the metal plates cover the openings and provide a non-fire rated seal against the passage of smoke and hot gasses."

"The horizontal pipe chase is located south of the charging pump cubicles and extends along the south wall of each pump cubicle (See Figure 1.3). The pipe chase is open ended at the pipe penetration areas adjacent to the

Unit 1 and 2 Containments, and has openings into the adjacent cubicles (seal water filters, heat exchangers, ...etc.) located on the south side of the pipe chase. The vertical pipe chase is located between cubicles 2-1A and 1-1C and extends vertically to the Volume Control Tank (VCT). This vertical chase has an unsealed opening into cubicle 1-1C and is open ended at the VCT with no intermediate openings. The vertical and horizontal pipe chases are not expected to create a fire exposure to the cubicles due to the lack of combustible material in the chases. A fire in cubicle 1-1C would not be expected to enter the pipe chases due to the negligible amount of combustibles in the chases. If the fire did enter the chases, it would travel out and away from the adjacent cubicles which have penetrations sealed with metal plates."

"It is not considered credible, based on the configuration described above, for a fire in an individual charging pump cubicle to expose an adjacent cubicle or to propagate out of the cubicle. A fire in cubicle 1-1C would not be expected to enter the pipe chases due to the negligible amount of combustibles in the chases. If the fire did enter the chases, it would travel out and away from the adjacent cubicles which have penetration seals. The metal plates will provide an adequate seal against the passage of smoke and hot gasses based on the configuration and lack of combustibles in the corridor and pipe chase. It is not considered credible for a fire in the open areas of the 259 ft.-6 in. elevations to expose a charging pump (although it may affect the power feeds) or valves within a cubicle since the floor openings have dikes. It is not credible for a fire to spread from the general areas of the 244 ft-6 in. elevation into the pipe chase due to the negligible combustible loading in the area and long travel distance from the open ends of the chase to the cubicles."

2. Figure 1-3 is replaced with the revised Figure 1-3 (attached).



**KEY**

- AUTOMATIC FIRE SUPPRESSION SYSTEM BOUNDARY
- CHARGING PUMP POWER FEED
- - - - - CCW PUMP POWER FEEDS
- ⊗ SMOKE DETECTORS
- ⊗ MANUAL VALVES FOR CHARGING PUMP DISCHARGE CROSSCONNECT

VIRGINIA ELECTRIC & POWER COMPANY  
 NORTH ANNA POWER STATION  
 UNITS 1&2

AUXILIARY BUILDING  
 ELEVATION 244'-6"

FIGURE NO.  
 1.3

CAD NO. NAIFIG72.APR

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
LICENSEE REQUEST FOR ADDENDUM TO EXEMPTION FROM  
CERTAIN REQUIREMENTS OF APPENDIX R TO 10 CFR PART 50  
NORTH ANNA POWER STATION UNITS 1 AND 2  
DOCKET NOS. 50-338 AND 50-339

## 1.0 INTRODUCTION

By letter dated December 11, 1992, Virginia Electric and Power Company (VEPCO), the licensee for North Anna Units 1 and 2, requested an addendum to Exemption 1, which was approved by the NRC in a letter to the licensee dated November 6, 1986. The original exemption was from the technical requirements of Section III.G.3 of Appendix R to 10 CFR Part 50 to the extent that fire detection and fixed suppression systems are not installed throughout the Auxiliary, Fuel, and Decontamination Buildings (Fire Area 11). The original safety evaluation, transmitted with the November 6, 1986 letter, stated that the charging pump cubicles have 3 hour fire-rated walls, and that the penetrations in these walls are sealed to a rating of 3 hours. The addendum revises the original exemption to account for the non-fire rated penetration seals and unprotected openings located in the south wall of the charging pump cubicles. The lack of rated penetration seals was identified in inspection report 50-338,339/92-18.

## 2.0 DISCUSSION

The licensee requested an addendum to a previously approved exemption from the technical requirements of Section III.G.3 of Appendix R to 10 CFR Part 50, to the extent that non-fire rated penetration seals and unprotected openings exist in the south wall of the charging pump cubicle. The 19 non-fire rated penetration seals and the unprotected openings, that are the subject of this request, are all located in the south wall of the charging pump cubicles. This wall is common to all 6 pump cubicles. The walls separating each charging pump from the adjacent pump(s) are fully qualified as 3-hour barriers. Hose stations and portable fire extinguishers are available in the area for manual suppression.

Two charging pumps are required to achieve safe shutdown of both units. A cross-connection is provided to tie the discharge header of the unit 1 pumps to the discharge header of the unit 2 pumps. The valves to open this connection are located in pump cubicles 1-1C and 2-1A. This connection is normally closed and would not be required to be opened unless all 3 charging pumps for one unit were unavailable.

## 3.0 EVALUATION

The original exemption for the lack of full area detection and fixed suppression was approved by the staff on the basis of low combustible loading in the area, smoke detection installed in each cubicle and in the ventilation ducts to each cubicle, and separation of the charging pumps by 3-hour rated fire barriers. The pipe chase and corridor adjacent to the south wall of the

charging pump cubicle have a low combustible load (equivalent fire severity of less than 20 minutes). The corridor adjacent to the south wall is free of fixed combustibles. The combustible load in each pump cubicle is also low (equivalent fire severity of less than 5 minutes). The combustibles that are present consist primarily of cable insulation and oil contained in the charging pumps. Each cubicle has a blackout opening in the south wall 2' x 3.5' in size, leading to a pipe chase. These penetrations are sealed with a metal plate covered by a 1" thick layer of Thermo-Lag fire barrier material. These penetration seals, although not fire rated, would restrict the propagation of fire to the unexposed side of the barrier for a fire in either the pipe chase or the pump cubicle. In each pump cubicle there are two openings, each 2" in diameter, in the south wall leading into the corridor, for valve reach rods. These penetrations are sealed with metal plates installed on the corridor side of the barrier. The licensee is modifying one of the penetrations in each pump cubicle by removing the reach rod and sealing the opening with a metal plug on each side of the barrier with a threaded rod running through the penetration to secure the plugs in place. No combustible materials traverse these penetrations. These seals, although not fire rated, will restrict the propagation of fire to the unexposed side of the barrier for a fire in either the corridor or the pump cubicle. The unprotected openings are located near the ceiling in the southwest corner of cubicle 1-1C. The unprotected openings are part of the horizontal and vertical pipe chases. There are no combustible materials within these unprotected openings. The other 5 pump cubicles do not have any unprotected openings.

The fire protection provided for the charging pump cubicles provides reasonable assurance that at least one charging pump for each unit will remain operable after a fire in this area. This determination is based upon; (1) the low combustible loading in the pipe chase, corridor and pump cubicles, (2) the smoke detection installed in each pump cubicle and in the ventilation ducts to each pump cubicle, (3) the manual fire suppression equipment located in the area, (4) the fully qualified 3-hour fire barriers that separate each pump cubicle from the adjacent cubicle(s), (5) the lack of unprotected openings into the pump cubicles, with the exception of cubicle 1-1C and, (6) the non-fire rated seals provided for the penetrations into the corridor and pipe chase.

#### 4.0 CONCLUSION

On the basis of this evaluation, the staff concludes that the lack of fire-rated penetration seals in the south wall of the pump cubicles does not change the conclusion that there is no undue risk to the public health and safety, notwithstanding that fire detection and fixed suppression systems are not installed throughout Fire Area 11. Such installation is not necessary to achieve the underlying purpose of Section III.G.3. to Appendix R, which is to ensure that safe shutdown capability is maintained.