

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

March 24, 1997

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

Serial No. 96-474A
NL&OS/GDM R4
Docket Nos: 50-280, 50-281
50-338, 50-339
License Nos. DPR-32, DPR-37
NPF-4, NPF-7

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA AND SURRY POWER STATIONS UNITS 1 AND 2
EXEMPTION FROM CRITICALITY ACCIDENT MONITORING REQUIREMENTS
REQUEST FOR ADDITIONAL INFORMATION

In our letter dated January 28, 1997 (Serial No. 96-474), Virginia Electric and Power Company submitted a request for permanent exemption from the criticality monitoring requirements specified in 10 CFR 70.24(a), "Criticality Accident Requirements," for Surry and North Anna Power Stations Units 1 and 2. During a subsequent telephone conversation between Mr. G. E. Edison, the NRC Project Manager for both Surry and North Anna, and Mr. G. D. Miller of our staff, Mr. Edison made a request for additional information regarding the exemption request. The six questions included in the NRC's request for additional information and our responses are provided in the attachment.

If you have any questions or require additional information, please contact us.

Very truly yours,



James P. O'Hanlon
Senior Vice President - Nuclear

Attachment

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Commitments included in this letter: None

cc: Regional Administrator
U.S. Nuclear Regulatory Commission
Region II
101 Marietta Street, N.W.
Suite 2900
Atlanta, Georgia 30323

Mr. R. A. Musser
NRC Senior Resident Inspector
Surry Power Station

NRC Senior Resident Inspector
North Anna Power Station

Attachment

Response to NRC Request for Additional Information Exemption from Criticality Accident Monitoring Requirements

Surry and North Anna Power Stations Units 1 and 2

The NRC recently requested additional information regarding the Virginia Electric and Power Company request for exemption from the requirements of 10 CFR 70.24(a), "Criticality Monitoring Requirements." The NRC questions and our responses for Surry and North Anna Power Stations are provided below.

NRC Question No. 1

Describe how fuel movement is procedurally controlled and designed to preclude criticality concerns prior to storage in the fresh fuel racks.

Response

At Surry and North Anna, fuel is shipped to the sites in containers that are designed to preclude a critical configuration even if flooded with unborated water (inside and out of the container). Station procedures for the receipt and storage of new fuel provide instructions for raising the shipping cask to a vertical position, and then removing each fuel assembly individually for storage in the new fuel storage racks. The fuel handling equipment used to unload and transfer the new fuel assemblies from the shipping containers to the storage racks precludes handling more than one fuel assembly at a time. Furthermore, one new fuel assembly, even in unborated water, cannot attain criticality; consequently, criticality concerns are precluded.

NRC Question No. 2

What are the possible sources of water during new fuel handling operations? How are these sources controlled during the handling of new fuel?

Response

There are numerous sources of water near the new fuel storage areas at Surry and North Anna (e.g., spent fuel pool, spent fuel pool cooling supply/return lines, fire main, component cooling water to the fuel pit cooling system heat exchangers, primary grade water, etc.). As noted in our original exemption requests, which were submitted and approved prior to the receipt of our operating licenses, even if unborated water were introduced into the new fuel storage areas inadvertently (e.g., pipe leakage, personnel error, fire fighting, etc.), the new fuel storage racks have been analyzed and shown that even with optimum moderation, the center-to-center spacing precludes criticality from

occurring. In addition, the bottom of the cells in the new fuel storage areas contain drainage holes to prevent the accumulation of water.

Furthermore, water cannot accumulate in the new fuel receiving areas at North Anna and Surry since the water will drain to lower levels of the Fuel Building away from the new fuel shipping containers. Also, as noted above, even if water were to accumulate in the new fuel receiving areas, the new fuel shipping containers are designed to preclude a critical configuration even if flooded with unborated water (inside and out of the container).

NRC Question No. 3

Has the new fuel storage area been analyzed to show that k_{eff} remains less than or equal to 0.95 if fully flooded?

Response

The current analyses for both Surry and North Anna show that k_{eff} in the new fuel storage area is less than 0.95 when fully flooded. The actual k_{eff} limit that these analyses were compared to was 0.98 as stated in Section 9.1.1, "New Fuel Storage," of NUREG-0800. Surry Technical Specification 5.4.B and North Anna Unit 1 and Unit 2 Technical Specifications 5.6.1.2 invoke a design criterion of $k_{\text{eff}} \leq 0.98$ for new fuel of the highest anticipated enrichment stored in the new fuel storage racks and assuming optimum moderation (e.g., aqueous foam).

NRC Question No. 4

What is the maximum U-235 enrichment approved for storage in the new fuel racks?

Response

The maximum approved U-235 enrichment for storage at Surry and North Anna is 4.1 weight percent and 4.3 weight percent, respectively, as stated in Surry Technical Specifications 5.3.A.3 and 5.4.B and North Anna Unit 1 and Unit 2 Technical Specifications 5.3.1.

NRC Question No. 5

Discuss why the exemption would remain valid for possible future fuel enrichment increases.

Response

Future increases will be shown to meet the same k_{eff} requirements for fuel storage. The same equipment limitations and procedural controls will apply. Furthermore, future fuel enrichments would require NRC review and approval. Our submittals would appropriately address any criticality issues.

NRC Question No. 6

Verify that, with the requested exemption, radiation monitoring remains available to meet the requirements of 10 CFR 50, Appendix A, General Design Criteria 63, for fuel storage areas. Also include a discussion of the training provided to personnel in responding to area radiation alarms.

Response

Radiation monitoring remains available in the new fuel storage area that meets the requirements of GDC 63. An area radiation monitor is provided in the new fuel storage area and a second radiation monitor is provided on the fuel pit bridge crane. Both of these monitors have associated area alarms and control room annunciators and would detect excessive radiation levels. Procedures currently address required employee responses to the alarms including evacuation upon receipt of an area alarm.

Furthermore, nuclear employee training is required of all nuclear employees prior to receiving a badge to enter the nuclear power station. Nuclear employee retraining is provided annually to nuclear workers thereafter. This training provides those individuals granted access to the Radiological Controlled Area direction regarding their required response upon hearing an alarm associated with an area radiation monitor. Employees are trained to immediately leave the area, notify the Health Physics department, and not re-enter the area until authorized by Health Physics.