

October 20, 2003

Mr. David A. Christian  
Senior Vice President - Nuclear  
Virginia Electric and Power Company  
5000 Dominion Blvd.  
Glen Allen, Virginia 23060

SUBJECT: NORTH ANNA POWER STATION, UNITS 1 AND 2 - APPROVAL OF  
PROPOSED REVISION TO THE EMERGENCY PLAN (TAC NOS. MB7524  
AND MB7525)

Dear Mr. Christian:

By letter dated January 27, 2003, as supplemented by letter dated May 1, 2003, Virginia Electric and Power Company submitted a proposed revision to the Emergency Plan for the North Anna Power Station, Units 1 and 2. You proposed to utilize an alternative to NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, in order to revise the North Anna emergency action levels and initiating conditions.

Our review is contained in the enclosed Safety Evaluation. The NRC staff has concluded that VEPCO's proposed revision to the North Anna Power Station Emergency Plan is acceptable since it meets the requirements of Title 10 of the *Code of Federal Regulations* (CFR) Section 50.47(b) and 10 CFR Part 50, Appendix E.

The NRC staff has completed its evaluation of this revision; therefore, we are closing out TAC Nos. MB7524 and MB7525.

Sincerely,

/RA/

Stephen R. Monarque, Project Manager  
Project Directorate II-1  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-338 and 50-339

Enclosure: As stated

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

PROPOSED CHANGE TO THE EMERGENCY PLAN

VIRGINIA ELECTRIC AND POWER COMPANY

NORTH ANNA POWER STATION, UNITS 1 AND 2

DOCKET NOS. 50-338 AND 50-339

1.0 INTRODUCTION

By letter dated January 27, 2003, as supplemented by letter dated May 1, 2003, Virginia Electric and Power Company (the licensee) requested changes to the Emergency Plan for the North Anna Power Station, Units 1 and 2.

The licensee proposed to revise the following initiating conditions (ICs) and corresponding emergency action levels (EALs) for the North Anna Station, Units 1 and 2.

1.1 Current Site-Specific Notification of Unusual Event No. 21

Condition/Applicability: 50-year flood or low water level

Mode Applicability: All Modes

Indication:

- Flood in the Lake Anna Reservoir with indicated level - greater than 254 feet MSL [Mean Sea Level]  
OR  
Low water level in the Lake Anna Reservoir with indicated level less than 246 feet MSL

The licensee proposed to eliminate the low water level IC and the corresponding EAL for the notification of unusual event classification from North Anna Station's EAL scheme.

1.2 Current Site-Specific Alert No. 27

Condition/Applicability: Flood or low water level near design levels

Mode Applicability: All Modes

Indication:

- Flood in the Lake Anna Reservoir with indicated level - greater than 263 feet MSL  
OR  
Low water level in the Lake Anna Reservoir with indicated level less than 244 feet MSL

The licensee proposed to eliminate the low water level IC and the corresponding EAL for the alert classification from North Anna Station's EAL scheme.

1.3 Current Site-Specific Site Area Emergency No. 22

Condition/Applicability: Flood or low water level above design levels

Mode Applicability: Modes 1, 2, 3, & 4

Indication:

Either condition a) or b) exists

a) Flood in the Lake Anna Reservoir with indicated level greater than 264 feet MSL  
OR

b) Low water level in the Lake Anna Reservoir with indicated level - less than 244 feet MSL

AND

Inability to satisfy action requirements of TR [Technical Requirement] 3.7.4 for North Anna Reservoir

The licensee proposed to eliminate Site Area Emergency No. 22 in its entirety from North Anna Station's EAL scheme.

2.0 REGULATORY EVALUATION

The NRC staff finds that the licensee identified the applicable regulatory requirements in the attachment of its submittal. The regulatory requirements and guidance for which the NRC staff based its acceptance are presented below.

2.1 Regulation

Title 10 of the *Code of Federal Regulations* (CFR) Section 50.47(b)(4) states, in part: "A standard emergency classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee..."

10 CFR Part 50, Appendix E, Section IV.B states, in part: "...These emergency action levels shall be discussed and agreed on by the applicant and State and local governmental authorities and approved by the NRC..."

Appendix E, Subsection IV.C, to 10 CFR Part 50, states, in part: "action levels (based not only on onsite and offsite radiation monitoring information but also on readings from a number of sensors that indicate a potential emergency, such as pressure in the containment and response of the Emergency Core Cooling System) for notification of offsite agencies shall be described. The emergency classes defined shall include (1) notification of unusual events, (2) alert, (3) site area emergency, and (4) general emergency..."

2.2 Guidance Documents

Regulatory Guide (RG) 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors," Revision 2, states, in part: "The criteria and recommendations contained in Revision 1 of NUREG-0654/FEMA-REP-1 are considered by the NRC staff to be acceptable methods for complying with the standards in 10 CFR 50.47 that must be met in onsite and offsite emergency response plans."

NUREG-0654/FEMA-REP-1, Rev 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," includes the following criteria for EALs:

Section II.D.1      An emergency classification and emergency action level scheme as set forth in Appendix 1 must be established by the licensee.

Section II.D.2      The initiating conditions shall include the example conditions found in Appendix 1 [of NUREG-0654]...

RG 1.101, Revision 3, endorsed NUMARC/NESP-007, "Methodology for Development of Emergency Action Levels," as an acceptable alternative to NUREG-0654 for developing EAL schemes. RG 1.101, Section D provided the following information:

"Except in those cases in which an applicant or licensee proposes an acceptable alternative method for complying with specific portions of the Commission's regulations, the method described in this regulatory guide will be used in the evaluation of emergency plans and preparedness for nuclear power reactors."

### 2.3      NRC Staff Position on EAL Changes

In June 1995, the NRC staff provided guidance on the acceptability of proposed emergency action level revisions that depart from the guidance in Appendix 1 of NUREG-0654. This guidance was issued on January 1992 as "Emergency Preparedness Position (EPPOS) on Acceptable Deviations from Appendix 1 of NUREG-0654 Based Upon the Staff's Regulatory Analysis of NUMARC/NESP-007, 'Methodology for Development of Emergency Action Levels' (EPPOS-1)." The guidance endorsed the use of the technical bases, developed in the NUMARC/NESP-007 document and the NRC's regulatory analysis of the NUMARC document, to improve or enhance EALs developed using NUREG-0654 guidance.

### 3.0      TECHNICAL EVALUATION

The NRC staff has reviewed the licensee's regulatory and technical analyses in support of its proposed emergency plan changes that are described in its submittal dated January 27, 2003, as supplemented by letter dated May 1, 2003. The detailed evaluation below will support the NRC staff's conclusion that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of this revision will not be inimical to the common defense and security or to the health and safety of the public.

#### 3.1      Deletion of "Low Lake Level" unusual event classification

The licensee proposed to eliminate the unusual event classification for low water level in the Lake Anna Reservoir. In its submittal dated May 1, 2003, the licensee stated that the Lake Anna Reservoir provides a backup source of service water to the Service Water Reservoir. The normal source of service water is the Service Water Reservoir. The Lake Anna Reservoir is not analytically credited in addressing the design-basis accident. The Updated Final Safety Analysis Report indicates the ultimate heat sink consists of the Lake Anna Reservoir, the

Service Water Reservoir and the associated retaining structures. This ultimate heat sink was designed in accordance with the RG 1.26, "Ultimate Heat Sink for Nuclear Power Plants," requirement to provide a 30-day supply of cooling water. The Service Water Reservoir is designed to provide sufficient cooling for at least 30 days. The Lake Anna Reservoir is not considered a structure, system, or component that is part of the primary success path to mitigate a design-basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier. A 30-day supply of cooling water is of sufficient quantity such that alternative means can be developed or actions taken before conditions reach the level indicating an emergency due to lack of cooling water availability. Since the Service Water Reservoir contains a sufficient volume of water to provide adequate cooling to the plant for the 30 days, without utilizing makeup water from Lake Anna Reservoir, the low water EAL for the Lake Anna Reservoir is not indicative of an emergency condition for the station. The current unusual event EAL for low water in the Lake Anna Reservoir does not indicate a condition of degraded plant safety or the potential for degraded safety. Deletion of this EAL does not decrease the effectiveness of this licensee's emergency plan.

### 3.2 Deletion of "Low Water Level" alert classification

The licensee proposed to eliminate the alert classification for low water level near design level in the Lake Anna Reservoir. The condition of low water level associated with the ultimate heat sink addresses the station's ability to remove decay heat. A low water level at the cooling water supply could preclude the station's ability to provide long-term cooling. The licensee's current EAL scheme provides the following EAL:

Secondary system cooling capability - UNAVAILABLE  
AND  
Loss of any of the following systems:  
Service Water  
Component Cooling  
RHR [Residual Heat Removal]  
AND  
RCS [Reactor Coolant System] temperature greater than 140°F

This EAL indicates that should cooling capability be lost for any reason, including inadequate level in the Service Water Reservoir, an alert would be declared since the plant would have previously been required to be in the applicable operating modes. This EAL provides a direct assessment of the impact to the ability to provide decay heat removal; consequently, this EAL is a more effective indicator of an emergency condition. Deletion of the low water level alert EAL and corresponding IC does not hamper classification at the alert level because the current scheme has the EAL above that encompasses a loss of cooling capability for any reason, including low level, should that occur. Deletion of the low lake level EAL does not decrease the effectiveness of North Anna's emergency plan because Alert No. 1 EAL, "Total Loss of Function needed for unit CSD [cold shutdown] condition," adequately encompasses the conditions associated with the impact of the low water level. Therefore, the condition is appropriately addressed.

### 3.3 Deletion of "Flood or Low Water Level Above Design Levels" site area emergency classification

The licensee proposed to delete the Site Area Emergency Classification No. 22 for severe natural phenomena being experienced. The proposal provides that existing North Anna EALs No. 1 and No. 23 (site area emergency) adequately address the timely classification of the events described by NUREG-0654 for this condition. The following alternative EALs are shown in the North Anna Power Station Emergency Plan Implementing Procedure:

#### Site Area Emergency No. 1

EAL Condition: Loss of function needed for unit HSD [hot shutdown] condition

Mode Applicability: MODES 1, 2, 3, & 4

IC/Indication(s)

- Total loss of the Charging/SI [Safety Injection] System

OR

Total loss of the Main Feedwater and Auxiliary Feedwater systems

#### Site Area Emergency No. 23

EAL Condition: Station conditions which may warrant notification of the public near the site

Mode Applicability: ALL MODES

IC/Indication(s)

Shift Supervisor/Station Emergency Manager judgment

The proposal provides that operation of the facility would terminate well before reaching the alert threshold for flooding; therefore, this Technical Requirements Manual required mode reduction effectively precludes occurrence of a site area emergency due to flooding. However, should a severe flood occur that would result in loss of the ability to maintain the unit in a hot shutdown condition, then the site area emergency classification would be made based on Site Area Emergency No. 1. The application of this EAL provides reasonable assurance that the appropriate classification will be made in a timely manner.

In addition, the licensee stated an alert classification would be made for a low water level condition that precludes the ability to maintain the unit in cold shutdown condition. The expected escalation for that condition, should the low water condition degrade further, is through the radiological release EALs at the site area or general emergency classes. This progression is consistent with the NUMARC-007 methodology. Use of the escalation progression provides reasonable assurance that the appropriate classification will be made in a timely manner.

### 4.0 STATE CONSULTATION

Appendix E of 10 CFR Part 50, states: "These emergency action levels will be discussed and agreed on by the applicant and State and local governmental authorities and approved by NRC." In its submittal dated May 1, 2003, the licensee provided a copy of the letter from the Commonwealth of Virginia indicating their agreement with the proposed revisions to North Anna's Emergency Plan. In addition, by letter dated November 12, 2002, the Commonwealth of Virginia indicated that all five at-risk localities had agreed with the licensee's proposed revisions. The NRC staff considers this agreement as satisfying the requirement of Appendix E.

## 5.0 CONCLUSION

Based on a review of the proposed change to the EAL classification scheme for the North Anna Station, the NRC staff concludes that the changes discussed in this evaluation are acceptable to meet the guidance in NUREG-0654 and, therefore, continue to meet the requirements of 10 CFR 50.47(b)(4) and Appendix E to 10 CFR Part 50.

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Date: October 20, 2003



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Units 1 and 2

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