



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NOS. 143 AND 126 TO  
FACILITY OPERATING LICENSE NOS. NPF-4 AND NPF-7  
VIRGINIA ELECTRIC AND POWER COMPANY  
OLD DOMINION ELECTRIC COOPERATIVE  
NORTH ANNA POWER STATION, UNITS NO. 1 AND NO. 2  
DOCKET NOS. 50-338 AND 50-339

1.0 INTRODUCTION

By letter dated February 23, 1989, as supplemented by letter dated December 31, 1990, Virginia Electric and Power Company (the licensee) requested amendments to the Technical Specifications (TS) for North Anna Power Station, Units 1 and 2 (NA-1&2), which would revise Section 3/4.6 Table 3.6-1, containment isolation valves for NA-1&2 to (1) identify valves that are associated with "water-filled" penetrations for which a Type C test penalty will not be added to the Type A (containment integrated leakage rate) test results, (2) add containment isolation valves not previously listed, and (3) delete a valve incorrectly listed in Table 3.6-1 for NA-1.

The December 31, 1990 letter provided additional information requested by the staff. The additional information did not alter the staff's initial determination of no significant hazards consideration as noticed in the Federal Register on August 8, 1989 (54 FR 32720).

2.0 DISCUSSION

2.1 "Water-Filled" Penetrations

Section III.A.1.(d) of Appendix J requires that during a Type A test, certain piping systems that penetrate containment must be vented to the atmosphere inside containment and drained of water, exposing the associated containment isolation valves to the containment atmosphere during the test and thus including them in the Type A test. This is intended to simulate accident conditions for piping systems that might rupture or otherwise be open to the containment atmosphere during a LOCA. As an alternative to venting and draining a system, Type C tests may be performed on the associated containment isolation valves and the measured leakage rates added to the Type A leakage rate.

The licensee asserts that Type C additions of this kind from certain valves in the service water system, the safety injection system (including the charging pumps) and the containment recirculation spray system are not required, because

these "water-filled" penetrations are not potential containment atmosphere leak paths; thus, their Type C leakage rates should not be added to the Type A leakage rate.

Containment isolation valves associated with the service water system include penetrations 79 through 86. These valves are outside of containment and the service water in the piping system does not communicate with the containment atmosphere or any other system inside containment. In accordance with Appendix J, Section III.A.1.(d), the staff finds that the lines containing the subject valves need not be vented to the containment atmosphere nor drained of water during Type A tests, and that the leakage rates measured by Type C tests on those valves need not be added to the Type A test results. Type C testing will continue and the measured leakage rates added to the sum of Type B and Type C tests.

Also, containment penetrations in question are nos. 7, 15, 22, 46, 60, 61, 62, 113, and 114 (various high head and low head safety injection pump discharge lines into containment), and 66 and 67 (recirculation spray pump suction lines from the containment recirculation sump). The valves in these penetrations are currently Type C tested and will continue to be Type C tested. Further, their leakage rates will continue to be added to the total of all local leakage rates. Total leakage must be less than  $0.60 L_a$  in accordance with Appendix J, where  $L_a$  is the maximum allowable leakage rate for the containment specified in the facility TS. The licensee proposes only that the Type C leakage rates for the subject penetrations not be added to the Type A leakage rate.

The high head and low head safety injection (HHSI and LHSI) systems and the recirculation spray system are engineered safety feature, safety-grade, and Seismic Category 1 systems. The HHSI has three redundant pumps whose discharge lines enter a common header outside containment before splitting to the various containment penetrations. The LHSI has two redundant pumps whose discharge lines are connected outside containment by a crosstie line with locked open valves. Water is supplied to these systems from the containment sump for long-term core cooling. Therefore, the staff finds that the designs of these systems assure (1) a supply of high pressure water to penetrations 7, 15, 22, 46, 60, 61, 62, 113, and 114 for at least 30 days after the onset of a LOCA, accounting for a worst-case single active failure (e.g., loss of a pump or diesel generator), and (2) a water seal of the subject valves, thereby precluding containment atmosphere leakage through the closed valve disks. However, some of the subject valves are oriented in such a way that valve packing/stem leakage of the valves located outside containment is not precluded by this water seal, thus providing a potential leak path out of the containment. For these valves, a water leg (pipe loop) exists between the valve and its penetration. Considering (1) the presence of the water legs, (2) the fact that the periodic Type C tests on all of the valves of concern include the possible packing/stem leak paths so that such leakage will be maintained low, and (3) that the North Anna subatmospheric containment is designed to reduce containment pressure below atmospheric pressure 1 hour after onset of a LOCA, significant packing/stem leakage for these valves is not likely. Therefore, the staff finds that penetrations 7, 15, 22, 46, 60, 61, 62, 113, and 114 need not be vented and drained during Type A tests and the associated Type C leakage rates need not be added to the Type A leakage rate.

Penetrations 66 and 67 are containment recirculation sump suction paths for the recirculation spray. The containment recirculation sump will be filled with water during a LOCA and will remain water filled throughout the accident. Therefore, the staff finds that the recirculation sump penetrations are not potential containment atmosphere leak paths, and the associated Type C leakage rates need not be added to the Type A leakage rate.

Based on the above, the staff concludes that "water-filled" containment penetrations 7, 15, 22, 46, 60, 61, 62, 66, 67, 113, and 114 are sealed with water to the extent that they need not be vented or drained during Type A tests, and the associated Type C leakage rates need not be added to the Type A leakage rate.

## 2.2 Adding Containment Isolation Valves to TS Table 3.6-1

TS Table 3.6-1 provides lists of containment isolation valves for NA-1&2. However, errors, omissions, and discrepancies between the tables for the two units exist. The licensee proposed a list of changes to obtain consistency between the NA-1&2 tables and to identify the core protection isolation valves. The staff considers these changes to be appropriate and acceptable.

## 2.3 Deletion of a Valve Incorrectly Included in the Table 3.6-1 for NA-1

The changes discussed in 2.2 above would not delete any valves from either table. However, the licensee states that check valve 1-SI-85 in the NA-1 Table 3.6-1 was included in error and should be deleted. The correct check valve for this isolation function, 1-SI-185, is already included in the NA-1 table. The change is acceptable to the staff.

## 3.0 EVALUATION

The staff concludes that the proposed changes to TS Tables 3.6-1 for NA-1&2 associated with the issues evaluated in Sections 2.1, 2.2, and 2.3 above are acceptable. The staff finds that the lines containing the subject valves need not be vented to the containment atmosphere nor drained of water during Type A tests, and that the leakage rates measured by Type C tests on those valves need not be added to the Type A test results. Type C testing will continue and the measured leakage rates will be added to the sum of Type B and Type C tests in the usual manner. Therefore, the proposed TS changes are acceptable.

## 4.0 ENVIRONMENTAL CONSIDERATION

These amendments involve a change to a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. We have determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that these amendments involve no significant hazards consideration and there has been no public comment on such finding.

Accordingly, these amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of these amendments.

#### 5.0 CONCLUSION

We have concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Date: February 20, 1991

Principal Contributor:  
J. Pulsipher