



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 110 AND 73 TO FACILITY OPERATING

LICENSE NOS. NPF-39 AND NPF-85

PHILADELPHIA ELECTRIC COMPANY

LIMERICK GENERATING STATION, UNITS 1 AND 2

DOCKET NOS. 50-352 AND 50-353

1.0 INTRODUCTION

By letter dated July 28, 1995, the Philadelphia Electric Company (PECO or the licensee) submitted a request for changes to the Limerick Generating Station (LGS), Units 1 and 2, Technical Specifications (TS). The requested changes would eliminate the TS requirement to perform 10 CFR Part 50, Appendix J, Type C leakage rate tests on certain valves that are assured a water seal following a Design Basis Accident (DBA). These valves are in portions of the High Pressure Coolant Injection (HPCI), Reactor Core Isolation Cooling (RCIC), Core Spray (CS), and Residual Heat Removal (RHR) system containment isolation valves (CIVs) that serve lines below the suppression pool and penetrate below the minimum water level in the suppression pool. Twenty-seven valves of this type per unit are noted as requiring leakage rate testing in TS Table 3.6.3-1, "Primary Containment Isolation Valves." These valves are located within closed systems outside the primary containment and remain below the minimum suppression pool water level following a DBA. These valves are presently subject to the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Section XI Code, Category A leakage testing requirements, although the licensee has indicated its intent to change this classification under 10 CFR 50.59. The 10 CFR Part 50, Appendix J, Type C leakage rate is not required nor necessary to ensure that the post DBA radiological releases from the primary containment are within allowable limits.

2.0 BACKGROUND

The Code of Federal Regulations, 10 CFR Part 50, Appendix J, establishes the requirements for containment leakage rate tests for all operating licenses for water-cooled power reactors. Three tests are specified in Option A of the regulation: Type A (integrated leakage), Type B (penetration local leakage), and Type C (containment isolation valve (CIV) local leakage). A CIV is defined in Appendix J, Option A as "any valve which is relied upon to perform a containment isolation function." Containment is defined as "...an essentially leak-tight barrier against the uncontrolled release of radioactivity to the environment." Therefore, for the purposes of Appendix J leakage rate testing, an Appendix J CIV is a valve which could represent a potential fission product release pathway to the environment following a postulated accident and, consequently, its allowable leakage must be maintained within allowable limits.

### 3.0 EVALUATION

The licensee has proposed to delete the TS requirement to perform a 10 CFR Part 50, Appendix J, Option A, Type C leakage rate test for 27 valves of the HPCI, RCIC, CS, and RHR systems that are assured a water seal following a DBA. Specifically, PECO has proposed to delete notation numbers 4, 5, 19, and 22 for the identified valves in TS Table 3.6.3-1, Part A, and add a new notation to TS Table 3.6.3-1 (Notation 35 for LGS, Unit 1 and Notation 36 for LGS, Unit 2) as follows:

"These valves are in lines that are below the minimum water level in the suppression pool, are part of closed systems outside primary containment, and are in portions of lines which a water seal will be present following an accident. Therefore, 10 CFR 50, Appendix J, Type C testing is not required."

Further, PECO proposes to retain TS Bases 3.6.3, TS Limiting Condition for Operation Section 3.6.1.2.d, requiring leakage rate testing, TS Surveillance Requirement (SR) 4.6.1.2.d.3, noting approval of exemptions permitting leakage rate testing, and TS SR 4.6.1.2.g, required frequency for leakage rate testing since there are valves other than those that are the subject of this proposal, that will continue to require leakage rate testing.

The staff's safety evaluation report (SER) for LGS (NUREG-0991), dated August 1983, considered the licensee's containment leakage testing program in Section 6.2.6. The staff's review included the licensee's proposal to hydrostatic test isolation valves in several systems that penetrated containment, including the HPCI, RCIC, CS, and RHR systems, rather than testing with air or nitrogen. The SER noted these liquid filled systems "are specifically designed to remain intact after a LOCA and thus provide a water seal for the system isolation valves or ensure that only liquid leakage from the containment will occur." The SER in Section 6.2.6.4 states: "The combined leakage from all these valves will satisfy the acceptance criteria of 10 CFR 100 regarding the site radiological safety analysis and will be included in the plant Technical Specifications. This leakage will therefore be excluded when the combined leakage rate for all penetrations and valves is determined, as provided for in Appendix J, Paragraph III.C.3." Thus, the SER concluded that the valves need not be tested with air or nitrogen and that the liquid leakage from the valves need not be included in the combined leakage rate for all containment penetrations and isolation valves. The SER, however, did not consider whether or not the valves actually performed a containment isolation function for potential primary containment atmospheric pathways to the environment. This evaluation considers that issue.

The piping associated with the subject valves penetrates the suppression pool and terminates below the minimum water level of the suppression pool. The suppression pool water level is assured under post-accident conditions (LGS Updated Final Safety Analysis Report (UFSAR) Section 6.2.3.2.3.1), whereby these valves will remain sealed with water 30 days following the postulated accident. The suppression pool level is designed and operated so that water

level is maintained in accordance with TS 3/4.5.3, "Suppression Chamber," 3/4.6.2, "Depressurization Systems - Suppression Chamber," and the associated TS Bases. Further, LGS calculation MISC-62 determined that the lowest water level that the suppression pool will experience after a DBA is at least 4 feet above the affected penetrations. The supply of water in the suppression pool is assured for 30 days during all DBA, post-accident modes of operation.

The licensee has stated that the affected valves may be open post-accident to support the design function of their associated Emergency Core Cooling System (ECCS). Therefore, containment leakage is limited by the suppression pool water seal and the integrity of the closed system outside containment. LGS TS Section 6.8.4.a, "Primary Coolant Sources Outside Containment," establishes a program to monitor and control leakage from systems located outside containment that could contain radioactive fluids during a serious transient or accident. This program applies to the ECCS affected by these proposed changes, and ensures that leakage into secondary containment (e.g., packing, flanges, seals) is controlled. Leakages from these systems previously have been found to be well below the established limit. The proposed change will not contribute to higher levels of system leakage and any leakage from these systems will be processed via standby gas treatment and the radwaste systems.

For these reasons, the staff finds that the suppression pool will remain filled with water at a level above the penetrations for the system discussed. Further, the staff finds that the isolated valves associated with these systems do not constitute potential containment atmosphere leak paths following a postulated accident.

The affected penetrations will continue to be subjected to the periodic 10 CFR Part 50, Appendix J, Option A, Type A testing (integrated Containment Leakage Rate Test). Paragraph III.A.1 of 10 CFR Part 50, Appendix J, Option A, lists the pretest requirements for conducting the Type A test. In particular, Paragraph III.A.1.(d) describes certain systems that are required to be in a specified condition for the test (i.e., vented, drained, filled with water, operating) and further requires that the isolation valves in the systems defined in the paragraph shall be Type C tested. The staff finds that the isolation valves for the systems in the licensee's proposed change request do not constitute potential containment atmosphere leakage paths and, as such, are not within those defined in paragraph III.A.1.(d) as requiring Type C testing. For these same reasons, the staff finds that the valves under consideration in the proposed change are not within the paragraph II.H description of containment isolation valves meant to be included in the Type C leakage rate testing.

These findings are consistent with the Nuclear Energy Institute (NEI) guidelines for implementing Option B of 10 CFR Part 50, Appendix J. NEI 94-01, which is approved by Regulatory Guide 1.163, September 1995, as acceptable for complying with Option B of Appendix J states on Page 4 that a Type C leakage rate test is not required for, among other things, "Primary Containment Boundaries that do not constitute potential primary containment atmospheric pathways during and following a Design Basis Accident (DBA)." The



findings are also consistent with the American Nuclear Standards Institute/American Nuclear Society (ANSI/ANS) 56-8-1994, Section 3.3.1, which states that "Primary containment boundaries not requiring Type B or Type C testing include: (1) boundaries that do not constitute potential primary containment atmospheric pathways during and following a DBA."

The licensee will continue to test the affected valves per the applicable inservice testing (IST) requirements in accordance with ASME Section XI, under the LGS IST Program. The licensee has stated an intent to reclassify the CIVs from ASME Section XI, Category A valves to Category B valves under 10 CFR 50.59. Category B valves are those for which seat leakage in the closed position is inconsequential for fulfillment of its required function(s).

Based on the above evaluation, the staff concludes that the proposed changes to TS Table 3.6.3-1, "Primary Containment Isolation Valves," to eliminate 10 CFR 50, Appendix J, Type C leakage rate testing of the twenty-seven CIVs in each unit are acceptable and that the containment systems for LGS continue to meet applicable requirements.

#### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendments. The State official had no comments.

#### 5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has 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 the amendments involve no significant hazards consideration, and there has been no public comment on such finding (60 FR 49941). Accordingly, the 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 the amendments.

#### 6.0 CONCLUSION

The Commission has 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

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