7590-01

UNITED STATES OF A'ERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of

PHILADELPHIA ELECTRIC COMPANY
PUBLIC SERVICE ELECTRIC AND GAS COMPANY
DELMARVA POWER AND LIGHT COMPANY
ATLANTIC CITY ELECTRIC COMPANY

(Peach Bottom Atomic Power Station,
Units 2 and 3)

Docket Nos. 50-277
and 50-278

EXEMPTION

I.

The Philadelphia Electric Company, et. al. (the licensee), is the holder of Operating License Nos. DPR-44 and DPR-56 which authorizes operation of the Peach Bottom Atomic Power Station, Units 2 and 3, at steady state reactor core power levels not in excess of 3293 megawatts thermal. The licenses provide, among other things, that the Peach Bottom Atomic Power Station, Units 2 and 3 are subject to the rules, regulations, and orders of the Commission now or hereafter in effect.

The plants are direct cycle boiling water reactors located at the licensee's site in York County, Pennsylvania.

II.

Section 50.54(o) of 10 CFR Part 50 requires that primary reactor containments for water cooled power reactors be subject to the requirements of Appendix J to 10 CFR Part 50. Appendix J contains the leakage test requirements, schedules, and acceptance criteria for tests of the leak tight integrity of the primary reactor containment and systems and components which penetrate the containment.

9012040031 901121
PDR ADOCK 05000277
P PDC

Section II.H.1 of Appendix J to 10 CFR Part 50 requires that Type C Local Leak Rate Tests (LLRTs), defined as tests intended to measure containment isolation valve leakage rates, include containment isolation valves that provide a direct connection between the inside and outside atmospheres of the primary reactor containment under normal operation, such as purge and ventilation, vacuum relief, and instrument valves. Section II.H.4 of Appendix J requires that Type C LLRTs include containment isolation valves that are in main steam and feedwater piping and other systems which penetrate containment of direct-cycle boiling water power reactors.

Section III.C.1 of Appendix J to 10 CFR Part 50 requires that Type C LLRTs shall be performed by local pressurization. Section III.C.2 of Appendix J requires that Type C LLRTs for valves, unless pressurized with fluid from a seal system, shall be performed at a test pressure of Pa, the calculated peak containment internal pressure related to the design basis accident. Section III.C.3 of Appendix J requires that the combined leakage rate for all penetrations and valves subject to Type B and C LLRTs shall be less than 0.60 f La, the maximum allowable leakage rate at pressure Pa.

III.

The licensee requested exemptions from the requirements of Appendix J, Sections II.H.4 and III.C.2 for local leakage rate testing of the main steam isolation valves (MSIVs). Sections II.H.4 and III.C.2 require leak rate testing of the MSIVs at the peak calculated containment pressure related to the design basis accident. The licensee requested that leak testing of the MSIVs be conducted at reduced pressure.

The main steam system design in most operating BWR plants, including Peach Bottom, necessitates leak testing of the MSIVs by pressurizing the pipes between the inboard and outboard valves resulting in test pressure acting on the inboard valve in the direction opposite to accident pressure. The MSIVs are angled in the main steam lines in the direction of flow to afford better sealing upon closure. Consideration of this feature was included at the design stage of the facility when the original test pressure of 25 psig was established. A test pressure of Pa acting on the inboard valve in the opposite direction is sufficient to lift the valve disc off its seat and results in excessive leakage into the reactor vessel. That would be a meaningless test. The licensee proposed to test the MSIVs at a test pressure of 25 psig (about one-half of the peak post-accident pressure) to avoid lifting the inboard valve disc. The total observed leakage through both the inboard and outboard valves is then conservatively assigned to the penetration. Based on a review of the licensee's submittals, the staff concludes that testing of the MSIVs at a reduced pressure of 25 psig will result in a conservative determination of the leakage rate through the MSIVs. The staff concludes that testing the MSIVs at 25 psig is acceptable due to the unique design of the valves.

The measured leakage rate for any one main steam line through the MSIVs is limited to a maximum pathway leakage of 11.5 standard cubic feet per hour (SCFH) as specified in the facility Technical Specifications (TS). As stated above, the MSIVs in some boiling water reactor (BWR) plants are angled in the main steam lines in order to afford better sealing in the direction of accident pressure. This condition was considered when the test pressure of 25 psig was

initially established for the MSIVs of many BWRs. Subsequently, industry experience in testing these valves at a pressure of 25 psig and [illegible] an acceptance criterion of 11.5 SCFH has been shown to be effective in determining the condition of these valves.

The licensee requested an exemption from the requirements of Appendix J, Sections II.H.1 and III.C for Type C testing on the Traversing In-Core Probe (TIP) system shear valves. The licensee proposed to exclude the TIP shear valves from Type C testing requirements.

Each of the five TIP guide tubes is equipped with two isolation valves, a ball valve that provides the primary means of containment isolation, and a shear valve that cuts the cable and isolates the guide tube in the event that isolation is required and the drive cable can not be withdrawn. The shear valve is an explosive-type valve, direct current-operated, with monitoring of each actuating circuit provided. The ball valve is Type C tested in accordance with Appendix J. It is impractical to test the shear valves since they require testing to destruction. In lieu of leak testing and ultimate destruction of the shear valves, the licensee committed to the following actions to ensure the shear valves will perform their intended function:

(1) Verification of the continuity of the explosive charge circuit which is monitored by an alarm in the control room.

(2) Initiation of one explosive squib charge at least once per operating cycle. The replacement charge for the explosive valve shall be from the same manufactured batch as the one fired or from another batch that has been certified by having one of that batch successfully fired.

(3) Replacement of all explosive charges in accordance with the manufacturer's recommended lifetime.

Based on the above justification, the staff finds that the proposed exemption for the shear valves from Type C testing will not increase radioactive leakage from the penetration because the use of the valves will be necessary only when the TIP cable fails to withdraw or the ball valve fails to close. Further, the functional capability of the TIP shear valve will be periodically checked as described above. Therefore, the proposed exemption from Appendix J Type C testing for the TIP shear valves is justified.

The staff's Safety Evaluation issued concurrently with this exemption, provides additional details and bases supporting the requested exemptions.

IV.

The underlying purpose of the requirements of Sections II.H.4 and III.C.2 of Appendix J to 10 CFR Part 50 is to ensure the integrity of the primary containment and its penetrations. The underlying purpose is achieved and served by testing at the reduced test pressure of 25 psig subject to the TS acceptance criterion of 11.5 SCFH per MSIV which allows for a meaningful test of the MSIVs. Thus, an equivalent level of protection is provided.

Therefore, the Commission's staff finds there are special circumstances in this case which satisfy the standards of 10 CFR 50.12(a)(2)(ii).

The underlying purpose of the requirements of Sections II.H.1 and III.C of Appendix J to 10 CFR Part 50 is to demonstrate by periodic testing that the primary reactor containment will be able to perform its function of providing a leak tight barrier against the uncontrolled release of radioactivity to the

environment. The underlying purpose is achieved and served by the licensee's proposed surveillance provisions of the TIP shear valves. Thus, an equivalent level of protection is provided.

Therefore, the Commission's staff finds that there are special circumstances in this case which satisfy the standards of 10 CFR 50.12(a)(2)(ii).

V.

Based on the above evaluation, the staff considers the licensee's reduced test pressure for Type C testing of MSIVs to be justified. Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12(a)(1), this exemption is authorized by law, will not present an undue risk to public health and safety, and is consistent with the common defense and security. The Commission has further determined that special circumstances, as set forth in 10 CFR 50.12(a)(2)(ii) are present, justifying the exemption; namely, that application of the regulation in this particular circumstance is not necessary to achieve the underlying purpose of the rule.

Accordingly, the Commission hereby grants the following exemption:

Philadelphia Electric Company is exempt from Sections II.H.4 and III.C.2 of Appendix J to 10 CFR Part 50 to allow the licensee to conduct Type C LLRTs of the MSIVs at a reduced pressure of 25 psig.

The Commission further considers that the licensee's alternate surveillance provisions for the TIP shear valves to be equivalent to that achieved by conformance to Appendix J to 10 CFR Part 50. Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12(a)(1), this exemption is authorized

by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. The Commission has also determined that special circumstances, as set forth in 10 CFR 50.12(a)(2)(ii) are present, justifying the exemption; namely that application of the regulation in this particular circumstance is not necessary to achieve the underlying purpose of the rule.

Accordingly, the Commission hereby grants the following exemption:

Philadelphia Electric Company is exempt from Sections II.H.1 and III.C of Appendix J to 10 CFR Part 50 to exclude the TIP shear valves from Type C testing requirements.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not have a significant effect on the quality of the human environment (55 FR 48710).

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Steven A. Varga, Director
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland
this 21st day of November 1990.