



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
SUPPORT AMENDMENT NO. 2 TO FACILITY OPERATING LICENSE NO. NPF-39  
PHILADELPHIA ELECTRIC COMPANY  
LIMERICK GENERATING STATION, UNIT NO. 1  
DOCKET NO. 50-352

1.0 Introduction

By letter dated December 18, 1985, the Philadelphia Electric Company (the licensee) requested a one-time-only approval to temporarily extend certain surveillance requirements in the Technical Specifications, which must be performed nominally every 18 or 24 months and which can only be done when the plant is shutdown. The change would extend the 18 or 24 month surveillance intervals for leakage testing of selected containment isolation valves by up to 12 weeks beyond the time allowed by the Technical Specifications. This would permit the licensee to delay performing this testing until a maintenance and surveillance outage which will begin on or before May 26, 1986.

By letters dated January 29, February 5, February 25, and March 3, 1986 the licensee provided additional information in support of the proposed changes. Technical Specification (TS) 4.6.1.2.d requires that Type C tests shall be conducted at intervals no greater than 24 months except for tests involving valves in hydrostatically tested lines. The 24 month interval for this Type C testing is consistent with the requirements of 10 CFR Part 50, Appendix J, paragraph III.D.3 which specifies that Type C tests shall be performed at intervals no greater than 2 years. The licensee's letter of December 18, 1985 requested an extension of the 24 month TS testing requirement by a maximum of 12 weeks for a group of 27 isolation valves. In addition, in the December 18, 1985 letter the licensee requested a one-time exemption from the Appendix J 24 month testing requirements for these 27 valves. The related exemption is the subject of a separate Safety Evaluation dated March 3, 1986.

Technical Specification 4.6.1.2.g requires that local leak rate tests on containment isolation valves in hydrostatically tested lines shall be leak tested at least once per 18 months. The licensee's letter of December 18, 1985 requested an extension of this 18 month TS testing requirement by a maximum of 12 weeks for a group of 10 isolation valves.

2.0 Evaluation

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Since the Limerick Unit 1 plant has been through an extended startup program schedule, which included relatively little startup testing program activity from about April to early August 1985, the scheduled surveillance tests fall in a period of what would otherwise be a continuation of first fuel cycle power operations. Since the plant must be shutdown for about two weeks to perform these tests and since the licensee plans to shut the plant down on or before May 26, 1986 to perform other surveillance tests and maintenance activities the licensee proposes to extend the surveillance interval for these isolation

valves to allow those tests to also be performed during the outage to begin on or before May 26, 1986.

The 18 and 24 month surveillance intervals were selected to provide flexibility in scheduling these tests for execution during refueling outages. Technical Specification 4.0.2 does allow the 18 month TS interval between surveillance testing to be extended by 25 percent in order to provide flexibility in operations scheduling. The end of the most limiting surveillance interval, considering the 24 month limit and the 18 month limit extended by the allowable 25 percent, is March 3, 1986.

The requirements of the TS for testing nominally every 18 or 24 months for which extensions are proposed and the reason these tests can only be performed while the reactor is shutdown are as follows.

General Design Criterion 56, Primary Containment Isolation, requires that lines to be isolated be provided with an isolation valve inside containment and an isolation valve outside containment. The design of the isolation valves and their associated piping and test connections requires personnel access to the primary containment to isolate the valve inside the containment from the balance of its associated system and to implement the test procedure. Entry into containment during power operations would expose personnel to the hazards of high air temperature (about 120°F), radiation exposure that is high with respect to as-low-as-reasonably-achievable (ALARA) standards (about 10 R/hour in representative areas) and the nitrogen environment of the inerted containment atmosphere for which self contained breathing apparatus (SCUBA) would be required. The licensee has stated orally that they consider the hazard of the inerted containment atmosphere to be too great to permit personnel access for routine plant operational tasks. The licensee has also stated that further factors which preclude testing these valves at power include the need to depressurize the reactor, drain the reactor enclosure chilled water (RECW) system, drain the drywell chilled water (DCW) system, drain the emergency service water (ESW) loop, remove the reactor recirculation pumps from service or a combination of the above. The staff concludes that the licensee has shown that it is not practical or feasible to test these valves at power and that the plant would be required to shutdown for about two weeks to cooldown, depressurize and conduct the tests beginning on March 3, 1986 unless the requested extension in surveillance test periods is granted.

The licensee has stated that the types of valves subject to this surveillance schedule extension request have traditionally good maintenance histories and do not include those valves known to be maintenance intensive in boiling water reactors such as the main steam isolation valves or the feedwater check valves. The licensee also points out that these valves are used in applications where they are either normally open or normally closed and are not used in a modulating mode to control flow rates. The licensee further states that such valves when used in non-modulating applications tend not to have problems meeting leakage criteria. In this regard, the licensee has also considered the leak rate information reported in Licensee Event Report (LER) No. 352/85-102. This LER deals with a valve that is not within the scope of the Limerick surveillance schedule extension request. The licensee has reached a determination, with which the staff concurs, that the LER 85-102 event was an isolated event and as such has no significant effect upon the conclusions and basis for the request for extension.

In support of the position that these valves are reliable in meeting leakage criteria the licensee has interrogated the Nuclear Plant Reliability Data System (NPRDS) for similar types of valves and has reviewed these specific valves' previous leakrate test histories.

The NPRDS query serves as a useful qualitative estimation of these valves' reliability since the reporting of data to the system is on a voluntary basis and therefore there is no representation that the data from the system represents all of the valves in the industry of that specific valve type. Nevertheless, the data as presented in the licensee's letter dated January 29, 1986, is useful in considering whether these valve types are generally reliable in meeting their leakage criteria. The licensee notes that the valves in the NPRDS data base have been in service for significant periods whereas the Limerick valves will have experienced only a part of the first fuel cycle's operating time by the date of the next planned surveillance test. The NPRDS data does not suggest that these valves, either individually or collectively, should be expected to experience undue difficulties in meeting the leakage criteria.

The licensee states that testing has been performed on those valves that can be tested at power such that only 37 valves out of a total of 245 valves in Part A of TS Table 3.6.3-1 require the one-time extension of the surveillance interval. This is reflected in the following specific system discussions wherein, as applicable, it is noted that the extension request does not apply to all of the valves in a given system since the other valves have been tested on a more recent schedule which does not require their retest until after May 26, 1986.

#### Technical Specification 4.6.1.2.d-Twenty-Four Month Tests

There are 27 valves subject to this specification for which the licensee has requested one time extension of no more than 12 weeks in the surveillance test schedule. These valves are as listed below.

<u>System</u>	<u>Valve Number</u>	<u>Size/Type</u>
° LPCI injection loops A,C,D	HV-51-1F017A,C,D	12" gate
° Suppression Pool Spray	HV-51-1F027A	6" globe
° Reactor enclosure cooling water		
- supply line	HV-13-106,108,109	3" and 4" gate
- return line	HV-13-107,110,111	3" and 4" gate
° Drywell Chilled Water, Loops A and B		
- Supply lines	HV-87-120A, 125A, 128 and 120B, 125B, 122	8" gate
- Return lines	HV-87-121A, 124A, 129 and 121B, 124B, 123	8" gate
° Reactor Water Cleanup supply line	HV-44-1F001, 1F004	6" globe

Technical Specification 4.6.1.2.d-Twenty-Four Month Tests (cont'd.)

<u>System</u>	<u>Valve Number</u>	<u>Size/Type</u>
° Recirculation Pump B seal purge	43-10048	1" check
° Instrument Gas Supply to ADs valves E and K	HV-59-151B 59-1112	1" globe 1" check

The licensee's letter of January 29, 1986 also provides information on the previous leakage testing for the specific valves which are subject to this amendment request. As indicated in the licensee's letters the total leakage measured as a result of the previous tests on all applicable Type C valve tests is about 22,000 standard cubic centimeters per minute (SCCM) which is about 23% of the total allowed by the Technical Specifications. Of this 22,000 SCCM only about 3800 SCCM (or 4% of the TS limit) was contributed by the 27 valves subject to the amendment application. Thus, it may be seen that leakage through these valves would have to increase many times before they contributed a large portion of either (1) the total measured leakage from all such valves or (2) the TS limit value. Some discussion of the individual valves is provided below.

LPCI Injection

Valves HV51-1F017A, C and D require an extension of less than 10 weeks in a 24 month surveillance interval. The comparable valve in the B loop was tested on a schedule which does not require its retest until after May 26, 1986. The leakage from these three valves during the previous tests totaled 1210 SCCM or 1% of the TS limit valve. The line in which these valves are located is provided with instrumentation which will detect and annunciate excessive leakage past the valves.

Suppression Pool Spray

Valve HV-51-1F027A requires an extension of about 8 weeks in a 24 month surveillance interval. The comparable valve in the B loop of suppression pool spray was tested on a schedule which does not require its retest until after May 26, 1986. The leakage from this valve during the previous test was 2.25 SCCM or 0.002% of the TS limit valve.

Reactor Enclosure Cooling Water (RECW)

Valves HV-13-106, 108, 109 in the RECW supply line and HV-13-107, 110, 111 in the RECW return line require an extension of 12 weeks in a 24 month surveillance interval. The leakage from these valves during the previous tests was 145 SCCM or 0.15% of the TS limit for the supply valves and 9 SCCM or 0.01% of the TS limit for the return valves.

### Drywell Chilled Water

The valves in loops A and B of the drywell chilled water system, each loop having 3 involved valves in the supply line and 3 involved valves in the return line, require an extension of up to 12 weeks in a 24 month surveillance interval. The leakage from these valves during the initial tests was 203 SCCM for loop A supply valves, 653 SCCM for loop A return valves, 668 SCCM for loop B supply valves and 338 SCCM for loop B return valves for a total of 1862 SCCM or 2% of the TS limit.

### Reactor Water Cleanup

Valves HV-44-1F001, 1F004 in the RWCU supply line require an extension of less than 10 weeks in a 24 month surveillance interval. The leakage from these valves from previous tests was 510 SCCM or 0.5% of the TS limit value.

### Recirculation Pump B Seal Purge

Valve 43-1004B in the reactor recirculation pump seal purge line requires an extension of 3 weeks in a 24 month surveillance interval. The comparable valve in the A loop line was tested on a schedule which does not require its retest until after May 26, 1986. The leakage from this valve from previous tests was 76 SCCM or 0.1% of the TS limit value.

### Instrument Gas Supply to ADS Valves

Valves HV-59-151B and 59-1112 in the instrument gas supply to automatic depressurization system (ADS) valves E and K require an extension of less than 2 weeks in a 24 month surveillance interval. Comparable valves in the gas supply line for ADS valves H, M and S and other instrument gas supply and return lines were tested on a schedule which does not require retest until after May 26, 1986. The leakage from these valves during the previous tests was 9 SCCM or 0.01% of the TS limit value.

### Summary for 24 Month Surveillance Interval Valves

In assessing whether an extension of 12 weeks in a 24 month surveillance interval would be appropriate for these valves the staff has considered the previous leak rate test results for these valves, their propensity for requiring extensive maintenance to maintain their leak tight integrity and the consequences of any additional degradation during the requested extension. Based on its review the staff finds that:

- (1) The previously measured Type C test leakage through these valves (3800 SCCM) constituted but 17% of the total measured Type C leakage. There is considerable margin between these values and the limit established by Appendix J and the technical specification of 0.6 L (94, 964 SCCM) for the Type B and C tests. These valves were not found to contribute either individually or collectively a disproportionate percentage of the total measured leakage or of the technical specification limit values.

- (2) To date these valves have not required maintenance, repairs or adjustments which would require reperformance of their Type C test. The licensee's review of similar valves via NPRDS provides a qualitative assessment that supports the licensee's findings that these valves typically have good maintenance histories, do not require intensive maintenance to ensure their leak tight integrity and thus are unlikely to degrade significantly in the period of the extension.
- (3) There is ample margin between the leakage previously measured during the Type C isolation valve tests, including the previous tests of the 27 valves subject to this amendment request, and the limiting leakage values in the technical specifications and in Appendix J to accommodate any degradation likely to be experienced by these 27 valves during the extension period. Therefore the consequences of leakage past these isolation valves is bounded by safety analyses previously performed which were based on the limiting leakage values in the technical specifications and in Appendix J.

The licensee has determined that the proposed changes will have little or no effect on containment integrity and that the proposed amendment will not alter any of the accident analyses. The staff has reviewed these determinations and the associated changes and concludes that, on the bases discussed above, they are acceptable.

#### Technical Specification 4.6.1.2.g - Eighteen Month Tests

There are 10 valves subject to this specification for which the licensee has requested a one time extension of no more than 10 weeks in the surveillance test schedule. Considering the 25% extension in the nominal 18 month period also provided for in the Technical Specifications these tests would be extended from about 22.5 months to 25 months. These valves are as listed below:

° Shutdown Cooling Return Loop A and B lines	HV-51-1F050A, B HV-51-151A, B	12" Check 1.5" Globe
° Low Pressure Coolant Injection Loop A, C and D lines	HV-51-1F041A, C, D HV-51-142A, C, D	12" Check 1.5" Globe

#### Shutdown Cooling Return

The extension request for the isolation valves in the shutdown cooling return lines apply only to the inboard valves since the outboard (outside containment) isolation valves were tested on a schedule which does not require their retest until after May 26, 1986. These lines are equipped with instrumentation which will annunciate leakage past the isolation valves to the operator. The leakage through these valves during the initial leak tests was 0.1 gallons per minute (gpm) for the loop A valves and no measured leakage for the loop B valves, well below the limit of 1.0gpm imposed by the Technical Specifications.

### Low Pressure Coolant Injection

The extension request for these isolation valves in the low pressure coolant injection lines applies to the A, C and D loop valves since the B loop valves were tested on a schedule which does not require their retest until after May 26, 1986. These lines are equipped with instrumentation which will annunciate leakage past the isolation valves to the operator. The leakage through these valves during the initial leak tests was 0.2 gpm for the A loop, 0.002 gpm for the C loop, and 0.09 gpm for the D loop, all of which are well below the limit of 1.0gpm imposed by the Technical Specifications.

### Summary for Eighteen Month Surveillance Interval Valves

In assessing whether an extension of 10 weeks in the 18 month surveillance interval, as extended by 25%, would be appropriate for these valves the staff has considered the previous leak rate test results for these valves, their propensity for requiring extensive maintenance to maintain their leak tight integrity and the consequences of any additional degradation during the requested extension. Based on its review the staff finds that:

- (1) The previously measured leakage for these valves (0.1 gallons per minute (gpm) maximum for any 1 valve) is well below the technical specification limit of 1 gpm for any 1 valve. Thus, ample margin exists between the previously measured leakage and the TS limiting value to accommodate any degradation likely to be experienced during the extension period.
- (2) The lines in which these valves are located are provided with instrumentation which will detect and annunciate excessive leakage past these valves.
- (3) The lines in which these valves are located are connected to closed systems outside of containment. Leakage out of those systems would be into the reactor enclosure thus facilitating collection and treatment.
- (4) The licensee's review of NPRDS data for similar valves provides a qualitative assessment that supports the licensee's findings that leakage rate test experience with these valves has been excellent.

The licensee has determined that these changes have little safety significance and that the proposed amendment will not alter any of the accident analyses. The staff has reviewed these determinations and the associated changes and concludes, on the bases stated above, that they are acceptable.

### 3.0 Environmental Consideration

This amendment changes some surveillance requirements on a one-time-only basis. The staff has determined that the amendment involves 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 this amendment involves no significant hazards consideration and there has been no public comment on such finding within the

time provided by the Federal Register notice of consideration of the licensee's amendment request. Thus, there is no need to make a final determination regarding no significant hazards consideration. Accordingly, this amendment meets 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 nor environmental assessment need be prepared in connection with the issuance of this amendment. However a related exemption from Appendix J to 10 CFR Part 50 is being processed relative to this action and a Notice of Environmental Assessment and Finding of No Significant Impact has been processed relative to the Exemption. This Notice of Environmental Assessment and Finding of No Significant Impact was published in the Federal Register on March 3, 1985 (51 FR 7344).

#### 4.0 Conclusion

The staff 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, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security nor to the health and safety of the public.

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