



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE INSERVICE TESTING PROGRAM RELIEF REQUESTS

PENNSYLVANIA POWER & LIGHT COMPANY

SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2

DOCKET NOS. 50-387 AND 50-388

1.0 INTRODUCTION

The *Code of Federal Regulations*, 10 CFR 50.55a, requires that inservice testing (IST) of certain American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 pumps and valves be performed in accordance with Section XI of the ASME *Boiler and Pressure Vessel Code* (the Code) and applicable addenda, except where alternatives have been authorized or relief has been requested by the licensee and granted by the Commission pursuant to Sections (a)(3)(i), (a)(3)(ii), or (f)(6)(i) of 10 CFR 50.55a. In proposing alternatives or requesting relief, the licensee must demonstrate that: (1) the proposed alternatives provide an acceptable level of quality and safety; (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; or (3) conformance is impractical for its facility. Section 50.55a authorizes the Commission to approve alternatives and to grant relief from ASME Code requirements upon making the necessary findings. Guidance related to the development and implementation of IST programs is given in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," issued April 3, 1989, and its Supplement 1 issued April 4, 1995. Also see NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants," and NUREG/CR-6396, "Examples, Clarifications, and Guidance on Preparing Requests for Relief from Pump and Valve Inservice Testing Requirements."

The 1989 Edition of the ASME Code is the latest edition incorporated by reference in paragraph (b) of Section 50.55a. Subsection IWV of the 1989 Edition, which gives the requirements for IST of valves, references Part 10 of the American National Standards Institute/ASME *Operations and Maintenance Standards* (OM-10) as the rules for IST of valves. OM-10 replaces specific requirements in previous editions of Section XI, Subsection IWV, of the ASME Code. Subsection IWP of the 1989 Edition, which gives the requirements for IST of pumps, references Part 6 of the American National Standards Institute/ASME *Operations and Maintenance Standards* (OM-6) as the rules for IST of pumps. OM-6 replaces specific requirements in previous editions of Section XI, Subsection IWP, of the ASME Code.

ENCLOSURE

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By letter dated June 28, 1996, Pennsylvania Power and Light Company (the licensee) responded to NRC's safety evaluation (SE) dated February 23, 1996, for the Susquehanna Steam Electric Station (SSES) Units 1 and 2, second 10-year interval program for inservice testing of pumps and valves. The SE had concluded that the licensee should review Refueling Outage Justification Number 21 (ROJ-21) to ensure that testing of valves quarterly and during cold shutdowns is in fact impractical. Following its review, the licensee responded by withdrawing ROJ-21 and submitting a new relief request (RR-33). RR-33 is evaluated below. The IST programs for SSES Units 1 and 2 were developed to the requirements of the 1989 Edition of the ASME Code. The SSES Units 1 and 2 are boiling-water reactors which began commercial operation on June 8, 1983, and February 12, 1985, respectively. The second 120-month interval for IST commenced on June 1, 1994, for both units.

The staff noted that in the summary table on page 2 of the submittal that valve 153070 was incorrectly listed as 15070. The staff considered this to be an administrative error and did not affect the evaluation and finding.

2.0 RELIEF REQUEST NUMBER 33 (RR-33)

RR-33 requests relief from the exercise testing requirements of OM-10, Paragraph 4.2.1.2 for manual valves in lines that supply cooling water and makeup water to spent fuel pool following a loss of normal fuel pool cooling. The valves in question are 1(2)51060, 1(2)51070, 1(2)53001, 1(2)53021, 1(2)53070A/B, 1(2)53018A/B, 1(2)53090A/B, 1(2)53091A/B, 1(2)53500, and 1(2)53501. The licensee has proposed to exercise these valves at least once each fuel cycle based on an argument that testing at higher frequencies as specified in the Code would result in a hardship without a compensating increase in the level of quality and safety.

3.0 LICENSEE'S BASIS FOR REQUESTING RELIEF

The licensee stated the following:

Each residual heat removal (RHR) fuel pool cooling assist line (one line per unit) contains six manual valves (1[2]51060, 1[2]51070, 1[2]53001, 1[2]53021, and 1[2]53070A/B). Each of the emergency service water (ESW) fuel makeup lines (two per unit) contains three manual valves (1[2]53090A/B, 1[2]53091A/B, 1[2]53500, and 1[2]53501). Each of the fuel pool cooling (FPC) normal supply lines to the fuel storage pool contains one manual isolation valve (1[2]53018A/B). The accidents defined in the FSAR do not consider these manual valves or the tie between the RHR or the ESW and fuel pool cooling and cleanup systems. The accidents defined in the FSAR are consistent with the guidance given in Regulatory Guide 1.70 and the Standard Review Plan. The FSAR does state that the ESW system provides a seismic Category I source of makeup water to the spent fuel pool; therefore, these valves are important to safety and should be tested periodically. An exercise testing frequency of once each fuel cycle for each of the aforementioned manual valves in

the RHR, ESW, and FPC system is considered to be commensurate with its importance to safety. Manual stroking of these valves any more frequently than that would not add any substantial safety benefit and would increase personnel exposure.

Since the beginning of plant operations, the subject manual valves have proven to be highly reliable. No difficulty has ever been observed with their operation or maintenance, and no significant maintenance has been required. The only maintenance ever needed for any of the manual valves in ESW system (12 total between the two units) was the repacking of the stem of one valve (153091B) in 1990. Maintenance on the manual valves in the FPC system (12 total between the two units) consisted of only one valve repack on 153070A in 1989. The RHR system (4 total between the two units) showed that each valve has been repacked once since the beginning of plant operations. Other than the valve repacks mentioned above, there has been no evidence of any of the valves failing to open or close. From this data, we conclude that these valves have a very low likelihood of failure.

Additionally, exercising each 92 days would result in a hardship without a compensating increase in the level of quality and safety for those valves in the fuel pool cooling, RHR, and ESW systems. The FPC system would have to be shutdown completely to stroke valve 1[2]53001 closed and would have to be placed in a restricted flow configuration to stroke either valve 1[2]53018A or B. Exercise testing of the 1[2]51070, RHR to FPC return valve, may cause the RHR Division I system to depressurize. The Division I of the RHR might have to be removed from service while refilling and venting of the discharge LPCI injection lines is accomplished. Exercising of the ESW system valves introduces the potential for transferring ESW grade water into the spent fuel pool. This is a hardship from a water quality standpoint.

Periodic exercising (opening and closing) of the manual valves in the ESW fuel pool makeup lines has been accomplished previously at a frequency of at least once each 3 or 4 years during the prior Code interval in conjunction with the fuel pool cooling and the ESW system pressure tests. This exercising frequency is considered to be commensurate with the safety functions to be performed by the manual valves and is considered to be sufficient for valves of such simplicity and high reliability. In summary, exercising these manual valves once each refueling cycle provides an acceptable level of quality and safety.

4.0 PROPOSED ALTERNATE TESTING

The licensee proposed the following:

Exercise each manual valve at least once each fuel cycle. Additionally, the fuel pool cooling system pressure test and the ESW system pressure test will continue to exercise the fuel pool cooling and ESW valves once every 3 to 4 years.

5.0 EVALUATION

Relief is requested from the exercising requirements of OM-10, Paragraph 4.2.1.2 for manual valves 1(2)51060, 1(2)51070, 1(2)53001, 1(2)53021, 1(2)53070A/B, 1(2)53018A/B, 1(2)53090A/B, 1(2)53091A/B, 1(2)53500, and 1(2)53501, which have an active safety function to allow flow of cooling water and makeup water to the spent fuel pool. The licensee has proposed to exercise these valves at least once each fuel cycle. The Code allows deferral of exercising to each fuel cycle if such testing is not practicable quarterly and during cold shutdowns.

The licensee indicated that there is hardship in performing the tests because of system constraints. The FPC system would have to be shut down completely (for valves 1[2]53001) and placed in a restricted flow configuration (for valves 1[2]53018A or B). Exercise testing of RHR valves may cause the RHR Division I system to depressurize and to be removed from service. Testing the ESW system valves introduces the potential for transferring ESW grade water into the spent fuel pool. Further, the licensee stated that the valves in question are of a simple design and have not experienced problems with operation or maintenance. Also, testing the valves would increase personnel's exposure to radiation.

Given the burden of testing and the proven reliability of these valves during more than 12 years of plant operation, the staff finds that compliance with the specified Code requirement would result in a hardship without a compensating increase in the level of quality and safety. The proposed alternative to exercise on a frequency of every fuel cycle provides the reasonable assurance of operational readiness of these valves.

6.0 CONCLUSION

The proposed alternative to the exercise requirement of OM-10, Paragraph 4.2.1.2 for the manual valves in question (exercising each manual valve at least once each fuel cycle and relying on fuel pool cooling system pressure tests and ESW pressure tests), provides a reasonable assurance of operational readiness and is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) based on the determination that compliance with the Code requirements results in a hardship without a compensating increase in the level of quality and safety.

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