



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO INSERVICE TESTING PROGRAM RELIEF REQUEST GPRR-4
PHILADELPHIA ELECTRIC COMPANY
LIMERICK GENERATING STATION, UNITS 1 AND 2
DOCKET NOS. 50-352 AND 50-353

1.0 INTRODUCTION

By a letter dated October 31, 1991, Philadelphia Electric Company (the licensee) requested relief from the pump inlet pressure instrument accuracy requirements of ASME Code, Section XI, Paragraph IWP-3100, for selected Residual Heat Removal, Core Spray, and Safeguard Piping Fill pumps for Units 1 and 2. The licensee has proposed to determine pump inlet pressure using the primary containment suppression pool level instrumentation.

2.0 DESCRIPTION AND DISCUSSION

2.1 Licensee's Basis for Requesting Relief

PECo proposes to measure pump inlet pressure by using suppression pool level indicators because pump suction is directly from the suppression pool and the level is monitored on a daily surveillance interval.

Determining inlet pressure based on suppression pool level is required because the permanently installed suction pressure instruments exceed the range requirements specified in IWP-4120. The installed instruments, which are pressure boundary Q, are required to assess system performance during plant conditions other than inservice testing. Therefore, to meet IWP-4120 range requirements for inservice testing, test gauges would have to be used. Installation and removal of test gauges is not desirable because it requires the repeated breaching of a contaminated system on a section of pressure boundary Q piping.

Accurate indication of pump suction pressure can be determined using the installed suppression pool level instrumentation. This instrumentation, which is used to satisfy Technical Specification ECCS operability requirements, is accurate to within +or- 1.1% of full-scale and meets the range requirements specified in IWP-4120 (23 feet water gauge reference value, 0 - 50 feet water gauge full-scale).

The following example illustrates that using suppression pool level instrumentation to determine pump inlet pressure meets the Code accuracy requirements.

Example: Safeguard Piping Fill Pump

The pump reference inlet pressure is 11.7 psi, based on the difference between the suppression pool level and the pump inlet. Therefore, using instrumentation that meets the Code requirements (full-scale is 35.1 psi and +or- 2% accuracy) the tolerance would be +or- 0.7 psi and the indicated accuracy is +or- 6% of the reference value which would be the maximum allowed by the Code.

Using the existing suppression pool level instrumentation with a full-scale range of 0 - 50 feet water gauge (wg) that is calibrated to +or- 1.1% full-scale, the instrument tolerance is +or- 0.5 feet wg, or +or- 0.24 psi.

The suppression pool instrument tolerance of +or- 0.24 psi is better than the Code required accuracy.

Dynamic losses are considered in the pump performance baseline and should remain approximately constant throughout plant life. Additionally, suppression pool atmospheric pressure contributions (approximately 0.2 to 0.5 psi) will be accounted for by mathematically correcting for these contributions in the surveillance tests.

2.2 Alternative testing

Suppression pool level instrumentation with an accuracy of +or- 1.1% of full-scale will be used to determine pump inlet pressure. No alternative testing will be performed.

3.0 EVALUATION

The pumps listed below are fitted with pump suction pressure instrumentation which does not meet Paragraph IWP-4120 of Section XI of the ASME Code with respect to full-scale range requirements for pressure measurement.

Residual Heat Removal	1AP202	2AP202
	1BP202	2BP202
	1CP202	2CP202
	1DP202	2DP202
Core Spray	1AP206	2AP206
	1BP206	2BP206
	1CP206	2CP206
	1DP206	2DP206
Safeguard Piping Fill	1AP256	2AP256
	1BP256	2BP256

The direct pressure measurement in accordance with the Code full-scale range requirements would require the installation and removal of test gauges. The installation of test gauges would be burdensome to the licensee and would require repeated breaching of an Engineered Safety Feature pressure retaining component and could result in the spread of radioactive contamination within the secondary containment. To directly measure pump inlet pressure would require significant system modifications, which would be costly and burdensome to the licensee. In addition, Table IWP-4110-1, of Section XI, states acceptable pressure instrument accuracy must be no more than $\pm 2\%$ of full-scale. The licensee has stated that the accuracy requirements for pressure measurement can be met through using the proposed testing approach and has provided justification that demonstrates the licensee's proposal to use existing suppression pool level instrumentation can measure pump inlet pressure to within $\pm 1.1\%$ of full scale. The licensee's proposed alternative method, calculating pump suction pressure based on the height of water above the suction point, can give adequate suction pressure information for evaluating pump operational readiness and presents a reasonable alternative to the Code requirements.

Also, the plant area where the temporary gauges have to be installed is a high radiation area. Installation and removal of the test gauges results in significant radiation exposure to personnel conducting the testing. The Commission's "As Low As Reasonably Achievable" (ALARA) policy requires licensees to pursue alternatives to reduce radiation exposure.

4.0 CONCLUSION

Based on the review of the licensee's IST relief request, the staff concludes that the relief request as evaluated by this SE will provide reasonable assurance of the operational readiness of the pumps to perform their safety related functions.

The staff also concludes that the use of the suppression pool level instrumentation in lieu of the installed pressure instrumentation to measure pump suction pressure provides an acceptable level of quality and safety within Code accuracy requirements. The staff has determined that literal compliance with the implied requirements to measure pressure directly (rather than indirectly) would result in hardship and unusual difficulty and would introduce safety concerns without a compensating increase in the level of quality and overall safety.

Based on the determination that compliance with the Code requirements would be a hardship without providing a compensating increase in the level of quality and safety, relief is granted from the Code accuracy and range requirements as requested, pursuant to 10 CFR 50.55a(a)(3)(ii). This relief is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden

upon the licensee that could result if the requirements were imposed on the facility. IST Program Relief Request GPRR-4 for Limerick Generating Station, Units 1 and 2, provided by a submittal dated October 31, 1991, is acceptable for implementation.

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Date: February 20, 1992