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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO RELIEF REQUEST NO. 23

PHILADELPHIA ELECTRIC COMPANY

LIMERICK GENERATING STATION, UNIT 1

DOCKET NUMBER 50-352

1.0 INTRODUCTION

The Technical Specifications for Limerick Generating Station, Unit 1, state that the inservice inspection of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). It is stated in 10 CFR 50.55a(a)(3) that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first ten-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) twelve months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable edition of Section XI of the ASME Code for the Limerick Generating Station, Unit 1 10-year inservice inspection (ISI) interval is the 1986 Edition. The components (including supports) may meet the requirements set forth in subsequent editions and addenda of the ASME Code incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein and subject to Commission approval.

Pursuant to 10 CFR 50.55a(g)(5), if the licensee determines that conformance with an examination requirement of Section XI of the ASME Code is not practical for its facility, information shall be submitted to the Commission in support of that determination and a request made for relief from the ASME Code requirement. After evaluation of the determination, pursuant to 10 CFR 50.55a(g)(6)(i), the Commission may grant relief and may impose alternative requirements that are determined to be authorized by law, will not endanger life, property, or the common defense and security, and are otherwise in the public interest, giving due consideration to the burden upon the

licensee that could result if the requirements were imposed. In a letter dated July 31, 1995, Philadelphia Electric Company submitted to the NRC its First Ten-Year Interval Inservice Inspection Program Plan, Request for Relief No. RR-23 regarding hydrostatic testing of the high pressure coolant injection pump turbine and associated lines for Limerick Generating Station, Unit 1.

2.0 EVALUATION AND CONCLUSIONS

The staff, with technical assistance from its contractor, the Idaho National Engineering Laboratory (INEL), has evaluated the information provided by the licensee in support of its First Ten-Year Interval Inservice Inspection Program Plan, Request for Relief No. RR-23 regarding hydrostatic testing of the high pressure coolant injection pump turbine and associated lines for Limerick Generating Station, Unit 1.

Based on the information submitted, the staff adopts the contractor's conclusions and recommendations presented in the Technical Letter Report attached. The Staff concludes that requiring a 4-hour hold time prior to performing the VT-2 visual examination of insulated portions of Class 2 High Pressure Coolant Injection (HPCI) Pump Turbine steam supply/exhaust lines, and associated drains and vents, and the lube oil cooler supply/outlet lines during hydrostatic testing at Limerick Generating Station, Unit 1, will result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Performing the VT-2 visual examination of insulated portions of the system with the system at operating pressure after a minimum 1-hour pump run will provide reasonable assurance of operational readiness. Therefore, the licensee's proposed alternative contained in Request for Relief No. RR-23 is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) provided that for insulated systems the VT-2 visual examination is performed once during the 10-year interval in conjunction with a pump functional test, following the expiration of a minimum of 1-hour of pump run time.

Attachment: Technical Letter Report

Principal Contributor: T. McLellan

Date: January 17, 1996

TECHNICAL LETTER REPORT
ON THE FIRST 10-YEAR INSERVICE INSPECTION INTERVAL
REQUEST FOR RELIEF RR-23
FOR
LIMERICK GENERATING STATION, UNIT 1
PHILADELPHIA ELECTRIC COMPANY
DOCKET NUMBER: 50-352

1.0 INTRODUCTION

By letter dated July 31, 1995, Philadelphia Electric Company submitted Request for Relief RR-23, Revision 0, for Limerick Generating Station, Unit 1. The Idaho National Engineering Laboratory (INEL) staff has evaluated the subject request for relief in the following section.

2.0 EVALUATION

The Code of record for the Limerick Generating Station, Unit 1, first 10-year inservice inspection interval is the 1986 Edition of the American Society of Mechanical Engineers, Boiler and Pressure Vessel Code, Section XI. The information provided by the licensee in support of the request for relief has been evaluated and the basis for disposition is documented below.

Request for Relief RR-23, Section XI, Table IWC-2500-1, Examination Category C-H, Hydrostatic Testing of the High Pressure Coolant Injection (HPCI) Pump Turbine and Associated Lines

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-H requires a VT-2 visual examination during hydrostatic tests of Class 2 systems performed in accordance with IWC-5222 near the end of the interval. IWA-5213 states that for system hydrostatic tests, a 4 hour hold time is required after attaining the test pressure and temperature conditions for insulated systems, and a 10 minute hold time for noninsulated systems or components.

The licensee previously requested relief from the hydrostatic pressure test requirements for Code Class 1, 2, and 3 systems. Specifically, the licensee requested to use Code Case N-498-1, *Alternative Rules for 10-Year System Hydrostatic Testing for Class 1, 2, and 3 Systems, Section XI, Division 1.* This request was approved in an NRC Safety Evaluation dated June 29, 1995.

For Class 2 system hydrostatic tests, Code Case N-498-1 states "Prior to performing the VT-2 visual examination, the system shall be pressurized to nominal operating pressure for a minimum of 4 hours for insulated systems and 10 minutes for noninsulated systems. The system shall be maintained at nominal operating pressure during performance of the VT-2 visual examination".

Licensee's Code Relief Request: The licensee requests relief from the 4-hour hold time prior to performing the VT-2 visual examinations associated with hydrostatic tests of the Class 2 High Pressure Coolant Injection (HPCI) Pump Turbine steam supply/exhaust lines, and associated drains and vents, and the lube oil cooler supply/outlet lines depicted on Figures RR-23-1 and RR-23-2 of the licensee's submittal.

Licensee's Basis for Requesting Relief (as stated):

"As a part of the Emergency Core Cooling System (ECCS), the HPCI System is not required to operate during normal plant operation. This system is, however, periodically tested in accordance with other applicable requirements. These periodic tests are conducted to verify the operability of the applicable components. The functional test conducted for the HPCI Pump and associated turbine steam supply and exhaust system normally includes approximately 90 minutes of pump run time. In order to satisfy the 4 hour hold time requirement of Code Case N-498-1, the test would require a HPCI pump run in excess of 5 hours (hold time plus examination time). Running the HPCI System functional test for this length of time is not practical, and represents an undue hardship on the facility, without a compensating increase in the level of quality and safety.

"Operating the HPCI Pump for the period of time required to satisfy the 4 hour hold time would subject the facility to unnecessarily excessive heat loads. Control of these heat loads would require the operation of additional safety related equipment, and challenge the Technical Specification limitations placed on the maximum allowable Suppression Pool water temperature.

"Removal of the insulation from the subject components, in order to qualify for the 10 minute hold time allowed by the Code Case, would be equally burdensome. The cost associated with insulation removal and reinstallation, including resource diversion, radiation exposure, and additional radwaste would not be warranted.

"Additionally, the Section XI periodic pressure test requirements, which have been imposed on this system during the first inspection interval (Functional Test, per IWA-5211(b)), only require a 10 minute hold time.

"Further, the ASME Section XI Committee is in the process of revising Code Case N-498-1 to remove the 4 hour hold time requirement. This proposed revision is in recognition of the unusual difficulties and hardship imposed by the 4 hour hold time on certain systems."

Licensee's Proposed Alternative Examination (as stated):

"The system pressure test described in Code Case N-498-1 will be conducted as required, except that a 10 minute hold time will be used in lieu of the 4 hour hold time requirement. This 10 minute hold time will match the hold time which has been required for the previous Section XI ISI Program pressure testing of this system."

Evaluation: Both the Code and Code Case N-498-1 specify a 4-hour hold time prior to performing the VT-2 visual examination during the hydrostatic test of insulated systems. The licensee has stated that compliance with the 4-hour hold time will result in a burden and could compromise plant safety. Based on the review of the information provided, the INEL staff believes that, under the circumstances presented, the 4-hour hold time for the subject system would require the operation of other safety-related systems, creating an operational

safety concern. This is because the required 4-hour hold time, during system operation, would cause the Suppression Pool water temperature to rise, requiring the startup of other safety-related systems to maintain the Suppression Pool water temperature within Technical Specifications. Under these test conditions, should an actual plant emergency occur, the additional actions required to bring the plant to a safe shutdown condition could be compromised.

The licensee's proposed 10-minute hold time before VT-2 visual examination is an acceptable waiting period for noninsulated systems because examiners have direct view of the piping and components. For insulated systems, an increased hold time is required to allow potential leaks to migrate through the insulation. The INEL staff believes that a hold time of 10 minutes will not ensure the detection of leakage in insulated systems.

The INEL staff believes that a hold time greater than 10 minutes should occur prior to the VT-2 visual examination of insulated portions of the subject system, but that requiring the licensee to comply with the 4-hour hold time would result in a burden on the licensee. The licensee stated that periodic tests at operating pressure are performed at three-month intervals. During these tests, the operating pressure is maintained for approximately 90-minutes of pump run time. Performing the VT-2 visual examination with the system at operating pressure after a minimum of 1-hour has expired in conjunction with a 90-minute pump run time will increase the probability of detecting leakage, if it is occurring, and provide reasonable assurance of operational readiness. Therefore, it is recommended that the licensee's proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(ii) provided that the VT-2 visual examination is performed once during the 10-year interval in conjunction with a pump functional test, following the expiration of a minimum of 1-hour of pump run time.

3.0 CONCLUSION

Requiring a 4-hour hold time prior to performing the VT-2 visual examination of insulated portions of Class 2 High Pressure Coolant Injection (HPCI) Pump Turbine steam supply/exhaust lines, and associated drains and vents, and the lube oil cooler supply/outlet lines during hydrostatic testing at Limerick Generating Station, Unit 1, will result in a burden on the licensee. Performing the VT-2 visual examination of insulated portions of the system in conjunction with a pump functional test following a minimum of 1-hour of pump run time with the system at operating pressure will provide reasonable assurance of operational readiness. Therefore, it is recommended that the licensee's proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(ii) provided that the VT-2 visual examination is performed once during the interval in conjunction with a pump functional test, after a minimum of 1-hour of pump run time has expired.