

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

# SAFETY EVALUATION BY THE NUCLEAR REACTOR REGULATION REGARDING REQUEST FOR RELIEF FROM ASME CODE REPAIR REQUIREMENTS

## FOR ASME CODE CLASS 3 PIPING

#### PHILADELPHIA ELECTRIC COMPANY

#### LIMERICK GENERATING STATION, UNIT 1

#### DOCKET NO. 50-352

#### 1.0 INTRODUCTION

Background

#### Temporary Non-Code Repairs

Pursuant to 10 CFR 50.55a(g), nuclear power facilit/ piping and components shall meet the applicable requirements of Section XI of the ASME Boiler and Pressure Vessel Cude (hereafter called the Code). Section XI of the Code specifies code-acceptable repair methods for flaws that exceed code acceptance limits in sping that is in service. A code repair is required to restore the structura integrity of flawed code piping, independent of the operational mode of the plant when the flaw is detected. Those repairs not in compliance with Section X1 of the Code are non-code repairs. However, the required code repair may be impractical for a flaw detected during plant operation unless the facility is shut down. Pursuant to 10 CFR 50.55a(g)(6)(i), the Commission will evaluate determinations of impracticality, and may grant relief and may impose alternative requirements. Generic Letter (GL) 90-05, entitled "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2 and 3 Piping," and dated June 15, 1990, provides guidance for the staff in evaluating relief requests submitted by licensees for temporary non-code repairs of code Class 3 piping. The Commission may grant relief based on a staff evaluation considering the guidance in GL 90-05.

#### 2.0 LICENSEE'S RELIEF REQUEST

By letter dated December 19, 1991, Philadelphia Electric Company (the licensee) requested relief from code repair requirements of certain code Class 3 piping at Limerick Generating Station (LGS), Unit 1. The licensee found a through wall pin hole leak in the emergency service water (ESW) piping. The piping is of carbon steel and three inches in diameter. The leak is ascribed to microbiologically induced corrosion (MIC).

9203030457 920226 PDR ADDCK 05000352 P PDR

#### Code Requirement

Article IWA-5250(a)(3) of Section XI of the Code specifies corrective measures:

- (a) The source of leakage detected during the conduct of a system pressure test shall be located and evaluated by the owner for corrective measures as follows:
  - (3) repairs or replacements of components shall be performed in accordance with IWA-4000 or IWA-7000, respectively.

#### Code Relief Request

Relief is requested from performing a code repair for the flaw detected during plant operation in code Class 3 piping.

#### Basis for Relief

Code repair requirements are impractical unless the facility is shut down.

#### Proposed Alternative

The licensee proposed to utilize the guidance in GL 90-05 and leave the leaking pipe "as is."

The licensee has determined that conformance with code repair requirements is impractical. There are no isolation valves between the leak and the Unit 1/ Unit 2 common ESW return header so an ASME Code repair would require a twounit shutdown. The licensee proposed leaving the piping "as is" because the leak rate is less than one drop per minute and clamping or covering the area could facilitate MIC. The leak will be monitored according to the requirements in GL 90-05. If necessary, an emergency repair will be done.

#### 3.0 EVALUATION

The "pin-hole" leak is actually a wetness on the small 3"pipe from the HPCI room coolers. The condition of the defect has been characterized and sized using ultrasonic testing (UT) and was determined to be a small pit originating at the inside surface of the pipe. The structural integrity of the flawed pipe has been evaluated using the "through-wall flaw" technique which was discussed in GL 90-05 and verified by a second method. An evaluation of the effects of postulated wall thinning on the existing calculated pipe stresses has been performed, and the results indicate that the measured thicknesses provide adequate structural integrity to maintain the piping stresser below the ASME code allowable for all required loading conditions. Thus, there is no safety concern with leaving the flawed pipe in the "as is" condition until the next refueling outage, which is scheduled to begin March 21, 1992.

The ESW system at Limerick is common to Units 1 and 2 and consists of two independent loops (A and B) with two 50% system capacity (100% loop capacity) pumps per loop. The system is described in Section 9.2.2 of the Updated Final Safety Analysis Report (UFSAR). During normal plant operation, all of the many heat exchangers (such as the HPCI pump compartment unit coolers) servicing safety-related equipment are cooled by the service water system. with the exception of the diesel generators. Essential heat loads normally cooled by the service water system are automatically transferred to the ESW system under accident conditions. The normal system alignment is that the "A" heat exchangers and coolers in each Unit are provided cooling water by the "A" loop of the ESW system and the "B" heat exchangers and coolers in each Unit are provided cooling water by the "B" loop of the ESW system. The leak or flaw is in the 3" pipe leading from the outlet of the High Pressure Coolant Injection (HPCI) room unit coolers to the common Unit 1/Unit 2 ESW return header. There are no isolation valves between the leak and the common ESW return header. The licensee is evaluating plant modifications to add various valves to the Service Water and ESW systems to permit isolation of some sections which are not now isolatable.

Isolation of the defect to implement a Code repair or replacement requires a two-unit shutdown in accordance with LGS Technical Specifications (TS) since the loss of the "B" loop of ESW makes the Unit 1 and Unit 2 HPCI room unit coolers inoperable, and therefore, the associated HPCI systems inoperable. The HPCI TS Limiting Condition for Operation requires that all other Emergency Core Cooling System (ECCS) components be operable with HPCI inoperable. However, since the "B" loop of ESW supplies cooling water to half of the diesel generators and half of the ECCS room unit coolers for both units, loss of this loop causes a subsequent loss of the associated diesel generators and ECCS systems. This condition requires that both units be in at least "Startup" within six (6) hours, at least "Hot Shutdown" within the following six (6) hours, and at least "Cold Shutdown" within the subsequent 24 hours.

As noted above, there is no safety concern with leaving the present flaw "asis" until the upcoming refueling outage for LGS, Unit 1. The staff agrees with the licensee that it would be an undue hardship to have to shutdown both Limerick Units to repair a non-problem. Considering safety issues such as shutdown risks and grid stability, it would be very undesirable to require shutdown of both units simultaneously without a compelling safety concern.

### CONCLUSION

The staff has determined that code repair requirements in this case are impractical as defined in GL 90-05. Repairing the pipe in conformance with code requirements would require shutdown of both Limerick units.

Furthermore, the licensee has committed to the guidance provided in GL 90-05 which will reasonably assure structural integrity and protect public health and safety. The structural integrity of the flawed pipe has been found acceptable by the "through wall" analysis technique defined in GL 90-05. If

the pipe is found during the monitoring period to deteriorate enough to compromise structural integrity, an emergency repair will be done.

Accordingly, the staff concludes that granting relief where code requirements are impractical and imposing alternative requirements are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest, giving due consideration to the burden upon the licensee and facility that could result if the code requirements were imposed on the facility. Pursuan to 10 CFR 50.55a(g)(6)(i) and consistent with the guidance in GL 90-05, relief is granted until the next scheduled outage exceeding 30 days, but no later than the next scheduled refueling outage. The flawed pipe must then be repaired or replaced in accordance with the code.

Principal Contributor: Lee Banic

Date: February 26, 1992