

July 19, 2000

Mr. John K. Wood
Vice President - Nuclear, Perry
FirstEnergy Nuclear Operating Company
P.O. Box 97, A200
Perry, OH 44081

SUBJECT: PERRY NUCLEAR POWER PLANT, UNIT 1 - RESOLUTION OF GENERIC LETTER 96-06, ASSURANCE OF EQUIPMENT OPERABILITY AND CONTAINMENT INTEGRITY DURING DESIGN-BASIS ACCIDENT CONDITIONS (TAC NO. M96850)

Dear Mr. Wood:

Generic Letter (GL) 96-06, "Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions," was issued on September 30, 1996. The GL requested licensees to determine (1) if containment air cooler cooling water systems are susceptible to either water-hammer or two-phase flow conditions during postulated accident conditions, and (2) if piping systems that penetrate the containment are susceptible to thermal expansion of fluid so that overpressurization of piping could occur. Your letters of October 30, 1996 (PY-CEI/NRR-2106L), January 28 (PY-CEI/NRR-2132L), March 14 (PY-CEI/NRR-2146L), May 30, 1997 (PY-CEI/NRR-2174L), August 31, 1998 (PY-CEI/NRR-2320L), and September 16, 1999 (PY-CEI/NRR-2428L), responded to the GL.

Water-hammer or Two-Phase Flow

Cooling water systems serving the containment air coolers may be exposed to the hydrodynamic effects of water-hammer during either a loss-of-coolant accident or a main steamline break. In addition, cooling water systems serving the containment air coolers may experience two-phase flow conditions during design-basis accident scenarios whereas the heat removal assumptions were based on single-phase flow conditions. Therefore, cooling water systems may need corrective actions to satisfy system design and operability requirements.

The containment cooling systems at Perry vulnerable to the concerns identified in the GL are the Drywell Cooling System and the Containment Vessel Cooling System. The Drywell Cooling System is designed to maintain ambient air temperatures in the drywell within its design temperature limit of 145 °F during normal plant operation. The Containment Vessel Cooling System is designed to maintain ambient air temperatures in the containment within its design limit of 95 °F during normal plant operation.

Based on the information provided in your response, it is the staff's understanding that:

- The containment and drywell cooling systems are not credited for accident mitigation,

- Sufficient static pressure is maintained in the containment vessel cooling system to prevent steam formation during the event scenarios of interest,
- Sufficient static pressure is maintained in the drywell cooling system to prevent steam formation in the fan coolers provided that temperatures are less than 250 °F, and
- Procedures have been modified to assure that the drywell cooling system will not be restored to service, following isolation, if the drywell temperature has reached or exceeded 250 °F at any time during the course of the event scenario.

Therefore, the staff concludes that your response adequately addresses the water-hammer and two-phase flow concerns identified in the GL.

Piping Overpressurization

Thermally induced overpressurization of isolated water-filled piping sections in containment could jeopardize the ability of accident-mitigating systems to perform their safety functions and could also lead to a breach of containment integrity via bypass leakage. Corrective actions may be needed to satisfy system operability requirements.

Your response identified 11 containment piping penetrations that were considered vulnerable to a water solid volume that could be subjected to an increase in pressure due to heating of trapped fluid. In order to minimize the possibility of overpressurizing these piping penetrations, your response indicated that two penetrations will be procedurally drained during normal plant operation and that eight penetrations have had pressure relief valves installed. The remaining penetration, which has two separate lines, will have one line procedurally drained and a pressure relief valve has been installed on the second line.

Based on this information, the staff concludes that your response adequately addresses the piping overpressurization concerns identified in the GL.

This action closes the staff's activities associated with GL 96-06.

Sincerely,

/RA/

Douglas V. Pickett, Sr. Project Manager, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-440

cc : See next page

- Sufficient static pressure is maintained in the containment vessel cooling system to prevent steam formation during the event scenarios of interest,
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- Procedures have been modified to assure that the drywell cooling system will not be restored to service, following isolation, if the drywell temperature has reached or exceeded 250 °F at any time during the course of the event scenario.

Therefore, the staff concludes that your response adequately addresses the water-hammer and two-phase flow concerns identified in the GL.

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This action closes the staff's activities associated with GL 96-06.

Sincerely,
/RA/
 Douglas V. Pickett, Sr. Project Manager, Section 2
 Project Directorate III
 Division of Licensing Project Management
 Office of Nuclear Reactor Regulation

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