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April 25, 1996
PY-CEI/NRR-2047L

United States Nuclear Regulatory Commission
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Washington, DC 20555

Perry Nuclear Power Plant
Docket No. 50-440
Response to Request for Additional Information Regarding Bulletin 95-02, "Unexpected Clogging of a Residual Heat Removal (RHR) Pump Strainer While Operating in Suppression Pool Cooling Mode." (TAC M93884)

Gentlemen:

On April 1, 1996, an NRC request for additional information (RAI) dated March 27, 1996, was received regarding the Perry Nuclear Power Plant (PNPP) response to NRC Bulletin 95-02, "Unexpected Clogging of a Residual Heat Removal (RHR) Pump Strainer While Operating in Suppression Pool Cooling Mode." This RAI followed a telephone conference with members of the NRC staff on March 20, 1996, discussing the same subject. The response to each item is below.

Question 1: Describe how the suppression pool is cleaned each refueling outage.

Response: Submerged suppression pool surfaces are methodically vacuumed free of any accumulated "dust" films, including the floor, drywell vents, and the Safety Relief Valve downcomers and spargers. The removed filtrate is quantified. During the fifth refueling outage, approximately 71 pounds of wet filtrate was removed from the pool. Also, other items removed from the pool during the cleaning process are logged. These items are either too heavy to be attracted and adhered to a strainer or, when combined, comprise a negligible total surface area such that the objects are not viewed as significant contributors to strainer fouling.

Question 2: Is the bottom of the pool free of corrosion products and other particulates after cleaning?

Response: Accumulations of corrosion products were not observed during the suppression pool cleanliness acceptance inspections. A post cleaning video inspection

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revealed that some light particles remain on the submerged surfaces. These particles are easily displaced with any movement, and remain because they were displaced by the cleaning activities. Since these minute particles are significantly smaller than strainer hole size, it is fully expected that these particles would pass through an Emergency Core Cooling System (ECCS) suction strainer.

Question 3: Provide the following information for any pump runs longer than those performed for the In-Service Testing during the last cycle (e.g., suppression pool cooling situations). In particular, we understand from a March 20, 1996 telecon with you that a 6+ hour run of one residual heat removal pump was performed.

- a. A description of the test;
- b. the results of the test, and;
- c: why the pump run(s) provide sufficient turbulence for ensuring adequate mixing of the entire suppression pool.

Response: On March 19 and 20, 1996 during refueling outage 5, a 6-1/3 hour RHR "B" pump run in test return mode was conducted. The purpose of this extended pump run was to verify satisfactory suppression pool cleanliness following initial cleaning. An inspection of the RHR "B" strainer immediately following this extended run revealed no visual evidence of fouling. No change in strainer differential pressure was expected or observed.

Because of the 1993 strainer fouling experienced at PNPP, the implemented suppression pool cleaning process is comprehensive. Pool areas are cleaned and inspected. Both RHR "A" and "B" systems at PNPP are equipped with nozzles to increase water velocity in the pool to preclude short cycling and thermal stratification during the pool cooling and test return modes of operation. At normal system flow rates, the discharge jet from either of these submerged nozzles increases the bulk suppression pool velocity to more than 1 foot per second (ft/sec). The flow from a single system is sufficient to easily suspend fiber, as evidenced by testing performed and documented in NUREG/CR 6368, Experimental Investigation of Sedimentation of LOCA-Generated Fibrous Debris and Sludge in BWR Suppression Pools, which showed fiber would be suspended in water at velocities as low as 0.01 ft/sec.

Question 4: Are there any plans for longer emergency core cooling system pump runs or pump runs with more than one pump, when checking for pool cleanliness?

Response: There are no plans for extended duration pump runs or runs with multiple pumps for pool cleanliness verification. An extended RHR "B" pump run described in the above response to question three has been performed. The previously described inspections of the suppression pool are judged to exceed the assurance of pool cleanliness provided by any single test, independent of its rigor.

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In view of the 1993 strainer fouling experience at PNPP, performance of pool cleanliness acceptance tests utilizing both RHR "A" and "B" simultaneously was considered. In light of the comprehensive, methodical approach to suppression pool cleaning now implemented at Perry as a result of the 1993 fouling experiences, the continued inspections through the operating cycle, and the velocity imparted to the pool by a single loop of RHR "A" or "B" operating, it was determined that further testing was not warranted.

If you have questions or require additional information, please contact Mr. James D. Kloosterman, Manager - Regulatory Affairs, at (216) 280-5833.

Very truly yours,



for Donald C. Shelton

TAH:th

cc: NRC Region III
NRC Resident Inspector Office
NRC Project Manager