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SENIOR VICE PRESIDENT  
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November 16, 1995  
PY-CEI/NRR-2000L

U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D.C. 20555

Perry Nuclear Power Plant  
Docket No. 50-440  
Response to NRC Bulletin 95-02: "Unexpected Clogging of a Residual Heat Removal (RHR) Pump Strainer While Operating in Suppression Pool Cooling Mode."

Gentlemen:

The subject bulletin dated October 17, 1995, addressed the unexpected clogging of a residual heat removal pump strainer while operating in suppression pool cooling mode. It requires licensees to submit within 30 days, a report indicating to what extent the licensee intends to comply with the requested actions in the bulletin. In the 30 day report, licensees that intend to comply are to provide a detailed description of the actions taken, the results of evaluations performed, any corrective actions taken, and a description of the planned test(s) and inspections for confirming the operability evaluations. In addition, the schedule for pool cleaning, the basis for the cleaning schedule, and a summary of any additional measures taken to detect and prevent clogging, are to be included in the response.

PNPP intends to fully comply with the actions requested in NRC Bulletin 95-02. This response fully meets the response requirements of the bulletin.

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

Very truly yours,

CRE:sc

Attachment  
Enclosure

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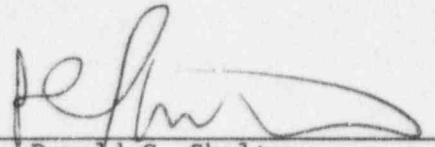
cc: NRC Project Manager  
NRC Resident Inspector Office  
NRC Region III Administrator

Operating Companies  
Cleveland Electric Illuminating  
Toledo Edison

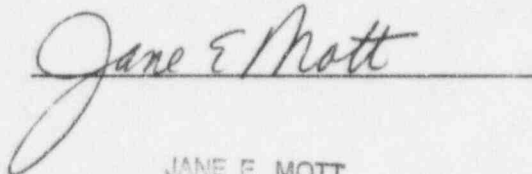
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I, Donald C. Shelton, being duly sworn state that (1) I am Senior Vice President, Nuclear of the Centerior Service Company, (2) I am duly authorized to execute and file this certification on behalf of The Cleveland Electric Illuminating Company and Toledo Edison Company, and as the duly authorized agent for Duquesne Light Company, Ohio Edison Company, and Pennsylvania Power Company, and (3) the statements set forth herein are true and correct to the best of my knowledge, information and belief.

  
Donald C. Shelton

Sworn to and subscribed before me, the 16<sup>th</sup> day of November,  
1995.



JANE E. MOTT  
Notary Public, State of Ohio  
My Commission Expires Feb. 20, 2000  
(Recorded in Lake County)

CODED/8838/SC

## RESPONSE TO NRC BULLETIN 95-02

NRC Bulletin 95-02 dated October 17, 1995, addressed unexpected clogging of a residual heat removal (RHR) pump strainer while operating in suppression pool cooling mode. The NRC Bulletin requested licensees to take five actions. The Perry Nuclear Power Plant (PNPP) intends to fully comply with the actions which are restated with their respective response below.

1. Verify the operability of all pumps which draw suction from the suppression pool when performing their safety functions (e.g., ECCS, containment spray, etc.), based on an evaluation of suppression pool and suction strainer cleanliness conditions. This evaluation should be based on the pool and strainer conditions during the last inspection or cleaning and an assessment of the potential for the introduction of debris or other materials that could clog the strainers since the pool was last cleaned.

### PNPP Response:

The PNPP suppression pool was last cleaned in 1994. It was last inspected on April 22, 1995, and met the acceptance criteria delineated in Plant Administrative Procedure (PAP)-0204, "Housekeeping/Cleanliness Control Program." Suppression pool suction strainers are inspected after every Emergency Core Cooling System (ECCS) pump run in which suction is taken from the suppression pool; this results in the strainers being inspected on a frequent basis (i.e., approximately twice a month). Additionally, the containment and drywell are maintained under Zone III (ANSI N45.2.3) cleanliness classification when the plant is in Operational Conditions 1, 2, and 3. Weekly housekeeping inspections with detailed inspection criteria are performed to ensure that appropriate cleanliness conditions of the containment and drywell are sustained. In 1993, PNPP encountered ECCS suction strainer fouling which resulted in the issuance of Confirmatory Action Letter (CAL) RIII-93-007. The responses to CAL RIII-93-007, contained in letters PY-CEI/OIE-0402 L, PY-CEI/OIE-0404 L, and PY-CEI/OIE-0405 L, detail actions taken and programs established to maintain suppression pool, containment, and drywell cleanliness. These responses are dated May 9, 1993, May 17, 1993, and May 24, 1993, respectively.

Based on an evaluation of strainer and suppression pool conditions and the cleanliness conditions of the containment and drywell, the five ECCS pumps (i.e., RHR A, RHR B, RHR C, Low Pressure Core Spray (LPCS), High Pressure Core Spray (HPCS)) and the Reactor Core Isolation Cooling (RCIC) pump, which draw suction from the suppression pool, are operable.

2. The operability evaluation in requested action 1 above should be confirmed through appropriate test(s) and strainer inspection(s) within 120 days of the date of this bulletin.

**PNPP Response:**

The tests needed to confirm the operability evaluation of action 1 above have been performed. The five ECCS pumps were tested in accordance with Technical Specification Surveillance Requirement 4.0.5 procedures. As part of each surveillance test procedure, the associated suppression pool suction strainer is inspected after the subject pump run. The table below lists the pump and date operability was confirmed through testing.

<u>Pump</u>	<u>Date Tested</u>
RHR A	9/22/95
RHR B	10/30/95
RHR C	10/28/95
LPCS	9/23/95
HPCS	10/18/95

Operation of either the RHR "A" or RHR "B" systems with its suction and discharge aligned to the suppression pool results in significant pool turbulence, and the suspension of neutral density debris in the pool. This mixing action, combined with the strainer inspections, is judged to provide an effective means of demonstrating suppression pool cleanliness and susceptibility to strainer fouling.

The RCIC system is not configured to operate in a test mode which utilizes the suppression pool as a suction source for sustained periods of time. The suction velocities at the RCIC strainer at normal flow rates are lower than those for the ECCS strainers; therefore, the ability of the RCIC strainer to attract and hold debris is less than that for the ECCS suction strainers. The RCIC strainer is inspected along with the ECCS suction strainers under the Plant Equipment Rounds (PERs) after each ECCS pump is operated with its suction aligned to the suppression pool. Although the RCIC suppression pool suction strainer is not tested for fouling, its susceptibility to fouling is adequately demonstrated by the periodic testing of the ECCS system suppression pool suction strainers and subsequent strainer inspections.

3. Schedule a suppression pool cleaning. The schedule for cleaning the pool should be consistent with the operability evaluation in requested action 1 above. In addition, a program for periodic cleaning of the suppression pool should be established, including procedures for the cleaning of the pool, criteria for determining the appropriate cleaning frequency, and criteria for evaluating the adequacy of the pool cleanliness.

**PNPP Response:**

The PNPP suppression pool was last cleaned in 1994. It was last inspected on April 22, 1995, and met the cleanliness acceptance criteria delineated in PAP-0204. In addition, as part of the PNPP repetitive maintenance program, cleaning of the suppression pool is scheduled at a frequency of once per fuel cycle and is currently scheduled for the end of the next refueling outage, approximately March 31, 1996. Instructions for the cleaning and inspection are contained in the repetitive task and a work order written specifically for the cleaning evolution. Procedure PAP-0204 delineates cleanliness acceptance criteria. The suppression pool suction strainers are inspected under the PERs during plant operation following the operation of each ECCS pump in which the suppression pool is used for suction. Accumulated debris on the strainers, if any, as well as any items dropped into the suppression pool, are dispositioned in accordance with Generic Maintenance Instruction (GMI-0154), "Suppression Pool Cleaning and Debris Characterization." A corrective action document (i.e., Potential Issue Form (PIF)) is initiated whenever an item which is dropped into the suppression pool cannot be immediately retrieved.

Based on the satisfactory results of the inspections performed to date, and the demonstrated effectiveness of cleanliness controls, the frequency and the next scheduled date for the suppression pool cleaning are considered to be appropriate.

4. Review FME procedures and their implementation to determine whether adequate control of materials in the drywell, suppression pool, and systems that interface with the suppression pool exists. This review should determine if comprehensive FME controls have been established to prevent materials that could potentially impact ECCS operation from being introduced into the suppression pool, and whether workers are sufficiently aware of their responsibilities regarding FME.



**PNPP Response:**

As a result of CAL RIII-93-007, PAP-0204 was extensively revised to include inspection criteria for the containment and drywell. The procedure directs plant personnel to notify the control room if items are dropped into the suppression pool or inaccessible areas. If the item cannot be easily retrieved, a PIF is initiated. Management has clearly communicated this expectation and review of the PIFs generated since the procedure change indicate that personnel are aware of the requirement to generate a PIF. This requirement is consistently implemented when equipment/material is dropped into the suppression pool.

Foreign Material Exclusion (FME) controls on systems and system internal cleanliness requirements are also addressed by PAP-0204. These controls and requirements are applicable to the piping systems taking suction from and providing discharge paths to the suppression pool, and ensure operational debris is not introduced through maintenance activities.

During the performance of the "Effectiveness of Corrective Action" audit, completed October 26, 1995, it was noted that nine PIFs have been generated for foreign material exclusion incidents. Based on the generation of the PIFs, the audit team questioned plant personnel about FME controls. Results of the interviews indicated that clarification is needed regarding FME controls. As a result, the contractor training and plant continuing training programs have been enhanced.

Plant Equipment Rounds procedures direct visual inspection of the suppression pool for debris on a daily basis. Review of plant records indicates that these inspections are being performed as required. Occasionally, unsatisfactory conditions are identified and documented. Records also indicate that the conditions are corrected.

Repetitive task 93-209 is used to track the weekly performance of housekeeping inspections in the containment and drywell. Repetitive task 86-11784 is used to track the performance of extensive suppression pool inspections following an outage and during non-outage periods with high levels of work activities in the containment and/or drywell. Review of the data base indicates that these repetitive tasks are being performed as required and processed accordingly.

Integrated Operating Instruction (IOI-1) "Cold Startup," and IOI-2, "Hot Startup," direct the completion of the containment and drywell closeout checklist. Inspection of the suppression pool and surrounding areas is detailed within the instructions including a requirement for the shift supervisor to perform the inspections. These inspections ensure that suppression pool cleanliness is established and acceptable for plant operating conditions.

Surveillance reports 95-023 and 95-059 document Quality Assurance section personnel walkdown evaluations of the suppression pool. No problems or concerns with suppression pool cleanliness were noted. Additionally, a recent INPO evaluation team indicated that the suppression pool cleanliness was excellent.

The above controls are evidence of the existence of an appropriate FME program which maintains the cleanliness of the suppression pool and the surrounding areas. The inspections, testing, and audits performed are evidence of the effectiveness of these controls. Hence, the established FME controls at Perry comprehensively prevent materials that could potentially impact ECCS operation from being introduced into the suppression pool as a result of operating practices.

5. Consider additional measures such as suppression pool water sampling and trending of pump suction pressure to detect clogging of ECCS suction strainers.

**PNPP Response:**

Sampling of suppression pool water is performed weekly with parameters to indicate presence of fibrous material and corrosion product build-up. However, previous experience at PNPP has shown that sampling of water from the suppression pool can indicate satisfactory results, even though fiber or other deleterious foreign materials may be present in the pool.

A new strainer design was installed at PNPP for the six suppression pool suction strainers in 1993. Due to the increased flow area of the new strainer design, differential pressure increases would not be a meaningful indication of strainer fouling. Using installed instrumentation to monitor suction pressure, a strainer differential pressure increase attributable to strainer fouling would not be detected until the strainer is approximately 80 percent fouled. Although an 80 percent fouled strainer would provide adequate net positive suction head for the pump under accident conditions, dependence on this parameter as an assurance of suppression pool cleanliness/strainer condition on a continuing basis is not appropriate.

Strainer differential pressure is monitored during surveillance testing of the ECCS pumps with parameters established for investigating the condition and for shutting down the pumps. Suction pressure instrumentation for RHR "A" and RHR "B" provide annunciation for low suction pressure conditions for these two pumps. Procedures are in place to backflush the strainers for these two pumps if such action is required, including during accident conditions.

The PNPP containment design affords the capability to visually inspect the suppression pool and suppression pool suction strainers during plant operation. These inspections provide direct evidence of suppression pool/strainer conditions. Additionally, direct access to the suppression pool allows for immediate correction of identified unsatisfactory conditions.

The PNPP has maintained a comprehensive program of suppression pool and strainer inspections, as well as control of cleanliness conditions in the suppression pool, containment, and drywell, since 1993. The combination of effective FME controls, scheduled cleanings of the suppression pool, water sampling, and a continuing requirement for testing and visual inspection, provide reasonable assurance that suppression pool cleanliness/strainer condition is being maintained at a very high level. This response meets the complete response requirements of NRCB 95-02 and constitutes the final response for the PNPP.