

NRCB No. 95-02
10CFR50.54(f)

PECO ENERGY

PECO Energy Company
Nuclear Group Headquarters
965 Chesterbrook Boulevard
Wayne, PA 19087-5691

November 16, 1995

Docket Nos. 50-277
50-278
50-352
50-353License Nos. DPR-44
DPR-56
NPF-39
NPF-85U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555Subject: Peach Bottom Atomic Power Station, Units 2 and 3
Limerick Generating Station, Units 1 and 2
Response to NRC Bulletin 95-02, "Unexpected Clogging of a
Residual Heat Removal (RHR) Pump Strainer While Operating
in Suppression Pool Cooling Mode"

Gentlemen:

Attached is PECO Energy Company's response to NRC Bulletin (NRCB) No. 95-02, "Unexpected Clogging of a Residual Heat Removal (RHR) Pump Strainer While Operating in Suppression Pool Cooling Mode," for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3, and Limerick Generating Station (LGS), Units 1 and 2, which was issued on October 17, 1995.

This Bulletin requests that licensees evaluate the operability of their ECCS, and other pumps, which draw suction from the suppression pool. This evaluation should be based on suppression pool cleanliness, suction strainer cleanliness, and the effectiveness of their foreign material exclusion (FME) practices. This operability evaluation should be confirmed through appropriate testing and inspection within 120 days from the date of this Bulletin. NRCB 95-02 also requests that addressees implement appropriate procedural modifications and other actions (e.g., suppression pool cleaning), as necessary, to minimize foreign material in the suppression pool, drywell and containment. In addition, NRCB 95-02 requires that all BWR licensees provide a written response within 30 days of the date of this Bulletin as stipulated in the "Required Response" section of NRCB 95-02.

Therefore, the attachment to this letter provides PECO Energy's response to NRCB 95-02. Each reporting requirement is restated in the attachment followed by our response for PBAPS, Units 2 and 3, and LGS, Units 1 and 2. This response is being submitted under affirmation in accordance with 10CFR50.54(f), and the required affidavit is enclosed.

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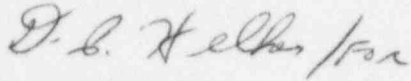
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November 16, 1995

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If you have any questions or require additional information, please do not hesitate to contact us.

Very truly yours,



G. A. Hunger, Jr.
Director - Licensing

Attachment
Enclosure

cc: T. T. Martin, Administrator, USNRC, Region I (w/ attachment & enclosure)
N. S. Perry, USNRC Senior Resident Inspector, LGS (w/ attachment & enclosure)
W. L. Schmidt, USNRC Senior Resident Inspector, PBAPS (w/ attachment & enclosure)

ATTACHMENT

Peach Bottom Atomic Power Station, Unit 2 and 3
Limerick Generating Station, Unit 1 and 2

Response to NRC Bulletin 95-02, "Unexpected Clogging of a
Residual Heat Removal (RHR) Pump Strainer While
Operating in Suppression Pool Cooling Mode"

**Peach Bottom Atomic Power Station, Units 2 and 3
Limerick Generating Station, Units 1 and 2
Response to NRC Bulletin 95-02**

On October 17, 1995, the NRC issued NRCB No. 95-02, "Unexpected Clogging of a Residual Heat Removal (RHR) Pump Strainer While Operating in Suppression Pool Cooling Mode," to alert licensees operating boiling water reactors (BWRs) of complications experienced during a recent event in which a licensee initiated suppression pool cooling in response to a stuck-open safety relief valve (SRV), and subsequently experienced clogging of one (1) Residual Heat Removal (RHR) system pump suction strainer.

Prior to the occurrence of this event, the NRC issued a draft generic communication (i.e., bulletin) for public comment entitled, "Potential Plugging of Emergency Core Cooling Suction Strainers by Debris in Boiling Water Reactors." This draft bulletin provides the NRC's proposed resolution to the generic BWR suction strainer clogging concern identified in previous NRC generic communications (i.e., NRCB 93-02 and NRCB 93-02, Supplement 1). The concerns covered in the draft bulletin, although related, differ from the issue discussed in NRCB 95-02. Specifically, the draft bulletin focuses on the potential for Emergency Core Cooling System (ECCS) pump suction strainers to be clogged by debris following a Loss of Coolant Accident (LOCA), while NRCB 95-02 addresses the potential for ECCS pump suction strainers to be clogged during normal operations by debris which is presently in the suppression pool, or which may accumulate in the suppression pool during normal operations.

Accordingly, NRCB 95-02 requests that BWR licensees review the operability of their ECCS and other pumps which draw suction from the suppression pool while performing their safety function. The licensee's evaluation should be based on suppression pool cleanliness, suction strainer cleanliness, and the effectiveness of their foreign material exclusion (FME) practices. This operability evaluation should be confirmed through appropriate testing and inspection within 120 days from the date of this Bulletin. This Bulletin also requests that addressees implement appropriate procedural modifications and other actions (e.g., suppression pool cleaning), as necessary, to minimize foreign material in the suppression pool, drywell and containment. In addition, NRCB 95-02 requires that all BWR licensees provide a written response within 30 days of the date of this Bulletin as stipulated in the "Required Response" section of NRCB 95-02. Each reporting requirement is restated below followed by PECO Energy's response for PBAPS, Units 2 and 3, and LGS, Units 1 and 2.

Reporting Requirement 1

Within 30 days of the date of this bulletin, a report indicating to what extent the licensee intends to comply with the requested actions in this bulletin. In this report, licensees that intend to comply should provide a detailed description of their actions, the results of their evaluations, any corrective actions they have taken, and a description of the licensee's planned test(s) and inspection(s) for confirming their operability evaluation. In addition, licensees should include their schedule for pool cleaning, the basis for the cleaning schedule, and a summary of any additional measures taken to detect and prevent clogging of the ECCS pump suction strainers. If a licensee does not intend to comply with these requested actions, its report should contain a detailed description of any proposed alternative course of action, and the safety basis for its having determined the acceptability of the planned alternative course of action.

Response

PECO Energy has inspected and/or cleaned the suppression pools at LGS, Units 1 and 2, and PBAPS, Units 2 and 3, in the last year. The following information provides details about the latest inspection and/or cleaning activities that occurred at LGS and PBAPS.

LGS, Unit 1

The Unit 1 suppression pool had not been cleaned since the time the unit commenced operation in 1986. The suppression pool was scheduled to be cleaned during the next refueling outage (i.e., Sixth Refueling Outage - 1R06) which is scheduled to begin in January 1996. However, as a result of the recent event that occurred at Unit 1 in September 1995, which is the basis for the issuance of this Bulletin, the suppression pool was thoroughly inspected by divers and cleaned. The suppression pool floor area and ECCS pump suction strainers were cleaned and vacuumed. The divers cleaning the suppression pool made many independent passes through the suppression pool after cleaning to ensure that any identified foreign material was removed. The majority of the sludge material on the floor was removed during this cleaning activity. The suppression pool water was cleaned/filtered to ensure that essentially all neutrally buoyant fibrous material (which is suspected to be one of the contributing factors responsible for the suction strainer clogging event) was eliminated. Water samples were taken from the suppression pool and analyzed to determine the amount of fibrous material that remained, if any, suspended in solution after the cleaning/filtering process. The analysis concluded that only a trace amount of fibrous material remained, which was evaluated to be insignificant. The sludge material removed from the suppression pool floor area was analyzed to determine if any visible fibrous type material was contained in the sludge. No visible fibrous material was identified. Additional cleaning of some areas of the suppression pool is planned to be performed during the upcoming refueling outage (i.e., 1R06) scheduled to begin in January 1996. A closeout inspection of the suppression pool area was performed as required by plant procedures to ensure the area was free of foreign material prior to restarting the unit. Unit 1 has been in continuous operation since restarting from the September 1995 forced outage.

LGS, Unit 2

The Unit 2 suppression pool was thoroughly inspected by divers and cleaned during its last refueling outage (i.e., Third Refueling Outage - 2R03) which ended in February 1995. The suppression pool inspection and cleaning operation performed was similar to that recently performed on LGS, Unit 1. Any foreign material that was identified was removed, and the suppression pool floor area and submerged vertical surfaces were vacuumed. The ECCS pump suction strainers were inspected and cleaned of any debris, as necessary. Several water samples were taken from the Unit 2 suppression pool over the last three (3) months and no fibrous material was identified. A closeout inspection of the suppression pool area was performed as required by plant procedures to ensure that any foreign material had been removed prior to restarting the unit from the refueling outage. The suppression pool area (i.e., air and water space) has not been entered since power operation commenced following the last refueling outage which ended in February 1995.

PBAPS, Unit 2

The Unit 2 suppression pool (i.e., torus) was thoroughly inspected by divers and cleaned during its last refueling outage (i.e., Tenth Refueling Outage - 2R010) which was completed in October 1994. Any foreign material that was identified was removed, and the torus shell was vacuumed. The ECCS pump suction strainers were inspected. No foreign material or sludge was found on the suction strainers. The sludge debris that was removed during this cleaning was analyzed, and no visible fibrous type material was identified. A closeout inspection of the torus area was performed as required by plant procedures after completing work activities in the torus to ensure that all foreign material was removed prior to restarting the unit from the refueling outage. The torus area (i.e., air and water space) has not been entered since completion of the unit's last refueling outage (2R010) which was completed in October 1994.

PBAPS, Unit 3

The Unit 3 suppression pool (i.e., torus) was last cleaned in 1991. During the last refueling outage (i.e., Tenth Refueling Outage - 3R010) which was completed in October 1995, a thorough inspection of one-half of the torus area was conducted by divers. No appreciable amount of debris/sludge was identified along the bottom of the torus shell area or on the ECCS pump suction strainers. Other than a couple of stands of fibrous type material found on one (1) suction strainer, the condition of the inspected suction strainers were found to be extremely clean. Samples of the debris found were analyzed, and no visible fibrous type material was identified. The amount of debris that was found in the torus during this last inspection indicates that the programs for controlling Foreign Material Exclusion (FME) and torus corrosion at PBAPS have been adequate since no foreign material, and only a negligible amount of sludge was found since the torus was last cleaned in 1991. Based on the finding that the inspected torus areas were clean, no further inspections were deemed necessary at that time.

Quarterly pump, valve, and flow tests have routinely been performed on the ECCS at LGS, Units 1 and 2, and PBAPS, Units 2 and 3, as required by the Inservice Testing (IST) programs being implemented at LGS and PBAPS. Based on the results of these routine system flow tests, there has been no indication of degraded pump performance during the tests. To further evaluate suction strainer conditions, the associated surveillance test procedures used in performing the quarterly pump, valve and flow tests at LGS and PBAPS will be revised to include a measurement of pump suction strainer differential pressure (ΔP). Calculations will be performed for the various ECCS pumps to identify "alert" and "action" values for pump suction strainer ΔP . Establishing these values will provide a mechanism to ensure early indication of degraded suction strainer performance, but before the point where strainer performance will impact ECCS pump operability. ECCS pump suction strainer ΔP will be trended for LGS, Unit 1 and 2, as part of the pump performance monitoring program. Trending this data will provide another mechanism for monitoring potential ECCS pump suction strainer degradation. At PBAPS, Units 2 and 3, pump suction pressure data is currently being recorded in existing surveillance tests.

Suppression pool and torus water samples were taken at LGS and PBAPS and analyzed to determine if any neutrally buoyant fibrous type material existed. As a result of these analyses no fibrous material was discovered suspended in solution at PBAPS, Units 2 and 3, or LGS, Unit 2. The only fibrous material identified was the material that remained in the LGS, Unit 1, suppression pool after the cleaning/filtering effort, which was determined to be insignificant. Plant chemistry sampling at PBAPS and LGS will be revised to require that torus and suppression pool water samples that are routinely taken be analyzed for visible fibrous material.

The LGS, Units 1 and 2, suppression pools will be thoroughly inspected during each unit's next scheduled refueling outage. These inspections will be performed to determine the amount of sludge material present and the condition of the ECCS pump suction strainers, and whether suppression pool cleaning is necessary. Some additional cleaning is planned to be performed on LGS, Unit 1, during its refueling outage (1R06) scheduled for January 1996. Based on the excellent cleanliness results for PBAPS, Units 2 and 3, the need to inspect the suppression chambers will be evaluated based on test results (e.g., water samples and pump performance data). The following table provides information about the schedule for the next refueling outages at PBAPS and LGS.

PBAPS			
Unit 2		Unit 3	
Next Scheduled Refueling Outage	Last Inspection or Cleaning	Next Scheduled Refueling Outage	Last Inspection or Cleaning
September 1996	September 1994 (Cleaned/Inspected)	September 1997	September 1995 (Inspected)
LGS			
Unit 1		Unit 2	
Next Scheduled Refueling Outage	Last Inspection or Cleaning	Next Scheduled Refueling Outage	Last Inspection or Cleaning
January 1996 (Additional Cleaning is Planned)	September 1995 (Inspected/Cleaned)	January 1997	January 1995 (Inspected/Cleaned)

In addition to any suppression pool cleaning activities, PECO Energy is evaluating the need to more routinely operate the LGS, Unit 1 and 2, Suppression Pool Cleanup systems. These systems operate by using a cleaning pump that sends suppression pool water to the main condenser hotwell and returns filtered and demineralized condensate water to the suppression pool. Operating these systems at LGS will reduce the turbidity levels and suspended solids that are present in the suppression pools. PECO Energy is also evaluating the use of a new system to operate in conjunction with the suppression pool cleanup systems at LGS. This new system will be designed to reduce dissolved oxygen concentrations in the suppression pools which may reduce the potential for corrosion product buildup in the suppression pools at LGS. At PBAPS, Units 2 and 3, the torus water has been routinely filtered/demineralized during recent refueling outages. This has been effective in reducing the amount of corrosion products in the suppression chambers. PECO Energy is evaluating other methods at PBAPS to further reduce corrosion and improve suppression chamber water quality.

Any established frequency or criteria for cleaning/desludging the suppression pools at PBAPS and LGS must consider the combined effect of the amount of sludge present and Loss of Coolant Accident (LOCA) generated debris on ECCS pump suction strainer performance, which is currently being evaluated by the Boiling Water Reactor Owners' Group (BWROG) as part of the long term resolution for NRCB 93-02, and NRCB 93-02, Supplement 1. Therefore, a schedule for periodic cleaning of the suppression pools at PBAPS and LGS will not be finalized until this issue is resolved by the BWROG.

Improvements have been made to PECO Energy's FME control program. Although foreign material was identified and removed during the LGS, Unit 1, forced outage in September 1995, a majority of this material is believed to have been present in the suppression pool since the unit first commenced its initial operation in 1986. Extensive closeout inspections were conducted following inspections and/or cleaning activities at PBAPS, Units 2 and 3, and LGS, Units 1 and 2, which were performed over the last year, to ensure that any identified foreign material was removed from the suppression pool areas prior to restarting the units. The PBAPS and LGS units have been operating since these last closeout inspections were completed, and suppression pool cleanliness is assured. Therefore, PECO Energy considers the existing FME controls at PBAPS and LGS for drywell and suppression pool/torus cleanliness adequate.

Although the FME control program is considered to be adequate, the applicable plant procedures at PBAPS and LGS will be reviewed and revised, as necessary, to make additional improvements based on the lessons learned. PECO Energy will have its Nuclear Quality Assurance (NQA) organization perform an independent assessment of the FME control programs at PBAPS and LGS. The purpose of this assessment will be to identify areas of strengths and weaknesses in the existing programs, and recommend ways to improve these programs. Work groups at PBAPS and LGS receive training specific to cleanliness controls. Since the recent event at LGS, there is a heightened awareness of cleanliness controls especially in the area of the drywell and suppression pool. Any procedural changes regarding FME controls that are necessary will be made prior to the next scheduled refueling outages at PBAPS and LGS.

In summary, the suppression pools at PBAPS and LGS have been thoroughly inspected and/or cleaned within the last year. Sludge and water samples have been taken and analyzed for evidence of fibrous material. No visible fibrous material was identified, except for the trace amount of material that remained at LGS, Unit 1, after the extensive cleaning/filtering effort. Following the inspections and/or cleanings, closeout inspections were performed prior to restarting the units. Since that time the PBAPS and LGS units have been operating and there have been no entries into the drywell or suppression pool areas. Routine suppression pool water samples at PBAPS and LGS will be analyzed for evidence of visible fibrous material. Quarterly pump, valve and flow tests will continue to be performed on the ECCS at PBAPS and LGS. During these tests, ECCS pump suction strainer ΔP will be monitored. The ECCS suction strainer ΔP data will be reviewed. In addition, PECO Energy will evaluate the BWROG's recommendations issued by letter dated September 29, 1995, in developing these planned actions.

Therefore, based on the current cleanliness conditions of the PBAPS and LGS suppression pools, and the FME controls that are currently in place, PECO Energy is confident that ECCS pumps at PBAPS and LGS are operable and capable of performing their design function. Furthermore, the programs as described above at PBAPS and LGS will ensure ECCS pump operability by maintaining suppression pool cleanliness conditions, FME controls, and providing for early indication of potential suction strainer performance degradation.

Reporting Requirement 2

If not addressed in the report discussed above by licensees that intend to comply with the requested actions, within 10 days of the completion of the confirmatory tests and inspections or completion of the proposed alternative actions, a second report confirming the completion of all pump operability testing and inspection and providing a description of the test/inspection results. Licensees who do not intend to comply with the requested actions should provide a second report indicating the completion of any proposed alternative actions within 10 days of completing the alternative actions.

Response

PECO Energy considers the actions taken and/or planned as discussed in response to Reporting Requirement 1 above, to be sufficient for ensuring the operability of the ECCS pumps at PBAPS and LGS, both in the short and long term. Therefore, no supplemental report is planned to be submitted at this time in response to this specific reporting requirement.

COMMONWEALTH OF PENNSYLVANIA :
 : ss.
COUNTY OF CHESTER :

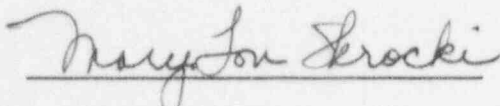
D. B. Fetters, being first duly sworn, deposes and says:

That he is Vice President of PECO Energy Company; that he has read the foregoing response to NRC Bulletin 95-02, "Unexpected Clogging of a Residual Heat Removal (RHR) Pump Strainer While Operating in Suppression Pool Cooling Mode," for Peach Bottom Atomic Power Station, Units 2 and 3, and Limerick Generating Station, Units 1 and 2, and knows the contents thereof; and that the statements and matters set forth therein are true and correct to the best of his knowledge, information, and belief.



Vice President

Subscribed and sworn to
before me this 16th day
of November 1995.



Notary Public

Notarial Seal
Mary Lou Sikrocki, Notary Public
Tredyffrin Twp., Chester County
My Commission Expires May 17, 1999
Member, Pennsylvania Association of Notaries