Station Support Department

NRCB 96-03

PECO NUCLEAR

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

September 6, 1996

Docket No. 50-353 License No. NPF-85

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U.S. Nuclear Regulatory Commission Attn: Document Control Desk Washington, DC 20555

Subject: Limerick Generating Station, Unit 2 Deferral of ECCS Suction Strainer Modification Activities Associated With NRC Bulletin 96-03

Gentlemen:

On May 6, 1996, the NRC issued Bulletin 96-03, "Potential Plugging of Emergency Core Cooling Suction Strainers by Debris in Boiling Water Reactors," requesting that all Boiling Water Reactor (BWR) licensees implement appropriate procedural measures and plant modifications to minimize the potential for clogging of the Emergency Core Cooling System (ECCS) suppression pool suction strainers by debris generated during a Loss of Coolant Accident (LOCA). Specifically, Bulletin 96-03 identified potential resolution options that could be implemented by licensees to ensure the capability of the ECCS to perform its safety function following a LOCA. These options include: 1) installation of a large capacity passive strainer design, 2) installation of a self-cleaning strainer, 3) installation of a backflush system, or 4) licensees could propose alternative options that provide an equivalent level of assurance that the ECCS will perform its design function following a LOCA. Bulletin 96-03 requested that the requested actions associated with the Bulletin be implemented by the end of the first refueling outage starting after January 1, 1997. The purpose of this letter is to provide notification that the requested actions identified in Bulletin 96-03 cannot be implemented for Limerick Generating Station (LGS), Unit 2, within the time period specified. PECO Energy will submit its final response to this Bulletin within 180 days of the date of the Bulletin as required.

PECO Energy has evaluated the options identified in Bulletin 96-03 and has determined that the installation of large-capacity, passive, pump suction strainers (i.e., Option 1 in Bulletin 96-03) is the most viable option for implementation at LGS due to the large amount of fibrous insulation installed on the piping in the drywell. PECO Energy is planning to install large-capacity, passive, strainers on the Residual Heat Removal (RHR) and Core Spray (CS) system pump suction lines at LGS, Units 1 and 2. The strainers will be similar in configuration to those described in the Boiling Water Reactors Owners' Group (BWROG) alternate strainer test report. However, if any new design concepts are developed by the BWROG or NRC regarding the installation of large-capacity, capacity, capa

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The large-capacity, passive, strainers will be of sufficient size to accommodate the maximum loading of fibrous insulation and sludge material that could be expected from any credible combination of accident and operational debris over the life of the plant. As part of the preliminary, strainer-sizing, design effort, we have determined that sufficiently sized strainers cannot be mounted on the existing piping without the installation of additional supports and reanalysis of the hydrodynamic loads. This is due to the existence of only a 2% structural load margin for the affected primary containment penetrations (i.e., RHR and CS suction lines). The required number and size of the supports to be installed cannot be determined until completion of the reanalysis of the hydrodynamic loading. The reanalysis of the hydrodynamic loads could result in an unreviewed safety question that requires prior NRC approval before the strainers can be installed.

PECO Energy is not committing to fabricating the new suction strainers in accordance with the applicable requirements of the American Society of Mechanical Engineers (ASME) Codes, as requested in Bulletin 96-03, since these strainers are not pressure retaining components.

PECO Energy does not plan on implementing any new Technical Specifications surveillance requirements for the strainers as requested in Bulletin 96-03. The new strainers will be included in the Inservice Inspection (ISI) Programs for LGS, Units 1 and 2.

LGS, Unit 2, is scheduled to begin its Fourth Refueling Outage (2R04) on January 24, 1997. This refueling outage is currently scheduled to last for approximately 20 days, with an expected restart date of February 13, 1997. PECO Energy has developed a critical path schedule to determine the time needed to perform the required engineering, procurement, and construction activities necessary to install the new suction strainers on the RHR and CS systems during 2R04. This schedule is based on both PECO Energy resource allocation and vendor estimates, and represents the minimum lead time needed to install the new strainers during 2R04. The engineering analysis which is being performed to support the new strainer design could result in an unreviewed safety question that will require prior NRC approval. Based on the schedule that has been developed for this modification, there will not be adequate time to complete the required engineering and procurement activities to support strainer installation during 2R04. Therefore, PECO Energy is requesting that the installation of the new, ECCS-pump, suction strainers for Unit 2 be deferred until the Fifth Refueling Outage (2R05), scheduled for April 1999.

In lieu of installing the new suction strainers on the ECCS pump suction piping on Unit 2 during 2R04, PECO Energy is planning to perform the following compensatory actions:

Suppression Pool Activities:

As Found Inspection: An as found inspection of the Unit 2 suppression pool (both above and below the waterline) and suction strainers will be performed. This will serve as a verification of the effectiveness of previous Foreign Material Exclusion (FME) control program practices and allow PECO to determine the extent of suppression pool cleaning required.

<u>Sludge and Water Sampling</u>: Sludge and water samples will be taken prior to cleaning and filtering of suppression pool water. These samples will be inspected for the presence of fibers with the potential to cause suction strainer clogging. This will provide another input into the intent of pool water filtering required as well as the effectiveness of the current FME control program.

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<u>Water Filtration</u>: PECO Energy intends to continuously filter the suppression pool water during the outage. The purpose of this filtering is intended to 1) remove particulate, suspended in the water from suppression pool cooling and cleaning operations, and 2) increase general visibility in the suppression pool to assure the thoroughness of the planned diver inspections.

<u>Suppression Pool Cleaning/Desludging</u>: This activity consists of several actions. Horizontal surfaces readily accessibly from the catwalk will be vacuumed to remove any dirt/debris. The inside of the suppression pool downcomers will be inspected and cleaned as necessary up to the waterlevel and any floating debris (if found) will be removed. Also, a thorough desludging of the suppression pool will be performed, if required, to assure that Unit 2 starts its next operating cycle with no appreciable accumulation of sludge or operational debris.

Documenting of any Debris Found: Any debris found during any of the inspections/cleaning will be documented. This will allow PECO to identify the source of the debris and identify any further required improvements to our FME control program.

Final Inspection: At the completion of the cleaning activities, a final inspection will be conducted of the suppression pool area to verify the thoroughness of the cleaning activities and the removal of all maintenance tools and equipment. This inspection will also be documented on video tape to provide a record of the effectiveness of the cleaning.

Drywell Activities:

Insulation Inspection: All insulation in the drywell will be inspected for damage and proper installation. Defects will be corrected to minimize the potential for generating operational debris.

<u>Removal/Replacement of Non-metallic Tags</u>: In order to reduce the concerns associated with operational debris, all non-metallic tags will be removed from the Unit 2 drywell or replaced with metallic tags.

<u>Closeout Inspection</u>: A thorough inspection will be conducted of the Unit 2 drywell just prior to closure. This inspection will assure that foreign material which may have been introduced during the outage has been removed.

In addition to the compensatory actions taken during the outage, several design features at LGS, and previous actions taken by PECO Energy, will also assure that Unit 2 can be operated safely in the interim prior to the installation of the new ECCS suction strainers. These plant features/actions are as follows:

<u>RHR Service Water Crosstie to the RHR System</u>: LGS has the capability to crosstie the Residual Heat Removal Service Water (RHRSW) System to the RHR system in order to flood the reactor vessel and containment if necessary. Therefore, RHRSW can provide a source of cooling water in the event of suction strainer fouling. The crosstie valves are motor-operated and can be opened from the Main Control Room.

<u>Operator Training</u>: In April, 1994, all licensed operators at LGS received training on ECCS suction strainer clogging. The training included a review of the findings from Susquehanna, Barseback, and Perry, and focused on the indications that would alert the Main Control Room operators to this condition. This training was instrumental in the timely recognition of the clogged RHR suction strainer at LGS in September, 1995. In September 6, 1996 Page 4

May, 1996, all licensed operators were retrained on RHR suction strainer clogging and trained on RT-6-051-640-*, "RHR Suction Strainer Differential Pressure." Additionally, licensed operators were evaluated on their ability to recognize and react to suction strainer clogging during Job Performance Evaluations (JPM) conducted earlier this year. This evaluation was conducted in the simulator using an "alternate path" JPM.

Inspection of Containment Coatings: An inspection of the Unit 2 containment coatings was conducted during the 1995 outage and no damaged areas of coating were identified. A coating inspection is planned for 2R04. Any damaged coatings will be repaired or evaluated at that time. This action reduces the amount of operational debris which might contribute to strainer fouling.

Trending of ECCS Suction Strainer dP: LGS currently trends dP data for ECCS pumps (with the exception of the High Pressure Coolant Injection (HPCI) system pumps) to detect any changes which might be indicative of suction strainer fouling. This program will continue until the new strainers are installed.

Additional Banding of NUKON insulation: The BWROG testing has shown that the installation of additional banding with modified latches can reduce the amount of insulation that would be damaged following a LOCA, and thereby reduce the potential for suction strainer fouling. PECO Energy is currently preparing an analysis of the effectiveness of this banding with the currently installed suction strainers, and the costs associated with this installation. PECO Energy will consider the installation of this additional banding during 2R04 based on the effectiveness of the additional banding on precluding plugging of the suction strainers.

A description of the critical path activities, which includes start and end dates for various work tasks, is provided in the attachment to this letter.

We would appreciate if the NRC would review our request to defer installing new suction strainers on the Unit 2 ECCS during 2R04, and provide its response by September 30, 1996.

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

Very truly yours,

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G. A. Hunger, Jr. Director - Licensing

Attachment

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H. J. Miller, Administrator, Region I, USNRC (w/ attachment)

N. S. Perry, USNRC Senior Resident Inspector, LGS (w/ attachment)

ATTACHMENT

Critical Path Activities Schedule

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Critical Path Schedule

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Activity	Start	End	Comments
Engineering Design Review existing strainer and penetration loads for margin	4/17/96	Complete	Existing penetrations and piping have only 2% load margin. Hydrodynamic loads will require reevaluation along with support/hanger work to accommodate larger strainers.
Perform Preliminary Strainer Sizing Calculations	5/6/96	Complete	Strainers sized in accordance with draft BWROG test data.
Prepare 3D CAD model of Limerick Suppression pool	5/24/96	Complete	Required to identify interferences for installation and to determine the maximum size strainer which can be installed.
Request and evaluate quotes for hydrodynamic loads evaluation	5/30/96	Complete	N/A
Reevaluate hydrodynamic loads	8/1/96	11/25/96	Includes validation and verification of software, computer model preparation and calculation preparation.
Design strainer supports and piping analycis.	12/1/96	12/28/96	N/A
Prepare UFSAR change and Potential Operating License Amendment	10/31/96	11/25/96	Potential License Amendment required due to revisions to Appendices 3A and 3B of the UFSAR (Design Assessment Report).
Submit Potential License Amendment to NRC for approval	11/25/96	11/25/96	N/A
Obtain NRC approval of Potential License Amendment	11/25/96	Undetermined	Installation of strainers cannot proceed prior to NRC approval of the potential unreviewed safety question resulting from the changes to Appendices 3A and 3B of the Limarick UFSAR (Design Assessment Report). These appendices will be revised to reflect the changes in the hydrodynamic loads ar is.
Prepare Engineering Change Request (ECR) for installation of strainer supports	12/29/96	2/13/97	One ECR for each personation.

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Activity	Start	End	Comments
Obtain PECO approval of Engineering Work Requests (ECRs)	1/6/96	2/14/97	N/A
Engineering Complete	2/14/97	2/14/97	Normally completed nine (9) months prior to the start of the refueling outage.
Procurement Activities			
Prepare specification for proposed strainers	7/22/96	9/13/96	Strainer structural design will be performed by the vendor. The associated structural supports will be designed based on the reevaluated loads. If the strainers were designed to the existing hydrodynamic loads, a more massive strainer structure will be required, and the proposed vendor delivery schedule still would not support the 2R04 outage schedule.
Issue spec for bids	9/13/96	9/13/96	N/A
Evaluate Bids and Award	9/30/96	10/4/96	N/A
Fabricate Strainers and Shipping	10/7/96	3/22/97	Fabrication duration provided by vendor. Includes material procurement, design, owner's review, and fabrication.
Perform QA Receipt Inspection of strainers	3/22/97	3/29/97	Required for all Q material
Pre-Installation Construction Activities			
Prepare Outage Work Orders	1/15/97	1/29/97	Normally completed six (6) months prior to the start of the refueling outage.
Perform QA and ANII review of Work Orders	1/29/97	2/5/97	Normal duration for review is approximately one (1) month.
Ready to Work		3/29/97	Outage starts 1/24/97. Neither engineering nor procurement activities support the installation of the new strainers during 2R04. To support an outage, materials are normally required to be onsite three (3) months prior to the start of the outage.