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February 24, 1992

NUCLEAR ENGINEERING &amp; SERVICES DEPARTMENT

Docket Nos. 50-277  
50-278  
50-352  
50-353

License Nos. DPR-44  
DPR-56  
NPF-39  
NPF-85

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

SUBJECT: Peach Bottom Atomic Power Station, Units 2 and 3  
Limerick Generating Station, Units 1 and 2  
Response to Generic Letter 88-14, "Instrument Air  
Supply System Problems Affecting Safety-Related  
Equipment"

REFERENCE: (1) Letter from J. W. Gallagher to NRC, dated  
February 13, 1989

Dear Sir:

Generic Letter 88-14, "Instrument Air Supply System Problems Affecting Safety-Related Equipment," dated August 8, 1988 requested licensees and applicants to review NUREG-1275, Volume 2, and perform a design and operations verification of the instrument air system at each plant. As a part of this verification, several actions were requested. In the Reference 1 letter, Philadelphia Electric Company (PECo) provided a response to the subject Generic Letter describing those actions which have been taken and actions which will be taken.

We also stated that a summary report would be submitted within 60 days following restart from the next refueling outage of Peach Bottom Atomic Power Station, Unit 3 which would provide notification of completion of all required actions.

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Attached is our summary report which provides notification of completion of all required actions to the commitments provided in the Reference 1 letter. Also contained in the "Completed Action" sections of the summary report are corrections and clarifications to the original response. These corrections and clarifications are contained in the completed actions for commitments 1B, 1D, 1E, and 3G.

If you have any questions, please contact us.

Very truly yours,



G. J. Beck, Manager  
Licensing Section

Attachment

cc: T. T. Martin, Administrator, Region I, USNRC  
J. J. Lyash, USNRC Senior Resident Inspector, PBAPS  
T. J. Kenny, USNRC Senior Resident Inspector, LGS

COMMONWEALTH OF PENNSYLVANIA :

: SS.

COUNTY OF CHESTER :

D. R. Helwig, being first duly sworn, deposes and says:

That he is Vice President, Nuclear Engineering and Services Department of Philadelphia Electric Company, the Applicant herein; that he has read the enclosed response to Generic Letter 88-14 for Peach Bottom Atomic Power Station, Units 2 and 3 Facility Operating License Nos. DPR-44 and DPR-56 and Limerick Generating Station, Units 1 and 2 Facility Operating License Nos. NPF-39 and NPF-85 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.

*DR Helwig*

Vice President

Subscribed and sworn to  
before me this *5th* day  
of *February* 1992.

*Erica A. Santon*

Notary Public

Notarial Seal  
Erica A. Santon, Notary Public  
Tridylton Twp., Chester County  
My Commission Expires July 10, 1995

Summary Report for Actions  
Completed in Response to Generic  
Letter 88-14, "Instrument Air Supply  
System Problems Affecting Safety-Related  
Equipment"

The following is (1) the information requested by the August 8, 1988 Generic Letter, (2) the quoted commitment provided in our February 13, 1989 response (Reference 1) as identified for either Limerick Generating Station (LGS), Units 1 and 2, Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3, or both, and (3) the completed actions.

Generic Letter Request 1

"Verification by test that actual instrument air quality is consistent with the manufacturer's recommendations for individual components served."

Commitment 1A

Limerick Generating Station, Units 1 and 2

"At Limerick Generating Station (LGS) Unit 1, instrument air quality meets the requirements of ANSI standard MC 11.1-1976 ("Quality Standard for Instrument Air") at the discharge of the filters downstream of the instrument air and primary containment instrument gas dryers. The manufacturer's recommended instrument air quality has been identified and compiled for individual safety-related user components served by instrument air systems..."

The acceptance criteria at these components are the same as ANSI Standard MC 11.1-1976 ("Quality Standard for Instrument Air") except that the acceptable particulate size is 40 microns, as compared to 3 microns, as discussed in the LGS FSAR Question 410.73. In the case of the particulate size, the manufacturer's recommended acceptance criterion for most user components is 40 microns or above. Six valves have a manufacturer's recommendation of 5 microns, and 2 valves have a manufacturer's recommendation of 25 microns. These valves have filters which maintain particulates at the appropriate size.

Periodic maintenance of these local filters of these valves will be incorporated into the preventive maintenance program by June 30, 1989. These filters will be monitored periodically and replaced in accordance with the manufacturer's recommendation..."

Completed Action

The maintenance activities associated with the identified filters have been incorporated into the preventive maintenance program as stated above. The filters are monitored periodically and replaced in accordance with manufacturer's recommendations.

Commitment 1B

Limerick Generating Station, Units 1 and 2

"...Filters are also located in the air lines which supply air to the safety-related air operated valves in the diesel generator starting air system and the air lines which supply the inflatable seals for the refueling floor (non-safety-related). The maintenance schedule for the diesel generator starting air system in-line filters is currently under review. Any changes shall be incorporated into the preventive maintenance program by June 30, 1989. The filters for the inflatable seals will be included in the preventive maintenance program by July 28, 1989."

Completed Action

The local filters located in the air lines supplying air to the safety-related air operated valves in the diesel generator starting air system, and in the air lines supplying air to supply the inflatable seals on the refueling floor, have been incorporated into the preventive maintenance program as specified above and are monitored periodically and replaced in accordance with manufacturer's recommendations.

Not all the refueling floor inflatable seals are non-safety-related as identified in the Reference 1 response. The reactor well inflatable seals and stop log inflatable seals are safety-related. As a result, a portion of the service air supplies (i.e., isolation check valves and downstream piping) to the reactor well inflatable seals and the stop log inflatable seals has been upgraded to safety-related.

Commitment 1C

Limerick Generating Station, Units 1 and 2

"At LGS Unit 2, a preoperational test to determine air quality will be performed for instrument air and nitrogen systems at the discharge of the filters downstream of the dryers. Acceptable air quality at the users is verified during the "Cleanness Verification Air Blow" performed under the "Startup Technical Program". Additionally, an air quality test and filter maintenance program similar to those described for LGS Unit 1 will be performed during each refueling outage."

### Completed Action

At LGS, Unit 2, a preoperational test was performed and the results verified that air quality meets the same criteria established for LGS, Unit 1 for instrument air and nitrogen systems at the discharge of the filters downstream of the dryers. Additionally, an air quality test and filter maintenance program similar to the program developed for LGS, Unit 1 is performed during each refueling outage.

### Commitment 1D

#### Peach Bottom Atomic Power Station, Units 2 and 3

"At Peach Bottom Atomic Power Station, an air quality test similar to that used at LGS Unit 1 will be performed prior to restart of each respective unit and during subsequent refueling outages. The manufacturer's recommended instrument air quality has been identified and compiled for individual safety-related user components served by instrument air systems. The manufacturer's recommendations concerning particulate size for 20% of the instrument air users are 50 microns. The manufacturer's recommendations for the other users are either "clean" or "filtered". A review of applicable operating experience, as discussed in LGS FSAR Question 410.73, determined that a limit of no visible particulates (i.e., particulates greater than 50 microns) will ensure long term reliable operation of each component. Therefore, an acceptance criteria for particulate size of 50 microns will be used in the air quality test at Peach Bottom."

### Completed Action

In satisfying the commitment to perform an air quality test similar to that established for LGS, Unit 1, a surveillance test was written and performed for PBAPS, Units 2 and 3 to measure instrument air quality for the Instrument Air System and the Instrument Nitrogen System. However, a recent review of the surveillance test determined that the air quality test performed at the instrument nitrogen header was performed during an outage when the pneumatic line-up to components inside primary containment utilized instrument air instead of instrument nitrogen through the instrument nitrogen header. There were no prerequisites established in the surveillance test to ensure that instrument nitrogen was lined-up and instrument air isolated; therefore, the test was performed taking only instrument air samples instead of instrument nitrogen samples. Subsequent to the discovery of this error, the surveillance test has been revised to ensure that both the Instrument Air System and the Instrument Nitrogen System are tested and that the line-up for each system is appropriate. This revised test has since been performed at PBAPS, Units 2 and 3. The test results are currently under review.



Commitment 1E

Peach Bottom Atomic Power Station, Units 2 and 3

"The control valves in the Containment Atmospheric Dilution System (CADS) supply at PBAPS are not supplied by instrument air or instrument nitrogen but are supplied with nitrogen from the safety grade CADS nitrogen supply. In order to assure air quality, local filters are provided. The filters for these valves will be placed in the preventive maintenance program by June 30, 1989 and will be monitored periodically and replaced in accordance with manufacturer's recommendation."

Completed Action

The filters for the CADS valves have been incorporated into the preventive maintenance program and are now monitored periodically and replaced in accordance with manufacturer's recommendations.

Generic Letter Request 2

"Verification that maintenance practices, emergency procedures, and training are adequate to ensure that safety-related equipment will function as intended on loss of instrument air."

Commitment 2A

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

"In response to INPO's Significant Operating Experience Report (SOER) 88-1, "Instrument Air System Failures", plant procedure ON-119, "Loss of Instrument Air", was written and approved at both stations. It prescribes actions that operations personnel should take in the event of a loss of instrument air. Lists of active (i.e., a component required to move to perform its intended safety function) safety-related air operated components are being added to procedure ON-119 at both stations. These lists will include the fail-safe positions of the components and comments to aid the operators in response to a loss of air event by identifying potential plant responses and directing them to other appropriate procedures, as applicable. These lists will be completed by September 1, 1989 for LGS and April 19, 1989 for PBAPS."

### Completed Action

Lists of active safety-related air operated components have been added to off-normal procedure ON-119 at both stations. These lists include the fail-safe positions of the components and comments to aid operators in response to a loss of air event by identifying potential plant responses and directing them to other appropriate procedures, as applicable.

### Commitment 2B

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

"Maintenance practices at both stations for the instrument air, instrument nitrogen and diesel generator starting air systems will be evaluated against the guidance provided in SOER 88-1 and NUREG-1275, Vol. 2 to determine their adequacy at operating reactors and LGS-2. This comparison will be completed by July 28, 1989 for LGS and February 17, 1989 for PBAPS."

### Completed Action

Maintenance practices at both stations for the instrument air, instrument nitrogen, and diesel generator starting air systems were evaluated using guidance provided in SOER 88-1 and NUREG-1275, Volume 2 and were determined to be adequate. The existing preventive maintenance programs for these systems were developed from vendor/manufacture recommendations, where recommendations were provided, and also from operating experience.

### Generic Letter Request 3

"Verification that the design of the entire instrument air system including air or other pneumatic accumulators is in accordance with its intended function, including verification by test that air-operated safety-related components will perform as expected in accordance with all design-basis events, including a loss of the normal instrument air system. This design verification should include an analysis of current air operated component failure positions to verify that they are correct for assuring required safety functions."



Commitment 3A

Limerick Generating Station, Units 1 and 2

The only safety-related portions of the air systems at LGS that contain accumulators are those that supply the Main Steam Isolation Valves (MSIVs) and the Automatic Depressurization System Main Steam Relief Valves (ADS MSRVs). Verification of the design has been accomplished by the following:

- 1) Calculations have been performed to ensure that the MSIVs and ADS MSRVs accumulator sizes are adequate...
- 2) Periodic testing of the ADS accumulator check valves for leakage is performed once per operating cycle as part of the Local Leak Rate Test (LLRT) Program. The MSIV accumulator check valves have been included in the Surveillance Test program.
- 3) The piping and tubing, which are safety-related, have been verified to be seismically designed.

Similar tests and verification will be performed on LGS Unit 2 prior to startup."

Completed Action

Similar testing and verification as specified were performed at LGS, Unit 2, and the results have determined that the design of the instrument air system is in accordance with its intended function.

Commitment 3B

Limerick Generating Station, Units 1 and 2

"For LGS Unit 1, loss of instrument air pressure tests were performed during preoperational testing. Similar testing will be performed on LGS Unit 2 during preoperational testing. A test description and acceptance criteria are provided in LGS Final Safety Analyses Report Table 14.2-4."

Completed Action

Limerick Generating Station, Units 1 and 2

Loss of instrument air pressure tests were performed successfully during preoperational testing on LGS, Unit 2. A description and acceptance criteria are provided in LGS Updated Final Safety Analyses Report Table 14.2-4.

Commitment 3C

Peach Bottom Atomic Power Station, Units 2 and 3

"The only safety-related portions of the air systems at PBAPS that contain accumulators or backup nitrogen bottles are those that supply the ADS MSRVs, MSIVs, CACS (Containment Atmospheric Control System) valves, CADS valves, and battery room and emergency switchgear dampers. Verification of the design at Peach Bottom Atomic Power Station has been accomplished by the following:

- 1) The ADS MSRV and MSIV accumulators have been verified to be of adequate capacity by calculation. The ADS MSRV and inboard MSIV accumulators are currently being replaced with larger accumulators so that existing accumulator leakage limits, which are very restrictive, can be relaxed. The design function of the ADS accumulators will be verified during the modification acceptance test, which will be performed after completion of the modification. This is scheduled to occur prior to restart of each respective unit..."

Completed Action

The ADS MSRV and inboard MSIV accumulators have been replaced with larger accumulators so that original accumulator leakage limits, which were very restrictive, could be relaxed. The design function of the accumulators was verified during the modification acceptance testing at both units. This Modification (1660) was completed prior to the end of the Cycle 7 Unit 3 refueling outage.

Commitment 3D

Peach Bottom Atomic Power Station, Units 2 and 3

- 1) "...The CADS and CACS air operated valves' back-up nitrogen bottles, which are a safety-related backup supply, will be replaced by the Safety Grade Instrument Gas System, which in turn, is supplied by the CAD tank. This modification will be performed to reduce maintenance requirements associated with the backup nitrogen bottles and will be completed prior to startup following the next refueling outage on each respective unit..."

### Completed Action

The backup nitrogen bottles for the CADS and CACS air operated valves, which were a safety-related backup supply, have been replaced by the Safety Grade Instrument Gas System which is supplied by the CAD tank. This modification (Mod 1316) was completed prior to the end of the Cycle 8 Unit 2 refueling outage for both units to reduce maintenance requirements associated with the back-up nitrogen bottles.

### Commitment 3E

#### Peach Bottom Atomic Power Station, Units 2 and 3

- 2) "...The battery room and emergency switchgear nitrogen bottle check valve leak tests will be included in the LLRT Program and will be performed by the end of the next refueling outage."

### Completed Action

Further review has determined that the leak tests should be included in the surveillance test program rather than the LLRT program. Therefore, the check valves have been incorporated into the surveillance test program at PBAPS, Units 2 and 3. The battery room and emergency switchgear nitrogen bottle check valve leak tests have been performed and found to be within the established leak rate criteria.

### Commitment 3F

#### Peach Bottom Atomic Power Station, Units 2 and 3

"At PBAPS, most air operated safety-related components are periodically tested to verify that the component goes to the fail position when stroking the valve from its control switch. These valves are tested per the Pump and Valve Inservice Testing Program, Local Leak Rate Test (LLRT) Program, Surveillance Tests, or other tests. Those components not included in the above tests (e.g., safety-related dampers) will be tested for loss of air by restart of each respective unit."

### Completed Action

Those components not included in the above tests (e.g., safety-related dampers) have been tested to verify proper operation on a loss of air condition. In all cases, the air operated component operated properly when the loss of air simulation was induced.

Commitment 3G

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

"At LGS and PBAPS, failure modes of air operated safety-related components were reviewed and verified that they are correct for assuring required safety functions."

Completed Action

Subsequent to the original response, an unacceptable failure mode for a pneumatic/electrical interface connected to the PBAPS High Pressure Service Water (HPSW)/Emergency Service Water (ESW) pump compartment fans was identified. The original review was performed using the Quality Assurance Diagrams (QADs) to verify the failure modes of air to safety-related component interfaces. The QADs did not identify the correct quality classification (safety-related) of the pneumatic/electrical interface for the HPSW/ESW pump compartment fan, therefore, the interface and the user were not reviewed. As a result of this discovery, all users identified as safety-related which had an interface with the air system were re-examined regardless of the safety classification of the interfaces. The review identified no additional discrepancies.

Subsequently, a review of safety-related and non-safety-related components at PBAPS has been performed as part of the Components Records List validation program. This effort further verifies the quality classification (safety-related versus non-safety-related) of component interfaces and confirms the operability and safety modes (passive or active) of all PBAPS components.

Generic Letter Request 4

"In addition to the above, each licensee/applicant should provide a discussion of their program for maintaining proper instrument air quality."

Commitment 4A

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

"The program for maintaining proper instrument air quality at LGS and PBAPS is described in our responses to requirements 1 and 2. In addition, regular preventive maintenance is performed on the air compressors, dryers and filters at both stations to maintain proper instrument air quality."

Completed Action

In addition to the actions described above, at PBAPS, Units 2 and 3, installation of modification 1795 was completed (November 8, 1991) which replaced the instrument and service air system compressors and upgraded the systems with new dryers, purification equipment, and instrumentation.