

PHILADELPHIA ELECTRIC COMPANY

2301 MARKET STREET

P.O. BOX 8699

PHILADELPHIA, PA. 19101

(215) 841-5020

M. J. COONEY
MANAGER
NUCLEAR PRODUCTION
ELECTRIC PRODUCTION DEPARTMENT

October 25, 1985

Docket No. 50-278

Inspection Report No. 50-278/85-31

Mr. Thomas T. Martin, Director
Division of Engineering and Technical Programs
U.S. Nuclear Regulatory Commission
Region I
631 Park Avenue
King of Prussia, PA 19406

Dear Mr. Martin:

Your letter dated September 25, 1985 forwarded Inspection Report No. 50-278/85-31 for Peach Bottom Atomic Power Station. Within the scope of this inspection, no violations were observed. However, a concern was identified relative to an incident which involved the exposures to gaseous radioactivity of individuals who entered the Unit 3 recombiner offgas pipe tunnel on March 1, 1985. As a result of this event, your letter requested that Philadelphia Electric Company provide an analysis of the incident including final beta dose to the individuals, the radiation survey meter response to noble gases, and the resolution of discrepancy report 85-087 regarding the difference between the survey meter and the TLD results.

Response

The noble gas release into the Unit 3 offgas pipe tunnel occurred as a result of a pressure transient in the offgas recombiner system. The pressure transient was a result of a combination of problems involving the main condenser and the recombiner mechanical compressors, as discussed in Peach Bottom LER 3-85-07. The prompt identification of the release and the immediate exit from the area by all personnel resulted in very minimal exposure to the individuals involved.

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During the event, the survey meter that was being used by the individuals in the off gas tunnel apparently indicated off scale on the 50 R/hr range with the beta shield open. Following the exit from the tunnel, the instrument reading gradually returned to normal.

Subsequent analysis of the thermoluminescence devices (TLD) worn by the four individuals indicated no beta exposure for three individuals, and 12.5 millirem exposure for the other individual. One individual expressed concern regarding the difference between the survey meter readings and the beta result obtained from his dosimetry. An "as found" calibration showed the instrument response to be normal to direct radiation. After this determination, the investigation centered on how the noble gas release could have caused an erratic up scale response. We suspect that the problem was caused by noble gas entering the detection chamber via a defect in the Mylar Window. We consider the dosimetry data to be representative of the exposure received by the individuals.

It is a known fact that an ionization chamber contaminated with radioactive gas within its chamber will read abnormally high. We are initiating a search for technical references that may quantify this effect. This search should be complete by November 22, 1985. If it is determined that no such experiments have been performed, Philadelphia Electric Company (PECo) will develop and perform in-house, or through a consultant, an experiment to determine such response. It is expected that data from such an experiment will resolve the Discrepancy Report 85-087 regarding the difference between the survey meter and the TLD results.

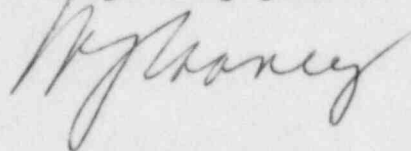
Recent testing of Eberline and Harshaw dosimetry indicates that both of these devices read low, by a factor of about 5, for beta energies less than 300 Kev. In the interest of conservatism, an assumption was made that 50% of the total beta exposure to the individuals involved was due to isotopes having energy levels less than 300 Kev. One of the four individuals involved with the March 1, 1985 event had an Eberline beta reading of zero and a Harshaw beta reading of 12.5 millirem for that date. The 12.5 millirem value has been adjusted conservatively to 38 millirem to account for beta energies less than 300 Kev. A value of 0.038 rem to the skin has been added to this individual's exposure record.

The remaining three individuals had zero beta exposure indicated by both their Eberline and Harshaw readings. Therefore, no adjustments will be made to the exposure

records of the latter three individuals. It is concluded that the agreement between the Eberline and Harshaw dosimetry confirms the low exposure levels experienced by all four individuals and supports our belief that the survey meter's offscale indication was a result of leakage of noble gas contamination into the detection chamber with resultant conservative up scale reading.

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

Very truly yours,



cc: T. P. Johnson, Resident Site Inspector