PHILADELPHIA ELECTRIC COMPANY
2301 MARKET STREET
P.O. BOX 8699
PHILADELPHIA, PA. 19101
(215) 841-5001

1881 - 1981

SHIELDS L. DALTROFF
VICE PRESIDENT
ELECTRIC PRODUCTION

January 30, 1981

Re: Docket Nos. 50-277
50-278

IE Bulletin 80-17 Su

Mr. Boyce H. Grier, Director
Office of Inspection and Enforcement
Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

Dear Mr. Grier:

This letter is in response to IE Bulletin 80-17 Supplement 4 which concerns those BWR's now utilizing a continuous monitoring system (CMS) to detect water in the scram discharge volume (SDV). It is estimated that approximately 40 hours were expended for the bulletin response preparation and approximately 1525 hours expended associated with corrective actions required by the bulletin. The "Actions to be Taken by Licensees of Operating BWR's Using CMS" and our responses are treated sequentially.

1. Bench Test of CMS

Make available the following information which describes the CMS design and the bench tests which have been performed to demonstrate system operability and sensitivity:

(a) System description including a schematic of the apparatus and associated electronics.

(b) Type of sensing device and characteristics (include response characteristics versus temperature).

(c) Calibration criteria, including transmission losses.

(d) Training and testing of personnel performing the calibration test.

Items a through c above may be referenced by the licensee if the information has been submitted to the NRC by the equipment manufacturer.

Response

(a)(b)&(c) The information requested by items (a) through (c) was submitted by General Electric to Mr. W. R. Mills of the NRC's Office of Inspection and Enforcement on December 12, 1980.

(d) The calibration and testing of the CMS was performed by Philadelphia Electric Company instrument technicians. The lead technician is qualified to "Special Tester A" (highest rating of site technicians), and has had extensive experience with similar equipment. The two technicians who assisted are currently in progression to "Special Tester A". Resumes for these three technicians are enclosed in Appendix A.

2. Operability Test of CMS

Prior to conducting the operability test, verify that the CMS on the SDV is installed and calibrated in accordance with the vendor recommendations.

In order to provide assurance of operability of the CMS, if not already performed, conduct an operability test within 14 days of the date of this bulletin. In this test, inject a sufficient amount of water into each SDV header to determine that the ultrasonic transducers are adequately coupled to the SDV piping and that the trip alarm function of the CMS will perform satisfactorily. The test may be performed by single (multiple) rod scram tests while operating. No water may be introduced into the SDV header while the reactor is operating except using the scram function. Independent level measurement must be used to verify CMS operation and proper calibration.

Response

Unit 2

The CMS was calibrated and installed in accordance with the vendor's technical manual with the exception of the coupling

compound used. The first CMS operability test performed on December 27, 1980, was unsuccessful and the system declared inoperable. Manual UT testing to detect water in the SDV was performed during the period of inoperability as described in Item 5 below. Corrective measures included additional cleaning of the SDV pipe exterior, replacement of the coupling compound with a higher temperature compound, and realignment of the transducers.

The CMS was successfully tested by individually scramming control rods during a planned power reduction on January 6, 1981. All 4 transducers responded properly and the water levels measured by the CMS agreed with the SDV level readings obtained using another UT level measuring device.

Alarm setpoints were verified on December 29, 1980, by backfilling the SDV through the scram instrument volume (SIV). Level was monitored with the CMS, another UT device, and a temporary sight glass. All alarms functioned properly.

Unit 3

The CMS was calibrated and installed in accordance with the vendor's technical manual with the exception of the coupling compound used. The compound used initially was replaced on December 20, 1980, with a higher temperature coupling compound. On December 20, 1980, the CMS was tested by backfilling the SDV through the SIV. All four transmitters functioned properly and alarmed at the required set point as confirmed by independent level measurement.

3. Interim Manual Surveillance

In the interim 14-day period before the operability test is completed, perform a manual surveillance for the presence of water in the SDV at least once per shift and after each reactor scram. In order to provide assurance that manual surveillance can detect water accumulation in the SDV, verify that the method and the operator have been qualified by testing which uses or simulates the SDV piping and has the ability to detect different levels of water in the SDV.

Surveillance of SDV manual measurement techniques should be done before completion of the operability test described in Item 2 above.

Response

Unit 2

As directed by the Bulletin, manual testing for the presence of water in the SDV was performed once per shift using the manual UT level detector which was used prior to installation of the CMS. This equipment was qualified on a test pipe which is the same diameter and wall thickness as the SDV pipe and is operated by station personnel trained in its use and calibration. The testing of equipment and training of personnel was conducted by personnel from the Philadelphia Electric In Service Inspection Group who are qualified in the use of UT equipment.

Unit 3

Unit 3 was shutdown on December 18, 1980, due to a scram the previous day. The CMS was successfully tested as required by Item 2 and determined to be operable prior to startup on December 21, 1980. For this reason, the interim manual surveillance was not performed or required.

4. Full Test of CMS to be Conducted During a Planned Outage

During a planned outage within six months, perform a full CMS test using the SDV headers:

(a) Admit water into the SDV to establish fill rates for several (not less than three) in-leakage flow rates. The in-leakage rates should range from approximately the minimum which results in water accumulation in the SDV to a full scram.

(b) Establish and record the response of the CMS indication and alarm functions from the trip level to a full SDV. Provide criteria for replacement or adjustment when exceeding design specifications of the system.

(c) Verify by independent measurement that the alarm initiates at the proper level setpoint.

Response

Unit 2

Tests were performed immediately following a shutdown on January 1, 1981, at three different fill rates and the response of the CMS was recorded. The shutdown was completed by manually scramming the reactor with 66 control rods at

position 48 and all other control rods at 00. The CMS responded to the increase in water level, indicated a full pipe, and alarmed properly. The three tests were: 1) Full scram with all control rods at the full in position to obtain the maximum possible flow rate, 2) Individual scram of one control rod on each header to obtain the minimum flow rate, and 3) Individual scram of four control rods on each header to obtain a flow rate between the minimum and maximum. These tests span the approximate range of possible flow conditions.

On all three tests, the system responded as expected (i.e., indicated increasing water level and alarmed properly). One transmitter did not respond initially on the third test, however, it worked properly after a minor repositioning adjustment. During the subsequent retest, a full scram occurred. The CMS worked properly during both the test and the scram.

Unit 3

The full test of the CMS on Unit 3 has not been performed yet, but is scheduled to be performed during the Spring 1981 refueling outage.

5. Operability of CMS During Reactor Operation

The CMS shall be operable prior to reactor startup and during reactor operation. If the CMS becomes less than fully operable, within 8 hours perform a manual check for water in the SDV and institute procedures for a manual check of the SDV each shift and following scram until the CMS is fully operable. When not fully operable, the CMS should be used to the extent practical in addition to the manual checks.

If the CMS is not operable within 7 days, the frequency of the manual check should be increased to once every 4 hours. If the CMS is not operable within 30 days, the plant shall be shutdown.

To demonstrate continued operability of the CMS during reactor operation, perform periodic surveillance tests for operability of the CMS. For these periodic surveillance tests, test as much of the CMS as practical during reactor operation without injecting water in the SDV. Establish criteria for repair or replacement when the system design criteria or estimated service life limitations are exceeded. The frequency of these periodic surveillance checks should be determined by the licensee.

These periodic surveillance tests should include the following:

(a) determination that the response and power output of the transducer has not degraded;

(b) visual inspection for adequate condition of the transducer to SDV coupling material; and,

(c) a calibration check of the electronics to assure alarm initiation in the control room.

Water should be periodically injected into the SDV to perform a CMS operability and calibration check similar to that specified in Item 2 above. This check should be performed semiannually and during startup after plant outages where maintenance operations may have taken place near to CMS equipment.

Response

Unit 2

The operability requirements specified in Item 5 have been followed, with one exception. The Interim Manual Surveillance Testing once per shift was initiated upon the receipt of the bulletin, as required by Item 3. The CMS operability test as required by Item 2 was performed unsuccessfully on 12/27/80. The unit was restarted on 12/30/80 with the CMS still inoperable. Permission was granted by NRC Region I Office of Inspection and Enforcement through the resident inspector to startup by substituting manual UT level measurement readings every 30 minutes in lieu of CMS operability. On January 5, 1981, the test frequency was decreased to once every 4 hours with Region I Inspection and Enforcement approval. On January 7, 1981, the CMS was determined to be operable following analysis of results of testing which was performed the previous day. The NRC resident inspector concurred with our determination and the manual testing was terminated. The system has been operable since that time

Unit 3

The CMS has been operable since it was tested on December 20, 1980 and therefore has not required additional testing.

Units 2 and 3

Surveillance tests have been written to demonstrate continued CMS operability during reactor operation and include the requirements specified by Bulletin 80-17 S4. Procedures are being written for operability testing and calibration checks similar to those specified in Item 2 to be performed semi-annually and during startup after plant outages for which

maintenance operations have been performed near CMS equipment. Based on evaluation of manufacturers service life recommendations, appropriate criteria will be incorporated in these procedures to prevent exceeding service life limitations. These procedures will be completed by March 1, 1981.

6. Operating Procedures

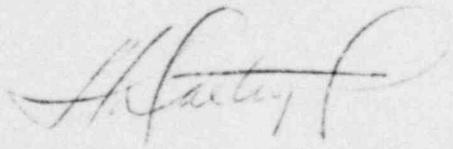
Develop procedures for operation, periodic testing and calibration of the CMS and for repair or replacement when system design specifications are exceeded. Develop procedures for the calibration and use of the hand held UT device in the event of a malfunctioning CMS. Notify the NRC before changing the established CMS alarm level setpoints.

Response

Procedures for operation, testing, and calibration of the CMS have been written or are being developed. These will be completed by March 1, 1981. Repairs to the system will be performed in accordance with Peach Bottom Administrative Procedures and the CMS vendor technical manual. Procedures exist for the calibration and use of our manual UT device which were established prior to the installation of the CMS. This manual system serves the same purpose (redundant monitoring capability) as the "hand held UT device" addressed in this section of the bulletin. No changes have been made to the CMS alarm level setpoints.

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

Very truly yours,



cc: U.S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Division of Reactor Operations Inspection
Washington, DC 20555

APPENDIX A
BULLETIN 80-17 SUPPLEMENT 4

Lead Technician Employed 4/12/72

High School: Monsignor Bonner - Graduated June 1961

U.S. Navy: February 1963 to April 1971 - Reactor Operator/Electronics Tech
ET - Class A school January to March 1963
- Class B school September to November 1968
Nuclear Power School - January to June 1964

Additional Training:

General Physics - Electricity & Electronics/Process Instrumentation & Control 8/11/80 - 9/12/80

General Physics - Practical Instrumentation Lab at Limerick Training Center 9/25-26/80

G.E. Company - BWR Systems & Nuclear Instrumentation Course 9/29/80 - 10/23/80

Works in PECo Susquehanna Test Branch, specializing in accoustic emissions equipment which is very similar to CMS.

Special Tester "A" - Highest rating of Technicians on site - requires 7 years Electronic Technician experience.

APPENDIX A
BULLETIN 80-17 SUPPLEMENT 4

Technician A — Employed 1/22/79

High School: Haddon Heights High - Graduated June 1973

College: Camden County College - Associates Degree in Electrical/Electronic Engineering Technology - Graduated June 1975

Additional Training:

General Physics - Electricity & Electronics/Process Instrumentation & Control 8/11/80 - 9/12/80

General Physics - Practical Instrumentation Lab at Limerick Training Center 9/25-26/80

Completed local training on Area Radiation Monitoring and Feedwater Control Systems in 1979

Currently in progression to Special Tester "A".

APPENDIX /
BULLETIN 80-17 SUPPLEMENT 4

Technician B Employed 9/8/80

High School: William Penn Senior High - Graduated June 1975

College: Penn State - Associates Degree in Electrical Engineering Technology - Graduated June 1977

Additional Training: Penn State - Intro to Microprocessor's 1980

Currently in progression to Special Tester "A".

COMMONWEALTH OF PENNSYLVANIA :

ss.

COUNTY OF PHILADELPHIA :

S. L. Daltroff, being first duly sworn, deposes and says:

That he is Vice President of Philadelphia Electric Company; that he has read the foregoing response to IE Bulletin 80-17 Supplement 4 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.

S. L. Daltroff

Subscribed and sworn to
before me this 30th day
of January, 1981

Elizabeth H. Boyer

Notary Public

ELIZABETH H. BOYER
Notary Public, Phila., Phila. Co.
My Commission Expires Jan. 30, 1982