PHILADELPHIA ELECTRIC COMPANY

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February 18, 1983

Docket Nos. 50-277
50-278

Mr. R. C. Haynes, Administrator
U. S. Nuclear Regulatory Commission
Region I
631 Park Avenue
King of Prussia, PA 19406

SUBJECT: Licensee Event Report Narrative Description

Dear Mr. Haynes:

The following occurrence was reported to Mr. R. A. Blough of Region I U.S. NRC on January 4, 1983:

Reference:	Docket Nos. 50-277 & 50-278
Report Number:	2-83-01/IX-1
Report Date:	February 18, 1983
Event Date:	January 4, 1983
Facility:	Peach Bottom Atomic Power Station Rd 1, Delta, PA 17314

Technical Specification Reference:

This LER is made in accordance with the requirements of USNRC I.E. Bulletin 79-01B which requires, in part, that a report be filed for any class 1E electrical equipment item which has been determined as not being capable of meeting environmental qualifications requirements for the service intended.

Description of the Event:

During environmental qualification testing, electrical switches of the type used for the ECCS room coolers failed. The nylon material used for the switch cam surface became embrittled and cracked during a radiation dose of 27 megarad. This switch is a General Electric type CR2940.

IE22

Cause of the Event:

Radiation induced embrittlement of the nylon cam surface material.

Probable Consequences of the Event:

One mode of failure could potentially cause the shutdown of the RHR System room coolers during the long term (180 day) cooling phase of the design basis LOCA. The radiation levels used in this test were representative of the long term design basis LOCA radiation profiles. Since the RHR system is the long term post LOCA cooling system, it is of primary interest. It is assumed that the loss of the room coolers could lead to the failure of the RHR pump motors due to overheating.

The 180 day LOCA radiation doses in the ECCS rooms are as follows:

System	Dose (MEGA RAD)
RHR	33.5
Core Spray	3.0
HPCI	12.8
RCIC	6.7

As stated in the prompt report, a second failure mode could potentially result in the operation of both room coolers (each room is provided with redundant coolers).

An engineering analysis of PBAPS process diagram Emergency Service Water Bechtel Print 6280 M-343, Rev. A indicates that the ESW design basis is for one ESW pump to provide adequate cooling flow for the four Diesel Generators and 10 ECCS coolers on each unit with an 18% reserve. Therefore, a single ESW pump could supply the four Diesel Generator coolers, 10 coolers in the non-LOCA plant, of which only one is used during a normal shutdown, 10 coolers on the LOCA plant, and an additional six coolers which are assumed to have failed in the "in service" mode. In addition, there is a redundant full capacity ESW pump.

This analysis shows that a switch failure, such that both coolers are operating in all ECCS rooms of the LOCA plant, does not effect long term post-LOCA cooling.

As an additional consideration, a previously reported problem concerning an electrical separation criteria has resulted in the requirement for continuous operation of one cooler in the HPCI, B Core spray, and B RHR rooms (LER 2-81-34/1T-0).

Immediate Corrective Action:

As an immediate corrective action, the control switch contacts have been jumpered in either the run or auto position, as appropriate, and leads have been lifted to ensure that the room coolers will function to provide the proper cooling in both the short and long term ECCS cooling modes.

Future Corrective Action:

Action has been initiated to rewire these switches so that they fail in a conservative mode. Further action on this rewiring is on hold pending the investigation of stainless steel cam material. If this material proves to be successful, new cams will be installed and the switches will be returned to their original configuration.

In addition, an investigation is underway to determine if an alternate material is available to replace the nylon cam surface or if a replacement switch is available.

Sincerely,

M. J. Cooney
Superintendent
Generation Divison-Nuclear

cc: Document Control Desk
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Washington, DC 20555

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Site Inspector
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