

50-352

PHILADELPHIA ELECTRIC COMPANY

2301 MARKET STREET

P.O. BOX 8699

PHILADELPHIA, PA. 19101

(215) 841-4502

MAR 14 1984

JOHN S. KEMPER  
VICE-PRESIDENT  
ENGINEERING AND RESEARCH

Mr. Thomas E. Murley, Director  
Office of Inspection and Enforcement - Region I  
United States Nuclear Regulatory Commission  
631 Park Avenue  
King of Prussia, PA 19406

Subject: Limerick Generating Station, Units 1 & 2  
Revision 1 to Final Significant Deficiency  
Report No. 126 - Feedwater/Safeguard Fill  
System Check Valves Installed Backwards

Reference: Final Significant Deficiency Report No. 126  
Transmitted via. letter J. S. Kemper to T. E.  
Murley - 1/19/84

File: QUAL 2-10-2 (SDR No. 126)

Dear Mr. Murley:

Enclosed is a revised report concerning reversed check valves found in the Feedwater/Safeguard Fill System at Limerick. The original report was sent to your office on January 19, 1984. This revision was made in order to incorporate responses to questions raised by the Resident NRC Inspector at the jobsite. Section II of the report now indicates that only one of the reversed check valves had been accepted by Quality Control and Section III was revised to include the corrective action taken by the construction organization.

Sincerely,

*John S. Kemper*

Copy to: Director of Inspection and Enforcement  
United States Nuclear Regulatory Commission  
Washington, DC 20555

S. Chadhary, Resident NRC Inspector, (Limerick)

8404030188 840314  
PDR ADOCK 05000352  
S PDR

IE27  
11

Limerick Generating Station, Units 1 & 2  
Significant Deficiency Report No. 126, Revision 1  
Feedwater/Safeguard Fill System  
Check Valves Installed Backwards

I. Introduction

This is a revision of the final report concerning a deficiency in orientation of the two check valves installed in the Safeguard Piping Fill System at Limerick. The stop-check valves were supplied by Rockwell International and installed by Bechtel Power Corporation, the Architect-Engineer for the Limerick project. The valves are on one inch diameter, Nuclear Class 1 lines.

II. Description of Deficiency

On November 11, 1983 during a start-up review of the local leak rate test procedures for the Limerick Generating Station, it was discovered that check valves 41-1036 A and B were installed backwards. The reversed check valves were in the Safeguard Piping Fill System connections to the reactor feedwater system. The connections are the outboard containment isolation check valves (41-1F074 A and B) for the feedwater injection line. The reversed valves identify a problem in both the construction and quality control process since valve 41-1036A had passed both construction and quality control inspections while valve 41-1036B had passed its construction inspection and was turned over to quality control for inspection at the time of this finding.

III. Corrective Action

The corrective action taken by the construction organization was to cut out the check valves, orient them correctly, and reinstall them in accordance with the original design requirements. The new welds will be inspected to the requirements for Nuclear Class 1 piping. To ensure the problem was not extensive, the small pipe field engineer who issued the "Field Installation Complete" drawings for the system was given an oral and practical examination by his supervisor which showed he was familiar with inspection criteria and design intent as detailed on the design drawings. The examination included orientation of equipment, which was a check point for this particular system as in any system. In addition, 40 other small pipe "Field Installation Complete" drawings were reviewed for compliance with field conditions and design drawings. Twenty of these drawings were issued by the field engineer involved in this finding and the other 20 represented a random sample from the Small Pipe Installation Group. The review included more than 700 feet of pipe and 95 various valve installations. The review was conducted by field engineers equal to or of higher classification than the engineer involved in the subject deficiency. No other problems were found.

As a general aid to others in the Small Pipe Installation Group, on February 27, 1984 a training and indoctrination class was given regarding the subject deficiency. Specific topics included valve types and orientation with respect to flow patterns and design intent. The relationship between piping and instrumentation diagrams with small pipe isometrics, and inspection criteria for small pipe and hanger systems was also discussed. In addition, a training package was issued to Construction Supervision for indoctrination of the craftsmen on the installation of mechanical equipment, such as check valves, requiring specific flow patterns.

Since one of the two valves had been accepted by Quality Control, the Quality Control Inspector who approved the reversed check valve was also given an oral and practical examination by his supervisor which demonstrated he was familiar with the inspection requirements. The orientation of equipment is a check point on the inspection instructions for small pipe systems and was part of the inspection process for this particular one. Also, a Quality Control Engineer of higher classification reviewed 20 other small pipe installation records from the Quality Control Engineer who approved the system. This review covered approximately 300 feet of pipe and 35 in-line components such as valves. No other problems were found.

#### IV. Safety Implications

The purpose of Safeguard Piping Fill System connection is to supply sealing water to the containment isolation check valves following a LOCA, such that containment bypass leakage through this line is precluded. As installed, the check valves (41-1036 A and B) would not allow the Safeguard Piping Fill System to fulfill its design safety function. If left uncorrected, the reversed check valves would prevent Safeguard Piping Fill sealing water flow to the feedwater containment isolation check valves. Not assuring that these valves are sealed could lead to potential offsite exposures exceeding the limits of 10CFR part 100 under design basis LOCA conditions. Since the check valves have been removed and reinstalled with the correct orientation, there are no further safety implications. Also, by testing the Quality Control and Small Pipe Field Engineers who approved the system with reversed check valves, and by satisfactorily reviewing other work performed by them, this condition is considered to be an isolated event.