

PHILADELPHIA ELECTRIC COMPANY

2301 MARKET STREET

P.O. BOX 8699

PHILADELPHIA, PA. 19101

(215) 841-4502

MAR 30 1984

JOHN S. KEMPER  
VICE PRESIDENT  
ENGINEERING AND RESEARCH

Dr. 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  
Significant Deficiency Report No. 96 (Attachment 1)

Reference: Letter - J. S. Kemper/PECo to T. E. Murley/NRC,  
dated 11/28/83

File: QUAL 2-10-2 (SDR No. 96)

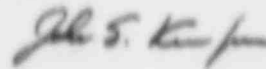
Dear Dr. Murley:

In compliance with 10CFR50.55(e), we are submitting our Final Significant Deficiency Report concerning loose valve stem anti-rotation devices (SDR No. 96).

An interim report (see reference) was previously submitted to your office.

We trust that this satisfactorily resolves the item. If further information is required, please do not hesitate to contact us.

Sincerely,



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

S. Chaudhary, Resident NRC Inspector (Limerick)

8404170014 840330  
PDR ADOCK 05000352  
PDR  
8

IE27  
11

LIMERICK GENERATING STATION, UNITS 1 & 2  
SIGNIFICANT DEFICIENCY REPORT NO. 96  
CONCERNING VALVE STEM ANTI-ROTATION DEVICES  
ANCHOR DARLING GLOBE VALVES

1.0 Introduction

This is the final report regarding the loosening of the set screw on valve stem anti-rotation collars on Anchor Darling globe valves. An initial notification was given to the USNRC by telephone on October 31, 1983 and an interim report was submitted on November 28, 1983.

2.0 Description of Problem

The stems of subject Anchor Darling valves are prevented from rotating by an anti-rotation collar which is fastened to the valve stem by means of one (1) or two (2) set screws depending on valve size. As long as the stem is prevented from rotating, the operator of the valve will drive the disk through its full stroke as desired. When the anti-rotation collar becomes loose, it may slip out of its locking position, permitting the locking key to drop out. With the disengagement of the locking arrangement, the stem will rotate when driven by the operator and the disk will no longer move to its proper position. This malfunction has been observed in several instances during start-up tests of various systems at Limerick Generating Station.

3.0 Corrective Action(s) to be Taken

An investigation of the problem has been completed by Anchor Darling Company, Bechtel Power Corporation and Philadelphia Electric Company. As part of the investigation, a procedure was prepared for implementation of the necessary corrective actions. A copy of the procedure is attached.

The recommended modification was applied to several valves in systems that were in process of start-up operation and were known to experience vibration. After a number of starts and extended periods of operation, a check revealed that the set screws remained tight. No loosening or relaxation of the set screws occurred. As a result of the successful performance of the modification, a program was initiated to perform the modification on all Anchor Darling motor operated globe valves located in safety systems. This work will be completed prior to fuel load of Unit 1.

#### 4.0 Safety Implications

The problem was identified in the Core Spray (CS) and Residual Heat Removal (RHR) systems. However, the potential deficiency also exists in the High Pressure Coolant Injection (HPCI) and the Reactor Core Injection Cooling (RCIC) systems since these systems also employ the type of Anchor Darling globe valve on which the problem has been identified. A reduction in coolant flow to the reactor core could occur in all four (4) systems if the Anchor Darling valves became inoperative in any partial or full open position.

In addition, if the Anchor Darling valves in the steam supply lines to the HPCI and RCIC turbines failed in a closed or partially open position, those systems would become either inoperable or operable at some reduced rate.

JNM:mtk 3/21/84-1

Locking Procedure for Stem Clamp Setscrew(s)

- A. Select the proper Allen wrench.
- B. Remove the setscrew(s) from the clamp.
- C. Hold the clamp in place and mark the location of the setscrew hole(s) on the valve stem.
- D. Allow the clamp to drop taking care not to lose the key(s).
- E. Use a drill to make a small indentation(s) in the stem. Dimensions for the indentation are given below.
- F. Replace the key(s) and lift the stem clamp into place.
- G. Apply Loctite No. 580 to setscrew threads.
- H. Replace the setscrew(s) and torque to the value shown below.
- I. Scribe reference mark on setscrew and on stem clamp for future use in assuring no loosening of the setscrew.

<u>SETSCREW SIZE</u>	<u>DRILL SIZE</u>	<u>MAX. DEPTH OF INDENTATION</u>	<u>TORQUE (ft-lbs.)</u>
1/4	1/4	3/16	3
5/16	5/16	7/32	6½
3/8	3/8	1/4	12
7/16	7/16	9/32	19
1/2	1/2	5/16	28
9/16	9/16	11/32	40
5/8	5/8	3/8	56
3/4	3/4	7/16	100