PHILADELPHIA ELECTRIC COMPANY

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PHILADELPHIA, PA. 19101

(215) 841-4502

JOHN S. KEMPER
VICE-PRESIDENT
ENGINEERING AND RESEARCH

DEC 12 1984

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

SUBJECT: Limerick Generating Station, Units 1 and 2
Significant Deficiency Report No. 163
Potential Leakage Path on Rosemount Pressure Transmitters

REFERENCE: Telecon of November 20, 1984
P. K. Pavlides (P.E.Co.) to Jim Beall (USNRC)

ATTACHMENT: 1) Letter: R. C. LaSell (Rosemount) to Wes Schilling (Bechtel) dated 9/10/84
2) Letter: R. C. LaSell (Rosemount) to Wes Schilling (Bechtel), dated 10/2/84
3) Letter: R. C. LaSell (Rosemount) to Wes Schilling (Bechtel), dated 10/15/84

FILE: QUAL 2-10-2 (SDR #163)

Dear Dr. Murley:

The enclosure to this letter is provided as a final report concerning Rosemount Model 1153 Series B transmitters that may be affected by questionable integrity of the electronics housing neck seal. This situation has been evaluated and determined to be reportable under 10CFR Part 21. Previous information was forwarded to the USNRC via the reference.

Sincerely,

John S. Kemper

1/1

IE27

RTG:tws
ts11298411023
Attachment
Copy to: Director of Inspection and Enforcement
United States Nuclear Regulatory Commission
Washington, DC 20555

J. Wiggins, Resident NRC Inspector (Limerick)

Limerick Generating Station
Significant Deficiency Report #163
Potential Leakage Path on Rosemount Pressure Transmitters
Final Report
SDR - 163

1.0 Introduction

This report is intended as a final report concerning a potential leakage path on Rosemount pressure transmitters at the Limerick Generating Station (LGS).

The USNRC was notified of this reportable condition in a telecon, dated November 20, 1984.

2.0 Description of Problem

On September 10, 1984 Rosemount issued a letter to Bechtel Power Corporation notifying them, as required by 10CFR Part 21 regulations, of a potential deficiency in Rosemount Model 1153 Series B pressure transmitters. P.E.Co. Quality Assurance was formally notified on October 17, 1984 and immediately initiated an evaluation to determine if this condition was reportable in accordance with established procedures. This notification along with subsequent correspondence defined the deficiency to be associated with Model 1153 Series B pressure transmitters manufactured from January 1984 to August 1984. The deficiency involves a potential leakage path in the seal of the threads between the sensor module and the electronics housing. This leakage path could allow moisture from the surrounding environment to enter the electronics housing during abnormal operating conditions (i.e., HELB or LOCA environmental conditions). This moisture may cause the transmitter to stop functioning (i.e., the output signal may saturate high or low or become unstable).

To correct the deficiency, Rosemount recommended that the transmitters in question be returned to the factory to rework the questionable seal. The seal will be disassembled, cleaned, and reassembled, including the addition of an elevated temperature cure for 12 hours at 200°F.

A review of Rosemount model 1153 Series B pressure transmitters purchased for use at LGS resulted in the finding of six pressure transmitters susceptible to this deficiency. These transmitters were located in the spare parts inventory.

3.0 Safety Implications

The six transmitters in question were purchased as safety-related replacement transmitters for use in safety-related instrument loops. If these replacement transmitters were installed, safety-related actuation, trip, or isolation functions could be adversely affected. Since these transmitters were located in the spare parts inventory, there was no immediate impact on the safety or reliability of the plant.

4.0 Corrective Action

The six transmitters in question will be returned to Rosemount by June 1, 1985 for rework of the questionable seal per Rosemount's recommendation. A non-conformance report has been written to track the return to, and rework by Rosemount of the six transmitters in question.

RTG:tws
December 5, 1984
ts112984r1044

ROSEMOUNT INC.
12001 West 78th Street
Eden Prairie, Minnesota 55344 U.S.A.
Tel. (612) 941-5560
TWX 910-576-3103 TELEX 29-0183

18739

Rosemount F253073

September 10, 1984

Bechtel Power Corp.
Agent for Philadelphia Electric Company
P.O. Box 3965
San Francisco, CA 94119
Attention: Wes Schilling

Subject: Notification Under 10CFR Part 21 Regulations

Reference: Purchase Order 8031-M-206-AC/Rosemount H.O. 418885

Gentlemen:

Rosemount has determined that a notification to you, our customer, is required under the regulations called out in 10CFR Part 21. This notification applies only to any Model 1153 Series B Pressure Transmitter manufactured after January 10, 1984 and does not affect any other model. The situation is as follows:

Rosemount has identified a potential leakage path in the seal of the threads between the sensor module and the electronics housing. There is a possibility that this leak path could allow moisture from the ambient surrounding environment to enter the electronics housing during abnormal operating conditions. This moisture may cause the transmitter to stop functioning (i.e. the output signal will saturate high, approximately 27 mA, saturate low, approximately 3 mA, or become unstable.) This leak in no way affects the pressure integrity of the transmitter pressure boundary.

As part of the Rosemount periodic quality audit a sample of transmitters is tested for electronic housing pressure integrity. The test is performed using a 5 PSI (air) pressure source to pressurize the internal electronics housing. "Snoop" is then used to detect leaks on all sealing interfaces.

NCR 10414 SHT #2 OF 4 Cont.

During the most recent audit, a leak was observed on two out of twelve pressure transmitters tested. These units were randomly selected from product hardware by Q.A. for the Product Audit. Based on these failures, an additional 87 production units were leak tested per the Product Audit Procedure. Eight of the 87 units failed the test. F253073

The validity of the Product Audit leak test is being verified by subjecting several of these units to a LOCA simulation. This LOCA simulation is also being used to help determine the cause of the leak path and what ambient temperature/pressure levels these pressure transmitters will withstand.

The Model 1153 Series B Pressure Transmitter has been placed on hold for both production and shipment. Testing is underway to determine a specific cause for the leak path. Once the specific cause has been identified (we anticipate in about two weeks), a corrective action will be established. An update letter will be sent to you when further data is available regarding the units that you have and any corrective action that may be necessary. Should you have any questions prior to receipt of that update letter, please contact us.

Very truly yours,

RC L. Lasell

Richard C. LaSell
Manager

/jka

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Eden Prairie, Minnesota 55344 U.S.A.
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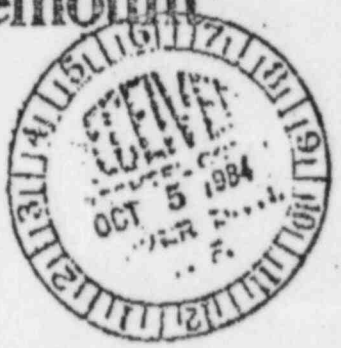
LIMERICK

OCT 5 1984

PROCUREMENT

NCR NO. S-1296-J
PAGE 13 OF 14

Rosemount



October 2, 1984

Mr. Wes Schilling
Bechtel Power Corporation
Agent for Philadelphia Electric Co.
P.O. Box 3965
San Francisco, CA 94119

Subject: 10 CFR Part 21 Notification Letter dated September 10, 1984

Reference: 1) Your Purchase order Number 8031-M-206-AC
2) Rosemount Order Number 418885

Gentlemen:

This is a follow-up to the above notification which will provide you with the serial numbers/tag numbers of those transmitters that may be affected by this potential problem. The enclosed listing identifies the 1153 Series B transmitters which were manufactured and shipped after January 10, 1984.

Again, the notification applies to only those 1153 Series B transmitters manufactured after January 10, 1984, and those units installed in an environment subject to a LOCA or HELB.

Currently we are in an extensive evaluation and test program to determine the cause of the leak path. Again, once the cause is identified, a corrective action will be established. We expect the results of our testing to be available in approximately two weeks. Another status letter will be sent to you at that time.

Very truly yours,

R.L. Volkmann/for

R.C. LaSell
Manager

/njb

Enclosure

ROSEMOUNT INC.

12001 West 78th Street
Eden Prairie, Minnesota 55344 U.S.A.
Tel. (612) 941-5560
TWX 910-576-3103 TELEX 29-0183

EFS

188953

Rosemount

October 15, 1984

Mr. Wes Schilling
Bechtel Power Corporation
Agt. for Philadelphia Electric Co.
P.O. Box 3965
San Francisco, CA 94119

Subject: Our September 10, 1984 Notification Under 10CFR 21

Reference: Purchase Order 8031-M-206-AC/RMT Order 418885

Gentlemen:

This letter updates our findings and defines corrective action on the potential neck seal problem previously reported.

The past few weeks have been dedicated to investigating the problem, including the review of all associated production processes, piece part modifications and any other variation which could be possible contributors. A summary of our findings and corrective action is detailed in the attached memo of October 11, 1984. Some of the 1153 Series B transmitters manufactured from January 1984 to August 1984 may be affected by questionable integrity of the neck seal and will require resealing. The transmitters serial numbers listed on the enclosure were manufactured in this timeframe. We are unable to determine which of these units will leak, and therefore recommend rework of all units produced during this period.

Current production units have been successfully tested to LOCA conditions. We are prepared to receive, rework, and return to you, certified, all transmitters identified in the enclosure. The complete rework and retest facilities of the factory are available to accomplish and certify the resealing. We encourage the return of these transmitters to our Eden Prairie, MN. facility.

188953

The rework efforts are being coordinated by Robert VandenBoom of our Nuclear Marketing Department at our Eden Prairie facility. Bob can be reached at A/C 612-828-3540.

It is our intention to perform this repair in the shortest time possible to minimize your inconvenience while considering each cutomers particular need. We are confident of your cooperation and understanding during this period.

Very truly,

R C LaSell

R.C. LaSell
Manager

Enclosure

Rosemount INTRACOMPANY MEMO

188953

CIRCULATE TO:

Jerry Anderson	A8
John Berra	A26
Andy Habiger	C6

DATE: October 11, 1984

TO: Dick LaSell - Manager, Nuclear Products (A10)

FROM: Bill Koch - Director, Quality Assurance (A3)

SUBJECT: MODULE NECK SEAL - MODEL 1153B

BACKGROUND

Process Control Audits on Nuclear Pressure Transmitters were started as an internal control procedure in March, 1981. Between 3/81 and 6/84, 146 units were checked for seal integrity by pressurizing the inside of the transmitter to 5 psi and checking the module/housing interface point for leaking with a special soap solution.

Of the 146 units, nine were found to be questionable and worthy of further investigation. Seven of the questionable units were detected in April and May of 1982. These units were found to have lower than specified torque on the lock nut and lacked the usually visible excess sealant at the housing/module neck joint. Qualification testing (which included a LOCA Simulation Test) was being conducted on units built at about the same time as the questionable units and there was no other information to indicate a change in process may have occurred. An in-depth study brought forth no assignable cause. All units passed the LOCA Simulation Test and the process was determined to be "in control." To add assurance, operators were reinstructed regarding proper torquing techniques and to use an increased amount of sealant. Subsequent process control checks were found to be acceptable throughout 1982.

In June of 1983, two more questionable units were detected. Casting flash on the housing lock nut interface was determined to be causing low torque values. Qualification testing on units produced shortly after the audit test units (same process) were found to pass the LOCA Simulation Test. This indicated the process was "in control" as determined by the only true indicator we have -- the LOCA Simulation Test (a destructive test). Subsequently, the 5 psi process control seal integrity checks produced no questionable units until June, 1984. The June, 1984 check initiated the sequence of actions which resulted in the 9/10/84 notification to affected customers.

EVENTS LEADING TO NOTIFICATION

During Product Audit Testing conducted in June, 1984, two questionable seals were detected. The in-depth followup investigation was unable t identify an assignable cause. No qualification program that included LOCA Simulation Test was ongoing or planned at that time; therefore, a special LOCA Simulation Test (completed 8/29/84) was planned and perfo to determine if a true leakage problem existed. During this LOCA Simulation Test, 5 of 8 units failed to complete the 72-hour test. Al five units were found to have moisture in the electronics housing. A notice had been previously issued on 8/22/84. Following the completio the LOCA Simulation Test, the matter was referred to the Nuclear Revie Committee. Additional investigation of the process and the units whic failed in the LOCA Simulation Test resulted in a Nuclear Review Commit meeting on 9/5/84. The Committee recommended a customer notification issued. A notification letter was issued on 9/10/84 to all affected customers. To determine the block of units which could be affected, t manufacturing date of 1/13/84 was used. All units prior to this date considered to be conforming, based on the previous acceptable product and LOCA Simulation Test results. Although this approach may include large number of conforming units, it appears to be a reasonable criter under the circumstances.

CORRECTIVE ACTION

Detailed information regarding all materials and parts was accumulated The most significant information obtained indicated that 12 hours of c at elevated temperatures provides a more predictable seal. Six test samples were produced with this process change. These samples were successfully tested in a LOCA Simulation Test ending on 10/3/84. The notice was conditionally released on 10/9/84. All units manufactured this date will include this process change in order to assure only qualification level units are shipped.

REMEDIAL ACTION

All units within the block of potentially questionable units in custom control should be disassembled, cleaned, and reassembled per our new process (including elevated temperature cure for 12 hours at 200°F). can be accomplished in the factory at Eden Prairie, Minnesota.

ATTACHMENT A

Purchase Order No. 8031-M-206-AC

Rosemount Order No. 418885

Tag No.	Serial No.
8031-M-206-AC;Item 78.1;FTDO-101A	409394
8031-M-206-AC;Item 78.1;FTDO-57101B	409395
8031-M-206-AC;Item 79.1;FTDO-102A	409396
8031-M-206-AC;Item 79.1;FTDO-102B	409397
8031-M-206-AC;Item 80.1;PTDO-102A	409398
8031-M-206-AC;Item 80.1;PTDO-102B	409399