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SUBJECT: Responds to NRC Bulletin 90-001, Suppl 1, "Loss of Fill-Oil in Transmitters Mfg by Rosemount."

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MAR 04 1993

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Division of Reactor Projects  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

**SUSQUEHANNA STEAM ELECTRIC STATION  
RESPONSE TO NRC BULLETIN 90-01, SUPPLEMENT 1:  
LOSS OF FILL-OIL IN TRANSMITTERS MANUFACTURED  
BY ROSEMOUNT  
PLA-3934 FILES R41-1A/R41-2**

*Reference: PLA-3413, Dated 9/13/90, H. W. Keiser to Dr. W. R. Butler, "Response to Bulletin 90-01, Loss of Fill-Oil in Transmitters Manufactured by Rosemount."*

Dear Mr. Miller:

Supplement 1 to NRC Bulletin 90-01 "Loss of Fill-Oil in Transmitters Manufactured by Rosemount" was issued to update information and supersede the actions requested in the original Bulletin. This Supplement is based on the NRC evaluation of the responses to the original Bulletin and NUMARC Report 91-02 titled "Summary of NUMARC Activities to Address Oil Loss in Rosemount Transmitters."

Specifically, this supplement requested that all operating license holders review plant records and identify any Rosemount Model 1153 Series B, Model 1153 Series D and Model 1154 transmitters manufactured before July 11, 1989 that are installed in safety-related systems or systems installed in accordance with 10 CFR 50.62 and

- 1a. Expediently replace or monitor for the life of the transmitter on a monthly basis using an enhanced surveillance monitoring program, any transmitters that have a normal operating pressure greater than 1500 psi and that are installed in reactor protection trip systems, ESF actuation systems or ATWS systems.

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RESPONSE

Plant records indicate that the Susquehanna plant does not have any Rosemount Model 1153 Series B transmitters installed in the reactor protection system, ESF actuation systems, or ATWS systems which operate at a pressure greater than 1500 psi. Additionally, there are no Model 1153 Series D or Model 1154 transmitters in use at Susquehanna. This request is not applicable to the Susquehanna SES.

- 1b. Replace or monitor for the life of the transmitter on a quarterly basis using an enhanced surveillance monitoring program, any transmitters that have a normal operating pressure greater than 1500 psi and that are used in safety-related applications but are not installed in the reactor protection system, ESF actuation systems, or ATWS systems. Monitoring at least once every refueling outage, but not exceeding 24 months, may be performed on transmitters in this category if the appropriate psi-month threshold criterion recommended by Rosemount has been reached, and the monitoring interval is justified based upon transmitter performance in service and its specific function.

RESPONSE

Plant records indicate four transmitters fall into this category, and all four are installed in the Containment Instrument Gas system. Their purpose is to monitor the instrument gas bottle pressure by providing pressure indication along with a low pressure alarm. Of these four transmitters, one has been manufactured after July 11, 1989 as indicated by the "A" in its serial number and is exempt from the requested action. The remaining three transmitters have accumulated in excess of 192,000, 226,000, 222,000 psi-months respectively at pressure, exceeding the recommended threshold criterion. The drift in all three transmitters has been random with no indication of loss of fill-oil systems.

As stated above, these transmitters provide indication and alarm of low pressure. Any oil loss would be in the conservative direction, causing a lower pressure reading than actual, resulting in a low pressure alarm at a higher actual bottle pressure. Oil loss in these transmitters would not prevent the Containment Instrument Gas system from performing its intended safety function. Susquehanna will continue to perform enhanced surveillance monitoring on all of these transmitters at an 18 month frequency.

- 1c. For BWRs, replace or monitor on a monthly basis using an enhanced surveillance monitoring program until the transmitters have reached the appropriate threshold criterion recommended by Rosemount, any transmitters that have a normal operating pressure greater than 500 psi and less than 1500 psi, that are installed in reactor protection system, ESF actuation systems, or ATWS systems. On a case-by-case basis except for transmitters that initiate reactor protection or ATWS trips for high pressure or low water level, licensees may monitor using an enhanced surveillance program at least once every refueling cycle, but not to exceed 24 months, if sufficient justification is provided based upon transmitter performance in service and its specific function.

### RESPONSE

Susquehanna SES has 32 Rosemount transmitters which operate between 500 psi and 1500 psi, all of which serve an ESF function. Of the 32 transmitters, 15 are mature plus one suspect lot transmitter was replaced after failure due to particle syndrome. This transmitter has a sensor module which was manufactured after July 11, 1989 and is exempt from this requested action. Breakdown of the mature transmitters shows that 5 transmitters have greater than 67,000 psi-months (recommended threshold of 60,000 psi-months) of service at pressure and a review of zero shift data indicates no symptoms of oil loss. These 5 transmitters are used in the Reactor Water Cleanup system to detect leakage through differential flow measurements.

Ten Rosemount transmitters in the MSIV Leakage Control System have greater than 64,000 psi-months (recommended threshold of 60,000 psi-months) of service at pressure and a review of their associated zero shift data also indicates no symptoms of oil loss.

The remaining 16 transmitters are non-mature (recommended threshold of 130,000 psi-months) and are shared between both Unit 1 and Unit 2. These transmitters currently have either 64,000 psi-months or 70,000 psi-months at pressure. These transmitters are located in the MSIV Leakage Control System and exhibit random drift characteristics with no symptoms of oil loss at this time. However, an anomalous indication has been recently observed for one of these transmitters. Current plans are to continue monitoring this transmitter for further indications to determine if replacement is required; it is not believed to be an oil loss problem at this time. Additionally, these non-mature transmitters have a minimum of five calibrations performed and the drift is random with no one sided drift indicative of oil loss symptoms. Rosemount has stated that they have never had a transmitter fail due to oil loss that had three successive calibrations which indicated random drift. As for system function, the MSIV Leakage Control System is a manually actuated post accident system. Some of these transmitters provide indication to the operator that conditions exist to permit operation. The remaining transmitters input

to system permissive logic to prevent operation at inappropriate conditions. Therefore, multiple failures would be required to mislead the operator and defeat permissive logic before incorrect system operation could occur. As a result, Susquehanna will continue to perform enhanced surveillance monitoring on all of these transmitters at an 18 month frequency.

- 1d. Replace or monitor at least once every refueling cycle, but not exceeding 24 months, using an enhanced surveillance monitoring program until the transmitter reaches the appropriate psi-month threshold criterion recommended by Rosemount, any transmitters used in safety-related systems that have a normal operating pressure greater than 500 psi and less than or equal to 1500 psi, and are not installed in reactor protection systems, ESF actuation systems or ATWS systems.

#### RESPONSE

Plant records indicate that 33 Rosemount transmitters fall into this category. Of these 33 transmitters 22 are mature and have surpassed the recommended threshold criterion, one has a sensor module manufactured after July 11, 1989 and is exempt, and the remaining 10 are non-mature. PP&L intends to perform enhanced surveillance monitoring on all the remaining transmitters in this category in accordance with the Technical Specifications intervals, not to exceed 18 months. This enhanced monitoring will continue until the appropriate psi-month threshold has been reached and it is determined that no benefit will result from continuing the monitoring program.

- 1e. At licensee discretion, exclude from the enhanced surveillance program any transmitters that have a normal operating pressure greater than 500 psi and less than or equal to 1500 psi that have reached the appropriate threshold criterion recommended by Rosemount.

#### RESPONSE

PP&L plans to continue performing enhanced surveillance monitoring on all categories of transmitters until it is determined that no benefit will result from continuing the enhanced monitoring.

- 1f. At licensee discretion, exclude from the enhanced surveillance program any transmitters that have a normal operating pressure less than or equal to 500 psi.

RESPONSE

As stated in the response to action 1e., PP&L plans to continue performing enhanced surveillance monitoring on all categories of Rosemount transmitters until it is determined that no benefit will result from this enhanced monitoring.

2. Evaluate the enhanced surveillance monitoring program to ensure that the program provides measurement data with an accuracy range consistent with that needed for comparison with manufacturer drift data criteria for determining degradation caused by a loss of fill-oil.

RESPONSE

Rosemount recommends recording the milliamp readings to two decimal places. Susquehanna SES records the milliamp readings to three decimal places. In addition, PP&L/Susquehanna policy specifies the use of Measurements and Test Equipment (M&TE) with accuracy four times greater than the instrument under test unless limited by state-of-the-art or extreme circumstances, but under no condition or circumstances may M&TE be utilized which is less accurate than the instrument under test.

Because of the high accuracy of Rosemount transmitters, the state-of-the-art M&TE may not meet the four to one accuracy ratio however in no instance is the one to one ratio exceeded. Therefore, the M&TE accuracy is consistent with the accuracy required to perform a successful calibration monitoring program.

PP&L has been performing its enhanced surveillance monitoring program since the issuance of Bulletin 90-01 and has a significant number of instrument calibrations to support the actions described above. Any future replacements of either transmitter sensors or entire transmitters will be with sensors and transmitters manufactured after July, 1989 for all applications defined in this supplement. It is therefore concluded that the actions discussed throughout this response completely address the requested actions of this Bulletin Supplement. Questions regarding this amended response should be directed to Mr. A. K. Maron at (215) 774-7852.

Very truly yours,



H. W. Keiser

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