

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

5N 157B Lookout Place

JUL 13 1990

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of)
Tennessee Valley Authority)

Docket Nos. 50-327
50-328

SEQUOYAH NUCLEAR PLANT (SQN) - NRC BULLETIN 90-01 - LOSS OF FILL-OIL IN
TRANSMITTERS MANUFACTURED BY ROSEMOUNT

This letter provides TVA's response to the subject bulletin. As requested, SQN has identified the Model 1153 Series B, Model 1153 Series D, and Model 1154 Rosemount transmitters installed in safety systems manufactured prior to July 11, 1989. There are a total of ten Model 1153 Series D transmitters installed with only one of these being from the suspect lot.

Enclosure 1 provides a detailed response to each action requested by the bulletin. A list of commitments for each unit (Enclosure 2) is also included.

If there are any questions concerning this issue, please telephone W. C. Ludwig at (615) 843-7460.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

R. H. Shell

for E. G. Wallace, Manager
Nuclear Licensing and
Regulatory Affairs

Enclosures

cc: See page 2

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U.S. Nuclear Regulatory Commission

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cc (Enclosures):

Ms. S. C. Black, Deputy Director
Project Directorate II-4
U.S. Nuclear Regulatory Commission
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852

Mr. J. N. Donohew
U.S. Nuclear Regulatory Commission
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852

NRC Resident Inspector
Sequoyah Nuclear Plant
2600 Igou Ferry Road
Soddy Daisy, Tennessee 37379

Mr. B. A. Wilson, Project Chief
U.S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323

ENCLOSURE 1

SEQUOYAH NUCLEAR PLANT (SQN) UNITS 1 AND 2

RESPONSE TO NRC BULLETIN 90-01,

LOSS OF FILL-OIL IN TRANSMITTERS MANUFACTURED BY ROSEMOUNT

ENCLOSURE 1

SQN Units 1 and 2 presently have a combined total of ten Model 1153 Series D Rosemount transmitters installed in safety systems. The following is a direct response to each reporting requirement and requested action from NRC Bulletin 90-01, Loss of Fill-Oil in Transmitters Manufactured by Rosemount.

Reporting Requirements:

"1. Provide, within 120 days after receipt of this bulletin, a response that:

- a) Confirms that Items 1, 2, 3, 4, and 5 of Requested Actions for Operating Reactors have been completed."

Requested Action:

"1. Identify Model 1153 Series B, 1153 Series D, and Model 1154 pressure or differential pressure transmitters, excluding Model 1153 Series B, 1153 Series D, and Model 1154 transmitters manufactured by Rosemount subsequent to July 11, 1989, that are currently utilized in either safety-related systems or systems installed in accordance with 10 CFR 50.62 (the ATWS rule)."

Response:

The following is a list of transmitters that are installed in the auxiliary feedwater (AFW) system and containment spray (CS) system. The AFW system and the CS system numbers are 3 and 72, respectively.

<u>ITEM</u>	<u>UNIT ID NO.</u>	<u>MODEL NO.</u>	<u>SERIAL NO.</u>	<u>FSAR FIGURE NO. AND COORDINATE</u>
1	1-FT-3-142	1153DB5PB	405348	10.4.7-7 (G-9)
2	2-FT-3-142	1153DB5PB	405349	10.4.7-7 (G-9)
3	1-FT-3-147	1153DB5PB	405448	10.4.7-7 (H-7)
4	1-FT-3-155	1153DB5PB	405452	10.4.7-7 (F-7)
5	1-FT-3-163	1153DB5PB	405568	10.4.7-7 (D-7)
6	1-FT-3-170	1153DB5PB	405571	10.4.7-7 (B-7)
7	1-FT-72-13	1153DB4PB	405344	6.2.2-3 (D-8)
8	1-FT-72-34	1153DB4PB	405345	6.2.2-3 (H-8)
9	2-FT-72-13	1153DB4PB	405343	6.2.2-3 (D-8)
10	2-FT-72-34	1153DB4PB	405346	6.2.2-3 (H-8)

Requested Action:

"2. Determine whether any transmitters identified in Item 1 are from the manufacturing lots that have been identified by Rosemount as having a high failure fraction due to loss of fill-oil. Addressees are requested not to utilize transmitters from these suspect lots in the reactor protection or engineered safety features actuation systems; therefore, addressees are requested to develop and implement a program to replace, at the earliest appropriate opportunity, transmitters from these suspect lots in use in the reactor protection or engineered safety features actuation systems."

Response:

Item 6 from the previous table, 1-FT-3-170, Model 1153DB5PB, Serial No. 405571, has been identified as the only transmitter from a suspect lot. It is not used in the reactor protection or engineered safety features actuation system. However, SQN does plan to replace this transmitter with one made after July 11, 1989, by the end of the Unit 1 Cycle 5 outage, which is currently scheduled to end in December 1991.

Requested Action:

"3. Review plant records (for example, the three most recent calibration records) associated with the transmitters identified in Item 1 above to determine whether any of these transmitters may have already exhibited symptoms indicative of loss of fill-oil. Appropriate operability acceptance criteria should be developed and applied to transmitters identified as having exhibited symptoms indicative of loss of fill-oil from this plant record review. Transmitters identified as having exhibited symptoms indicative of loss of fill-oil that do not conform to the operability acceptance criteria should be addressed in accordance with the applicable technical specification. Transmitters identified as having exhibited symptoms indicative of loss of fill-oil that do not conform to the operability acceptance criteria and are not addressed in the technical specifications should be replaced at the earliest appropriate opportunity."

Response:

Plant records, calibration cards, surveillance instructions, and work requests were reviewed to determine whether any of the transmitters identified had the symptoms indicative of loss of fill-oil. None of the ten transmitters in question exhibited the symptoms of loss of fill-oil, namely, continual drift. The calibration data reviewed was for the last five years or three calibration cycles. Although some of the transmitters were found out-of-calibration or had experienced drift, none had continual drift in one direction over the entire time period.

Requested Action:

"4. Develop and implement an enhanced surveillance program to monitor transmitters identified in Item 1 for symptoms of loss of fill-oil. This enhanced surveillance program should consider the following or equally effective actions:

- a) Ensuring appropriate licensee personnel are aware of the symptoms that a transmitter, both during operation and during calibration activities, may exhibit if it is experiencing a loss of fill-oil and the need for prompt identification of transmitters that may exhibit these symptoms;
....."

Response:

SQN has made appropriate personnel in Operations and Instrument Maintenance aware of the symptoms of loss of fill-oil. Operations' personnel have already received training during Week 5 of the 1989 License Requalification Training. Similar training will take place every three to four years as a reminder. The subject was also included in the monthly SQN Instrument Maintenance Safety Meeting held June 27, 1989. On June 12-15, 1990, the subject was covered again during the Quarterly Industry/SQN Experience Report Familiarization. For future awareness, the calibration procedures will contain appropriate steps and precautions to appraise the Instrument Maintenance personnel that they are working on a Rosemount transmitter. Also a section will be added to the Initial Instrument Maintenance Apprentice Training Program to familiarize new Instrument Maintenance personnel with the loss of fill-oil issue. The updated training programs will be in place by January 15, 1991.

Requested Action:

"4. b) Enhanced transmitter monitoring to identify sustained transmitter drift;"

Response:

SQN will continue to use the same calibration interval for these ten Rosemount transmitters. However, to better monitor for the very slow loss of fill-oil, a trending program to monitor for drift will be established for the ten identified Rosemount transmitters by October 31, 1990. This decision to remain with the normal calibration interval is based upon the minimum use of the AFW and CS systems. The AFW system is used for unit start-up and shutdown, and for unpredicted unit trips and safety injection. Two of the transmitters have an elevated static pressure during normal plant operation. Although these two transmitters will sense a static pressure for plant operation, the current calibration interval is adequate since there is backup instrumentation if they fail and they provide no controlling function. The other four AFW transmitters are depressurized during normal plant operation and are only pressurized during AFW system operation. The four CS transmitters are only pressurized for the quarterly flow surveillance tests and during the operability test every refueling outage. The rest of the time the system is depressurized. Based upon the above reasoning, increased monitoring would provide no meaningful data.

Requested Action:

"4. c) Review of transmitter performance following planned or unplanned plant transients or tests to identify sluggish transmitter response;"

Response:

SQN does not have the capability to automatically record and log transmitter response after a planned or unplanned plant transient or test and therefore does not plan to review transmitter performance after a transient. The transmitter for the AFW turbine speed control is set to control the speed from 2,200 revolutions per minute (RPM) to 3,970 RPM.

If the transmitter response is sluggish, the pumps will run at the upper limit (3,970 RPM), but will not continue into the overspeed area. In addition, the operator can take manual control of the pump speed to correct speed and flow problems. The other four AFW transmitters are for flow indication to each steam generator. The transmitters provide no control function. Steam generator level indication and AFW pump and valve status are available as backup indication to ensure heat sink availability.

The two CS transmitters (two per unit) control the miniflow bypass valve. Should the transmitter fail to respond to increasing header flow and allow the miniflow valve to open, there is still sufficient flow to the spray headers to meet design requirements.

Requested Action:

- "4. d) Enhanced awareness of sluggish transmitter response to either increasing or decreasing test pressure during calibration activities;"

Response:

As indicated in 4a, part of the enhanced awareness will be provided by periodic retraining for the appropriate operators. Additionally, appropriate steps and precautions will be added to the procedures to make the instrument mechanic aware of the Rosemount issue and that if the transmitter is discovered outside the normal drift tolerance, additional management review is required. The information will be sent to Technical Support for trending. These procedure upgrades will be completed by the start of the Unit 2 Cycle 4 outage, which is currently scheduled to start in September 1990. This is prior to the next scheduled calibration of any of the ten subject transmitters.

Requested Action:

- "4. e) Development and implementation of a program to detect changes in process noise;"

Response:

Presently, SQN does not elect to implement a program to detect changes in process noise. Such a program would not provide additional assurance of proper transmitter performance. These transmitters are installed on two systems that are not used during normal power operation. The AFW system is only operated for plant start-up, shutdown, and surveillance testing. Based upon SQN's present operating history, the operating time is minimal. The CS system is only operated during quarterly full-flow testing and an operability test every refueling outage. Because of the limited operation time, insufficient process data can be collected to monitor and evaluate any changes that may be detected.

Requested Action:

- "4. f) Development and application to transmitters identified as having exhibited symptoms indicative of loss of fill-oil of an appropriate operability acceptance criteria. Transmitters identified as having exhibited symptoms indicative of loss of fill-oil that do not conform to the operability acceptance criteria should be addressed in accordance with the applicable technical specification. Transmitters identified as having exhibited symptoms indicative of loss of fill-oil that do not conform to the operability acceptance criteria and are not addressed in the technical specifications should be replaced at the earliest appropriate opportunity."

Response:

At SQN when a transmitter, Rosemount or other transmitter, drifts outside its tolerance band during its as-found calibration, the surveillance package is reviewed for operability. At that time, a decision is made to either decrease the surveillance interval, approve the as-left calibration, or replace the transmitter. As stated in 4.d. the appropriate procedures will be revised to identify the need to have additional management review of Rosemount transmitters that display symptoms of possible oil loss. This review will determine whether the transmitter is a suspected case of oil loss. From this review an operability assessment will be made. This assessment will be based on observed symptoms and behavior of the transmitter rather than specific criteria.

Requested Action:

- "5. Document and maintain in accordance with existing plant procedures a basis for continued plant operation covering the time period from the present until such time that the Model 1153 Series B, 1153 Series D, and Model 1154 transmitters from the manufacturing lots that have been identified by Rosemount as having a high failure fraction due to loss of fill-oil in use in the reactor protection or engineered safety features actuation systems can be replaced. In addition, while performing the actions requested above, addressees may identify transmitters exhibiting symptoms indicative of loss of fill-oil that do not conform to the established operability acceptance criteria and are not addressed in the technical specifications. As these transmitters are identified, this basis for continued plant operation should be updated to address these transmitters covering the time period from the time these transmitters are identified until such time that these transmitters can be replaced. When developing and updating this basis for continued plant operation, addressees may wish to consider transmitter diversity and redundancy, diverse trip functions (a separate trip function that may also provide a corresponding trip signal), special system and/or component tests, or (if necessary) immediate replacement of certain suspect transmitters."

Response:

One suspect lot transmitter has been identified in Unit 1. The transmitter is located in the AFW system and indicates flow to the Loop 4 steam generator. The transmitter identification is 1-FT-3-170. It is not a part of the reactor protection or engineered safety features actuation system and does not perform any actuation function. This instrument is however part of the postaccident monitoring instrumentation and is therefore important to safety and will be replaced by the end of the Unit 1 Cycle 5 outage.

Reporting Requirement:

- "1. b) Identifies the indicated manufacturer; the model number; the system the transmitter was utilized in; the approximate amount of time at pressure; the corrective actions taken; and the disposition (e.g., returned to vendor for analysis) of Rosemount Model 1153 Series B, Model 1153 Series D, and Model 1154 transmitters that are believed to have exhibited symptoms indicative of loss of fill-oil or have been confirmed to have experienced a loss of fill-oil. This should include Model 1153 Series B, Model 1153 Series D, and Model 1154 transmitters manufactured after July 11, 1989."

Response:

No action is required since SQN has not identified any Rosemount transmitters within the scope of this bulletin in safety systems that have displayed symptoms of a loss of fill-oil.

Reporting Requirement:

- "1. c) Identifies the system in which the Model 1153 Series B, 1153 Series D, and 1154 transmitters from the manufacturing lots that have been identified by Rosemount as having a high failure fraction due to loss of fill-oil are utilized and provides a schedule for replacement of these transmitters which are in use in the reactor protection or engineered safety features actuation systems."

Response:

As stated in response to Item 2 under Requested Action, SQN has identified one transmitter from a suspect lot that has been installed. It is installed in the AFW system and is planned for replacement by the end of the Unit 1 Cycle 5 outage.

Reporting Requirement:

- "2. Model 1153 Series B, Model 1153 Series D and Model 1154 transmitters that, subsequent to providing the response required by Item 1 above, exhibit symptoms of loss of fill-oil or are confirmed to have experienced a loss of fill-oil should be reviewed for reportability under existing NRC regulations. If determined not to be reportable, addressees are requested to document and maintain, in accordance with existing plant procedures, information consistent with that requested in Item 1 b) above for each transmitter identified."

Response:

Rosemount Model 1153 Series B and D and Model 1154 transmitters that do not meet technical specification acceptance criteria or that have failed, causing noncompliance with technical specifications, will be reported to NRC using the licensee event report process, as applicable.

Rosemount Model 1153 Series B and D and Model 1154 transmitters that exhibit definite symptoms of loss-of-oil will be replaced. For these transmitters, the following information will be documented in accordance with plant corrective maintenance procedures:

- Manufacturer
- Model number
- Involved system
- Corrective action taken (i.e., replacement)

Additionally, TVA is currently participating in the Nuclear Plant Reliability Data System (NPRDS). In accordance with this participation, TVA will be reporting data for NPRDS (reportable failures of those Rosemount transmitters that are within the scope of NPRDS).

ENCLOSURE 2

List of Commitments

1. Replace 1-FT-3-170 by the end of Unit 1 Cycle 5 outage.
2. Revise procedures by adding steps and/or precautions to ensure appropriate personnel are aware of the loss of fill-oil issue and the need for additional management review if a Rosemount transmitter is discovered outside the normal drift tolerance. This will be performed by the start of Unit 2 Cycle 4 outage.
3. A program will be developed to ensure retraining of Operations' personnel every three to four years and initial qualification training for Instrument Maintenance's personnel. Lesson plans will be revised by January 15, 1991, to include the symptoms of loss of fill-oil.
4. A trending program to monitor for drift will be established for the ten identified Rosemount transmitters by October 31, 1990.