

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555

April 21, 1989

NRC INFORMATION NOTICE NO. 89-42: FAILURE OF ROSEMOUNT MODELS 1153 AND 1154
TRANSMITTERS

Addressees:

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose:

This information notice is being provided to alert addressees about recent failures of Rosemount models 1153 and 1154 pressure and differential pressure transmitters. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

During 1986 and 1987, five Rosemount model 1153 HD5PC differential pressure transmitters malfunctioned at Northeast Utilities' (NU) Millstone Nuclear Power Station, Unit 3. During power operation, the Millstone operators noted that the signals from the Rosemount 1153 transmitters were deviating from redundant channel signals and that the transmitters were indicating reduced levels of process noise. The transmitters were declared out of service by NU personnel, and the affected channels were placed in the tripped condition. After attempts to calibrate the transmitters failed, NU returned the transmitters to Rosemount and informed them that the malfunctions had occurred with transmitters of the same model and related serial numbers. Destructive testing performed by Rosemount determined that the failures were caused by the loss of oil from the transmitter's sealed sensing module. However, Rosemount indicated that the failures appeared to be random and not related to any generic problem with Rosemount 1153 pressure transmitters. NU submitted a 10 CFR Part 21 notification to the NRC on this issue on March 25, 1988, and provided additional information on the failures via a letter dated April 13, 1989.

Discussion:

After additional evaluations by NU and Rosemount, Rosemount issued a letter to its customers on December 12, 1988, regarding the potential malfunction of models 1153 and 1154 pressure and differential pressure transmitters. The

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Rosemount letter was supplemented with a letter dated February 7, 1989, to customers who had purchased transmitters from specific lots that were identified by Rosemount as being potentially defective. Rosemount issued a separate letter dated February 16, 1989, to customers who had purchased model 1153 and 1154 transmitters from lots that were not considered suspect. Rosemount indicated that transmitters from the suspect lots were susceptible to a loss of silicone oil from the transmitter sealed sensing module and to possible failure. According to Rosemount, as the oil leaks out of the sensing module the transmitter's performance gradually deteriorates and may eventually lead to a detectable failure.

Some of the symptoms that have been observed during operation and before failure include slow drift in either direction of about 1/4 percent or more per month, lack of response over the transmitter's full range, increase in the transmitter's time response, deviation from the normal signal fluctuations, decrease in the detectable noise level, deviation of signals from one channel compared with redundant channels, "one sided" signal noise, and slow response to a transient or inability to follow a transient. Some of the symptoms observed by NU personnel during calibration include the inability to respond over the transmitter's entire range, slow response to either increasing or decreasing hydraulic test pressure, and drift of greater than 1% from the previous calibration.

Although some of the defective transmitters have shown certain symptoms before their failure, it has been reported that in some cases the failure of a transmitter may not be detectable during operation. In addition, Rosemount now indicates that the potential for malfunction may not be limited to the specified manufacturing lots previously identified in the February 1989 letter.

It is important for addressees to determine whether any Rosemount models 1153 and 1154 pressure and differential pressure transmitters, regardless of their manufacturing date, are installed in their facilities and to take whatever actions are deemed necessary to ensure that any potential failures of these transmitters are identified. Although it may not be possible to detect the onset of failure in all instances, some transmitters have exhibited some of the aforementioned symptoms before failure. It is important for potential failure modes to be identified and that operators be prepared for handling potential malfunctions. In addition, careful examination of plant data, calibration records, and operating experience may yield clues that identify potentially defective transmitters. Addressees may wish to contact Rosemount for assistance in determining appropriate corrective actions whenever any of the aforementioned symptoms are observed or if failures are identified.

On April 13, 1989, the NRC staff met and discussed this matter with Rosemount and several industry groups. Rosemount has launched a program to identify the root cause of the loss of oil from the sensing module and to determine recommendations for its customers to address potentially defective transmitters.

No specific action or written response is required by this information notice. If you have any questions regarding this matter, please contact one of the technical contacts listed below or the Regional Administrator of the appropriate regional office.


Charles E. Rossi, Director
Division of Operational Events Assessment
Office of Nuclear Reactor Regulation

Technical Contacts: Kamal Naidu, NRR
(301) 492-0980

Jaime Guillen, NRR
(301) 492-1170

Attachment: List of Recently Issued NRC Information Notices

LIST OF RECENTLY ISSUED
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
89-41	Operator Response to Pressurization of Low-Pressure Interfacing Systems	4/20/89	All holders of OLs or CPs for nuclear power reactors.
88-75, Supplement 1	Disabling of Diesel Generator Output Circuit Breakers by Anti-Pump Circuitry	4/17/89	All holders of OLs or CPs for nuclear power reactors.
89-40	Unsatisfactory Operator Test Results and Their Effect on the Requalification Program	4/14/89	All holders of OLs or CPs for nuclear power reactors.
89-39	List of Parties Excluded from Federal Procurement or Non-Procurement Programs	4/5/89	All holders of OLs or CPs for nuclear power reactors.
89-38	Atmospheric Dump Valve Failures at Palo Verde Units 1, 2, and 3	4/5/89	All holders of OLs or CPs for nuclear power reactors.
89-37	Proposed Amendments to 40 CFR Part 61, Air Emission Standards for Radionuclides	4/4/89	All U.S. NRC licensees.
89-36	Excessive Temperatures in Emergency Core Cooling System Piping Located Outside Containment	4/4/89	All holders of OLs or CPs for nuclear power reactors.
88-86, Supp. 1	Operating with Multiple Grounds in Direct Current Distribution Systems	3/31/89	All holders of OLs or CPs for nuclear power reactors.
89-35	Loss and Theft of Unsecured Licensed Material	3/30/89	All U.S. NRC byproduct, source and special nuclear material licensees.

OL = Operating License
CP = Construction Permit

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*OGCB: DOEA: NRR JGuillen 04/13/89	*VIB: DRIS: NRR KNaidu 04/17/89	*C/VIB: DRIS: NRR BBrach 04/17/89	*C/SICB: DEST: NRR *AD/SAD: DEST: NRR SNewberry 04/17/89 ATHadani 04/17/89

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04/17/89

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*RPB:ARM
TechEd
04/12/89

C/SICB:DEST:NRR
SNewberry
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AD/SAD:DEST:NRR
ATHadani
04/17/89

By Phone
CAB

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It is important for addressees to determine whether any Rosemount models 1153 and 1154 pressure and differential pressure transmitters, regardless of their manufacturing date, are installed in their facilities and to take whatever actions are deemed necessary to ensure that any potential failures of these transmitters are identified and to preclude any deterioration of the safety functions of these transmitters. Although it may not be possible to detect the onset of failure in all instances, some transmitters have exhibited some of the aforementioned symptoms before failure.

The NRC staff is continuing to investigate this matter and plans to meet with Rosemount and several industry groups in the near future to discuss this matter.

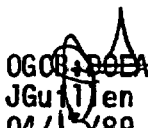
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