



# Entergy Operations

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A4.05

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July 17, 1990

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

Subject: Waterford 3 SES  
Docket No. 50-382  
License No. NPF-38  
NRC Bulletin 90-01, "Loss of Fill-Oil in Transmitters  
Manufactured by Rosemount"

Gentlemen:

NRC Bulletin 90-01 requested that licensees provide, within 120 days after receipt, a response that identifies and reports specific actions taken for Model 1153 Series B, Model 1153 Series D and Model 1154 transmitters manufactured by Rosemount prior to July 11, 1989 which may potentially fail because of leaking fill-oil. Accordingly, please find in Attachment 1 the response to the requested Bulletin information for Waterford 3. Each specific reporting requirement of the Bulletin is listed in the Attachment first and then followed by the Waterford 3 response to each as applicable.

You will note that the scope of the Bulletin response was limited for Waterford 3 because there are no Model 1153 Series B or Model 1153 Series D Rosemount transmitters and only two Model 1154 Rosemount transmitters currently installed in the plant.

If you have any questions concerning this response, please contact T.J. Gaudet at (504) 739-6666.

Very truly yours,

RFB/TJG/ssf  
Attachment

cc: Messrs. R.D. Martin (NRC Region IV), D.L. Wigginton (NRC-NRR),  
E.L. Blake, W.M. Stevenson, R.B. McGehee  
NRC Resident Inspectors Office

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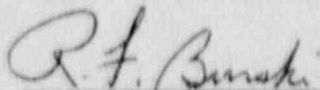
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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the matter of )  
 )  
Entergy Operations, Inc. ) Docket No. 50-382  
Waterford 3 Steam Electric Station )

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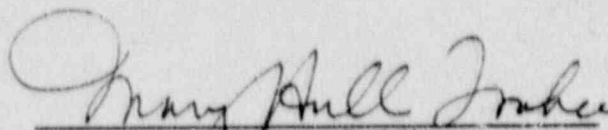
R.F. Burski, being duly sworn, hereby deposes and says that he is Director, Nuclear Safety, Waterford 3 of Entergy Operations, Inc.; that he is duly authorized to sign and file with the Nuclear Regulatory Commission the attached NRC Bulletin 90-01; that he is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge, information and belief.



R.F. Burski  
Director, Nuclear Safety

STATE OF LOUISIANA )  
 ) ss  
PARISH OF ORLEANS )

Subscribed and sworn to before me, a Notary Public in and for the Parish and State above named this 17th day of July, 1990.

  
Notary Public

My Commission expires life.

Attachment 1

Response to NRC Bulletin No. 90-01 Specific Reporting Requirements

NRC Bulletin Request

- 1(a)(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).

Waterford 3 Response

- 1(a)(1) Waterford 3 performed a review of the Station Information Management System listing of Rosemount transmitters installed in the plant. Included in the review was a check of transmitters of the same Model type that were manufactured by Rosemount but may have been refurbished or remanufactured by other sources (Bailey Controls, Fisher Controls). Also, any potential safety-related Rosemount transmitters that were identified from these sources were verified by visual inspection.

Results of the review indicated that there are no Model 1153 Series B, Model 1153 Series D nor Model 1154 pressure or differential pressure Rosemount transmitters currently utilized in either safety-related systems or systems installed in accordance with 10 CFR 50.62 (ATWS) at Waterford 3. There are, however, two Model 1154 Rosemount transmitters installed as part of the Refueling Water Level Indication System (RWLIS) and two Model 1153 Series D stored as spares in the warehouse. The two Model 1154 Rosemount transmitters [RWLIS narrow range transmitter (RC ILT0108) and RWLIS wide range transmitter (RC ILT0109)] are nonsafety-related and normally isolated until they are required during Mode 5, Cold Shutdown. The two Model 1153 Rosemount transmitter spares [Part No.'s 1153DD4PC (stock No. 999-A06620) and 1153GD7PC (stock No. 999-B05483)] have been designated as Waterford 3 surplus scrap.

NRC Bulletin Request

- 1(a)(2) Determine whether any transmitters identified in Item 1(a)(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.



Waterford 3 Response

- 1(a)(2) The two Model 1154 and the two spare Model 1153 Series D Rosemount transmitters listed above in response to Item 1(a)(1) are not from the suspect manufacturing lots identified by Rosemount as having a high failure fraction due to loss of fill-oil. As such, implementation of a program to replace them is unnecessary for Waterford 3.

NRC Bulletin Request

- 1(a)(3) Review plant records (for example, the three most recent calibration records) associated with the transmitters identified in Item 1(a)(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.

Waterford 3 Response

- 1(a)(3) Waterford 3 has conducted a review of reported Nuclear Plant Reliability Data System (NPRDS) failures with respect to Rosemount transmitters utilized at Waterford 3. Results of this review indicated that although a few failures were identified with NPRDS Rosemount transmitters, none were with Model 1153 Series B, Model 1153 Series D and Model 1154 Rosemount transmitters and none were related to or confirmed as loss of fill-oil failures.

In addition to the above, the four most recent calibration records for the two 1154 transmitters installed as part of the RWLIS were reviewed. Again, in support of the aforementioned conclusion, no symptoms or failures indicative of fill-oil loss were identified. Accordingly, the development of operability acceptance criteria or the scheduling of the replacement of such suspect transmitters was unnecessary for Waterford 3.

NRC Bulletin Request

- 1(a)(4) Develop and implement an enhanced surveillance program to monitor transmitters identified in Item 1(a)(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;
  - (b) Enhanced transmitter monitoring to identify sustained transmitter drift;
  - (c) Review of transmitter performance following planned or unplanned plant transients or tests to identify sluggish transmitter response;
  - (d) Enhanced awareness of sluggish transmitter response to either increasing or decreasing test pressure during calibration activities;
  - (e) Development and implementation of a program to detect changes in process noise; and
  - (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.

Waterford 3 Response

- 1(a)(4) Because there are no Models 1153 Series B, 1153 Series D, nor 1154 Rosemount transmitters which were manufactured prior to July 11, 1989 installed in any safety-related or ATWS systems at Waterford 3 [Refer to the responses provide in Items 1(a)(1) and 1(a)(2)], the implementation of an enhanced surveillance program is not directly applicable to Waterford 3. It is

Waterford 3 Response

1(a)(4) believed, however, that the existing surveillance program at  
(cont'd) Waterford 3 for monitoring safety-related transmitters regardless  
of manufacturer is sufficient to detect symptoms of transmitter  
degradation irrespective of whether it is due to the loss of  
fill-oil, setpoint drift, slow response, being out of calibration or  
being out of tolerance. This program includes the calibration of  
transmitters every 18 months and trending thereafter.

During calibrations, Waterford Maintenance personnel assure that  
the as-left setpoint falls within a predetermined range.  
Calibration work by Maintenance personnel continues until the  
as-left value meets procedure acceptance criteria (i.e., a  
specified percent tolerance window around the normal setpoint).  
Also, the out of calibration condition would be trended on the  
as-found data. At Waterford 3, a five point calibration is  
performed either on the transmitter itself or the electronics  
portion of associated loop (indicator, transmitter, card, etc.)  
depending on the transmitter's location. In a five point  
calibration, the transmitters and the electronic sections of these  
loops are checked at five different points throughout their  
calibrated range. For example, if a transmitter has a range of 0  
to 100 inches of water, the calibration is done at the following  
levels:

1.	0%	=	0 <sup>in</sup>	6.	75%	=	75 <sup>in</sup>
2.	25%	=	25 <sup>in</sup>	7.	50%	=	50 <sup>in</sup>
3.	50%	=	50 <sup>in</sup>	8.	25%	=	25 <sup>in</sup>
4.	75%	=	75 <sup>in</sup>	9.	0%	=	0 <sup>in</sup>
5.	100%	=	100 <sup>in</sup>				

<sup>in</sup> = inches of water

In this case, there are actually a total of nine points checked,  
five of which are different.

For safety-related transmitters located inside containment (Plant  
Protection System), the five point calibration is performed on the  
transmitter itself. Each transmitter is calibrated to a narrow  
1/4% tolerance level. If the transmitter tolerance during  
calibration approaches greater than 1/2, then the transmitter is  
fine tuned. Because this information is documented, adverse  
trends could be detected on individual transmitters. For safety-  
related transmitters located outside containment, the five point  
calibration is performed on the electronics portion of the  
associated loop. Each loop in this case would be calibrated to a  
1/2% tolerance level. Because drift is not added into the  
calculation performed, the loop would give an indication of being  
excessively out of tolerance if there was an inordinate amount of  
drift. In any case, if excessive (repeated) drift occurs, the  
transmitter or loop component would be replaced.



In addition to the above, the following actions are being taken as a result of the Rosemount transmitter concern as precautionary measures for Rosemount transmitters in use in safety-related systems at Waterford 3:

- Training of appropriate Maintenance personnel will be conducted to ensure that they are aware of the symptoms a transmitter may exhibit during operation or calibration if it is experiencing a loss of fill-oil and to emphasize the importance of taking prompt corrective action when such conditions are identified;
- Waterford 3 is currently investigating the feasibility of having the Plant Monitoring Computer provide a statistical sample of those Rosemount transmitter/loop inputs that are fed into the Computer. Essentially, this sample would provide a weighted average of available inputs which could be reviewed and trended; and
- Waterford 3 is also exploring means to detect changes in process noise in which technological advancements are currently being made.

Based on the above, it is believed that no further transmitter surveillance actions by Waterford 3 are warranted.

#### NRC Bulletin Request

- 1(a)(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.

Waterford 3 Response

- 1(a)(5) Based on the information provided above in response to Items 1(a)(1) through 1(a)(4), this action request is not applicable to Waterford 3. However, should any safety-related transmitter regardless of manufacturer appear sluggish, drift excessively or begin a pattern of noticed failure, the Waterford 3 philosophy is to replace the transmitter as soon as possible, contingent upon accessibility. If a transmitter is not accessible, then Waterford 3 personnel would enter, as applicable, the Nonconformance/Indeterminate Qualification Process as documented in Nuclear Operations Procedure NOP-019. This process would include the identification, operability determination, engineering evaluation and development of the corrective action should there be concern with a safety-related transmitter that could not be fixed or replaced in the short term.

NRC Bulletin Request

- 1(b) Identify 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.

Waterford 3 Response

- 1(b) Based on the information provided in response to Items 1(a)(1) through 1(a)(5), this action request is not applicable to Waterford 3.

NRC Bulletin Request

- 1(c) Identify the system in which 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 are utilized and provide a schedule for replacement of these transmitters which are in use in the reactor protection or engineered safety features actuation systems.

Waterford 3 Response

- 1(c) Based on the information provided in response to Items 1(a)(1) through 1(a)(5), this action request is not applicable to Waterford 3.



NRC Bulletin Request

2. Model 1153 Series B, Model 1153 Series D and Model 1154 transmitters that, subsequent to providing the response required by Items 1(a), (b) and (c) 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 request in Item 1(b) above for each transmitter identified.

Waterford 3 Response

2. Because Waterford 3 does not utilize any Model 1153 Series B, 1153 Series D and Model 1154 pressure or differential pressure transmitters that were manufactured prior to July 11, 1989 in either safety-related systems or systems installed in accordance with 10CFR50.62, this request generally does not apply to Waterford 3. However, Rosemount transmitters that meet the existing NPRDS reportable component criteria are entered into the NPRDS Database. As such, failures of the entered transmitters would be reported to the NPRDS.

It should be noted that as a result of INPO revisions 3 and 4 to the NPRDS Reportable System and Component Scope Manual, the following plant systems will be reviewed in accordance with INPO Reporting Guidance as part of Waterford 3's 1990 NPRDS Action Plans:

Engineered Safety Features Actuation	Generator and 25KV Distribution
Plant Protection	Main Turbine
Excure Nuclear Instrumentation	Reheat Steam
Process Analog Control	Electro-Hydraulic Fluid
Steam Generator	Condensate

Any Rosemount Transmitters included in the above systems that meet the revised NPRDS reportable component criteria will be entered into the NPRDS Database.