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Executive Vice President
Nuclear Generation

March 5, 1993
JPN-93-010

U. S. Nuclear Regulatory Commission
Mail Station P1-137
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Washington, DC 20555

SUBJECT: James A. FitzPatrick Nuclear Power Plant
Docket No. 50-333
Response to NRC Bulletin No. 90-01, Supplement 1
Loss of Fill-Oil in Transmitters Manufactured by Rosemount

- References:
1. NRC Bulletin No. 90-01, Supplement 1, "Loss of Fill-Oil in Transmitters Manufactured by Rosemount," dated December 22, 1992.
 2. NYPA letter, R. E. Beedle to the NRC, dated July 19, 1990, (JAFP-90-0549), "Response to NRC Bulletin 90-01."
 3. NRC Bulletin No. 90-01, "Loss of Fill-Oil in Transmitters Manufactured by Rosemount," dated March 9, 1990.

Dear Sir:

This letter describes the actions taken by the New York Power Authority in response to NRC Bulletin No. 90-01, Supplement 1 (Reference 1) at the James A. FitzPatrick Nuclear Power Plant. The Bulletin addresses Rosemount transmitters, Models 1153 Series B, 1153 Series D, and 1154, used in safety-related or ATWS mitigation systems, that have experienced a history of failures resulting from a loss of fill-oil. The Bulletin requests either replacement or an enhanced surveillance monitoring program of those transmitters that fail to satisfy the screening criteria presented in the Bulletin.

Status of FitzPatrick Transmitters

The James A. FitzPatrick Nuclear Power Plant has ninety-seven (97) Rosemount transmitters, Model 1153 Series B, that are used in safety-related systems or systems installed to meet to the requirements of 10 CFR 50.62 (the ATWS rule). There are no Rosemount transmitters Model 1153 Series D or Model 1154 installed at the plant. The status

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of the installed transmitters is presented in Attachment 1. Seventy-four (74) of these transmitters are excluded from additional monitoring requirements by meeting the Bulletin 90-01, Supplement 1 exclusion criteria as follows:

- Twenty-three (23) transmitters were refurbished after July 11, 1989, or replaced with a transmitter manufactured after July 11, 1989.
- Twenty-nine (29) transmitters have normal operating pressures of less than 500 psig.
- Twenty-two (22) transmitters require an additional twelve days of exposure to normal operating pressure to reach the 60,000 psi-month maturity threshold. For the purposes of this submittal, they are designated as mature.

The once per operating cycle calibration drift monitoring program, described in Attachment 2, will continue for the above transmitters with normal operating pressures of less than 500 psi and those that have not reached the psi-month maturity threshold criterion (51 total) for at least the next two operating cycles to assure that a high degree of confidence is maintained for detecting potential failures caused by a loss of fill-oil in these transmitters.

Proposed Actions

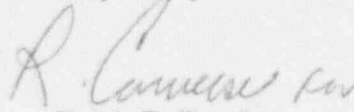
The remaining twenty-three (23) Rosemount transmitters, Model 1153 Series B, have a normal operating pressure between 500 psig and 1500 psig, and do not meet the Rosemount psi-month maturity threshold criterion. These transmitters are subject to Bulletin 90-01, Supplement 1, preventive measures; i. e., replacement with a post July 11, 1989 transmitter, or subject to a monthly enhanced surveillance monitoring program. The Authority will subject these twenty-three (23) transmitters to the existing enhanced surveillance monitoring program as described in Attachment 2. The enhanced surveillance monitoring program consists of four checks/tests: the daily operational instrument check, the weekly operational verification check, the response time test, and once per cycle drift monitoring using calibration data. This surveillance program has been effective, based on past performance, in detecting degradation caused by the loss of fill-oil.

The Bulletin permits an extension in the frequency of the enhanced surveillance program from monthly to once per every refueling cycle, but not exceeding 24 months, provided sufficiently high reliability for the applicable safety function exists. The last test listed above (drift monitoring) is performed once per cycle. This frequency is justified by the high level of reliability for the safety functions provided by the redundancy and diversity of applicable instrumentation and control systems. Attachment 3 describes the reliability of the safety functions associated with the twenty-three transmitters subject to the enhanced surveillance. Additionally, as described in Attachment 2, calibrating these transmitters at power exposes the plant to a possible transient which could challenge safety systems.

The program described above for the Rosemount transmitters conforms with the actions requested by the Bulletin and meets the objectives of assuring the continued reliability of safety-related transmitters. This conclusion is based on the effectiveness of the enhanced surveillance program described, the need to avoid risks associated with inadvertent operational transient initiations (scram) and the reliability of the associated safety functions.


If you have any questions, please contact Mr. J. A. Gray, Jr.

Very truly yours,


Ralph E. Beedle

**STATE OF NEW YORK
COUNTY OF WESTCHESTER**

Subscribed and sworn to before me
this 5th day of March 1993.


Notary Public

MINA HOLDEN
NOTARY PUBLIC, State of New York
Westchester County
No. 4829150
My Commission Expires Aug. 31, 1993

Attachments

cc: Regional Administrator
U. S. Nuclear Regulatory Commission
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ATTACHMENT 1

RESPONSE TO NRC BULLETIN 90-01, SUPPLEMENT 1

ROSEMOUNT MODELS 1151 & 1153 TRANSMITTERS INSTALLED AT THE JAMES A. FITZPATRICK NUCLEAR
POWER PLANT

SEE NOTES AT END OF TABLE.

ID NO.	FUNCTION (Note 8)	MODEL	SERIES TYPE	RANGE CODE	SERIAL NO. (Note 3)	SERVICE DATE	PRES (PSIG)	MONTHS		% MATUR (Note 7)	STATUS (Note 1,2)
								AT	PSI		
02-3LT-57B	ESF	1153DB5RC	B	5	410053	860501	1000	50	50010	83	ES
02-3LT-58B	ESF	1153DB5RC	B	5	414000	860728	1000	48	47660	79	ES
02DPT-116A	ESF	1153DB7RC	B	7	410559	850301	1000	60	59600	46	ES
02DPT-116B	ESF	1153DB7RC	B	7	410560	850301	1000	60	59600	46	ES
02DPT-116C	ESF	1153DB7RC	B	7	410561	850301	1000	60	59600	46	ES
02DPT-116D	ESF	1153DB7RC	B	7	410562	850301	1000	60	59600	46	ES
02DPT-117A	ESF	1153DB7RC	B	7	410563	850301	1000	60	59600	46	ES
02DPT-117B	ESF	1153DB7RC	B	7	410570	850301	1000	60	59600	46	ES
02DPT-117C	ESF	1153DB7RC	B	7	410564	850301	1000	60	59600	46	ES
02DPT-117D	ESF	1153DB7RC	B	7	409987	850301	1000	60	59600	46	ES
02DPT-118A	ESF	1153DB7RC	B	7	409988	850301	1000	60	59600	46	ES
02DPT-118B	ESF	1153DB7RC	B	7	409998	851106	1000	55	55630	42	ES
02DPT-118C	ESF	1153DB7RC	B	7	409990	850301	1000	60	59600	46	ES
02DPT-118D	ESF	1153DB7RC	B	7	410565	850301	1000	60	59600	46	ES
02DPT-119A	ESF	1153DB7RC	B	7	410566	850301	1000	60	59600	46	ES
02DPT-119B	ESF	1153DB7RC	B	7	410567	850301	1000	60	59600	46	ES
02DPT-119C	ESF	1153DB7RC	B	7	410568	850301	1000	60	59600	46	ES
02DPT-119D	ESF	1153DB7RC	B	7	410569	850301	1000	60	59600	46	ES
02PT-134A	ESF	1153GB9RC	B	9	416738	890807	1000	20	20030	33	ES
13DPT-83	ESF	1153DB5RC	B	5	417481	860904	1000	46	46450	77	ES
13DPT-84	ESF	1153DB5RC	B	5	410582	901229	1000	8	7270	12	ES
23PT-68B	ESF	1153GB9RC	B	9	416737	900129	1000	15	14980	25	ES
23PT-68D	ESF	1153GB9RC	B	9	416297	870904	1000	38	38100	64	ES
02-3LT-101B	RPS	1153DB4RC	B	4	409979	850301	1000	60	59600	99	MATURE
02-3LT-101C	RPS	1153DB4RC	B	4	410553	850301	1000	60	59600	99	MATURE

ID NO.	FUNCTION (Note 8)	MODEL	SERIES TYPE	RANGE CODE	SERIAL NO. (Note 3)	SERVICE DATE	PRES (PSIG)	AT PRES	MONTHS PSI (Note 7)	% MATUR (Note 1,2)	STATUS
02-3LT-72C	ESF	1153DB5RC	B	5	410575	850301	1000	60	59600	99	MATURE
02-3LT-72D	ESF	1153DB5RC	B	5	410576	850301	1000	60	59600	99	MATURE
02-3LT-79	ESF	1153DB5RC	B	5	410577	850301	1000	60	59600	99	MATURE
02-3LT-83A	ESF	1153DB4RC	B	4	410555	850301	1000	60	59600	99	MATURE
02-3LT-83B	ESF	1153DB4RC	B	4	410556	850301	1000	60	59600	99	MATURE
02-3PT-102A	ATW	1153GB9RC	B	9	409968	850301	1000	60	59600	99	MATURE
02-3PT-102C	ATW	1153GB9RC	B	9	409970	850301	1000	60	59600	99	MATURE
02-3PT-52A	ESF	1153GB9RC	B	9	409972	850301	1000	60	59600	99	MATURE
02-3PT-52B	ESF	1153GB9RC	B	9	409973	850301	1000	60	59600	99	MATURE
02-3PT-52D	ESF	1153GB9RC	B	9	409975	850301	1000	60	59600	99	MATURE
02-3PT-55B	RPS	1153GB9RC	B	9	409977	850301	1000	60	59600	99	MATURE
02-3PT-55C	RPS	1153GB9RC	B	9	410540	850301	1000	60	59600	99	MATURE
02PT-134C	ESF	1153GB9RC	B	9	410545	850301	1000	60	59600	99	MATURE
05PT-14B	ESF	1153GB9RC	B	9	410047	850301	1000	60	59600	99	MATURE
13PT-87C	ESF	1153GB9RC	B	9	410040	850301	1000	60	59600	99	MATURE
13PT-87D	ESF	1153GB9RC	B	9	410041	850301	1000	60	59600	99	MATURE
23DPT-76	ESF	1153DB5RC	B	5	410579	850301	1000	60	59600	99	MATURE
23DPT-77	ESF	1153DB5RC	B	5	410580	850301	1000	60	59600	99	MATURE
23PT-68A	ESF	1153GB9RC	B	9	410042	850301	1000	60	59600	99	MATURE
23PT-68C	ESF	1153GB9RC	B	9	410044	850301	1000	60	59600	99	MATURE
02PT-250A	1ST	1151GP7B22	P	7	20239	740101	1000	NA	NA	NA	MODEL
02PT-250B	1ST	1151GP7B22	P	7	20238	740101	1000	NA	NA	NA	MODEL
19-4DPT-26	FPO	1151DP6E22	P	6	843547	870805	0	NA	NA	NA	MODEL
19-4FT-26	FPO	1151DP5J12	P	5	691420	870805	0	NA	NA	NA	MODEL
33PT-100A	CVA	1151DP5G22	P	5	1044893	890726	(-)14	NA	NA	NA	MODEL
33PT-100B	CVA	1151DP5G22	P	5	1046929	890727	(-)14	NA	NA	NA	MODEL
33PT-155A	CVA	1151DP5G22	P	5	1046930	890724	(-)14	NA	NA	NA	MODEL
33PT-155B	CVA	1151DP5G22	P	5	1042354	890725	(-)14	NA	NA	NA	MODEL
01-125FT-106	SBG	1153DB3RA	B	3	420401	881001	0	NA	NA	NA	PRESS
05PT-12A	RPS	1153GB5RC	B	5	503491	920215	2	NA	NA	NA	PRESS
05PT-12B	RPS	1153GB5RC	B	5	409877	850301	2	NA	NA	NA	PRESS
05PT-12C	RPS	1153GB5RC	B	5	416804A	920313	2	NA	NA	NA	PRESS
05PT-12D	RPS	1153GB5RC	B	5	410590A	920213	2	NA	NA	NA	PRESS

ID NO.	FUNCTION (Note 8)	MODEL	SERIES TYPE	RANGE CODE	SERIAL NO. (Note 3)	SERVICE DATE	PRES (PSIG)	MONTHS AT PRES	PSI MONTHS (Note 7)	% MATUR (Note 1,2)	STATUS
10FT-136A	ESF	1153DB5RA	B	5	420396	881019	0	NA	NA	NA	PRESS
10FT-136B	ESF	1153DB5RA	B	5	420397	881019	0	NA	NA	NA	PRESS
10FT-137A	ESF	1153DB5RA	B	5	420398	881019	2	NA	NA	NA	PRESS
10FT-137B	ESF	1153DB5RA	B	5	420399	881019	2	NA	NA	NA	PRESS
10PT-101A	RPS	1153GB5RC	B	5	410591A	920406	2	NA	NA	NA	PRESS
10PT-101B	RPS	1153GB5RC	B	5	410587	850301	2	NA	NA	NA	PRESS
10PT-101C	RPS	1153GB5RC	B	5	416296A	920413	2	NA	NA	NA	PRESS
10PT-101D	RPS	1153GB5RC	B	5	410589	850301	2	NA	NA	NA	PRESS
27FET-664	PAS	1153DB3PBN	B	3	407456	841113	0	NA	NA	NA	PRESS
27FT-102	CAD	1153DB4RC	B	4	416547	870403	0	NA	NA	NA	PRESS
27PT-101A	IND	1153GB6RA	B	6	417189	900430	0	NA	NA	NA	PRESS
27PT-101B	IND	1153GB5RA	B	5	500950	900430	0	NA	NA	NA	PRESS
27PT-101B1	IND	1153GB6RA	B	6	417190	900430	0	NA	NA	NA	PRESS
27PT-117	IND	1153GB7RC	B	7	417222	870317	0	NA	NA	NA	PRESS
29PT-201A	MSL	1153GB5RA	B	5	417117	870309	0	NA	NA	NA	PRESS
29PT-201B	MSL	1153GB5RA	B	5	417116A	920427	0	NA	NA	NA	PRESS
33PT-135A	ESF	1153AB5RC	B	5	409999	850301	(-)14	NA	NA	NA	PRESS
33PT-135B	ESF	1153AB5RC	B	5	410000	850301	(-)14	NA	NA	NA	PRESS
33PT-135C	ESF	1153AB5RC	B	5	410001	850301	(-)14	NA	NA	NA	PRESS
33PT-135D	ESF	1153AB5RC	B	5	410002	850301	(-)14	NA	NA	NA	PRESS
46FT-101A1	ESW	1153DB4PG	B	4	420505	881026	200	NA	NA	NA	PRESS
46FT-101A2	ESW	1153DB4PG	B	4	420506	881026	200	NA	NA	NA	PRESS
46FT-101B1	ESW	1153DB4PG	B	4	420507	881026	200	NA	NA	NA	PRESS
46FT-101B2	ESW	1153DB4PG	B	4	420508	881026	200	NA	NA	NA	PRESS
02-3LT-72B	ESF	1153DB5RC	B	5	410583A	930228	1000	NA	NA	NA	SER NO
02-3LT-73	ESF	1153DB5RC	B	5	410089A	930228	1000	NA	NA	NA	SER NO
02-3LT-101A	RPS	1153DB4RC	B	4	412287A	920423	1000	NA	NA	NA	SER NO
02-3LT-101D	RPS	1153DB4RC	B	4	416335A	920511	1000	NA	NA	NA	SER NO
02-3LT-57A	ESF	1153DB5RC	B	5	416442A	920504	1000	NA	NA	NA	SER NO
02-3LT-58A	ESF	1153DB5RC	B	5	410054A	920502	1000	NA	NA	NA	SER NO
02-3LT-72A	ESF	1153DB5RC	B	5	416440A	920429	1000	NA	NA	NA	SER NO
02-3LT-83C	ESF	1153DB4RC	B	4	500016	891001	1000	NA	NA	NA	SER NO
02-3LT-83D	ESF	1153DB4RC	B	4	500017	891001	1000	NA	NA	NA	SER NO

ID NO.	FUNCTION (Note 8)	MODEL	SERIES TYPE	RANGE CODE	SERIAL NO. (Note 3)	SERVICE DATE	PRES (PSIG)	MONTHS AT PRES	PSI MONTHS (Note 7)	% MATUR (Note 1,2)	STATUS
02-3LT-94	RWL	1153DB5RC	B	5	416443A	921030	1000	NA	NA	NA	SER NO
02-3PT-102B	ATW	1153GB9RC	B	9	414007A	920203	1000	NA	NA	NA	SER NO
02-3PT-102D	ATW	1153GB9RC	B	9	500742	900618	1000	NA	NA	NA	SER NO
02-3PT-52C	ESF	1153GB9RC	B	9	416275A	920205	1000	NA	NA	NA	SER NO
02-3PT-55A	RPS	1153GB9RC	B	9	410551A	920404	1000	NA	NA	NA	SER NO
02-3PT-55D	RPS	1153GB9RC	B	9	410548A	920401	1000	NA	NA	NA	SER NO
02PT-134B	ESF	1153GB9RC	B	9	416736A	920211	1000	NA	NA	NA	SER NO
02PT-134D	ESF	1153GB9RC	B	9	417418A	930129	1000	NA	NA	NA	SER NO
03DPT-211	CRD	1153DB8RA	B	8	500259	900330	1000	NA	NA	NA	SER NO
05PT-14A	ESF	1153GB9RC	B	9	409971A	920314	1000	NA	NA	NA	SER NO
05PT-14C	ESF	1153GB9RC	B	9	410043A	920318	1000	NA	NA	NA	SER NO
05PT-14D	ESF	1153GB9RC	B	9	410547A	920317	1000	NA	NA	NA	SER NO
13PT-87A	ESF	1153GB9RC	B	9	410543A	920129	1000	NA	NA	NA	SER NO
13PT-87B	ESF	1153GB9RC	B	9	417225A	920413	1000	NA	NA	NA	SER NO
03PT-210	CRD	1153DP7N22	P	7	420447	881115	1000	NA	NA	NA	SERIES
06FT-50A	FDW	1153DP6G22	P	6	1217668	900129	1000	NA	NA	NA	SERIES
06FT-50B	FDW	1153DP6G22	P	6	1217669	900129	1000	NA	NA	NA	SERIES
19PT-104	FPO	1153GP8E22	P	8	268611	870805	0	NA	NA	NA	SERIES
23LT-201C	SPO	1153DP3A22	P	3	100595	770824	2	NA	NA	NA	SERIES

NOTES:

- 1) Status column lists the exemption nomenclature (i.e., Pressure-"Press", Serial Number-"Ser No", Maturity, or Model) which meet the exempt requirements of NRC Bulletin No. 90-01, Supplement 1.
- 2) ES status: Transmitters subject to the enhanced surveillance program are labeled "ES".
- 3) Transmitter serial number ending with a suffix of "A" is a unit rebuilt with a sensing module manufactured after July 11, 1989.
- 4) Range code 3, 4 & 5 for differential transmitters require 60,000 psi-month for exclusion based on service life.

- 5) Range code 6,7 & 8 for differential transmitters require 130,000 psi-month for exclusion based on service life.
- 6) Range code 6,7,8,9 & 10 for gage & absolute transmitters requires 60,000 psi-month for exclusion based on service life.
- 7) Psi-month history was computed by totaling the plant on-line time from the installation date of the transmitter through February 25, 1993.
- 8) Function codes: ATWS (anticipated transient without scram), CAD (containment atmosphere dilution system), CVA (condenser vacuum), ESF (engineered safety features), FPO (spent fuel pool), IND indicator), MSL (main steam line leakage collection system), RPS (reactor protection system), RWL (reactor water level), SBG (standby gas treatment system), SPO (suppression pool monitoring), 1st (main turbine system), FDW (feedwater), PAS (post accident sampling system).

ATTACHMENT 2

ENHANCED SURVEILLANCE MONITORING PROGRAM

Response to NRC Bulletin 90-01, Supplement 1
Loss of Fill-Oil in Rosemount Transmitters
James A. FitzPatrick Nuclear Power Plant

The twenty-three (23) Rosemount transmitters, Model 1153 Series B, that have a normal operating pressure between 500 psig and 1500 psig, and do not meet the Rosemount psi-month maturity threshold criterion, will be subject to the enhanced surveillance monitoring program until the maturity (psi-month) threshold criterion is reached. This enhanced surveillance monitoring program, currently in effect, consists of the following:

- Daily operational instrument check: During the daily rounds, the operator reads, records and compares the instrument reading with previous readings and readings from instruments in the same functional group to identify trends or abnormalities. If the reading is abnormal or out of the specified tolerance, a review is performed by the Operations Department, then referred to the I & C Department for further investigation.
- Weekly operational verification check: The I & C Department monitors transmitter output signals by calibrated plant computer points, and compares each signal with the mean output signal of the same instrument group. Further investigation is performed for transmitter output deviations of greater than two standard deviations from the mean. Adverse trends are also identified by the check.
- Response time testing: Response testing of the transmitters by step impulses will detect large losses of fill-oil, and will be used as an aid in confirming abnormal surveillance indications.
- Once per cycle drift monitoring: Calibration data is analyzed by comparing instrument performance to theoretical acceptance limits; i. e., the difference between the "as-found" and the previous "as-left" calibration values are compared to calculated calibration uncertainties. Anomalies at both ends of the span are investigated for oil loss conditions.

The once per cycle frequency for the last test listed is justified by the high level of reliability for the safety functions provided by the redundancy and diversity of applicable instrumentation and control systems. Attachment 3 provides an assessment supporting this conclusion.

The transmitter calibrations are performed on a once per cycle frequency to avoid the risks associated with performing instrument calibrations on-line. During power operations, hydraulic transients in instrument sensing lines, coupled together by common piping, are known to cause safety function actuations or trips when instruments are valved in and out of

service at operating pressure (1000 psig). Calibrating these instruments at power exposes the plant to a possible transient, which could challenge safety systems.

Some of the transmitters subject to the enhanced surveillance monitoring program may be considered for replacement with post July 11, 1989 transmitters in the future; in which case, the surveillance program would be modified to reflect their new status.

For transmitters not subject to the replacement or enhanced surveillance requirements of Bulletin 90-01, Supplement 1, the Bulletin requires that a high degree of confidence be maintained for detecting transmitter failure caused by a loss of fill-oil. This involves the transmitters exposed to normal operating pressures below 500 psig and those that have reached the maturity (psi-month) threshold criterion. Accordingly, the once per operating cycle calibration drift monitoring program, described above, will continue for these two groups of transmitters (51 total) for at least the next two operating cycles to assure that a high degree of confidence is maintained for detecting failures caused by a loss of fill-oil. Any decision to discontinue this surveillance program beyond the next two operating cycles, would be based on a conclusion that adequate reliability has been established and will be maintained.

ATTACHMENT 3

CONFIRMATION OF SAFETY FUNCTION RELIABILITY

Response to NRC Bulletin 90-01, Supplement 1
Loss of Fill-Oil in Rosemount Transmitters
James A. FitzPatrick Nuclear Power Plant

Twenty-three Rosemount transmitters which are subject to the preventive measures of NRC Bulletin 90-01, Supplement 1, are not scheduled for replacement. Continued reliability of the safety functions associated with these transmitters will be assured by the enhanced surveillance program described in Attachment 2, and the design of the safety function instrumentation as described below.

High Main Steam Line Flow Transmitters

Total Number: 16

Instrument No: 02DPT-116 A thru D
02DPT-117 A thru D
02DPT-118 A thru D
02DPT-119 A thru D

Model No: 1153DB7RC

Safety Function: ESF - Provides a main steam line flow signal for generating a Group 1 containment isolation signal on high steam flow. A Group 1 isolation trip closes valves on the main steam containment penetration. High flow is indicative of a main steam line break.

Redundancy:

There are four main steam high flow transmitters monitoring flow on each of the four main steam lines (16 total). There are four channels, two channels for each of two logics. One of the two channels must trip to effect a logic trip. Both logics must trip to initiate isolation. Each of the four transmitters on a main steam line provides an input to each of the four channels. Any two main steam high flow channels is capable of generating a Group 1 containment isolation signal. A failure of one of the subject transmitters will neither prevent nor initiate a Group 1 isolation.

Diversity:

Two other independent ESF signals provide the same safety function as the Main Steam flow transmitters; i. e., initiate Group 1 isolation in the event of a main steam line break. These signals are main steam tunnel high temperature and reactor low water level. The instrumentation and methodologies are diverse from the main steam line high flow trip system. Sixteen temperature sensors feed four main steam tunnel high temperature channels. Four reactor water level sensors, two in each of two independent logic channels, will initiate Group 1 isolation on low reactor water level.

Main Steam Line Pressure Transmitter

Total Number: 1

Instrument No: 02PT-134A

Model No: 1153GB9RC

Safety Function: ESF - Provides a main steam line steam pressure signal for generating a Group 1 containment isolation trip on low pressure. A Group 1 isolation closes valves on the main steam containment penetration. Low pressure is indicative of a turbine pressure regulator failure.

Redundancy:

There are four main steam line pressure transmitters, two in each of the two independent trip logic channels. Trip of either instrument will trip the logic channel. Main steam isolation requires a trip of both logic channels. Failure of one transmitter will neither prevent nor initiate a Group 1 isolation. The other three transmitters (02PT-134B, 02PT-134C, 02PT-134D) are not subject to the preventive measures of Bulletin 90-01, Supplement 1.

Other Considerations:

Used as a pressure transmitter, a postulated high side pressure sensor oil loss will result in a lower than actual pressure signal, and a postulated low side pressure sensor oil loss will result in no change in the pressure signal. The most likely side for a failure to occur is the high side since that side is exposed to operating pressure. This worst case failure due to loss of fill-oil would result in a lower than actual pressure signal which will neither prevent or initiate an isolation on low steam pressure. The failure would result in a premature trip of one of the two logic channels. Actuation of the safety function would not occur until the other logic channel trips.

Reactor Water Level Transmitter

Total Number: 2

Instrument No: 02-3LT-57B
02-3LT-58B

Model No: 1153DB5

Safety Function: ESF - Provides a reactor water level signal for generating a Group 1 containment isolation signal when level decreases below the level 1 setpoint.

Redundancy:

There are four reactor water level transmitters, two in each of two independent trip logic channels. Trip of either instrument will trip the logic channel. Group 1 isolation requires a trip of both logic channels. The subject transmitters feed separate logic channels. Failure of one transmitter will neither prevent nor initiate Group 1 isolation. The other two transmitters associated with this trip system were refurbished after July 11, 1989.

Diversity:

A Group 1 isolation would be effective in conserving reactor coolant inventory only if there is a main steam line break. Other detections systems (main steam line high flow, and main steam area high temperature) are also utilized for effecting a Group 1 isolation in the event of a main steam line break. In addition, depressurization due to a break in the reactor coolant system will initiate a Group 1 isolation on low steam pressure.

RCIC Steam Flow Transmitter

Total Number: 2

Instrument No: 13DPT-83
13DPT-84

Model No: 11153DB5RC

Safety Function: ESF - Provides a RCIC steam flow signal for generating an isolation of the RCIC turbine steam line on high steam flow. Indicative of a breach in the RCIC steam line.

Redundancy:

Each transmitter provides an input signal to an independent trip channel. The tripping of either of these two channels initiates isolation of the RCIC turbine steam line.

Diversity:

Two other independent ESF signals provide the same safety function; i. e., initiate closure of the RCIC turbine steam line in the event of a breach in the RCIC steam line. These are the RCIC turbine steam supply line low pressure, and area high temperature. The instrumentation and methodologies are diverse from the high flow isolation trip system. Four low pressure transmitters provide signals to two independent steam line isolation trip channels. Each trip channel will initiate an isolation when both transmitters within the channel sense low pressure. None of these transmitters are subject to the preventive measures of Bulletin 90-01, Supplement 1. There are eight high temperature sensors, four sensors in each of two independent channels, feeding the high temperature isolation trip system. Any one of the four high temperature sensors within a channel will initiate isolation.

HPCI Steam Line Low Pressure Transmitter

Total Number: 2

Instrument No: 23PT-68B
23PT-68D

Model No: 1153GB9

Safety Function: ESF - Provides a HPCI steam line low pressure signal for generating HPCI isolation and turbine trip signal on low HPCI steam line pressure. Indicative of a breach in the HPCI steam line.

Redundancy:

There four HPCI steam line pressure transmitters providing input to two trip logic channels. Both logic channels must trip to effect isolation and turbine trip. Each channel receives inputs from two pressure transmitters, either one of which can trip the logic channel. The subject transmitters feed the same logic channel. Failure of one transmitter will neither prevent nor initiate isolation. The other two transmitters (23PT-68A and 23PT-68C) are not subject to the preventive measures of Bulletin 90-01, Supplement 1 (exceed maturity threshold).

Diversity:

Two other independent ESF signals provide the same safety function; i. e., initiate closure of the HPCI turbine steam supply in the event of a breach in the HPCI steam line. These are HPCI steam line high flow, and area high temperature. The instrumentation and methodologies are diverse from the low steam pressure trip system. Four low pressure transmitters provide signals to two independent steam line isolation trip channels. Each trip channel will initiate an isolation when both transmitters within the channel sense low pressure. Neither of these transmitters are subject to the preventive measures of Bulletin 90-01, Supplement 1. There are sixteen (16) area high temperature sensors, eight in each of two independent channels, feeding the high temperature isolation trip system. Any one of the eight high temperature sensors within a channel will initiate isolation.

Other Considerations:

Used as a pressure transmitter, a postulated high side pressure sensor oil loss will result in lower than actual pressure signal, and a postulated low side pressure sensor oil loss will result in no change in the pressure signal. The most likely side for a failure to occur is the high side since that side is exposed to operating pressure. This worst case failure due to loss of fill-oil would result in a lower than actual pressure signal which will neither prevent nor initiate an isolation on low HPCI steam pressure. The failure would result in a premature trip of one of the two logic channels. Actuation of the safety function would not occur until the other logic channel trips.