

NEUTRON MONITOR AND FLOW BYPASS SWITCH MALFUNCTIONS

DESCRIPTION OF CIRCUMSTANCES:

Defective Neutron monitoring bypass switches have been experienced by General Electric during fabrication of control panels which were designated for shipment to nuclear power plants. According to GE, switch malfunctions of this type also were reported from nuclear power plants following their initial finding. The types of malfunctions experienced were:

1. Failure to move to a positive position.
2. Double contact operation causing an intermittent double bypass action.

The cause of the bypass switch malfunctioning has been identified by the General Electric Company as improper fabrication (an inadequate weld of parts of the switch mechanism). This phenomenon occurs after numerous bending motions and results in improper switch alignment, referred to by GE as "metal creep."

Portions of a GE service letter containing information about these bypass switches is attached to this Circular. Further information regarding this problem can be obtained from General Electric Company, 175 Curtner Avenue, San Jose, California 95125.

ACTION TO BE TAKEN BY LICENSEES AND PERMIT HOLDERS:

For all boiling water reactor facilities with an operating license or construction permit:

1. Describe any malfunction experienced by your facility regarding these switches. Include in your response the approximate date of failure and any corrective measure taken to resolve the failure.
2. If you have received the attached General Electric service letter (SIL 111, Rev. 1, dated August 29, 1975), describe the actions taken regarding corrective measures to resolve the bypass control switch problem as discussed in the attached GE service letter. Include in your response your means of testing this circuitry to assure operability.
3. If you have not received General Electric SIL 111, Rev. 1, describe the actions planned if switches of the type described in the

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attached General Electric service letter are in use or planned for use in safety-related systems at your facility. Include in your response your means of testing this circuitry to assure operability.

Reports from facilities with operating licenses should be submitted within 60 days after receipt of this Circular, and reports from facilities with construction permits should be submitted within 90 days after receipt of this Circular. Your report should include the date when the above actions were or will be completed.

Reports should be submitted to the Director of the NRC Regional Office and a copy should be forwarded to the NRC, Office of Inspection and Enforcement, Division of Reactor Inspection Programs, Washington, D. C. 20555.

Approval of NRC requirements for reports concerning possible generic problems has been obtained under 44 U. S. C. 3512 from the U.S. General Accounting Office. (GAO Approval B-180255 (R0072), expires 7/31/77).

ATTACHMENT:

Extract from General Electric SIL 111, Rev. 1.

Extract from General Electric SIL 111, Rev. 1:

NEUTRON MONITOR AND FLOW BYPASS SWITCH MODIFICATION

General Electric has learned of a "metal creep" phenomenon which exists within the joystick operators of certain control room switches. These switches are used at most operating GE/BWR plants in the Source Range Monitor (SRM), Intermediate Range Monitor (IRM), Average Power Range Monitor (APRM) and Rod Block Monitor (RBM) Systems. The switches are also used as flow bypass switches and in other applications. "Metal creep" is a condition which occurs in metal after numerous bending motions. This causes the metal to expand slightly. The problem of "metal creep" with the joystick operator can result in improper switch alignment. This can cause the switch to make multiple contacts (characterized by two or more channels being bypassed simultaneously). Also, the joystick handle may appear to be in a neutral position while actually the switch contacts (due to "metal creep") are in a bypass condition.

General Electric recommends that the bypass position be verified by the channel bypass indicator light and/or a computer run whenever these switches are operated. General Electric also recommends replacement of both the switch and operator with improved components if problems are encountered. The replacement switches will vary from one generation of GE BWR to another. The physical description should include the number of contact blocks in the switch; the presence or absence of physical barriers between the contact blocks; and whether or not the switch is enclosed in a metal box. The new switches contain both physical barriers and a metal switch enclosure. The part numbers given below may be of assistance in determining your particular requirements:

New Part No.	Old Part No.	Where Used
193B1100G003	193B1100G001	APRM
193B1100G004	193B1100G002	IRM
158B7191G008		SRM

To provide additional assurance that the RBM and flow bypass switches do not become improperly aligned due to metal creep, GE recommends implementing the wiring change given in the table below.

BYPASS SWITCH	OLD								NEW							
	Channel Position				Relay Contacts				Channel Positions				Relay Contacts			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
Flow	0°	0°	90°	90°	3,4	3,4	15,16	15,16	0°	0°	180°	180°	3,4	3,4	9,10	9,10
RBM	0°	90°	-	-	3,4	15,16	-	-	0°	180°	-	-	3,4	9,10	-	-