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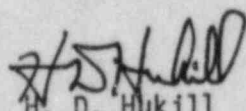
Office of Nuclear Reactor Regulation
Attn: J. F. Stolz, Director
PWR Projects Directorate No. 6
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Stolz:

Three Mile Island Nuclear Station Unit 1 (TMI-1)
Operating License No. DPR-50
Docket No. 50-289
Auto Initiation of EFW

As a result of our meeting on October 9, 1985 at TMI-1, GPUN was asked to respond to a number of questions which were documented in your meeting minutes of October 24, 1985. Enclosed please find our responses.

Sincerely,


H. D. Hukill
Director, TMI-1

HDH/LWH/gpa

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Enclosure

cc: J. Thoma
R. Conte

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ENCLOSURE I

- Item 1 The licensee is to send to the NRC a copy of the shift and daily checks.
- Response A copy of the ESAS Checklist which includes the EFW Checklist as a subset was provided to J. Thoma on November 7, 1985. This list is filled out by the Control Room Operators from Control Room indications and information from the Secondary Auxiliary Operators Log. The Secondary Auxiliary Operators Log contains readings taken locally. The Secondary Auxiliary Operator's Log Sheets were also provided. These log sheets are reviewed by the Shift Foreman of each shift.
- Item 2 The licensee is to send to the NRC a copy of the drawings of the control room panels which relate to EFW controls.
- Response Draft copies of the Control Room Panels associated with the EFW system were reviewed at the meeting. These drawings are being revised and will be provided to NRC in December, 1985 (Impell Dwgs 0370-064-010 & 011).
- Item 3 During the review, several diagrams were provided to the NRC staff. These diagrams are to be documented via a letter from the licensee. Specific diagrams include the following (a) latest EFW piping diagram and (b) drawings for MSV 13 A and B.
- Response The following drawings were provided from GPUN to NRC at the October 9, 1985 meeting:
- "Index and Legend" GAI No. 208-001 Rev. 5
 "Identification of Devices" GAI No. 208-002 Rev. 0
 "Piping Flow Diagram Emergency Feedwater" GAI No. 302-082 Rev. 6
 "HSPS Elementary Diagram EFW Turbine Steam Supply Valves MSV 13 A and B" Impell Nos. 0370-064-168 and 169 Rev. 0.
 "Motor Driven Emergency Feedwater Pump 2A and 2B" GAI No. 208-203 Rev. 7 and 208-205 Rev. 8
 "Control Switch Developments" GAI No. 208-129 Rev. 5
 "ES Bus Motor Feeder Breaker" GAI No. 208-138 Rev. 0
- Item 4 The licensee is to provide a statement concerning the design philosophy for testing the EFW and its consistency with that for testing the RPS system (i.e., a normal 2/4 logic becomes a 2/3 logic during testing).
- Response The sensing portion of the Heat Sink Protection System uses electronics in four independent channels with the actuation logic of two out of four (2/4). Such an arrangement will withstand a

single failure in any 2/4 channel even if one channel has been bypassed (2/3) for maintenance testing or repair. The actuation portion of the HSPS electronics is two independent trains. A single failure of either train will not prevent at least one train of EFW from operating.

HSPS uses a similar philosophy to that of the RPS (FSAR Section 7.1.2). The redundant RPS input operates in a 2 out of 4 or a 2 out of 3 mode with either state providing sufficient redundancy for reliable performance.

Item 5

The licensee is to provide documentation identifying the Foxboro isolation devices. If they have not been previously reviewed by the NRC staff, sufficient documentation must be submitted to show that those components are qualified isolation devices. The documentation should include data to verify that the maximum credible fault (120 V AC, 20 amps) was applied to the output of the device in the transverse mode (between signal and return) and other faults were considered (i.e., open and short circuits).

Response

Isolation devices N-2AO-VAI and N-2AO-L2C-R are used in the HSPS. Isolation device N-2AO-VAI qualification test report was supplied in our letter dated January 16, 1984 (5211-84-2300) and isolation device N-2AO-L2C qualification test report is available in the GPUN Corporate Office for review. The maximum credible fault (600 VAC/10 Sec/SSE) was applied to N-2AO-VAI (Attachment 1 QOAAA20-1 P72 Rev. 13) and N-2AO-L2C-R (Attachment 2 QOAAA20-1 P59 Rev. B).

Item 6

For valves operated more often than once per year (i.e., possibly EF-V10), the licensee is to provide bypass indication or justification for not providing bypass indication. In particular for EF-V10 valves, will their cycling for testing purposes end when all the new block valves (EF-V52) are installed and operational?

Response

As indicated in Tech Spec 4.9.1.2, during testing a dedicated individual in communications with the control room is stationed at the local EFW manual valves. On instruction from the control room operators, the individual shall realign the valves from the test mode to their operational alignment. [TMI-1 Restart SER (NUREG-0680) under Short Term Actions 1a.4a (page C1-4) and 1a.7 (page C1-7)]. It is GPUN's position that an operator stationed locally at the EFW components and in communication with the Control Room during testing represents more positive control and is equivalent to bypass indication described in IEEE 279-1971 Section 4.13.

Presently the EFV-10's (normally locked open manual valves) are cycled for testing purposes.

EF-V10A/B will not be cycled for testing purposes when the new block valves (MS-V52's not presently installed on EF-P2A train) are operational and turned over to the plant. However, bypass indication may still not be available or considered necessary if these block valves are to be manual valves without position indication in the control room. In this event, the same administrative controls of Tech. Spec. 4.9.1.2 will apply to the manual block valves as are applied to EF-V10A/B now.

Item 7

The licensee is to describe how all components are tested at power. In particular, testing of relays 62/EFA and B, 63/EFA and B, and 95 EFA and B was questioned but this issue applies to all components. Testing at power should be done for all components. However, for any component not tested at power, the licensee is to provide the testing frequency and justification for not testing at power.

Response

All devices in the EFW auto initiation circuitry can be tested at power. However, level and pressure transmitters are live transmitters and will likely be tested at refueling intervals. The low OTSG level and high RB pressure actuations are tested using the built-in test features of the HSPS as discussed at the October 9 meeting. It is expected at this time that logic (e.g. 2/4 matrices) and one analog actuation channel will be tested monthly.

The remaining EFW actuations, loss of both FW pumps and loss of all RCP's, are existing EF pump auto start actuation circuitry. The surveillance testing is described in procedures 1303-11.39 ("EF pump auto start"), and 1302-6.17 ("EF initiation quarterly-loss of feedwater,"). Modifications will be necessary to reflect the interface with the HSPS. However, the methodology and majority of steps will not change except that the EF-V30's will open but the block valves will be maintained closed. These procedures are available at Parsippany or TMI-1.

Item 8

The licensee is to provide functional (Foxboro) diagrams identified during the review. The licensee indicated that these diagrams may be provided in about two weeks on an optimistic schedule.

Response

The draft versions of those drawings were provided during the October 9 meeting. The completed set of functional drawings (see list attached) were provided to J. Thoma by express mail on November 13, 1985.

Item 9

If the licensee decides to manually disable EFW auto start on low OTSG water level when power levels are below 15% due to level oscillations in the steam generator, the licensee is to commit to installing automatic removal of this operating bypass when power increases above 15%.

Response Based on the review of oscillations in steam generator level at low power GPUN has decided that it will not be necessary to disable EFW auto initiation on OTSG water level below 15% power. Therefore, no operating bypass is warranted.

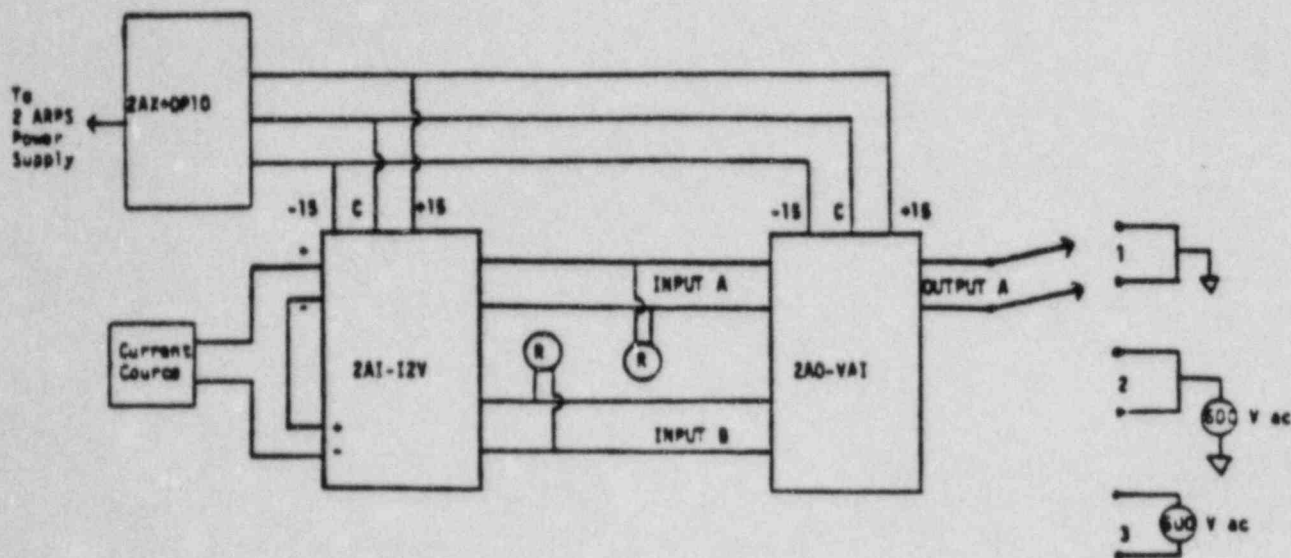
Item 10 The EFW turbine section nozzle hand valves are to be locked open. How often will they be exercised?

Response The EFW turbine section nozzle hand valves are normally locked open. They are not exercised as part of a surveillance and are therefore not operated more often than once a year. Therefore, bypass indication is not required.

Item 11 The staff provided a general comment concerning technical specifications. Technical Specifications should be implemented at start up from the Cycle 6 refueling. Since the system is being designed now, the system should be built so that not only the manufacturer's recommended tests can be performed but also so that recommended testing in accordance with the guidelines of the standard technical specifications can be performed.

Response GPUN is currently drafting Tech Specs for the EFW System using existing Tech Specs (customized) and B&W STS as general guidelines. GPUN is also participating with the B&W Owners Group on improved specifications for the B&W plant. It is anticipated that Tech Specs will be submitted by the end of the fall 1986.

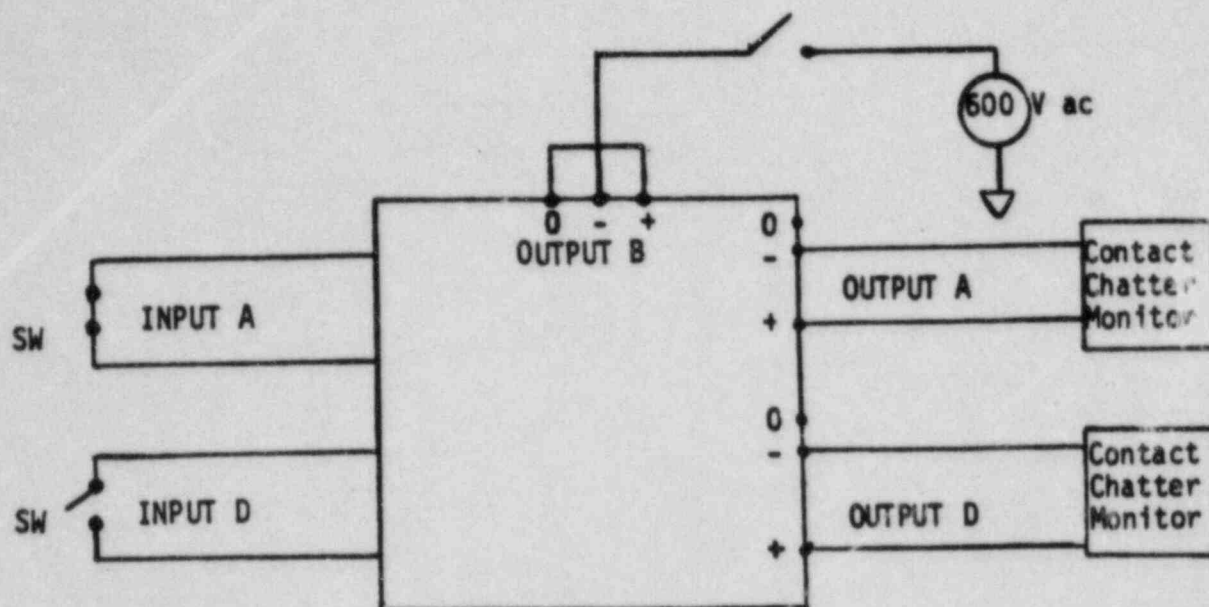
Figure 31
Seismic Test Setup
2AO-VAI ECEP 9236
Voltage-to-Current Converter



Test Condition:

Three tests are to be performed: 1) Ground both outputs of Channel A for 10 seconds during 1 SSE. 2) Apply 600 V ac between both output leads tied together and ground for 10 seconds during another SSE. 3) Apply 600 V ac across the output leads during a third SSE for 10 seconds; current source input at 12 mA, recorders calibrated for full scale traverse of 5 V dc $\pm 5\%$.

Figure 18
Seismic Test Setup
2A0-L2C-R Contact Output Isolator



Test Conditions:

Input A shorted; input D open; outputs A & D monitored with contact chatter monitors capable of detecting 100 us opening or closure; both A&D outputs switched during OPE and SSE test; 600 V ac applied to output B for 10 seconds during one SSE test

Company	Document No.	Sheet	Rev.	Title
FOXBORO	84N35B33 FD 0000	1	0	FUNCTIONAL DIAGRAM ELEMENTS
	FD 0001	1		CHAN I, GEN A, PRESS/LVL LOOP
		2		CHAN III, GEN A, PRESS/LVL LOOP
		3		CHAN I & III, GEN A, TRAIN A EF/FW CONTROL
	FD 0002	1		CHAN I, GEN B, PRESS/LVL LOOP
		2		CHAN II, GEN B, PRESS/LVL LOOP
		3		CHAN I & II, GEN B, TRAIN A EF/FW CONTROL
	FD 0003	1		CHAN II, GEN A, PRESS/LVL LOOP
		2		CHAN IV, GEN A, PRESS/LVL LOOP
		3		CHAN II & IV, GEN A, TRAIN B EF/FW CONTROL
	FD 0004	1		CHAN II, GEN B, PRESS/LVL CONTROL
		2		CHAN IV, GEN B, PRESS/LVL LOOP
		3		CHAN II & IV, GEN B, TRAIN B EF/FW CONTROL
	FD 0005	1		FEEDWATER RUPTURE DETECTION
		2		CONT. PRESS-RPS/ES & FWRD
		3		CONT. PRESS-RPS/ES & FWRD
		4		OTSG A & B FWRD TRAIN A & B
	FD 0006	1		COND. STOR. TANK A LEVEL
		2		COND. STOR. TANK B LEVEL
		3		COND. STOR. TANK A & B LEVEL
	FD 0007	1		OTSG A FW ISOL. ON HI LVL
		2		OTSG A FW ISOL. ON HI LVL (2)
		3		OTSG A FW ISOL.
	FD 0008	1		OTSG B FW ISOL. ON HI LVL
		2		OTSG B ISOL. ON HI LVL (2)

FOXBORO FUNCTIONAL DRAWINGS

Company	Document No.	Sheet	Rev.	Title	
FOXBORO	84N35833	FD0008	3	0	OTSG B FW ISOL.
		FD0009	1		OTSG A EF INIT. ON LO LVL (PUMPS)
			2		OTSG A/EF PUMPS EF INIT. - TRAIN A
			3		OTSG A/EF PUMPS EF INIT. - TRAIN B
		FD0010	1		OTSG EF INIT. ON LO LVL (PUMPS)
			2		OTSG B/EF INIT. - TRAIN A
			3		OTSG B/EF INIT. - TRAIN B (PUMPS)
		FD0011	1		OTSG A FW ISOL. ON HI LVL/EF INIT ^(PUMP) LOW LVL
		FD0012	1		OTSG B FW ISOL. HI LVL/EF INIT. LO LVL ^(PUMP)
		FD0013	1		OTSG A MSRD TRAIN A
			2		OTSG A MSRD TRAIN B
			3		OTSG A MSRD TRAIN A & B
		FD0014	1		OTSG B MSRD TRAIN A
			2		OTSG B MSRD TRAIN B
			3		OTSG B MSRD TRAIN A & B
		FD0015	1		OTSG A EF INIT ON LO LVL (VALVE)
			2		OTSG B EF INIT ON LO LVL (VALVE)
			3		OTSG A EF INIT ON LO LVL (VALUES)
			4		OTSG B EF INIT ON LO LVL (VALUES)
		FD0016	1		FUNCTIONAL DIAG HSPS
		FD0017	1		OTSG A INPUT-OUTPUT LOGIC
		FD0018	1		OTSG B INPUT-OUTPUT LOGIC