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January 9, 1986

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Dresden Station Units 2 and 3
Additional Information on Safe
Shutdown Paths (Appendix R)
NRC Docket Nos. 50-237 and 50-249

Dear Mr. Denton:

This transmittal provides additional information regarding our Appendix R exemption requests currently under review. The information provided in the enclosure documents our response to questions previously discussed during teleconferences with your staff in September, 1985.

Please direct any questions you may have concerning this matter to this office.

One signed original and five (5) copies of this transmittal are provided for your use.

Very truly yours,

J. R. Wojnarowski
Nuclear Licensing Administrator

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Enclosure

cc: R. Gilbert - NRR
NRC Resident Inspector - Dresden

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I. Spurious Operations

Discussion

Two cases of spuriously operating valves were analyzed. Case 1 examined those valves whose maloperation could impact the operation of safe shutdown equipment. Case 2 considered those valves whose malfunction or could result in loss of reactor inventory. No high-low pressure interfaces were found in the above analyses. Operator actions in the control room are used to prevent spurious operation of two types of valves: MSIV's and Target Rock and electromatic relief valves. (See response to Questions A.1 and A.2a). Spurious signals affecting these valves can only originate in the control room/Auxiliary Electric Equipment Room Fire Area (TB-V). The operations necessary to prevent the spurious operation can be performed within a minute after scram. Therefore, the operators could perform these actions before evacuating the control room. Upon leaving the control room, additional actions will be performed to a spurious operation.

A. Spurious Opening of Valves

For the following valves, clarify what procedure(s) will be followed or what post-fire action will be performed to insure their closure and thus prevent their fire induced spurious openings. Also, indicate when in the fire scenario, these procedures will be followed or post-fire action be completed:

1. MSIVs   AO2(3)-203-1A,B,C,D   Main Steam System
            AO2(3)-203-2A,B,C,D

Response

Spurious signals affecting the operation of the MSIV's can only originate in the control room. For a fire outside of the control room/Auxiliary Electric Equipment Room Fire Area (TB-V), these valves will be closed from the main control panel. For a fire in TB-V the operators will still close the MSIV's prior to leaving but will also cut off the air supply to the outboard MSIV's. The air valves used to perform this function are located outside of the main steam pipe chase and are accessible from the common corridor in the turbine building. This action will be performed after the control room is evacuated.

2a. Target Rock Valve 2(3)-203-3A

or

Electromatic Relief Valves 2(3)-203-3B,C,D,E.

Response Spurious signals affecting these valves can only originate in the control room/auxiliary electric equipment room fire area (TB-V). For all fire areas the operator will turn the inhibit switch to "INHIBIT" and the control switches to "OFF" to prevent automatic operation of these valves. In the event of a fire in TB-V an operator will also remove 125VDC power from these valves at the turbine building MCC. Removing power from the Target Rock valve will not disable its mechanical operation mode. This action will be performed after the control room is evacuated.

2b. What is TB-V referred to in this context?

Response TB-V is the name given for the Control Room and Auxiliary Electric Equipment Room fire area.

2c. You have referred to subsections 6.2.1.8 and 6.2.2.8 regarding the inhibit switch being utilized for preventing spurious opening of the Target Rock valve or electromatic relief valves due to fire in plant areas other than TB-V. Where are these subsections described? What does the inhibit switch do? Is it to be manually operated?

Response The Blowdown Inhibit Switch is a manually-operated switch located on Main Control Room panel 902-3 (903-3 for Unit 3). This switch is also part of Fire Area TB-V. When in the "INHIBIT" position, this switch disables the "low reactor water level" and "high drywell pressure" inputs to auto blowdown. Another switch at the same Main Control Room panel is labled "MAN-OFF-AUTO" and, in the "OFF" position, disables the reactor vessel pressure controller signal to the relief valves. By operating these two switches, the operators in the control room can prevent spurious opening of the electromatic valves and Target Rock valve for any fire external to Fire Area TB-V. The Target Rock will continue to operate in its mechanical mode.

If the fire is within Fire Area TB-V, it is possible for the fire to create hot shorts that will defeat these switches. However, credit is taken for the operators to actuate these switches (two per unit) immediately after scramming the reactors. For such a fire, the safe shutdown procedures will require a manual action to trip all of the 125VDC feeds to the auto blowdown logic. This action is taken at the 125VDC distribution panels located above the control room (Unit 2 Battery Room) and in southwest corner of the second floor turbine building (Unit 3 DC panel room). Subsections 6.2.1.8 and 6.2.2.8 are part of a different report and present a brief statement about the Unit 2 and Unit 3 inhibit switches respectively.

6.2.1.8 Provide Inhibit Switch for Auto Blowdown

An "Auto Blowdown Inhibit" switch has been added to Main Control Room panel 902-3. This switch, if turned to "INHIBIT" while the previously-existing key-operated "MANUAL-OFF-AUTO" switch is in the "OFF" position, will prevent spurious blowdown for a fire anywhere outside of the Control Room and Auxiliary Electrical Equipment Room (Zones 2.0 and 6.2) (Fire Area TB-V).

This modification was identified in the 1984 reanalysis and will be utilized in all fire areas. Additional actions will be performed outside of TB-V for a fire in TB-V.

3a. RWCU Valve MO2(3)-1201-2

Response This valve is powered from 250VDC MCC 2A (3A for Unit 3). To remove power form this valve, the operators can trip the breaker at the 250VDC MCC (located on Reactor Building Elevation 570'0"). If this is not accessible or convenient, they can trip the feed to the MCC at the 250VDC MCC in the turbine building. After removing power, the operator will verify closure of the valve or manually close it.

3b. Will the closure of the above single valve ensure RWCU isolation? (This question arises because you have listed 5 valves for this system).

Response Yes, because closure of this valve will isolate rest of system and any spurious operations downstream of this valve would have no effect. The MO2(3)-1201-3 and MO2(3)-1201-4 valves are in a line which bypasses the MO2(3)-1201-2 valve and are normally closed (see attached drawing). No high-low pressure interface exists.

4. 2(3)-1301-17 Isolation Condenser
2(3)-1301-20

These valves are located on the isolation condenser floor and are air operated valves which fail closed. Manual valve 1301-16 which is located upstream of these valves will be closed to assure isolation of these valves. (see Figure A-4 of the September 11, 1985 submittal) This action will be performed as part of manual isolation condenser initiation.

5. MO2(3)-2301-3 HPCI Steam Valve

If the HPCI system is not providing vessel makeup, this valve needs to be closed to prevent inventory loss to the torus. This valve is powered from 250VDC MCC 2A (3A for Unit 3). To remove power from this valve, the operators can trip the breaker at the 250VDC MCC (located on Reactor Building Elevation 570'0"). If this is not accessible or convenient, they can trip the feed to the MCC at the 250VDC MCC in the turbine building. After removing power the operator will verify closure of this valve or will manually close it.

B. <u>Spurious Closure of the Valves</u>
For the following valves, clarify what procedures will be followed to prevent their spurious closures and keep them open. How soon in the fire scenario will you ensure that they are in the open position?

1a. Control Rod Drive Valves MO2(3)-0302-8 or both AO2(3)-0302-6A and AO2(3)-0302-6B.

Response Upon receipt of a scram signal, the CRD system flow is diverted through the scram inlet valves (CV2(3)-0305-126) forcing the CRD's to insert. The high flow through the charging line closes the AO2(3)-0302-6A and AO2(3)-0302-6B valves. Therefore, if a spurious signal is received closing the MO2(3)-0302-8 valve, flow to the vessel will not be interrupted. (see Figure A-5 of the September 11, 1985 submittal) To assure that flow continues through the charging line, the scram signal will not be reset.

1b. What is the other RPV make-up water source you have referred to in this context?

Response The other RPV make-up sources referred to are Feedwater and Emergency Core Cooling make-up systems. However, no credit has been taken for these systems in fire areas which have the CRD system identified for make-up.

2. MO2(3)-1301-2 and MO2(3)-1301-3 — Isolation Condenser

For the above valves, how will the operator remove power from the appropriate Motor Control Center prior to opening them manually using hand wheels?

Response These valves are powered from 250VDC MCC 2A (3A for Unit 3). For the isolation condenser method of shutdown, these are the only 250VDC services required. To remove power from these valves, the operators can trip the breakers at the 250VDC MCC (located on Reactor Building Elevation 570'0"). If this is not accessible or convenient, they can trip the feed to the MCC at the 250VDC MCC in the turbine building. Either method will disable the motor operator and will not impact any other safe shutdown equipment. Once power is removed, the valves can be manually opened. This operation must be done to initiate the isolation condenser.

C. Page 2.2-3 top paragraph of August 10, 1984 submittal states that the valve MO2(3)-4102 will be manually opened to prevent spurious closure of the valve which will prevent supply of make-up water to the isolation condenser from service water system. Table 1 of the August 9, 1985 submittal additionally lists the valve MO2(3)-1301-10, which it states can be used in lieu of the valve MO2(3)-4102. Clarify this.

Response Figure A-4 of the Sept. 11, 1985 submittal has a sketch of the isolation condenser (IC) system. The MO2(3)-1301-10 valve must be opened within 20 minutes of IC operation to supply make-up from the condensate storage tanks to the shell side. This valve is powered from 250VDC. Power can be removed from this valve either at the MCC located on the Reactor building third floor south or the turbine building 250VDC MCC. Opening of the MO2(3)-4102 in conjunction with the MO2(3)-1301-10 valve will provide make-up water from the service water system. Since guidance will be provided regarding the availability of sufficient condensate storage water, make-up from the service water system will not be needed for at least 2 hours after IC initiation.

II. Electrical Isolation Deficiency

In your response to staff's Question 2 (letter from J. A. Zwolinski of NRC to D. L. Farrar of Commonwealth Edison dated July 1, 1985) relating to electrical isolation deficiency, you state that several items were found to be deficient. You further state that the defective fuses would be replaced by spare fuses available at convenient locations. Since the staff considers pulling out blown fuses and replacing them by spare fuses as repair work and does not normally allow such replacements for achieving hot shutdown, clarify the following with regard to your approach for handling the problem of electrical isolation defiency.

Response Dresden Station does not use a remote shutdown panel in performing safe shutdown procedures. The shutdown procedures have identified manual operation of switchgear and local control of equipment. Of the nineteen required safe shutdown circuits identified as being singly fused, twelve are 4kv switchgear. These 4kv switchgears are equipped with local mechanical "TRIP" and "CLOSE" buttons that are good for one close and one trip without the benefit of control. This stored capability within the switchgear is equivalent to redundant fusing since both require a manual action.

Two of the remaining seven identified circuits are 480 volt switchgears, which may be jacked closed. Of the remaining five identified circuits which may require fuse replacement, only four can be affected by a single fire (i.e., the 2/3 DG room).

1. How many circuits are involved that may have electrical isolation deficiency?

Response A total of 7 circuits have been found which may require a repair as defined by the NRC, by jacking closed 480 volt switchgear, or fuse replacement as a result of a faulted control circuit.

2. What are the equipment that are served by these circuits?

Response The equipment affected is listed in Table 1.

3. How soon will this equipment be needed?

Response The time associated with starting of this equipment is listed in Table 1.

4. If several replacements are needed, can they be completed in a timely manner?

Response Five circuits have been identified as possibly needing fuse replacement for proper operation. A fire in the 2/3 diesel generator room could affect four of these.

If a fire affects the local controls (located in the 2/3 DG room) for the inboard isolation condenser valves, it may be necessary to replace a fuse at each of the isolation switches in the Unit 2 Shutdown Cooling Pump Room and Unit 3 TIP room. Procedures will require operators to be sent to these rooms to operate the isolation switches and replace fuses as necessary. Replacement fuses and fuse pullers will be maintained under surveillance in the proximity of these rooms and will be readily accessible if fuse replacement is needed.

The remaining curcuit for which fuse replacement will be the only available solution is the engine starting controls at the 2/3 diesel generator. However, replacement fuses and fuse pullers will be maintained under surveillance in the proximity of these controls. Also, these controls will be operated locally.

Because of the minimal number of possible fuse replacements, sufficient time is available to replace these fuses.

5. Since redundant fuse (alternative approach to that suggested by you) is normally connected only at one end of the appropriate circuit and consequently cannot energize the circuit unless a transfer switch completes the circuit. Why would separate or redundant fusing leave some parts of a circuit hot when only one fuse is pulled?

Response The fuses are presently at the point where control power enters the equipment, prior to any connections to switches, relays, lights, etc. The redundant fuse would leave certain terminals of the LOCAL-REMOTE selector switch hot if only the original fuse is pulled; in LOCAL position the entire circuit could be hot. We maintain that the small quantity of required fuse replacements, combined with the small likelihood of a serious fire, does not warrant this personnel hazard.

III. Since your reverification submittals to date do not contain any information regarding cold shutdown, clarify whether you have completed reverification of your cold shutdown approach, and if so, summarize your findings in this regard.

The cold shutdown analyses have been completed. Two exemption requests justifying separation of redundant shutdown trains within a fire area were submitted on October 16, 1985.

TABLE 1

LIST OF CIRCUITS PER IEIN 85-09 CONCERNS WHICH MAY REQUIRE MANUAL ACTION FOLLOWING A FIRE

		Time of Use (Minutes After Scram)
I.	480V BREAKERS	
	A. Bus 28 Main Feed	10
	B. Bus 38 Main Feed	10
II.	OTHER	
	A. 2/3 Diesel Generator Local Controls (Engine Starting)	10
	B. Isolation Condenser Valve M02-1301-1 Isolation Switch	15
	C. Isolation Condenser Valve M02-1301-4 Isolation Switch	15
	D. Isolation Condenser Valve M03-1301-1 Isolation Switch	15
	E. Isolation Condenser Valve M03-1301-4 Isolation Switch	15

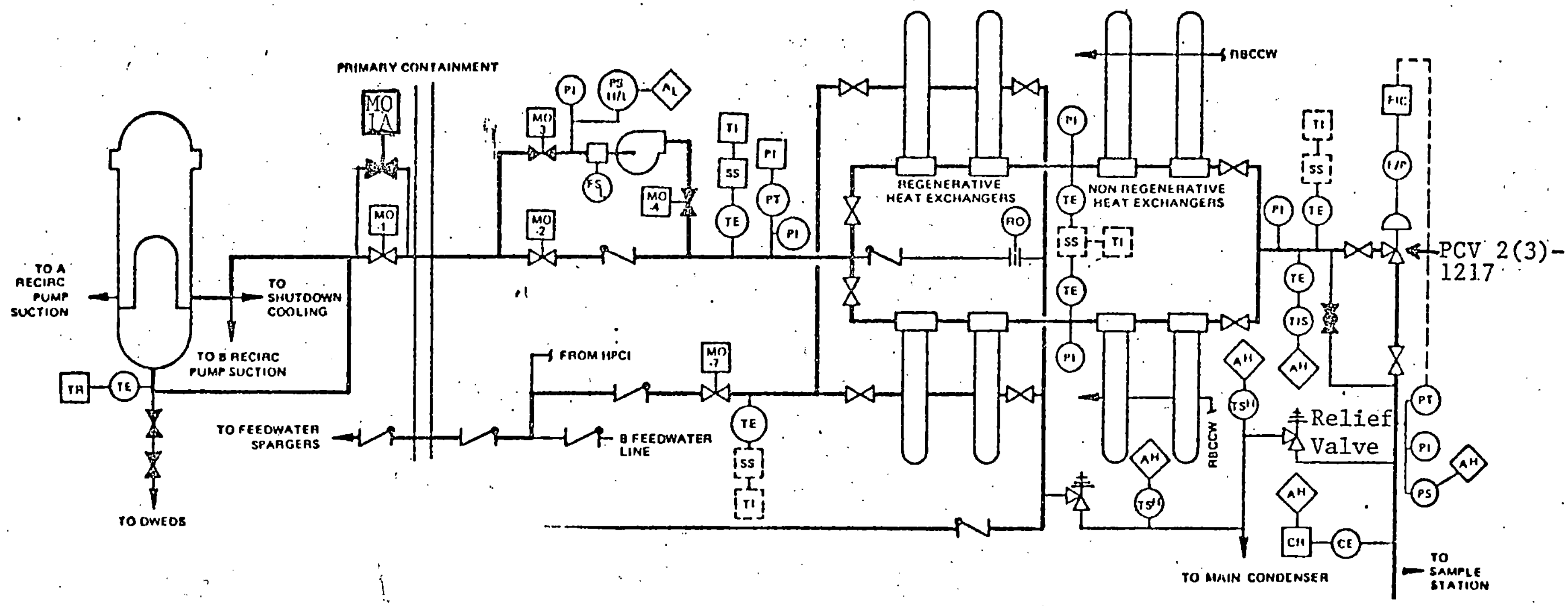

FIGURE 1. REACTOR WATER CLEANUP SYSTEM