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October 12, 1982

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

Attention: Ms. E. G. Adensam, Chief
Licensing Branch No. 4

Re: McGuire Nuclear Station
Docket No. 50-370

Dear Mr. Denton:

Attached are five copies of an evaluation of McGuire Unit 2 concerning the applicable requirements of 10 CFR 50, Appendix R. This supplements the letter of October 21, 1981, by William O. Parker, Jr. Please note that the device locations and cable routes for Unit 2 are omitted due to their similarity to those provided in the referenced letter for Unit 1.

Very truly yours,

H.B. Tucker / [illegible]

Hal B. Tucker

REH:jfw
Attachment

cc: James P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

P. R. Bemis
Senior Resident Inspector
McGuire Nuclear Station

B002

RESPONSE TO

APPENDIX R

McGUIRE NUCLEAR STATION UNIT 2

SECTION III.G - FIRE PROTECTION OF SAFE SHUTDOWN CAPABILITY

As outlined in our March 1980 submittal of the design description for the McGuire Standby Shutdown Facility, Duke plans to exercise the option of a dedicated shutdown capability referenced in Section III.G.3 of Appendix R. The March 1980 submittal did not address the associated circuits referenced in Section III.G.3 or separation of cables in noninerted containments referenced in Section III.G.2 These were addressed for Unit 1 in the October 21, 1981 submittal. This submittal addresses these items for Unit 2. The information for associated circuits is identical to that for Unit 1. The separation of circuits for Unit 2 is reviewed to provide the appropriate valve numbers, etc.

Associated Circuits

With regard to associated circuits as outlined in Section III.G.3 of Appendix R, Duke has conducted a review of associated circuits at McGuire. The results of this review are provided in the following:

Shutdown capabilities are assured by separating the shutdown divisions by fire barriers outside of the Reactor Building. Circuits which may be associated with the redundant shutdown divisions, have not had the same fire barrier requirements applied.

The subject associated circuits can be divided into two categories as follows:

1. Those circuits considered associated by being electrically connnected to a shutdown division's power busses.

2. Those circuits considered associated by proximity by sharing raceways, etc. The first category of associated circuits can be addressed by use of the following "worst case" illustration.

A fire zone was postulated which contained both Division A and Standby Shutdown Facility (SSF) shutdown cables. By the Duke criteria Division B Shutdown cables would not be present in this fire zone. However, the criteria does not prohibit Division B associated cables (which are connected to the Division B power busses) from being present in the subject fire zone. (See Figure 1 for pictorial representation).

For the case of an all consuming fire in the fire zone no degradation of the Division B shutdown division would occur since the associated circuit breaker (or fuse) will operate to clear the fault provided this breaker is coordinated with the bus incoming breaker. This breaker coordinaton is provided as part of the Duke design.

The second category of associated circuits are those which are routed in the same raceways as shutdown circuits but are not supplied power from the shutdown busses. In this instance the goal is to contain or interrupt the fault current in the associated circuit to prevent it from propagating to a redundnat shutdown division cable (see Figure 2). For this case breaker coordination is not a concern since the power source to the associated cable is not from a shutdown division bus.

Interruption of the fault current is accomplished by the breaker feeding the associated circuit. The breaker is adequately sized to protect the cable per standard Duke Power design practice.

Additionally the cable used by Duke Power is of the armored type. Duke has performed tests that demonstrate a fault within a cable will not propagate into an adjacent cable, even if the breaker feeding the faulted cable fails to trip.

Hence as shown above, the presence of associated circuits in a fire zone with a shutdown division will not propagate the effects of a fire in that zone in such a way as to prevent the other shutdown division from performing its intended function.

With installation of the Standby Shutdown Facility (SSF) there will be two independent areas from which a hot standby condition can be achieved and maintained. As indicated in the previous submittal, cabling for these two independent systems are routed through a switchgear room and penetration room to the Reactor Building.

Since cabling for the SSF is routed directly through a switchgear room and penetration room to the Reactor Building and does not interface with any other plant areas, Duke Power Company requests an exemption to Section III.G.3 of the rule which requires that "a fixed fire suppression system...be installed in the... zone under consideration." The zone under consideration, the Control Room, is separated by physical separation and 3-hour fire barriers from the penetration room where redundant SSF cabling enters Auxiliary Building and routes to Reactor Building. Fire detection devices are presently installed in the Control Room. A fixed fire suppression system in the control room is not deemed necessary (or desirable) in light of the existing commitment to install the SSF.

A review of routings for circuits inside the Reactor Building necessary for hot standby has been conducted utilizing the criteria in Section III G of Appendix R.

Due to design considerations, the Reactor Building is divided into the annulus and inner containment. For analysis purposes the annulus is being considered part of the containment.

The criteria for review of the cable routings was to provide separation of cables and equipment of redundant shutdown functions by a horizontal distance of more than 20 feet with no intervening combustibles. Since the PVC jacket has been stripped from the armored cable located in the inner containment, the intervening area between cables and equipment of redundant shutdown functions is considered to be devoid of combustibles (note that there are a limited number of cases where the function of the circuits required jacketed cables).

In the annulus area the PVC jacket has been left on the armored cable. This situation will be addressed by upgrading the installed manually actuated sprinkler system to a preaction sprinkler system. The installed detectors will be left in place.

Several cable routes and devices are eliminated from this review based on the similarity of device location and cable routes noted in the review on Unit 1. These results, noted in our October 21, 1981 submittal, as they apply to Unit 2 are categorized in the following six groups:

Group 1 contains SSF devices which have alternates outside the containment. (Reactor Building).

1. The steam generator secondary side isolation valves 2BB5A, 2BB6A, 2BB7A and 2BB8A have as their alternates 2BB1B, 2BB2B, 2BB3B, and 2BB4B, respectively.

2. The nuclear sampling system SSF isolation valves 2NM25A and 2NM22A have as their alternate 2NM26B. The other nuclear sampling sysetm SSF isolation valves 2NM3A and 2NM6A have as their alternate 2NM7B.

3. The chemical volume control system (CVCS)/reactor coolant system (RCS) SSF isolation valve 2NV1A has as an alternate 2NV7B.

Group 2 contains valves which isolate as an SSF function because of the low flow capabilities of the standby makeup pump. Because a fire inside containment will not effect equipment outside, a much larger flow is available from the centrifugal charging pumps and the reciprocating charging pumps. Therefore, these PORV isolation functions are not necessary.

1. The SSF power operated relief valves 2NC32B, 2NC34A, and 2NC36B have as their alternate valves 2NC31B, 2NC33A, and 2NC35B respectively located inside containment.

2. The reactor coolant system letdown SSF valves 2NC272A and 2NC273A have no alternate valves.

3. The reactor coolant system SSF isolation valves 2NC274B and 2NC275B have no alternate valves.

4. The normal reactor coolant pump seal water return SSF isolation valve 2NV94A does not have an alternate valve.

5. The chemical volume control system/reactor coolant system [illegible] solation valves, 2NV24B and 2NV25B can act as alternates to each other and 2NV26B can serve as a second alternate, but the cables associated with these valves are located in the same area.

6. The standby makeup pump test SSF valve 2NV1012C does not have an alternate.

7. The standby makeup pump SSF isolation vlave 2NV1013C does not have an alternate.

Group 3 contains the pressurizer spray SSF isolation valves 2NC27 and 2NC29 which have no alternate devices. If these valves cannot be closed due to a fire, the corresponding reactor coolant pump can be tripped.

Group 4 contains the residual heat removal system SSF isolation valve 2ND2A which has as an alternate valve 2ND1B. Both valves are located inside containment, therefore, will not be available with a postulated fire. The existing control cable for 2ND2A will be separated into two control cables to ensure no internal shorts would open the valve.

Group 5 contains the cables for ter erature monitoring for the SSF by means of five incore thermocouples. An alternate for the incore thermocouples is a hot-leg, cold-leg RTD pair from one reactor coolant loop. However, the cable routes of the RTD coincide with the incore thermocouples. The incore thermocouples will be separated by a minimum of twenty feet.

Group 6 contains the SSF power cable to the pressurizer heater. If a fire renders this equipment inoperable, the necessary shutdown function can be performed without the use of the pressurizer heater.

Other cables that were examined were either associated with a device inside inner containment or an alternate device located in the annulus. For devices located in inner containment the cables are routed through the annulus. As was previously stated, the criteria for review of the cable routings was to provide separation of cables and equipment of redundant shutdown functions by a horizontal distance of more than 20 feet with no intervening combustibles. In the annulus area the PVC jacket remains on the cable, therefore, the existing manually actuated sprinkler system will be upgraded to a pre-action sprinkler system. We conclude that this meets the intent of Appendix R Section III.G.2.

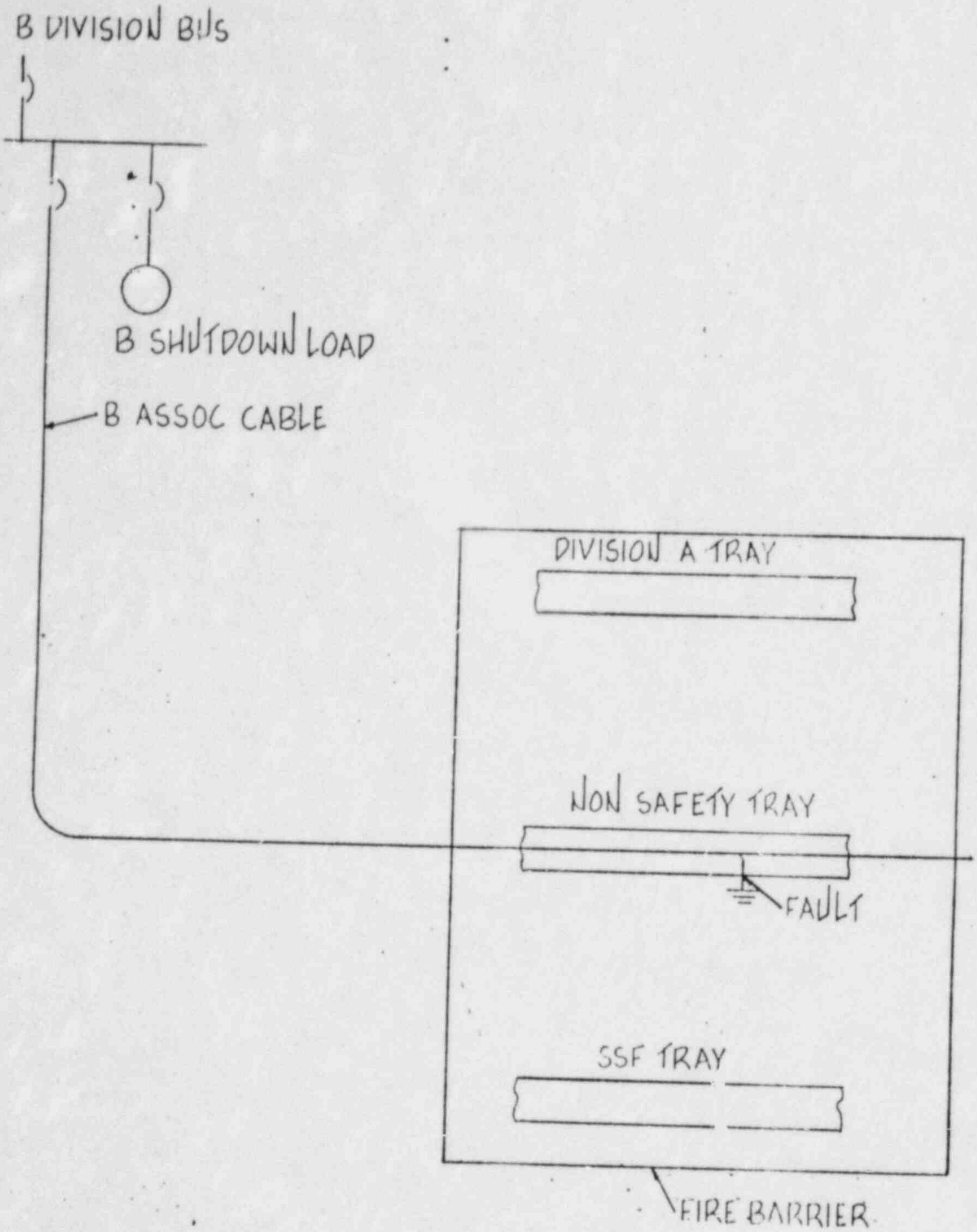
B DIVISION BUS
B SHUTDOWN LOAD
B ASSOC CABLE
DIVISION A TRAY
NON SAFETY TRAY
FAULT
SSF TRAY
FIRE BARRIER

FIGURE 1

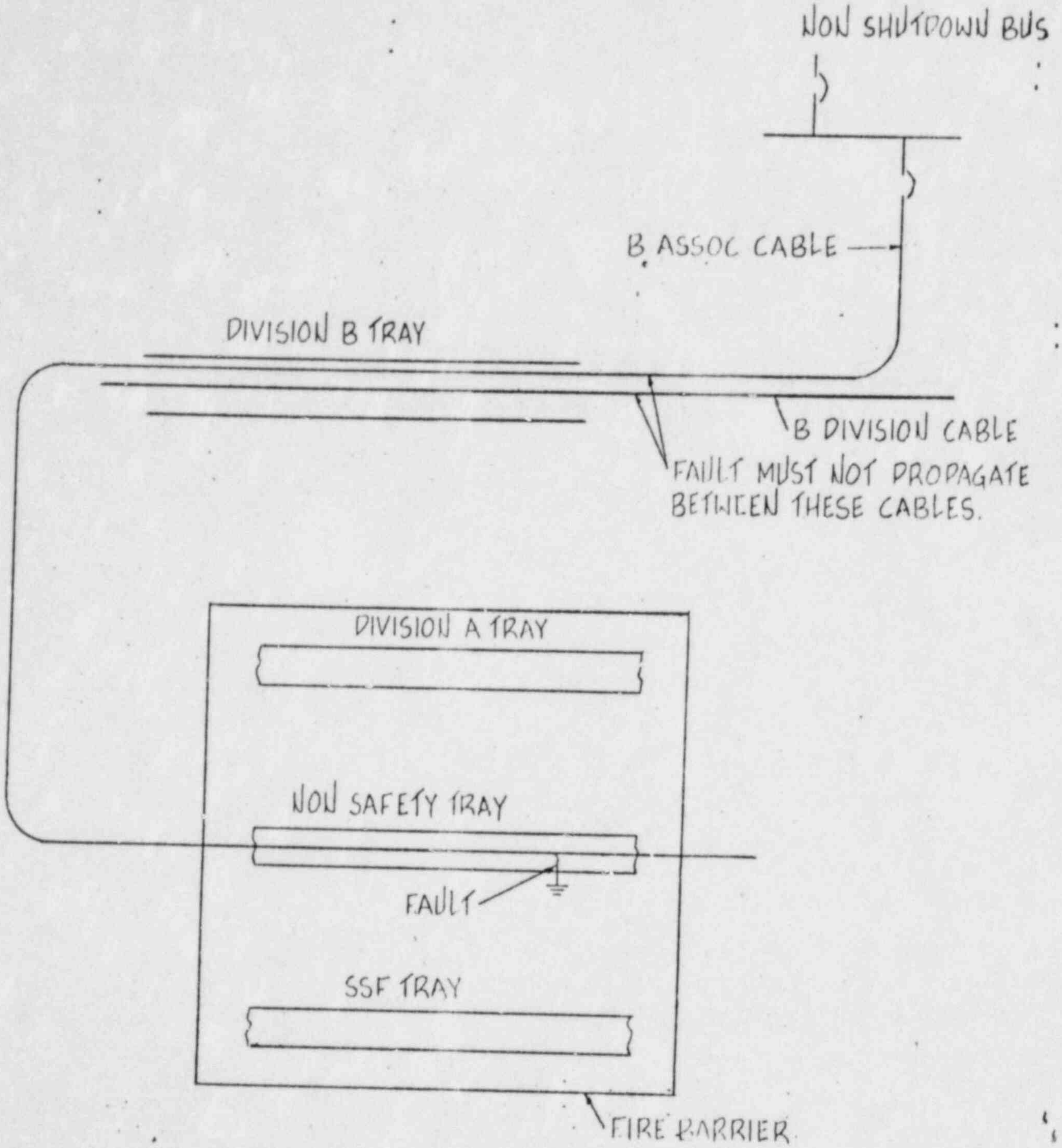
NON SHUTDOWN BUS
B ASSOC CABLE
DIVISION B TRAY
B DIVISION CABLE
FAULT MUST NOT PROPAGATE
BETWEEN THESE CABLES.
DIVISION A TRAY
NON SAFETY TRAY
FAULT
SSF TRAY
FIRE BARRIER

FIGURE 2