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July 1, 1982

Mr. Darrell G. Eisenhut, Director
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Dresden Station, Units 2 & 3
Response to Fire Protection - Safe
Shutdown NRC Information Requests
NRC Docket Nos. 50-237 and 50-249

References (a): D.G. Eisenhut letter to All Power Reactor Licensees with Plants Licensed Prior to January 1, 1979, dated February 20, 1981. (Generic Letter 81-12)

(b): G.C. Lainas letter to L.O. DelGeorge, additional information request concerning the fire protection safe shutdown capability of Dresden Station, Units 2 & 3, dated April 30, 1982.

Dear Mr. Eisenhut:

In the letters referenced above, information was requested concerning the fire protection safe shutdown capability of Dresden Station, Units 2 & 3. Commonwealth Edison provided information relevant to the Reference (a) request in submittals dated January 23, 1980, February 29, 1980, May 19, 1981, August 3, 1981, January 29, 1982, and March 16, 1982. The attached Enclosures, A through E, provide a final and complete response to the information requested in References (a) and (b).

In the submittals dated January 23, 1980, and February 29, 1980, responses to Questions 8a-1 listed in Enclosure 1 of Reference (a) were provided. These questions requested information concerning shutdown methods, manpower requirements, procedures, and technical specification requirements related to safe shutdown. Much of the information provided in these submittals has become dated and is in need of clarification. The attached Enclosure A provides updated responses to Questions 8a-1.

The attached Enclosure B provides a summary of the responses to Questions 1A-C and 2A-D listed in Enclosure 2 of Reference (a) concerning associated circuits. Enclosure B also includes the final response to Questions 1D and 1E listing the exact shutdown methods and necessary safe shutdown modifications for Dresden Station. It should be noted that necessary procedures reflecting the proposed shutdown methods will not be

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written and proposed modifications will not be implemented until final NRC approval is received. Submitted with this letter and referenced in enclosure B are six copies of the Dresden Station 2&3 Fire Protection Associated Circuits Analysis and Modifications Report. Copies of the cable discrepancy lists, previously submitted on March 16, 1982, will be revised and resubmitted by August 16, 1982 as a supplement to the Modifications Report.

The attached Enclosure C provides a response to the more recent Questions (1-4) listed in Enclosure 1 to Reference (b). This enclosure provides responses concerning information previously requested and not supplied. In response to Enclosure 5 of Reference (b), Commonwealth Edison's position related to source range monitoring independent of the control room is stated in Enclosure D.

Having reviewed 10 CFR 50.48 and Appendix R 10 CFR 50, we have determined that it is necessary to request exemption from certain requirements of Paragraph III.G.3 to Appendix 'R'. Enclosure E to this letter lists the requested exemptions and provides a technical basis for each. This request is being made pursuant to the provisions of 10 CFR 50.12.

Because of the extreme complexity and magnitude of the fire protection safe shutdown issue, we believe that it is in the best interests for all parties concerned that a meeting be held as soon as possible to discuss the proposed safe shutdown methods, modifications, and requested exemptions for Dresden Station. We are available for such a meeting at the convenience of your staff.

One (1) signed original and thirty-nine (39) copies of this cover letter are provided for your use. Due to their volume, only six (6) copies of Enclosures A-E are attached.

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

Very truly yours,

Thomas J. Rausch
Nuclear Licensing Administrator

Enclosures

cc: Region III Inspector - Dresden

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Enclosure A

These responses have been updated to reflect revised shutdown schemes resulting from the associated circuits analysis. Therefore, this information supersedes the responses in our submittals of January 23, 1980 and February 29, 1980.

Question 8a

Description of the systems or portions thereof used to provide the shutdown capability and modifications required to achieve the alternate shutdown capability if required.

Response

The descriptions of the systems or portions thereof used to provide the shutdown capability and modifications required to achieve the alternate shutdown capability are discussed for each fire zone in Section 5.0 of the Dresden 2 & 3 Fire Protection Associated Circuits Analysis and Modifications Report.

Question 8b

System design by drawings which show normal and alternate shutdown control and power circuits, location of components, and that wiring which is in the area and the wiring which is out of the area that required the alternate system.

Response

The locations of components and their control and power circuits are shown by fire zone on Dresden drawings ES-374 (Unit 2) and ES-375 (Unit 3). Fire zone drawings are included in the Dresden 2 & 3 Fire Protection Associated Circuits Analysis and Modifications Report.

Question 8c

Demonstrate that changes to safety systems will not degrade safety systems. (e.g., new isolation switches and control switches should meet design criteria and standards in FSAR for electrical equipment in the system that the switch is to be installed; cabinets that the switches are to be mounted in should also meet the same criteria (FSAR) as other safety related cabinets and panels; to avoid inadvertent isolation from the control room, the isolation switches should be keylocked, or alarmed in the control room if in the "local" or "isolated" position; periodic checks should be made to verify switch is in the proper position for normal operation; and a single transfer switch or other new device should not be a source for a single failure to cause loss of redundant safety systems).

Response

All modifications to existing safety systems will meet as a minimum the design criteria and standards in the FSAR. New isolation switches in safety system circuitry will be keylocked or alarmed in the control room.

Question 8d

Demonstrate that wiring, including power sources for the control circuit and equipment operation for the alternate shutdown method, is independent of equipment wiring in the area to be avoided.

Response

All wiring necessary to operate equipment for the alternate shutdown methods described in the Dresden 2 & 3 Fire Protection Associated Circuits Analysis and Modifications Report will be either independent of wiring in the area to be avoided, or separated from redundant wiring in the area in conformance with Section III.G.2 of Appendix R. Control power sources were included in the analysis.

Question 8e

Demonstrate that alternate shutdown power sources, including all breakers, have isolation devices on control circuits that are routed through the area to be avoided, even if the breaker is to be operated manually.

Response

Isolation will be provided for all alternate shutdown power sources, including the control circuits for necessary breakers.

Question 8f

Demonstrate that licensee procedure(s) have been developed which describe the tasks to be performed to effect the shutdown method. A summary of these procedures should be submitted.

Response

The existing safe shutdown procedures will be modified in accordance with the shutdown schemes discussed in the Dresden 2 & 3 Fire Protection Associated Circuits Analysis and Modifications Report upon receipt of NRC approval for the alternate shutdown method.

Question 8g

Demonstrate that spare fuses are available for control circuits where these fuses may be required in supplying power to control circuits used for the shutdown method and may be blown by the effects of a cable spreading room fire. The spare fuses should be located convenient to the existing fuses. The shutdown procedure should inform the operator to check these fuses.

Response

The Dresden 2 & 3 Fire Protection Associated Circuits Analysis and Modifications Report, Section 5.17, discusses the alternate shutdown method to be used in case of a fire in the auxiliary electric equipment room, which serves as the cable spreading area. The alternate shutdown method relies on local control of the diesel generator and necessary circuit breakers, local or manual operation of necessary valves, and local monitoring of instrumentation. Since the normal control circuits will be deenergized or locally isolated, replacement fuses are not necessary.

Question 8h

Demonstrate that the manpower required to perform the shutdown functions using the procedures of (f) as well as to provide fire brigade members to fight the fire is available as required by the fire brigade technical specifications.

Response

Upon receipt of NRC staff approval for the proposed alternate shutdown method, station procedures will be revised in a manner ensuring that the necessary shutdown functions can be performed by the available manpower.

Question 8i

Demonstrate that adequate acceptance tests are performed. These should verify that: equipment operates from the local control station when the transfer or isolation switch is placed in the "local" position and that the equipment cannot be operated from the control room; and that equipment operates from the control room but cannot be operated at the local control station when the transfer or isolation switch is in the "remote" position.

Response

Preoperational tests are performed and documented as part of each modification procedure. The CECo Quality Assurance Program for Fire Protection requires that these preoperational tests be performed before the equipment is placed into service. These tests are designed to verify the functional operation of the control circuitry and include verification that the equipment operates from the local control station when the isolation device is in the "local" mode. The tests also include verification that the equipment cannot be operated from the control room.

There is not a sound technical basis for disallowing operation from the "local" control position when the isolation device is in the "remote" mode, since the intent of the isolation capability is to ensure that local control is available.

Question 8j

Technical Specifications of the surveillance requirements and limiting conditions for operation for that equipment not already covered by existing Tech. Specs. For example, if new isolation and control switches are added to a service water system, the existing Tech. Spec. surveillance requirements on the service water system should add a statement similar to the following:

"Every third pump test should also verify that the pump starts from the alternate shutdown station after moving all service water system isolation switches to the local control position."

Response

While Technical Specifications should call out the surveillance requirements and intervals, they should not address actions to be taken to carry out those requirements. The best method for describing how a Technical Specification requirement is fulfilled is by Station Procedures. Station Procedures have the flexibility of being upgraded for the best methods of doing surveillance testing in a timely manner. Tech Specs require substantial time for upgrading as improvements in methods of surveillance testing are found.

Question 8k

Demonstrate that the systems available are adequate to perform the necessary shutdown functions. The functions required should be based on previous analyses, if possible (e.g, in the FSAR), such as a loss of normal a.c. power or shutdown on a Group I isolation (BWR). The equipment required for the alternate capability should be the same or equivalent to that relied on in the above analysis.

Response

The systems used are adequate to perform the necessary safe shutdown functions. The two methods, Isolation Condenser and HPCI, are those discussed in the Dresden 2 & 3 FSAR Amendement 13/14 referenced in our May 19, 1981 submittal. The referenced analysis discusses shutdown in the event of loss of offsite power.

Question 81

Demonstrate that repair procedures for cold shutdown systems are developed and material for repairs is maintained on site.

Response

The alternate shutdown methods were reanalyzed as a result of the associated circuits review. As a result of this analysis, existing or proposed mechanical and electrical crossties were utilized to formulate the revised alternate shutdown method. The new hot shutdown method alleviates the problem of 4KV switchgear 23-1 and 24-1 (33-1 and 34-1 for Unit 3) located in the same fire zone. These switchgear also provide power to the shutdown cooling pumps. As a result of loss of both switchgear in a fire, a temporary power cable from the other Unit to one shutdown cooling pump would be required to achieve cold shutdown. Upon final NRC approval of the proposed modifications described in the Dresden Station 2&3 Associated Circuits Analysis and Modifications Report, a repair procedure will be developed to install this cable and the necessary materials will be stored on site.

ENCLOSURE B

The following are a summary of responses (dated August 3, 1981, January 29, 1982, and March 16, 1982) to questions 1A through E and 2A through D of enclosure 2 to generic letter 81-12 dated February 20, 1981.

Question 1.A.

Provide a table that lists all equipment including instrumentation and support system equipment that are required by the alternative or dedicated method of achieving and maintaining hot shutdown.

Summary of Response

In the submittals referenced above, copies of drawings ES-374 and ES-375 were provided. The latest and final revision of these drawings were submitted on March 16, 1982. These drawings listed all equipment including instrumentation and support system equipment required by the alternative method of achieving and maintaining hot shutdown.

Question 1.B.

For each alternative shutdown equipment listed in 1.A above, provide a table that lists the essential cables (instrumentation, control and power) that are located in the fire area.

Summary of Response

The revision of drawings ES-374 and ES-375 submitted on March 16, 1982 highlighted the essential power, instrumentation, and control cables which were located in the fire zones in which operation of the equipment was considered necessary. All cable appearing in highlighted areas were then listed by fire zone in the Dresden 2 & 3 Cable Discrepancy Lists also submitted on March 16, 1982.

Question 1.C.

Provide a table that lists safety related and non-safety related cables associated with the equipment and cables constituting the alternative or dedicated method of shutdown that are located in the fire area.

Summary of Response

The revision of drawings ES-374 and ES-375 submitted on March 16, 1982 referenced (by numbered notes) safety and non-safety related cables associated with equipment and cables considered necessary for the alternative method of shutdown. The cables referenced in the notes are listed in pages 15A through J of ES-374, and pages 12A through K of ES-375. These associated cables are higlighted in fire zones in which proper operation of the associated essential equipment and cables was considered necessary. All associated cables appearing in highlighted areas were also listed by fire zone in the Dresden 2 & 3 Cable Discrepancy Lists submitted on March 16, 1982.

Question 1.D

Show that fire-induced failures of the cables listed in B and C above will not prevent operation or cause maloperation of the alternative or dedicated shutdown method.

Final Response

Approximately 2000 associated and essential cables were identified in this analysis. In the March 16, 1982 submittal, the Dresden Station Units 2 & 3 Cable Discrepancy Lists identified approximately 200 pages of cables in which fire-induced failures could prevent operation or cause maloperation of the identified alternative shutdown method for each fire zone. Due to the magnitude of problems identified by the associated circuits analysis, new proposed alternative shutdown methods were devised for each fire zone. Submitted along with enclosure B to this letter are six copies of the Dresden Station 2 & 3 Fire Protection Associated Circuits Analysis and Modifications Report. This report discusses the exact alternate safe shutdown method proposed for each fire zone and the modifications required to ensure the availability of that method. The new proposed alternative shutdown methods were chosen in a manner to resolve all problems identified in the cable discrepancy lists. Revised copies of the cable discrepancy lists indicating those modifications resolving each discrepancy will be submitted by August 16, 1982 to supplement the Analysis and Modifications Report.

Question 1.E

For each cable listed in 1.B above, provide detailed electrical schematic drawings that show how each cable is isolated from the fire area.

Final Response

All modifications necessary to comply with item 1.D above have been described in the Dresden Station Fire Protection Associated Circuits Analysis and Modifications Report. Essential cables for the new proposed alternative shutdown methods will be either indepndent of the area to be avoided or will be protected in accordance with Section III.G.2 of Appendix R. The Associated Circuits Analysis and Modifications Report provides sufficient information concerning cable isolation to obtain preliminary NRC approval for the proposed shutdown methods. Upon receipt of preliminary NRC approval of the proposed alternative shutdown methods, detailed electrical schematic drawings necessary for final review will be provided.

Questions 2.A,B,C,D

A. Identify each high-low pressure interface that uses redundant electrically controlled devices (such as two series motor operated valves) to isolate or preclude rupture of any primary coolant boundary.

B. Identify the device's essential cabling (power and control) and describe the cable routing (by fire area) from source to termination.

C. Identify each location where the identified cables are separated by less than a wall having a three-hour fire rating from cables for the redundant device.

D. For the areas identified in item 2.C above (if any), provide the bases and justification as to the acceptability of the existing design or any proposed modifications.

Summary of Response

There are no high-to-low pressure interfaces at Dresden 2 and 3 which utilize only motor operated valves for isolation.

Enclosure C

Question

You should confirm that the capability will be provided to achieve cold shutdown within 72 hours as required by Section III.L of Appendix R to 10 CFR Part 50.

Response

The capability will be provided to achieve cold shutdown within 72 hours in conformance with Appendix R.

Question

We have reviewed your submittals dated January 29, 1982 and March 16, 1982, regarding associated circuits. From the limited information provided we cannot conclude that associated circuits have been adequately addressed. We request that you provide a point-by-point response to the February 20, 1981 generic letter 81-12, with respect to interaction of associated circuits. Your response should include fire damage to control room panels and logic panels located elsewhere in the plant.

Response

Answers to this question are adequately addressed in Enclosure B of this submittal.

Question

Your submittal indicates that the safe cold shutdown analysis depends on the manual operation of valves (TCV-3904 A and B) located in the fire area where the fire has occurred. In addition this analysis takes credit for valves located in the fire area as failing in the open position. The valves in question are the shutdown cooling heat exchanger valves. The licensee should demonstrate that these valves will fail in the open position due to a fire.

Response

The Brookhaven review has incorrectly identified these valves as "shutdown cooling heat exchanger valves". The valves in question are located in the service water outlet lines from the reactor building closed cooling water heat exchangers. These valves are controlled by temperature elements on the RBCCW side of the heat exchangers, which regulate the air to the solenoids. The valve position controls the service water flow in order to maintain the RBCCW temperature constant. The valves open fully upon loss of air.

The most likely fire-induced effect on these valves is heatup of the temperature elements, which would result in the valve opening fully to compensate by increasing service water flow. The Unit 2 valves (TCV2-3904A,B,C) are located at 38/K-L along the east wall, at approximately 2, 8, and 14 feet off the floor. The fire loading in this zone is approximately 18,000 BTU/ft^2, equivalent to a fire of about 15 minutes duration. However, the combustibles in this zone are almost exclusively cables. The nearest cables to the TC valves are located approximately 20 feet south along the wall. Since only one valve is needed to operate for cold shutdown, and since operation is not required for several hours after the fire, it is simply not credible to postulate failures which would close all three valves (simulating a colder temperature) and a heat flux which could stick the valves in the closed position.

Similarly, the Unit 3 valves TCV3-3904A&B are located along the west wall at 50/K-L. Again, the only significant combustibles are cable trays, and the nearest trays are approximately 20 feet south of the valves. Even if the fire did not cause the valves to fail open, the operator could open them after the fire by simply removing the air supply.

Question

Your submittal dated May 19, 1981, Item D, is not clear. There are concrete enclosures which protect valves MO2-1301-3 and MO3-1301-3 individually, which are inside large fire areas. With a fire in the large fire area, access to these valves is prevented. You should demonstrate how valves located in the affected fire area are going to be manually operated.

Response

The "concrete enclosures" are part of a continuous pipe chase. There are access doors to the pipe chase at each level. As discussed in the Dresden 2 & 3 Fire Protection Associated Circuits Analysis and Modifications Report, these doors will be upgraded to 3-hour fire doors, ensuring that the valves will remain available for manual operation. Installation of the 3-hour fire doors will be implemented pending NRC approval of the proposed safe shutdown modifications.

Enclosure D

In response to the Staff position related to source range monitoring external to the control room, it is the position of Commonwealth Edison that such monitoring is not necessary to achieve safe shutdown in the event of a fire at Dresden Station, Units 2&3. This position is based on the fact that it is not credible for a postulated fire to prevent full insertion of all control rods into the reactor core. As it is not possible for the reactor core to become critical at any time after all control rods are inserted, source range monitoring of the core will provide no useful information to the operator. Since no technical justification for the need of source range monitoring has been demonstrated, no further action regarding this matter will be taken.

Enclosure E

Exemption

In accordance with 10 CFR 50.12, an exemption is requested for Dresden Station, Units 2 & 3 from the fixed fire suppression requirement, as defined in Section III.G.3.b of Appendix 'R' to 10 CFR 50 in fire zones where alternate shutdown capability is required. That equipment requiring fixed suppression as defined in Section III.G.3.b to which an exemption is requested are listed below.

1. All panels located in the control room
2. 4KV SWGR's 23 and 24
3. 4KV SWGR's 23-1 and 24-1
4. 480V SWGR's 28 and 29
5. 480V MCC's 28-7 and 29-7
6. 250V MCC's 2A and 2B
7. 125V Distribution Panels 2A and 2B
8. 4KV SWGR's 33 and 34
9. 4KV SWGR's 33-1 and 34-1
10. 480V SWGR's 38 and 39
11. 480V MCC's 38-7 and 39-7
12. 250V MCC's 3A and 3B
13. 125V Distribution Panels 3A and 3B

Justification

All of the items listed above are critical to the power distribution necessary for normal and emergency operation of safety related equipment for Units 2 & 3. Inadvertant actuation of any fixed water suppression system located over the power distribution equipment listed above could result in the fault or failure of that equipment. Installation of any other type of fixed suppression system other than water such as cardox, halon, or foam, would be ineffective or inappropriate for the areas in which the equipment listed above are located or for the type of fire likely to occur in the area. All equipment listed above are in high traffic areas which are currently provided with fire detection and manual suppression systems. Furthermore, the existing fire detection and suppression systems currently installed in the areas containing the equipment listed above have been reviewed and approved by the NRC in the Dresden Station Units 2&3 Fire Protection SER. As the probability of inadvertant actuation of a fixed suppression system is of far greater magnitude than the probability of occurrence of a fire severe enough to require the use of the alternate shutdown method independent of the fire area, Commonwealth Edison feels that the installation of such fixed suppression systems would only result in a decrease in plant safety.