Commonwealth Edison
One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

May 30, 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
Appendix R Technical Exemption
Request Submittals
NRC Docket Nos. 50-237 and 50-249

References (a): September 18, 1985 Exemption Request Submittals.

(b): October 16, 1985 Exemption Request Submittals.

Dear Mr. Denton:

As a result of recent discussions with your staff, Commonwealth Edison is revising our References (a) and (b) Appendix R Technical Exemption Requests for Dresden Units 2 and 3. The following paragraphs describe the nature of the changes documented in the enclosures to this letter.

During the re-evaluation of Dresden Station's compliance with 10 CFR 50, Appendix R, CECo interpreted the Appendix R Section III.G.3 requirement for independence of alternate safe shutdown systems to mean that these systems and their associated components are required to be separated by 3-hour rated barriers from the area, room, or zone for which they are provided. This was based on the statement in Section VIII of I&E Information Notice 84-09 that Section III.L of Appendix R applies to the alternate safe shutdown option under Section III.G. Section III.L states that alternative shutdown capability shall be independent of the fire areas under consideration. The definition of fire area was specified in Generic Letter 83-33. Based on this interpretation, CECo proceeded to upgrade the barriers between areas containing alternate safe shutdown equipment. Where the barriers between alternate safe shutdown systems could not be upgraded to complete

A006
1/1

3-hour barriers, the resistance to fire transmission was justified in a request for an exemption from the requirements of Section III.G.2 and III.L of Appendix R.

On April 8, 1986, CECo personnel participated in a meeting with the NRC staff. NRR reviewer, John Stang, stated NRR's interpretation of Section III.G of Appendix R. According to this interpretation:

(1) The separation criteria of Section III.G.2 does not apply to alternative safe shutdown systems,

(2) If the alternative safe shutdown capability option is employed in the Appendix R compliance analysis, then exemption requests are only necessary from the III.G.3 requirements for fixed fire suppression and detection in the area, room, or zone under consideration, and

(3) The independence requirement of III.G.3 is demonstrated by the presence of fire protection measures or combination of measures (e.g., substantial barriers, spatial separation, automatic detection, automatic suppression) which assure that the alternative safe shutdown systems will be free of fire damage for fires in the area, room, or zones for which the alternative capability is provided. Thus, exemptions from the requirements of III.G.3 for lack of fire barriers between alternative shutdown components are not necessary and will not be granted.

Based on the NRR interpretation of Appendix R Section III.G.3, CECo is withdrawing certain exemption requests in the referenced submittals. However, since there exists no definitive criteria for establishing indepedence of an alternative safe shutdown system from the area, room, or zone under consideration, CECo is requesting that NRR review these submittals with regard to the independence of alternative safe shutdown systems described therein. CECo further requests that a summary of the NRR review and concurrence of the independence provided be documented in the safety evaluation of the remaining Appendix R exemption requests.

Table 1 identifies the sections of the referenced submittals for which exemptions are no longer requested but for which the review with regard to independence is requested. Table 2 identifies the sections of the referenced submittals which have been modified as a result of the April 8, 1986 meeting. Also enclosed are the pages which have been changed.

Please note that the revised pages include a discussion of fuse pulling/replacement and common power sources (sections 7.2 and 7.3). These sections respond to other concerns raised by your staff in these areas.

One signed original and five (5) copies of this letter and its attachments are provided for your use. If you have any questions regarding this transmittal, please contact this office.

Very truly yours,

J. R. Wojnarowski
Nuclear Licensing Administrator

lm

Attachments

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

1661K

Table 1

Section	Submittal	Justification For:
3.2	Sept. 1985	Lack of complete 3-hour fire barriers around Fire Zone 1.3.2
3.3	Sept. 1985	Lack of complete 3-hour fire barriers between fire areas
3.8	Oct. 1985	Separation between mechanical components of Redundant Cold Shutdown Systems
4.2	Sept. 1985	Lack of complete 3-hour fire barriers between fire areas
4.8	Oct. 1985	Lack of complete 3-hour barriers around Fire Zone 1.4.1
4.9	Oct. 1985	Lack of complete 3-hour fire barriers around Fire Zone 1.3.1
4.10	Oct. 1985	Separation between mechanical components of Redundant Cold Shutdown Systems
5.2	Sept. 1985	Lack of complete fire barriers surrounding Turbine Building Zone Groups

Table 1 - Continued

Section	Submittal	Justification For:
9.1	Oct. 1985	4KV Bus Duct Penetrations
9.2	Oct. 1985	Standby Gas Treatment System Piping Penetrations
10.1	Oct. 1985	Appendix R Structural Steel Request

Table 2

Exemption Request Sections Which Have Been Modified

Section	Reason for Change
3.8	Delete Subsection 3.8.4.1 "Separation of Valves Within A Fire Zone"
4.10	Delete Subsection 4.10.4.1 "Separation of Valves Within a Fire Zone"
7.2/7.3	Additional sections added to justify additional fuse pulling and/or fuse replacement to comply with the intent of IEIN 85-09 and to address common power source concerns.
9.2	Change in Table 9.2-1 to indicate what fire zones are involved and add one additional standby Gas Treatment System penetrations.

3.8 JUSTIFICATION FOR SEPARATION BETWEEN MECHANICAL COMPONENTS OF REDUNDANT COLD SHUTDOWN SYSTEMS

3.8.1 Introduction

There are two shutdown methods which have been identified to bring Unit 2 to cold shutdown: shutdown cooling (SC) and Low Pressure Coolant Injection (LPCI). Of these SC has been identified as available throughout the turbine building and a majority of reactor building fire zones.

In the Unit 2 reactor building fire area, the shutdown cooling system can be used for cold shutdown in every fire zone except for the mezzanine floor, Fire Zone 1.1.2.3 (Fire Area RB2-II) and the shutdown cooling pump room, Fire Zone 1.3.2 (Fire Area RB2-I). On the mezzanine floor, the presence of the RBCCW pumps precludes the use of the shutdown cooling system. In the shutdown cooling pump room, the presence of the shutdown cooling pumps preclude the use of the shutdown cooling systems.

This exemption request justifies the presence of redundant mechanical cold shutdown equipment i.e., RBCCW and LPCI pumps and associated motors, in the same fire area. This equipment is separated by two floor elevations as well as horizontal separation. Only the analysis for availability of cold shutdown mechanical equipment (pumps and associated motors and valves) is involved. Electrical equipment within each of the reactor building fire areas i.e., RB2-I and RB2-II was assumed functionally disabled if a fire is postulated to occur anywhere within that fire area. The functional capability of mechanical equipment was assumed lost only if the fire occurred in the particular fire zone where the equipment is located except in two cases where the redundant valving is located in the fire zone of intended use. One of these valves are assumed to retain its manual operability. Subsection 3.8.4 provides justification for the separation between adjacent fire zones which assures the functional capability of at least one train of mechanical cold shutdown equipment. This equipment can be operated if a temporary feed from a power source in the other unit is provided.

3.8.2 Fire Protection System

The reactor building has complete fire detection except as listed below. The fire zones which do not have complete detection either contain no safe shutdown equipment or have very low fire loading, i.e., less than 1000 Btu/ft^2. The fire zones are:

1.1.2.1	Torus Basement
1.1.2.5.B	Isolation Condenser Pipe Chase
1.1.2.5.C	Isolation Condenser Pipe Chase
1.1.2.6	Refueling Floor
1.1.2.3	Mezzanine Floor (above heat exchanger area).

3.8.3 Safe Shutdown Equipment

The cold shutdown mechanical equipment located in the reactor building is listed in Table 3.8-1.

3.8.4 Fire Hazards Analysis

The reactor building is divided into fire zones by floor elevations. These floor slabs present a substantial barrier to the spread of fire. However, they are not fire rated. The combustible loading is low and area-wide automatic fire detection would ensure that the fire was detected and extinguished before it spread to adjacent floor elevations disabling the mechanical components and their operators. The electrical penetrations through the floor are sealed. A 20-foot by 20-foot hatchway exists in each floor from elevation 545 feet 6 inch to elevation 613 feet 0 inch. This open path allows smoke and hot gases to escape to the refuel floor thus limiting the smoke damage to equipment above the fire zone containing the fire. Hose stations and manual fire extinguishers are located throughout the reactor building.

The location of the valving associated with the shutdown cooling and the LPCI methods of achieving cold shutdown are listed in Table 3.8-1. The valving is generally assumed to retain mechanical operability after fire. The major com-

ponents i.e., pumps and associated motors, of the LPCI/CCSW and the shutdown cooling methods of achieving cold shutdown are located in different fire zones. The pumps associated with the shutdown cooling method are located in Fire Zone 1.1.2.3 and 1.3.2 which do not adjoin Fire Zone 11.2.1 (which contains the LPCI pumps). The following provides justification for the separation between adjacent fire zones which assures the availability of these major components.

3.8.4.1 Fire Zone 1.1.2.3 (Elevation 545 feet 6 inches)

The cold shutdown equipment contained in this fire zone is listed in Table 3.8-1. The RBCCW pumps are located on the floor between column rows L-M and 39-40. The main combustible at the floor level is the 4kV switchgear which is located at least 15 feet from the pumps. The other major source of combustibles in this zone are cables in cable trays near the ceiling. The electrical penetrations through the floor and ceiling are sealed. Smoke and hot gases from a fire in this zone would escape up the 20-foot by 20-foot equipment hatch located between column rows M-N and 42-43. The pumps are located approximately 50 feet from the open hatch. The fire zone is provided with complete ionization detection except above the regenerative and nonregenerative heat exchanger area. The combustible load in this fire zone is less than 17,000 Btu/ft^2 and is composed mainly of cable in cable trays. There is no continuity of combustibles between zones and transient combustibles are controlled by administrative procedure. Therefore, a fire starting in this fire zone will not spread to adjacent zones. The LPCI pumps are approximately 70 feet below in Fire Zone 1.1.2.1 and no LPCI pumps or motors are located in the intervening Fire Zone 1.1.2.2.

3.8.4.2 Fire Zone 1.1.2.2 (Elevation 517 feet 6 inches)

The cold shutdown equipment contained in this fire zone is listed in Table 3.8-1. There is no mechanical equipment associated with the shutdown cooling method of achieving cold shutdown which has been identified for use in this fire zone.

This fire zone has complete fire detection which alarms in the control room. Hose stations and manual fire extinguishers are located in this fire zone. Fire Zone 1.3.2 which contains the shutdown cooling pumps is separated from this fire

zone by equivalent 3-hour barriers. The electrical penetrations in the floor and ceiling are sealed. Transient combustibles are controlled by administrative procedure and there is no continuity of combustibles between fire zones, therefore, a fire starting in this fire zone will not spread to adjacent fire zones. The majority of combustibles in this fire zone, cable in cable trays, are located near the ceiling. The only components of either cold shutdown method located in this fire zone are LPCI valves which can be manually operated.

3.8.4.3 Fire Zone 1.3.2 (Elevation 517 feet 6 inches)

This fire zone is separated from adjacent fire zones by equivalent 3-hour barriers. The cold shutdown equipment located in this fire zone is listed in Table 3.8.1.

3.8.4.4 Fire Zone 11.2.1 (Elevation 476 feet 6 inches)

The cold shutdown equipment in this zone is listed on Table 3.8-1. The LPCI pumps located in this zone are on the floor between column rows M-N and 43-44. This fire zone is protected by complete thermal fire detection. The combustible loading is less than 27,000 Btu/ft^2. The electrical penetrations through the ceiling are sealed. Smoke and hot gases from any fire in this zone would escape up the open stairwell in the ceiling and into the open hatchway which starts at the 545 foot 6 inch elevation. There is no continuity of combustibles and transient combustibles are administratively controlled. Therefore, a fire starting in this fire zone would not spread to adjacent fire zones. The major components, pumps and associated motors, of the shutdown cooling method of achieving cold shutdown are located in Fire Zone 1.3.2 which is surrounded by equivalent 3-hour barriers and Fire Zone 1.1.2.3 which is located approximately 70 feet above.

3.8.5 Conclusion

Based on the protection described above, the ability to safely achieve cold shutdown is insured and the intent of Appendix R for cold shutdown is satisfied. The separation of the redundant pumps, motors and valves ensure that one of the

two shutdown methods can be employed even though the cables to the pumps may be destroyed, because the motors of at least one of the independent trains will be unaffected by fire. Procedures have been developed to power the unaffected pumps from an unaffected 4kV power source. Justification for this is as follows:

1. The redundant cold shutdown mechanical components employed have approximately 70 feet vertical separation and 50 feet horizontal separation.

2. The floor elevation (Fire Zone 1.1.2.2) between these two fire zones has complete ionization detection and a fire loading of less than 21,000 Btu/ft^2.

3. There is no continuity of combustibles between Fire Zones 11.2.1, 1.1.2.2 and 1.1.2.3.

TABLE 3.8-1

MECHANICAL COLD SHUTDOWN EQUIPMENT CONTAINED IN THE UNIT 2 REACTOR BUILDING
FIRE AREAS RB2-I and RB2-II

Fire Zone 1.1.2.1

Shutdown Cooling

1. SC Valve MO2-1001-5A
2. SC Valve MO2-1001-5B
3. RBCCW Valve MO2-3702
4. RBCCW Valve MO2-3703

LPCI, Division II

1. LPCI Valve MO2-1501-22B
2. LPCI Valve MO2-1501-20B
3. LPCI Valve MO2-1501-38B
4. LPCI Valve MO2-1501-18B
5. LPCI Valve MO2-1501-19B
6. LPCI Valve MO2-1501-13B

Fire Zone 1.1.2.2

LPCI, Division II

1. LPCI Valve MO2-1501-21B

Fire Zone 1.1.2.3

Shutdown Cooling

1. SC Heat Exchangers

   2A-1003
   2B-1003
   2C-1003

2. RBCCW Pumps and Associated Motors

   2A-3701
   2B-3702
   2/3-3701

3. RBCCW Heat Exchangers

   2A-3702
   2B-3702
   2/3-3702

TABLE 3.8-1 (Cont'd)

Fire Zone 1.1.2.3 (Cont'd)

4. RBCCW Valve MO2-3701
5. RBCCW Valve MO2-3704
6. Service Water Valve TCV-2-3904A
7. Service Water Valve TCV-2-3904B
8. Service Water Valve TCV-2-3904C
9. SC Valve MO2-1001-4A
10. SC Valve MO2-1001-4B
11. SC Valve MO2-1101-4C

LPCI, Division II

1. LPCI Valve MO2-1501-27B
2. LPCI Valve MO2-1501-28B

Fire Zone 1.3.2

Shutdown Cooling

1. SC Pumps and Associated Motors

   2A-1002
   2B-1002
   2C-1002

2. SC Valves

   MO2-1001-2A
   MO2-1001-2B
   MO2-1001-2C

Fire Zone - 11.2.1

LPCI, Division II

1. LPCI Pumps and Associated Motors

   2C-1502
   2D-1502

2. LPCI Emergency Air Cooler 2-5746B
3. LPCI Valve MO2-1501-3B
4. LPCI Valve MO2-1501-5C
5. LPCI Valve MO2-1501-5D
6. LPCI Valve MO2-1501-11B
7. LPCI Valve MO2-1501-32B

4.10 JUSTIFICATION FOR SEPARATION BETWEEN MECHANICAL COMPONENTS OF REDUNDANT COLD SHUTDOWN SYSTEMS

4.10.1 Introduction

There are two shutdown methods which have been identified to bring Unit 3 to cold shutdown: shutdown cooling (SC) and Low Pressure Coolant Injection (LPCI). Of these SC has been identified as available throughout the turbine building and a majority of reactor building fire zones.

In the Unit 3 reactor building fire area, the shutdown cooling system can be used for cold shutdown in every fire zone except for the mezzanine floor, Fire Zone 1.1.1.3 (Fire Area RB3-II) and the shutdown cooling pump room, Fire Zone 1.3.1 (Fire Area RB3-II). On the mezzanine floor, the presence of the RBCCW pumps precludes the use of the shutdown cooling system. In the shutdown cooling pump room, the presence of the shutdown cooling pumps preclude the use of the shutdown cooling systems.

This exemption request justifies the presence of redundant mechanical cold shutdown equipment i.e., RBCCW and LPCI pumps and associated motors, in the same fire area. This equipment is separated by two floor elevations as well as horizontal separation. Only the analysis for availability of cold shutdown mechanical equipment (pumps and associated motors and valves) is involved. Electrical equipment within each of the reactor building fire areas i.e., RB3-I and RB3-II was assumed functionally disabled if a fire is postulated to occur anywhere within that fire area. The functional capability of mechanical equipment was assumed lost only if the fire occurred in the particular fire zone where the equipment is located except in two cases where the redundant valving is located in the fire zone of intended use. One of these valves are assumed to retain its manual operability. Subsection 4.10.4 provides justification for the separation between adjacent fire zones which assures the functional capability of at least one train of mechanical cold shutdown equipment. This equipment can be operated if a temporary feed from a power source in the other unit is provided.

4.10.2 Fire Protection System

The reactor building has complete fire detection except as listed below. The fire zones which do not have complete detection either contain no safe shutdown equipment or have very low fire loading, i.e., less than 1000 Btu/ft^2. The fire zones are:

1.1.1.1	Torus Basement
1.1.1.5.B	Isolation Condenser Pipe Chase
1.1.1.5.C	Isolation Condenser Pipe Chase
1.1.1.6	Refueling Floor
1.1.1.3	Mezzanine Floor (above heat exchanger area)

4.10.3 Safe Shutdown Equipment

The cold shutdown mechanical equipment located in the reactor building is listed in Table 4.10-1.

4.10.4 Fire Hazards Analysis

The reactor building is divided into fire zones by floor elevations. These floor slabs present a substantial barrier to the spread of fire. However, they are not fire rated. The combustible loading is low and area-wide automatic fire detection would ensure that the fire was detected and extinguished before it spread to adjacent floor elevations disabling the mechanical components and their operators. The electrical penetrations through the floor are sealed. A 20-foot by 20-foot hatchway exists in each floor from elevation 545 feet 6 inch to elevation 613 feet 0 inch. This open path allows smoke and hot gases to escape to the refuel floor thus limiting the smoke damage to equipment above the fire zone containing the fire. Hose stations and manual fire extinguishers are located throughout the reactor building.

The location of the valving associated with the shutdown cooling and the LPCI methods of achieving cold shutdown are listed in Table 4.10-1. The valving is generally assumed to retain mechanical operability after a fire. The major

components i.e., pumps and associated motors, of the LPCI/CCSW and the shutdown cooling methods of achieving cold shutdown are located in different fire zones. The pumps associated with the shutdown cooling method are located in Fire Zones 1.1.1.3 and 1.3.1 which do not adjoin Fire Zone 11.1.1 (which contains the LPCI pumps). The following provides justification for the separation between adjacent fire zones which assures the availability of these major components.

4.10.4.1 Fire Zone 1.1.1.3 (Elevation 545 feet 6 inches)

The cold shutdown equipment contained in this fire zone is listed in Table 4.10-1. The RBCCW pumps are located on the floor between column rows L-M and 48-49. The main combustible at the floor level is the 4kV switchgear which is located at least 15 feet from the pumps. The other major source of combustibles in this zone are cables in cable trays near the ceiling. The electrical penetrations through the floor and ceiling are sealed. Smoke and hot gases from a fire in this zone would escape up the 20-foot by 20-foot equipment hatch located between column rows M-N and 45-46. The pumps are located approximately 50 feet from the open hatch. The fire zone is provided with complete ionization detection except above the regenerative and nonregenerative heat exchanger area. The combustible load in this fire zone is less than 16,000 Btu/ft^2 and is composed mainly of cable in cable trays. There is no continuity of combustibles between zones and transient combustibles are controlled by administrative procedure. Therefore, a fire starting in this fire zone will not spread to adjacent zones. The LPCI pumps are approximately 70 feet below in Fire Zone 1.1.1.1 and no LPCI pumps or motors are located in the intervening Fire Zone 1.1.1.2.

4.10.4.2 Fire Zone 1.1.1.2 (Elevation 517 feet 6 inches)

The cold shutdown equipment contained in this fire zone is listed in Table 4.10-1. There is no mechanical equipment associated with the shutdown cooling method of achieving cold shutdown which has been identified for use in this fire zone. This fire zone has complete fire detection which alarms in the control room. Hose stations and manual fire extinguishers are located in this fire zone. Fire Zone 1.3.1 which contains the shutdown cooling pumps is separated from this fire zone by equivalent 3-hour barriers (See Section 4.9). The electrical

penetrations in the floor and ceiling are sealed. Transient combustibles are controlled by administrative procedure and there is no continuity of combustibles between fire zones therefore a fire starting in this fire zone will not spread to adjacent fire zones. The majority of combustibles in this fire zone, cable in cable trays are located near the ceiling. The only components of either cold shutdown method located in this fire zone are LPCI valves which can be manually operated.

4.10.4.3 Fire Zone 1.3.1 (Elevation 517 feet 6 inches)

This fire zone is separated from adjacent fire zones by equivalent 3-hour barriers (see Section 4.9). The cold shutdown equipment located in this fire zone is listed in Table 4.10.1.

4.10.4.4 Fire Zone 11.1.1 (Elevation 476 feet 6 inches)

The cold shutdown equipment in this zone is listed on Table 4.10-1. The LPCI pumps located in this zone are on the floor between column rows M-N and 49-50. This fire zone is protected by complete thermal fire detection. The combustible loading is less than 17,000 Btu/ft^2. The electrical penetrations through the ceiling are sealed. Smoke and hot gases from any fire in this zone would escape up the open stairwell in the ceiling and into the open hatchway which starts at the 545 foot 6 inch elevation. There is no continuity of combustibles and transient combustibles are administratively controlled. Therefore, a fire starting in this fire zone would not spread to adjacent fire zones. The major components, pumps and associated motors, of the shutdown cooling method of achieving cold shutdown are located in Fire Zone 1.3.1 which is surrounded by equivalent 3-hour barriers and Fire Zone 1.1.1.3 which is located approximately 70 feet above.

4.10.5 Conclusion

Based on the protection described above, the ability to safely achieve cold shutdown is insured and the intent of Appendix R for cold shutdown is satisfied. The separation of the redundant pumps, motors and valves ensure that one of the

two shutdown methods can be employed, even though the cables to the pumps may be destroyed, because the motors of at least one of the independent trains will be unaffected by fire. Procedures have been developed to power the unaffected pumps from an unaffected 4kV power source. Justification for this is as follows:

1. The redundant cold shutdown mechanical components employed have approximately 70 feet vertical separation.

2. The floor elevation (Fire Zone 1.1.1.2) between these two fire zones has complete ionization detection and a fire loading of less than 23,000 Btu/ft^2.

3. There is no continuity of combustibles between Fire Zones 11.1.1, 1.1.1.2 and 1.1.1.3.

4. Both the LPCI and the RBCCW pumps are located a minimum of 50 feet from the 20-foot by 20-foot equipment hatch.

TABLE 4.10-1

MECHANICAL COLD SHUTDOWN EQUIPMENT CONTAINED IN THE UNIT 3 REACTOR BUILDING
FIRE AREAS RB3-I and RB3-II

Fire Zone 1.1.1.1

Shutdown Cooling

1. SC Valve M03-1001-5A
2. SC Valve M03-1001-5B
3. RBCCW Valve M03-3702
4. RBCCW Valve M03-3703

LPCI, Division II

1. LPCI Valve M03-1501-22B
2. LPCI Valve M03-1501-20B
3. LPCI Valve M03-1501-38B
4. LPCI Valve M03-1501-18B
5. LPCI Valve M03-1501-19B
6. LPCI Valve M03-1501-13B
7. LPCI Valve M03-1501-32B

Fire Zone 1.1.1.2

LPCI, Division II

1. LPCI Valve M03-1501-21B
2. LPCI Valve M03-1501-27B
3. LPCI Valve M03-1501-28B

Fire Zone 1.1.1.3

Shutdown Cooling

1. SC Heat Exchangers

   3A-1003
   3B-1003
   3C-1003

2. RBCCW Pumps and Associated Motors

   3A-3701
   3B-3702

3. RBCCW Heat Exchangers

   2A-3702
   2B-3702
   2/3-3702

TABLE 4.10-1 (Cont'd)

4. RBCCW Valve M03-3701
5. RBCCW Valve M03-3704
6. Service Water Valve TCV-3-3904A
7. Service Water Valve TCV-3-3904B
8. SC Valve M03-1001-4A
9. SC Valve M03-1001-4B
10. SC Valve M03-1101-4C

Fire Zone 1.3.1

Shutdown Cooling

1. SC Pumps and Associated Motors

   3A-1002
   3B-1002
   3C-1002

2. SC Valves

   M03-1001-2A
   M03-1001-2B
   M03-1001-2C

Fire Zone - 11.1.1

LPCI, Division II

1. LPCI Pumps and Associated Motors

   3C-1502
   3C-1502

2. LPCI Emergency Air Cooler 3-5746B
3. LPCI Valve M03-1501-3B
4. LPCI Valve M03-1501-5C
5. LPCI Valve M03-1501-5D
6. LPCI Valve M03-1501-11B
7. LPCI Valve M03-1501-32B

7.0 APPENDIX R EXEMPTION REQUEST FOR HOT SHUTDOWN REPAIRS

Per the provision of 10 CFR 50.12, Commonwealth Edison Company (CECo) requests exemption from the requirement of Section III.G.1 of Appendix R that one train of systems need for hot shutdown be free of fire damage, in so far as this is interpreted as disallowing the use of repairs to implement hot shutdown (SECY-83-269, Section 1.2.1). CECo specifically requests that an exemption be granted.

1) To allow the pulling of fuses in order to place the condensate transfer pumps into local control.

2) To allow the pulling of closing fuses to defeat high impedance faults.

3) To allow the pulling and replacement of fuses on selected control circuits in lieu of redundant fusing as suggested by IEIN 85-09.

Section	Justification For
7.1	Hot Shutdown Repair
7.2	Removal of Control Power High Impedance Faults
7.3	Pulling and Replacement of Fuses in Lieu of Redundant Fusing

Justification for this exemption request is provided in the following sections.

7.2 JUSTIFICATION FOR REMOVAL OF CONTROL POWER TO DEFEAT HIGH IMPEDANCE FAULTS

7.2.1 Discussion

Common power source concerns were addressed in the safe shutdown analysis. All of the safe shutdown loads on a given bus are known to be free of fire-induced faults whenever that bus is called upon to power safe shutdown loads. The non-safe shutdown loads that are also connected to the essential buses were not analyzed to determine if a high impedance fault could cause a tripping of the feed breakers. The safe shutdown procedures address high impedance faults on non-safe shutdown loads by instructing the operator to trip all such loads. After tripping these loads an additional manual action of pulling the control power fuses is specified as a precaution against spurious closure of electrically-operated breakers.

When a breaker at a motor control center (MCC) is tripped, no further action is needed to prevent spurious closure. The same is true for manually-operated breakers at the 480V switchgear buses (28, 29, 38 and 39). When an electrically-operated breaker at 4kV or 480V switchgear bus is tripped, spurious closure remains possible until 125V dc control circuit fuses are pulled. These fuses are rated 15 amperes or less, and the actual load currents are considerably less therefore no personal safety equipment is needed.

In each of the 480V switchgear buses, the control circuit fuses for all breakers on the bus are housed in a single fuse compartment. Each breaker's fuses are mounted in a plug-in fuse block that is equipped with a handle for fast, safe removal.

The control circuit fuses for each 4kV breaker are mounted in similar plug-in blocks, and are located in the relay compartment directly above the affected

breaker. Separate fuses are used for the closing circuit and the tripping circuit; only the closing circuit fuse block needs to be removed.

The operators routinely rack out 480V and 4kV buses prior to working on the equipment. The first step in racking out a breakers is the removal of the closing fuse. Removal of the fuses precludes spurious closure and makes it unnecessary to rack out the breakers. The time necessary for removal of these fuses is being considered in the manpower requirements for the safe shutdown procedures.

The tripping of unwanted 480V loads needs to be performed only for shutdown paths that use the affected unit's own power train. Two of the hot shutdown paths that will be used for fires in most fire areas, use equipment and cables in the unaffected unit, where the potential for fire-induced faults does not exist. Only two of the identified fire areas have the potential for fire induced faults which may affect 480V and 4kV non-safe shutdown loads.

The addition of an isolation switch on the non-safety shutdown loads would not increase the operator safety or decrease the time necessary to perform this operation. Some safety related equipment will be disabled by the removal of these fuses, however this operation as it is incorporated in the safe shutdown procedures follows the requirements set forth in 10 CFR 50.54(X).

The pulling of fuses is considered a repair for the purpose of Appendix R therefore an exemption to Appendix R is necessary for the use of this procedure to achieve and maintain hot shutdown.

7.2.2 Conclusion

Based on this analysis, the intent of Appendix R requirements are met also, the pulling of the closing fuses would not affect safe shutdown of the plant. The justification for removal of these fuse is summarized as follows:

1) The operation needs only to be done for electrically operated breakers at the 4kV and 480V essential switchgears.

2) This procedure will only be used to guard against possible high impedance faults for a fire involving two plant areas.

3) The fuses are easily identified and removed.

4) The operation is familiar to the operators.

5) All equipment necessary for these operations is in the proximity of the equipment of intended use and is kept under periodic surveillance.

7.3 PULLING AND REPLACEMENT OF FUSES IN LIEU OF REDUNDANT FUSING

Each safe shutdown equipment item for which local control is utilized was checked to determine whether a fault on the remote circuit (prior to isolation) can blow a fuse needed for local control. Several items were found to be deficient in this regard (Table 1).

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 protected by a single fuse, twelve are 4kv circuit breakers. These 4kv breakers are equipped with local mechanical "TRIP" and "CLOSE" buttons that are good for one close and one trip without the benefit of control power. This stored energy within the switchgear is equivalent to redundant fusing since both require a manual action.

Two of the remaining seven identified circuits are 480 volt breakers, one each on bus 28 and 38. These circuits feed the condensate transfer pumps 2A and 3A. One of these pumps is needed to provide shell side makeup to both isolation condenser. If the control circuit is found to be inoperable then these breakers may be jacked closed. These pumps are not needed until at least 20 minutes after scram (Table 1). Of the remaining five identified circuits that may require fuse replacement, only four can be affected by a single fire (i.e., a fire in the 2/3 DG room).

If a fire affects the local control station (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 circuit for which fuse replacement will be the only available solution is the engine starting controls at the 2/3 diesel generator. Again, replacement fuses and fuse pullers will be maintained under surveillance in the proximity of these controls. An operation will be in the 2/3 diesel generator room to locally control the diesel generator and inboard isolation condenser valves for all paths which use the 2/3 diesel generator.

Because of the minimal number of possible fuse replacements, sufficient time is available to replace these fuses. The pulling and replacement of fuses is being considered in the manpower requirements for the safe shutdown procedures.

All of the proposed fuse replacements are in low-voltage circuits (120 Vac or 125 Vdc). The fuses are of the cartridge type and can be removed or inserted under load by means of a standard fuse puller. All are in control circuits (not power circuits) and are rated 15 amperes or less. Actual load currents are considerably less, therefore no personal safety equipment is needed. The operators have been trained at pulling and replacing similar fuses for routine testing and maintenance operations.

The fuses are presently connected at the point where control power enters the equipment, prior to any connections to switches, relays, lights, etc. The presence of a redundant fuse would leave certain terminals of the LOCAL-REMOTE selector switch hot if only te 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.

Fuse pulling and replacement is considered a repair for the purpose of Appendix R; therefore, an exemption to Appendix R is necessary for the use of this operation in lieu of providing redundant fusing.

Conclusion

Following is a summary of the justification for pulling and replacing fuses in safe shutdown control circuits.

1) Less than five safe shutdown circuits which are protected by a single fuse would be affected by circuit faults resulting from any single fire.

2) Pulling and replacement of fuses is routine practice at Dresden Station and the station operators are familiar with this operation.

3) Replacement fuses and fuse pullers will be maintained in the proximity of the fuse replacement locations and kept under periodic surveillance.

4) The circuits that are involved in this procedure are low-voltage control circuits. The fuses are rated at 15 amperes or less, and are actually carrying currents that are considerably less.

5) The fuses in the equipment of concern can be easily located and replaced.

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	20
B. Bus 38 Main Feed	20
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

TABLE 9.2-1

STANDBY GAS TREATMENT SYSTEM PENETRATIONS

SBGT System Penetration	Size	Fire Zone	Fire Areas
Unit 3 Drywell Suction	6 inch	1.1.1.2/8.2.6.C	TB-II / RB3-II
Unit 2 Drywell Suction	6 inch	1.1.2.2/8.2.6.C	TB-II / RB2-II
Unit 3 HPCI Gland Seal Condenser	3 inch	1.1.1.1/11.1.3	RB3-II / RB-2/3
Unit 2 HPCI Gland Seal Condenser	3 inch	1.1.2.1/11.2.3	RB2-II / RB-2/3