UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
COMMONWEALTH EDISON COMPANY	)	Docket No. 50-237 and 50-249
	)	
(Dresden Nuclear Power Station, Unit Nos. 2 and 3)	)	

EXEMPTION

I.

Commonwealth Edison Company (CECo, the licensee) is the holder of Provisional Operating License No. DPR-19 and Facility Operating License No. DPR-25 which authorizes the operation of Dresden Nuclear Power Station, Unit Nos. 2 and 3 (the facilities) at a steady state power level not in excess of 2527 megawatts thermal. This license provides, among other things, that the facilities are subject to all rules, regulations, and Orders of the Nuclear Regulatory Commission (the Commission or the staff) now or hereafter in effect. The facilities are boiling water reactors (BWR's) located at the licensee's site in Grundy County, Illinois.

II.

Section 50.54 of Title 10 of the Code of Federal Regulations (10 CFR 50.48, "Fire Protection") and Appendix R to 10 CFR Part 50, "Fire Protection Program for Nuclear Facilities Operating Prior to January 1, 1979," set forth certain fire protection features required to satisfy the General Design Criterion related to fire protection (Criterion 3, Appendix A to 10 CFR Part 50).

Section III.G of Appendix R requires fire protection for equipment important to post-fire shutdown. Such fire protection is achieved by various combinations of fire barriers, fire suppression systems, fire detectors, and separation of safety trains (III.G.2) or alternate post-fire shutdown equipment free of the fire area (III.G.3). The objectives of this protection is to assure that one train of equipment needed for hot shutdown would be undamaged by fire, and that systems needed for cold shutdown could be repaired within 72 hours (III.G.1).

III.

By letter dated August 10, 1984 as supplemented by letters dated September 18, 1985, March 12 and March 20, 1986, CECo requested exemptions from Section III.G of Appendix R to 10 CFR Part 50. By letter dated October 16, 1985, CECo submitted additional fire protection exemption requests and by letter dated May 30, 1986, CECo further revised exemption request submittals based on a meeting held with the NRC staff on April 8, 1986. This information was further supplemented by CECo in a letter dated April 14, 1987. A description of the exemptions requested and a summary of the Commission's evaluation follow.

Exemption Requested

The licensee requested exemptions from the requirements of Section III.G.1 of 10 CFR Part 50 Appendix R which, in part, requires that one train of systems necessary to achieve and maintain hot shutdown be free of fire damage. In

their submittals, the licensee identified several shutdown circuits and associated equipment that could be compromised due to failure of fuses associated with these circuits, or due to fire induced spurious operation of certain shutdown equipment. The licensee requested exemptions in regard to the following equipment and failure modes:

(1) Condensate transfer pumps 2A and 3A; control circuits for 4KV and 480V safe shutdown circuit breakers; inboard isolation condenser (IC) valves; and Swing DG 2/3 control circuits affected by postulated fuse failures due to inadequate electrical isolation from circuits compromised by the fire.

(2) 4KV and 480V safe shutdown buses affected by failures of non-safety load circuits to a fire.

(3) Reactor relief valves affected by fire induced failures of associated circuits causing their spurious operation.

The licensee proposed hot shutdown repairs to justify their request for exemption from Section III.G.1. Fire induced postulated failures of fuses protecting safe shutdown circuits, prior to the isolation of these circuits for local control, was justified by evidence of redundant manual controls including pulling out of appropriate fuses, and by controls for fuse replacement. The staff determined that the licensee controls for the location, accessibility, surveillance, and operator safety in regard to replacement of fuses and other proposed manual controls are acceptable.

Repairs for fuse failures caused by high impedance faults associated with common power sources and fire induced spurious operation of equipment were justified by evidence of established plant shutdown procedures and controls

requiring tripping of circuit breakers, operating disconnect switches, and removing fuses. These procedures also require shedding of non-safety loads from appropriate 4KV and 480V safety buses, and the removal of 125V DC control power fuses from appropriate non-safety load circuit breakers. The staff determined these procedures and controls to be acceptable.

The staff has also determined that there is reasonable assurance that the licensee's proposed manual actions including the hot shutdown repairs (fuse replacement) meet the intent and purpose of IE Information Notice No. 85-09, "Isolation Transfer Switches and Post-Fire Shutdown Capability," dated January 31, 1985, and are therefore acceptable.

The special circumstances of 10 CFR 50.12 apply in that application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. In this case, the hot shutdown repairs involving fuse removal and replacement preclude the possibility of postulated fire induced fuse failures and high impedance faults from impairing the operability of required safe shutdown systems from performing their safety function. Thus, the underlying purpose of the rule would be satisfied without requiring redundant fusing and electrical isolation.

Exemption Requested

The licensee requested an exemption from the requirements of Section III.G.2 of Appendix R because intervening combustibles or fire hazards are present between the redundant trains of safe shutdown equipment in the upper and lower crib houses (Fire Zone 11.3 Crib House).

The staff's principal concern was that the intervening combustibles and fire hazards may create a path for the spread of fire between redundant safe shutdown systems and result in a loss of safe shutdown capability. However, because of the light fuel load in these zones, a fire of significant magnitude or duration to cause a loss of safe shutdown capability is not expected to occur.

If a fire should occur, it should not spread from the place of origin or endanger redundant pumps in the upper or lower crib house because the installed curbs should contain lubricating oil spills, sprinkler systems installed above cable trays and in other areas should extinguish or control fires to prevent their spread via intervening combustibles, and the detection systems or water flow alarms should alert the plant fire brigade to respond to the fire. Upon arrival, the fire brigade should extinguish the fire if the sprinkler systems have not. On this basis, the staff concludes that the licensee's alternative fire protection configuration provides an equivalent level of fire safety to that achieved by compliance with Section III.G.2.

The special circumstances of 10 CFR 50.12 apply in that application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. In this case, the light fuel load in these zones in combination with the existing fire protection features and completed modifications minimize the possibility of a fire in one train spreading and causing damage to the redundant train. Thus the underlying purpose of the rule would be satisfied without requiring the 20 foot minimum separation distance free of intervening combustible material.

Exemption Requested

The licensee requested an exemption from the requirements of Section III.G.2 of Appendix R in the following fire zones: Fire Zone 1.1.2.2, Unit 2 Reactor Building, Elevation 517 feet, 6 inches; Fire Zone 1.1.2.3 Unit 2 Reactor Building, Elevation 545 feet, 6 inches; Fire Zone 1.1.1.2, Unit 3 Reactor Building, Elevation 517 feet, 6 inches; and Fire Zone 1.1.1.3, Unit 3 Reactor Building 517 feet, 6 inches. These exemptions were submitted because: although safe shutdown equipment in these zones is separated by a horizontal distance of more than 20 feet, intervening combustibles or fire hazards are present between the redundant trains of equipment (reactor coolant water level and pressure instrumentation) and automatic fire suppression systems are not provided throughout the zones.

The staff's principal concern was that the intervening combustibles and fire hazards may create a path for the spread of fire between redundant safe shutdown systems and that the lack of fire suppression systems may permit the fire to continue and result in a loss of safe shutdown capability. However, because of the light to moderate fuel load, it is not expected that a fire of significant duration or magnitude would occur. Intervening combustibles in Fire Zones 1.1.2.2, 1.1.2.3, 1.1.1.2, and 1.1.1.3 provide a path for the spread of fire between redundant safe shutdown systems in the form of cables in trays. However, cable quantities along these paths are small, path distances are at least 75 feet, and the licensee has installed fire detection systems in all four of these zones and fire stops in cable trays in Fire Zones 1.1.2.2, 1.1.1.2, 1.1.2.3 and 1.1.1.3 which cross from one side of the Reactor Building to the other. Should a fire start, it should not spread to

endanger redundant systems because the detection systems will alert the plant fire brigade to respond to the fire prior to extensive spread. On this basis, the staff concludes that the licensee's proposed fire protection configuration provides an equivalent level of fire safety to that achieved by compliance with Section III.G.2.

The special circumstances of 10 CFR 50.12 apply in that application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. In this case, the light to moderate fuel load in combination with the fire detection systems installed by the licensee in all four of these zones and fire stops in cable trays in all four zones which cross from one side of the reactor building to the other minimize the possibility of a fire in one train spreading and causing damage to the redundant train. Thus the underlying purpose of the rule would be satisfied without requiring the 20 foot minimum separation distance free of intervening combustible material.

Exemption Requested

The licensee requested an exemption from the requirements of Section III.G.3 of Appendix R in 23 fire zones located in Reactor Building Fire Areas RB2-1 and RB2-11 for Unit 2 and Reactor Building Fire Areas RB3-II for Unit 3 because fire detection systems and/or fixed fire suppression systems have not been installed in zones or areas for which alternative shutdown capability is provided.

The staff's principal concern was that a fire in one of these fire zones could cause a loss of normal safe shutdown capability. However, the fire loading in all of these fire zones ranges from negligible to low and in no case does the equivalent fire severity exceed 21 minutes. Because of the low

combustible loading, a fire of significant magnitude or duration is not expected to occur. Except for seven fire zones, area-wide fire detection is provided. For the seven fire zones not having area-wide fire detection, there is either linear cable fire detection or spot fire detection, or the fire zones are open to an adjacent fire zone having fire detection installed throughout. Adequate means (extinguishers and/or hose lines) for manual fire fighting is available in all of the fire zones as required. Therefore, there is reasonable assurance that a fire in any of the 23 subject fire zones would be detected in its early stages and extinguished by the fire brigade before adjacent safety-related locations are threatened.

Should a fire damage any safe shutdown components in any of these locations before the fire brigade extinguishes it, an independent alternative shutdown capability is available to be used to achieve and maintain safe shutdown. The alternative safe shutdown path is separated from all fire zones where it is intended to be used by 3-hour fire rated barriers and any unsealed openings in a rated barrier are protected by an automatic suppression system in accordance with Generic Letter 86-10 for unsealed penetrations. On this basis, the staff concludes that the licensee's proposed alternative fire protection configuration provides an equivalent level of fire safety to that achieved by compliance with Section III.G.3.

The special circumstances of 10 CFR 50.12 apply in that application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. In this case, the low fire loadings and the area-wide or linear cable or spot fire detection in combination with adequate means for manual fire fighting in all 23 fire zones and independent alternative shutdown capability eliminate the possibility of not achieving or

maintaining safe shutdown. Thus the underlying purpose of the rule would be satisfied without requiring fire detection systems and/or fixed fire suppression systems in each of the zones.

Exemption Requested

The licensee requested an exemption from the requirements of Section III.G.3 of Appendix R in 22 fire zones located in Central, Eastern, and Western Zone Groups of the Turbine Building because fixed-fire suppression systems and/or fire detection systems have not been installed in zones for which an alternative safe shutdown capability is provided.

The staff's principal concern was that a fire in one of these fire zones could cause a loss of normal safe shutdown capability. Although some of these fire zones have a high fire load, the fire loading is due to diesel fuel or lubricating oils in steel tanks. These steel tanks have been reviewed to the provisions of the "Flammable and Combustible Liquids Code" (NFPA-30) published by the National Fire Protection Association. While the tanks do not conform in all details to this code, they do satisfy the major provisions of the code and are considered to provide an equivalent level of protection. In addition, these fire loads are protected by automatic fire suppression systems. With these exceptions, however, the fire loads range from negligible to moderate and, in no case, do they exceed a 1-hour equivalent fire severity. Because of these low to moderate fire loadings, and given that the diesel fuel and lubricating oil fire hazards are contained and protected by fire suppression systems, a fire of significant magnitude or duration is not expected to occur. All fire zones are protected by fire detection or fire suppression systems or

both. Therefore, there is reasonable assurance that a fire in any of the subject fire zones will be detected in its early stages and extinguished by the automatic fire suppression systems or by the fire brigade before adjacent safety-related locations are threatened.

If a fire should damage any normal shutdown components in any one of these zones before it is extinguished, the alternative shutdown capability, which is independent of these zones per Section III.L of Appendix R, is available to be used to achieve and maintain safe shutdown. On this basis, the staff concludes that the licensee's proposed alternative fire protection configuration provides an equivalent level of fire safety to that achieved by compliance with Section III.G.3.

The special circumstances of 10 CFR 50.12 apply in that application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. In this case, most of the fire zones have negligible to moderate fire loadings and the high fire loading zones, which have the diesel fuel and lubricating oil, are contained in tanks which satisfy the major provisions of the fire protection codes. Since all fire zones are protected by the fire detection or suppression equipment or both and independent alternative shutdown capability is available, the possibility of not achieving or maintaining safe shutdown is eliminated. Thus the underlying purpose of the rule would be satisfied without requiring fire detection systems and/or fixed fire suppression systems in each of the zones.

Exemption Requested

The licensee requested an exemption from the requirements of Section III.G.3 of Appendix R in Fire Zones 1.1.2.6 and 1.1.1.6 of the Unit 2 and 3 Reactor Building, respectively, because fire detection and/or fixed-fire suppression systems have not been installed since they form a part of the plant area for which an alternative shutdown system has been provided.

The staff's principal concern for a fire in one of these two fire zones is that a fire could develop and spread to adjacent fire zones (for which alternative shutdown capability has been provided) and damage normal safe shutdown system components contained therein. These two fire zones have fire loads that are negligible and, in no case, does the equivalent fire severity exceed 2 minutes. Because of the negligible fire loads, a fire of significant magnitude or duration is not expected to occur. Should a fire occur, it should develop slowly, remain small, and dissipate its heat to the surrounding environment without spreading to adjacent fire zones. The fire detection systems in the adjacent fire zones would detect the fire and the fire brigade would be summoned to extinguish the fire manually.

Since there are no safe shutdown components in these two fire zones, there is no concern for any immediate fire damage potential. On this basis, the staff concludes that the licensee's proposed alternative fire protection configuration provides an equivalent level of fire safety to that achieved by compliance with Section III.G.3.

The special circumstances of 10 CFR 50.12 apply in that application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. In this case, the negligible fire loadings in

combination with the fire detection systems and alternate shutdown capability in adjacent zones eliminates the possibility of not achieving or maintaining safe shutdown. Thus the underlying purpose of the rule would be satisfied without requiring fire detection systems and/or fixed fire suppression systems in both of these zones.

Exemption Requested

The licensee requested an exemption from the requirement of Section III.G.2 of Appendix R in Fire Zones 1.1.2.1 and 1.3.2 of the Unit 2 Reactor Building and Fire Zones 1.1.1.1 and 1.4.1 of the Unit 3 Reactor Building because an automatic fire suppression system has not been installed.

The staff's concern was that a fire in one of these fire zones could cause a loss of normal safe shutdown capability. However, the fire loading in these fire zones is negligible. Because of the low combustible loading, a fire of significant magnitude or duration is not expected to occur. Fire detection is provided for these fire zones. Therefore, there is reasonable assurance that a fire in any of the subject fire zones will be detected in its early stages and extinguished by the fire brigade before redundant safety-related components are threatened.

The provision of a 1-hour fire rated wrapped conduit that contains the alternative isolation condenser valves power and control feeds routed through these fire zones also ensures that the alternative safe shutdown path remains available with respect to the isolation condenser valve flow path because of the low fire severity potential and lack of fire hazards in these four fire zones. On this basis, the staff concludes that the licensee's proposed

alternative fire protection configuration provides an equivalent level of fire safety to that achieved by compliance with Section III.G.2.

The special circumstances of 10 CFR 50.12 apply in that application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. In this case, the negligible fire loadings in combination with existing fire protection features and alternative shutdown capability eliminate the possibility of not achieving or maintaining safe shutdown. Thus the underlying purpose of the rule would be satisfied without requiring an automatic fire suppression system to be installed.

Exemption Requested

The licensee requested an exemption from the requirements of Section III.G.2 of Appendix R in Fire Zones 1.1.1.2 and 1.1.1.3 of the Unit 3 Reactor Building because an automatic fire suppression system has not been installed.

The staff's concern for these two fire zones was that a fire could start and damage redundant Diesel Generator (DG)-2/3 cables or its bus ducts. DG-2/3 supplies power to both units and is required for emergency power in the event of a fire in most fire zones.

For both of these fire zones, the fire load is low and does not exceed, on the average, a 21-minute fire severity. In the vicinity of the 1-hour wrapped DG-2/3 cables, there are either no combustibles or only a negligible amount. Therefore, it is expected that a fire would develop slowly and remain small.

Fire detection is provided for these two fire zones so that there is reasonable assurance that the fire brigade would be summoned in a timely manner. Because of the low fire load, the fire brigade can quickly extinguish

the fire. In the interim, the Unit 2 cables and bus duct which are 1-hour fire rated wrapped can successfully withstand the effects of a small fire associated with these two fire zones.

The staff has determined that there is reasonable assurance that a fire in either of these two fire zones will not result in the loss of safe shutdown capability. On this basis, the staff concludes that the licensee's proposed alternative fire protection configuration provides an equivalent level of fire safety to that achieved by compliance with Section III.G.2.

The special circumstances of 10 CFR 50.12 apply in that application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. In this case, the low fire loadings in combination with fire detection and protection features provided, eliminate the possibility of not achieving or maintaining safe shutdown. Thus the underlying purpose of the rule would be satisfied without requiring an automatic fire suppression system to be installed.

Exemption Requested

The licensee requested an exemption from the requirements of Section III.G.3 of Appendix R in Fire Area TB-V located in the Main Control Room and Auxiliary Electric Equipment Room because a fixed-fire suppression system has not been installed in a fire area for which an alternative shutdown capability is provided.

The staff's primary concern for this fire in the main control room could cause the loss of normal shutdown capability. However, should a fire occur within the main control room, it is expected to be promptly detected by either the automatic fire detection system or by one of the station's personnel manning the area. The fire is expected to develop slowly and be extinguished promptly

by the control room personnel or the fire brigade. Should fire damage be extensive, requiring evacuation, then an alternative safe shutdown system can be used. Because Fire Area TB-V has complete 3-hour fire rated barriers (except, as described above, for the unprotected structural steel supporting the Control Room ceiling which will not be subjected to temperatures high enough to cause concern), it is expected that a fire would not spread beyond the barriers because of the low fire load. On this basis, the staff concludes that the licensee's proposed alternative fire protection configuration provides an equivalent level of fire safety to that achieved by compliance with Section III.G.3.

The special circumstances of 10 CFR 50.12 apply in that application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. In this case the existing fire detection system or station personnel manning the area should promptly detect the fire and once detected promptly, extinguish it. In the unlikely event that extensive damage, requiring control room evacuation should occur, the alternative safe shutdown system can be used. The above combination eliminates the possibility of not achieving or maintaining safe shutdown. Thus the underlying purpose of the rule would be satisfied without requiring a fixed-fire suppression system to be installed.

IV.

Accordingly, the Commission has determined that pursuant to 10 CFR 50.12, this exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. The Commission has further determined that special circumstances,

as set forth in 10 CFR 50.12(a)(2)(ii), are present justifying the exemption, namely that the application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. Specifics are discussed in each exemption request, but in general the underlying purpose of the rule is to accomplish safe shutdown in the event of a single fire and maintain the plant in a safe condition. This is accomplished by assuring that sufficient undamaged equipment is available to support safe shutdown, assuming a fire within the area of concern. In the areas for which an exemption is being requested, passive as well as active fire protection features assure that any single fire will not result in the loss of safe shutdown capability. These features include fire detection systems, separation distance, fire barriers, water spray systems to preclude propagation, and manual actions. The fire protection features, in conjunction with low combustible loadings and in some cases physical location and configurations, provide a high degree of assurance that a single fire will not result in loss of post-fire shutdown capability.

Accordingly, the Commission hereby grants the exemptions from the requirements of 10 CFR Part 50, Appendix R as described in Section III above.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will have no significant impact on the environment (54 FR 32399) August 7, 1989.

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Gary M. Holahan, Acting Director
Division of Reactor Projects - III,
IV, V, and Special Projects
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland
this 15th day of August 1989.