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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

DOCKETED
USNRC

In the Matter of

DEQUESNE LIGHT COMPANY
OHIO EDISON COMPANY
PENNSYLVANIA POWER COMPANY

(Beaver Valley Power Station
Unit No. 1)

Docket No. 84-334 A9:13

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GENERAL INVESTIGATIVE
DIVISION

EXEMPTION

I.

The Duquesne Light Company, Ohio Edison Company and Pennsylvania Power Company (the licensees), are the holder of Facility Operating License No. DPR-66 which authorizes operation of the Beaver Valley Power Station, Unit No. 1 (the facility) at steady-state power levels not in excess of 2652 megawatts thermal. The facility is a pressurized water reactor (PWR) located at the licensee's site in Beaver County, Pennsylvania. The license provides, among other things, that it is subject to all rules, regulations and Orders of the Nuclear Regulatory Commission (the Commission) now and hereafter in effect.

II.

On November 19, 1980, the Commission published a revised Section 10 CFR 50.48 and a new Appendix R to 10 CFR 50 regarding fire protection features of nuclear power plants (45 FR 76602). The revised Section 50.48 and Appendix R became effective on February 17, 1981. Section III of Appendix R contains fifteen subsections, lettered A through O, each of which specifies requirements for a particular aspect of the fire protection features at a

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nuclear power plant. One of those fifteen subsections, III.G, is the subject of this exemption.

Subsection III.G specifies detailed requirements for fire protection of the equipment used for safe shutdown by means of separation and barriers (III.G.2). If the requirements for separation and barriers cannot be met in an area, alternative safe shutdown capability, independent of that area and equipment in that area is required (III.G.3).

In response to previous requests from the licensee, the Commission granted an exemption to requirements of Subsection III.G and III.L on March 14, 1983. By letter dated December 16, 1983 and supplemented by letter dated May 30, 1984, Duquesne Light Company requested additional exemptions from the requirements of Subsection III.G of Appendix R.

III.

We have reviewed the licensee's exemption requests and evaluation of these requests is as follows:

1. Fixed Suppression and Detection Systems

For the following areas, an exemption is requested from Section III.G.3 to the extent it requires fixed suppression and detection to be provided throughout a fire area for which alternative shutdown has been provided:

Primary Auxiliary Building (PA-1A), Elev. 768

Control Room HVAC Equipment Room (CR-2), Elev. 713

Emergency Switchgear Rooms (ES-1 & 2), Elev. 713

Process Instrument Room (CR-4), Elev. 713

Communications Equipment & Relay Panel Room (CR-3), Elev. 713

Normal Switchgear Room (NS-1), Elev. 713

Carbon Dioxide Storage/PG Pump Room (CO-2)

Pipe Tunnel (Sub-area QP-1), Elev. 735

With the exception of the Carbon Dioxide Storage/PG Pump Room (CO-2), all of these areas are provided with either partial or complete fire detection systems. The carbon dioxide storage area is in a separate building adjacent to the diesel generator buildings. A fire in this area would not threaten safe-shutdown equipment.

All of the fire areas for which exemptions have been requested represent a similar configuration, i.e., combustible loading is light, there is alternate shutdown capability, detection (except CO₂ storage area) and manual fire suppression equipment is available. (The CO₂ storage area contains only equipment valves and cables in conduit. It is in a separate building and a fire here would not threaten adjacent safety related areas.) The low combustible loading in these areas ensures that safety-related equipment in adjacent areas will not be threatened. The installation of a fixed fire suppression system would not significantly increase the level of fire protection in these areas.

Based on our evaluation, we find that the existing fire protection in conjunction with alternate shutdown capability in the eight areas for which an exemption has been requested provides a level of fire protection equivalent to the technical requirements of Section III.G.3 of Appendix R and, therefore, the exemptions should be granted.

2. Control Room HVAC Equipment Room (CR-2) Elev. 713

An exemption is requested from Section III.G.2 to the extent it requires the separation of adjacent fire areas by 3-hour rated fire barriers.

The control room HVAC equipment room is separated from other areas by 3-hour rated fire barriers with the exception of a 1 1/2-hour rated fire door

which leads to the Relay Room (CR-3). The combustibile loading in both areas (CR-3 and CR-2), if totally consumed, would correspond to an equivalent fire severity of approximately 40-50 minutes on the ASTM E-119 Standard Time-Temperature Curve. Smoke detection and manual fire suppression equipment is provided in each area. Alternate shutdown capability is provided independent of the fire area.

The 1 1/2-hour rated fire door which leads to the relay room exceeds the combustibile loading in both the HVAC equipment room and the relay room with considerable margin. In the event a fire occurred in either room, there is reasonable assurance that the installed smoke detection system would alarm and alert the fire brigade before the door's integrity is challenged. Replacing the existing door with a 3-hour rated assembly would not significantly enhance fire protection safety.

Based on our evaluation, we find that the existing fire door in the HVAC equipment room (CR-2) provides a level of fire protection equivalent to the technical requirements of Section III.G. The exemption should, therefore, be granted.

3. Emergency Switchgear Rooms (ES-1 and ES-2) Elev. 713

An exemption is requested from Section III.G.2 to the extent it requires the separation of adjacent fire areas by 3-hour rated fire barriers.

The Emergency Switchgear Rooms are located on the 713 elev. beneath the cable spreading room. The ceiling which forms a boundary between the two areas constitutes a 1 1/2-hour fire barrier. All other adjacent boundaries are 3-hour rated. The combustibile loading in the emergency switchgear room, if totally consumed, would correspond to an equivalent fire severity of approximately 25 minutes on the ASTM E-119 Standard Time-Temperature Curve.

Smoke detection and manual fire suppression equipment are provided in the area. The 1 1/2-hour rated ceiling exceeds the combustibile loading in the switchgear room with considerable margin. In the event a fire occurred, there is reasonable assurance that the installed smoke detection system would alarm and alert the fire brigade before the ceiling's integrity is challenged. Replacing the existing ceiling with a 3-hour rated assemblies would not significantly enhance fire protection safety.

Based on our evaluation, we find that the protection provided for the emergency switchgear room ceiling provides a level of fire protection equivalent to the technical requirements of Section III.G. The exemption should, therefore, be granted.

4. Process Instrument Room (CR-4), Elev. 713

An exemption is requested from Section III.G.2 to the extent it requires the separation of adjacent fire areas by 3-hour rated fire barriers.

The process instrument room is located on the 713 elev. beneath the cable spreading room. The ceiling which forms a barrier between the process instrument room and the cable spreading room is a 1 1/2-hour rated fire barrier. In addition, three doors which communicate to the adjacent relay room (CR-3) are 1 1/2-hour rated fire doors. All other boundaries are 3-hour rated.

The combustibile loading in the area, if totally consumed, would correspond to an equivalent fire severity of approximately 45 minutes on the ASTM E-119 Standard Time-Temperature Curve. Smoke detection and manual fire suppression equipment are provided in the area. Alternate shutdown capability independent of the area is also provided.

The 1 1/2-hour rated fire doors which lead to the relay room and 1 1/2-hour rated ceiling exceed the combustibile loading in both the process

instrument room and the relay room with considerable margin. In the event a fire occurred in either room, there is reasonable assurance that the installed smoke detection system would alarm and alert the fire brigade before the door's or ceiling's integrity is challenged. Replacing the existing doors and ceiling with 3-hour rated assemblies would not significantly enhance fire protection safety.

Based on our evaluation, we conclude that the protection provided for the process instrument room provides a level of fire protection equivalent to the technical requirements of Section III.G. The exemption should, therefore, be granted.

5. Communication Equipment & Relay Panel Room (CR-3) Elev. 173

An exemption is requested from Section III.G.2 to the extent it requires the separation of adjacent fire areas by complete 3-hour' rated barriers.

The communications equipment and relay panel room is located on the 713' elev. beneath the cable spreading room. The ceiling that separates the relay room from the cable spreading room is a 1 1/2-hour rated fire barrier. In addition, two doors that communicate with the adjacent process instrument room (CR-4) carry a 1 1/2-hour rating.

Smoke detection and manual fire suppression equipment are provided in the area. The combustible loading in the area, if totally consumed, would correspond to an equivalent fire severity of approximately fifty minutes on the the ASTM E-119 Standard Time-Temperature Curve. Alternate shutdown capability independent of the area is provided.

The 1 1/2-hour rated fire doors which lead to the process instrument room and the 1 1/2-hour rated ceiling exceed the combustible loading in both the process instrument room and the relay room with considerable margin. In the

event a fire occurred in either room, there is reasonable assurance that the installed smoke detection system would alarm and alert the fire brigade before the door's integrity is challenged. Replacing the existing doors and ceiling with 3-hour rated assemblies would not significantly enhance fire protection safety.

Based on our evaluation, we conclude that the protection provided for the Communications Equipment & Relay Panel Room provides a level of fire protection equivalent to the technical requirements of Section III.G. The exemption should, therefore, be granted.

6. Normal Switchgear Room NS-1 Elev. 713

An exemption is requested from Section III.G.2 to the extent it requires the separation of adjacent fire areas by 3-hour rated barriers.

The normal switchgear room is located on the 713 elev. of the service building, one floor below the cable spreading room. The normal switchgear room is surrounded by 3-hour rated barriers with the exception of 1 1/2-hour rated fire dampers installed in the ductwork that penetrates the cable spreading room.

Smoke detection and manual fire suppression equipment are provided in the area. The combustible loading in the area, if totally consumed, would correspond to an equivalent fire severity of approximately 50 minutes on the ASTM E-119 Standard Time-Temperature Curve. Alternate shutdown capability independent of the area is provided.

The 1 1/2-hour rated fire dampers which lead to the cable spreading room exceed the combustible loading in the normal switchgear room with considerable margin. In the event a fire occurred in the switchgear room, there is reasonable assurance that the installed smoke detection system would alarm and alert the fire brigade before the dampers' integrity is challenged. Replacing

the existing dampers with 3-hour rated assemblies would not significantly enhance fire protection safety.

Based on our evaluation, we conclude that the protection provided for the normal switchgear room provides a level of fire protection equivalent to the technical requirements of Section III.G. The exemption should, therefore, be granted.

7. Cable Spreading Room

An exemption is requested from Section III.G.2 to the extent it requires the separation of adjacent fire areas by complete 3-hour rated barriers.

The cable spreading room is located on the 725'6" elev. of the service building. The walls and ceilings constitute 3-hour rated barriers. The floor is a 1 1/2-hour rated floor. Ductwork is provided with 3-hour rated dampers except those ducts which penetrate the floor and the west wall which separates the cable spreading room from the normal switchgear room. These ducts are provided with 1 1/2-hour rated dampers. All cables and equipment needed for safe-shutdown will be removed from the normal switchgear room and relocated at the next refueling outage. The cable spreading room doors are 3-hour rated except for the 1 1/2-hour rated door that opens to the east stairtower.

The combustible loading in the cable spreading room, if totally consumed, would correspond to an equivalent fire severity of approximately 1-hour and twenty minutes on the ASTM E-119 Standard Time-Temperature Curve.

To approve fire area boundaries of less than a 3-hour rating, we need reasonable assurance that the proposed boundaries will exceed the in-situ fuel load with margin. In the cable spreading room, the margin proposed is not considered adequate for the general case. However, in the three specific cases cited, we have evaluated the location and configuration of the 1

1/2-hour rated components and consider them acceptable for the following reasons:

- ° 1 1/2-hour rated stairtower door - Section C.5.a of our guidelines recommends the use of 2-hour rated concrete stairtower enclosures with self-closing Class B (1 1/2-hour) fire doors. The licensee has provided this level of protection. We, therefore, find the 1 1/2-hour rated fire doors acceptable.
- ° 1 1/2-hour rated floor and 1 1/2-hour rated fire dampers in the floor. In the event of a fire in the cable spreading room, the heat from the fire would rise and challenge the ceiling and upper wall areas of the cable spreading room. Only after a considerable time period will the heat transfer down through the floor become significant. With the added benefit of the installed smoke detection system, automatic suppression system and response of the fire brigade, there is reasonable assurance that the 1 1/2-hour rated floor and dampers will remain functional.
- ° 1 1/2-hour rated dampers penetrating the wall to the normal switchgear room. The licensee has committed to remove all cables and equipment from the normal switchgear room needed for safe-shutdown. Therefore, if a fire propagated to this area, by the failure of the 1 1/2-hour rated damper, no safe-shutdown equipment would be damaged. The walls of the normal switchgear room that separate it from the remainder of the plant are 3-hour rated barriers. Therefore, a cable spreading room fire which spreads to the switchgear room by failure of the 1 1/2-hour rated dampers will not spread beyond the normal switchgear room.

Based on our evaluation, we conclude that the protection provided for the cable spreading room provides a level of fire protection equivalent to the

technical requirements of Section III.G. The exemption should, therefore, be granted.

8. Reactor Containment RC-1

An exemption is requested from Section III.G. to the extent it requires the separation of redundant trains of the source range monitor within containment by greater than 20 feet.

This fire area includes the entire area inside containment. The redundant trains of safe shutdown components in this area include the containment ventilation, pressurizer pressure controls, pressurizer power operated relief valves, pressurizer relief blocking valves, pressurizer heaters, steam generator level transmitters, pressurizer level transmitters, reactor coolant hot and cold leg temperature instrumentation, and associated cables.

The combustible loading in this area consists of approximately 48,000 pounds of cable insulation, 265 gallons of lubricating oil for each of three reactor coolant pumps, and 200 pounds of charcoal in the containment air filter cubicles.

All cable insulation is qualified to a test comparable to IEEE Standard 383. The reactor coolant pumps are fitted with an oil collection system. Smoke detection systems and water deluge systems are provided only in the cable penetration area and in the residual heat removal pump area. Portable fire extinguishers and manual hose stations are provided throughout the fire area.

We had previously approved an exemption for the separation of redundant equipment and cables inside containment. At our request, the licensee has added an additional channel of source range neutron detection. Due to the physical arrangement inside containment, separation of the redundant cables by

more than 20-feet is not possible. A minimum separation of approximately five feet is maintained. Each channel of neutron detection is in a separate conduit.

The protection for redundant trains of safe shutdown equipment inside containment does not meet the technical requirements of Section III.G because redundant power cables are not separated by at least 20 feet free of combustibles. Due to the configuration and location of the cables within the containment and to the restricted access of these sub-areas during plant operation, an exposure fire involving the accumulation of significant quantities of transient combustible materials is unlikely. Because there are only a few cables in these sub-areas and all cables inside containment are qualified to a test comparable to that of IEEE Standard 383 and routed in conduit, a fire of sufficient magnitude to damage redundant cables or components is also unlikely.

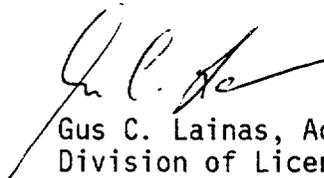
Based on the above evaluation, the existing protection for the containment area provides a level of fire protection equivalent to the technical requirements of Section III.G of Appendix R. Therefore, the exemption should be granted.

IV.

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12, an exemption is authorized by law and will not endanger life or property of common defense and security and is otherwise in the public interest and hereby grants an exemption from the requirements of Subsections III.G of Appendix R to 10 CFR 50 to the extent that it requires fixed suppression and detection systems, 3-hour rated fire barriers or 20-foot separation of redundant equipment for the areas/equipment described above.

Pursuant to 10 CFR 51.32, the Commission has determined that the issuance of the Exemption will have no significant impact on the environment (49 FR 32135).

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink, appearing to read "Gus C. Lainas", is written over a horizontal line.

Gus C. Lainas, Acting Director
Division of Licensing

Dated at Bethesda, Maryland
this 30th day of August 1984

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UNITED STATES NUCLEAR REGULATORY COMMISSION

DOCKET NO. 50-334 OL

DUQUESNE LIGHT COMPANY

OHIO EDISON COMPANY

PENNSYLVANIA POWER COMPANY

NOTICE OF EXEMPTION FROM APPENDIX R TO 10 CFR 50
FIRE PROTECTION REQUIREMENTS

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The U. S. Nuclear Regulatory Commission (the Commission) has granted an Exemption from certain requirements of Appendix R to 10 CFR 50 to Duquesne Light Company, Ohio Edison Company and Pennsylvania Power Company (the licensees). The Exemption relates to the Fire Protection Program for the Beaver Valley Power Station, Unit No. 1 (the facility) located in Beaver County, Pennsylvania. The Exemption is effective as of

The Exemption waives certain requirements of Subsection III.G for this facility, to the extent that fixed fire suppression and detection systems need not be provided for certain fire areas, 3-hour rated fire barriers need not be installed between certain fire areas, and 20-foot separation is not required between certain pieces of equipment. The Exemption is granted mainly on the basis that the combustible loading in all these areas are light. Details are provided in the Exemption.

The request for Exemption complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR which are set forth in the Exemption.

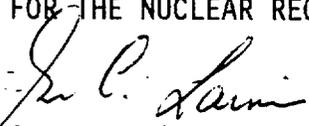
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Pursuant to 10 CFR 51.32, the Commission has determined that the issuance of the Exemption will have no significant impact on the environment (49 FR 32135).

For further details with respect to this action, see (1) the application for Exemption dated December 16, 1983 and supplemented by letter dated May 30, 1984, (2) the Commission's letter dated August 30, 1984 and (3) the Exemption. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C. and at the B. F. Jones Memorial Library, 663 Franklin Avenue, Aliquippa, Pennsylvania 15001. A copy of items (2) and (3) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Licensing.

Dated at Bethesda, Maryland, this August 30, 1984.

FOR THE NUCLEAR REGULATORY COMMISSION


Gus C. Lainas, Acting Director
Division of Licensing