Omaha Public Power District
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402/536-4000

March 8, 1985
LIC-85-037

Mr. James R. Miller, Chief
Office of Nuclear Reactor Regulation
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, DC 20555

References: (1) Docket 50-285
(2) Letter from R. L. Andrews to J. R. Miller dated December 3, 1984 (LIC-84-411)

Dear Mr. Miller:

10 CFR 50, Appendix R

In Reference (2) the Omaha Public Power District provided a description of systems and components in Fire Area 30 (the containment building) affected by the subject regulation, planned corrective actions and requests for exemption from Section III.G of Appendix R.

Subsequently, discussions between the District and the Commission staff regarding Reference (2) have resulted in the District modifying its position. This letter provides revised information intended to supercede the contents of Attachment 1 of Reference (2). The changes are indicated by vertical lines in the right hand margin.

Upon completion of the planned corrective actions contained in Attachment 1, and the granting of exemptions requested in Attachment 1, the District will be in full compliance with the provisions of 10 CFR 50, Appendix R for Fire Area 30.

Sincerely,

R. L. Andrews
Division Manager
Nuclear Production

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Attachment

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Mr. E. G. Tourigny, NRC Project Manager
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Male Female

Attachment 1

A. Description of Fire Area 30

The containment structure is located in the center of the auxiliary building. It is bordered on the east by the electrical penetration area, on the west by the fuel handling area, and on the north by the mechanical and pipe penetration areas and the HVAC equipment area. All walls separating this area from the other mentioned areas are 3-hour fire rated barriers.

The containment consists of three floors; basement (989'), ground (1013'), and operating (1045'). These are connected by two unenclosed stairwells. The reactor, two steam generators, pressurizer, and four primary coolant pumps are enclosed in concrete cells running vertically through all three floors. There are four safety related divisions of cables in the containment. These are routed so that they meet the separation criteria of IEEE-384-1977 as a minimum. Much of the cabling is enclosed in conduit.

This fire area includes the entire area inside containment. The redundant trains of safe shutdown components in this area include control rod drives, pressurizer pressure controls and instrumentation, pressurizer power operated relief valves, pressurizer heaters, charging and auxiliary pressurizer spray valves, auxiliary feedwater system valves, steam generator pressure and level transmitters, reactor coolant hot and cold leg temperature instrumentation, and neutron flux indication and all associated cables. These components are discussed individually below:

1) Pressurizer power operated relief valves (PORV's) PCV-102-1 and PCV-102-2, are located at elevation 1047 near the pressurizer vessel. These redundant components and their associated cables are not separated by more than 20 feet, by 3-hour rated barriers, or by radiant energy shields. These valves fail-closed (shutdown position) upon loss of electrical power; therefore, their safe shutdown function cannot be compromised by any fire in containment.

2) Auxiliary feedwater system isolation valves, HCV-1107A and HCV-1108A are separated by more than 20 feet and do have 3-hour fire rated concrete walls located between them; however, their associated cables do not meet the separation/protection requirements. These valves, however, fail to their desired shutdown position (fail-open) upon loss of power. No credible fire in containment would prevent these valves from performing their safe shutdown function.

3) Control rod drive mechanisms are located atop the reactor vessel head seismic skirt. Motors and associated cables are intermixed and do not have 20-foot separation; however, these devices fail to their desired position (i.e., control rods are inserted into the core) upon loss of power. No credible fire in containment would prevent their safe shutdown function.

4) Numerous redundant channels of steam generator pressure and level instrumentation exist as tabulated below:

Steam Generator RC-2A	Steam Generator RC-2B
A/L-901,A/L-911	A/L-904,A/L-912
B/L-901,B/L-911	B/L-904,B/L-912
C/L-901,C/L-911	C/L-904,C/L-912
D/L-901,D/L-911	D/L-904,D/L-912
A/P-902,A/P-913	A/P-905,A/P-914
B/P-902,B/P-913	B/P-905,B/P-914
C/P-902,C/P-913	C/P-905,C/P-914
D/P-902,D/P-913	D/P-905,D/P-914
L-903X,L-903Y	L-906X,L-906Y
P-907	P-908

Transmitters and cables are located such that at least two redundant channels are completely separated by more than 20 feet. However, this minimum separation of 20 feet is not, in all cases; free of intervening combustibles. In general the combustible material is IEEE-383 qualified cable, much of which is enclosed in rigid steel conduit. In many cases, existing walls and barriers which serve as radiant energy shields separate sections of redundant channels. In some cases, redundant channels are separated by no less than 40 feet.

5) As in item 4), above, numerous channels of RCS hot and cold leg temperature instrumentation are available. RTD's are located in separate concrete cells near the steam generators and reactor coolant pumps, and cable is routed such that a minimum separation of 20 feet is maintained. However, this minimum separation of 20 feet is not in all cases free of intervening combustibles. In general the combustible material is IEEE-383 qualified cable, much of which is enclosed in rigid steel conduit.

6) Four independent, redundant channels of wide-range excore neutron flux detectors are located at elevation 994'. Cable for these sensors is routed completely in rigid steel conduits from sensor to penetration. These cables are routed such that in all places, at least one redundant channel is routed well over 20 feet from any other channel. However, this minimum separation of 20 feet is not in all cases free of intervening combustibles. In general this combustible material is IEEE-383 qualified cable, much of which is enclosed in rigid steel conduit.

7) The auxiliary pressurizer spray valves, HCV-240 and HCV-249, are located next to each other at elevation 1047 in containment. Cables connecting the auxiliary pressurizer spray valves to their respective electrical penetrations maintain separation in excess of the required 20 feet, except at three locations. The three locations are:

(1) at the valves
(2) at the penetrations
(3) for a short length of approximately 28 feet.

However, the minimum separation of 20 feet is not in all cases free of intervening combustibles. In general the combustible material is IEEE-383 qualified cable, much of which is enclosed in rigid steel conduit.

8) Three redundant pressurizer level transmitters (LT-101X, LT-101Y, and LT-106) are located on instrument racks at elevation 1013 in containment. LT-101X and LT-106 are separated from LT-101Y by approximately 30 feet; however, the cable for LT-101Y, routed in rigid steel conduit, passes within approximately 2 feet of the redundant transmitters. Beyond this single point, cables diverge to meet the 20 foot separation criteria. However, this minimum separation of 20 feet is not in all cases free of intervening combustibles. In general the combustible material is IEEE-383 qualified cable, much of which is enclosed in rigid steel conduit. At the electrical penetrations, however, redundant cables again come within approximately 7 feet of each other.

9) Four independent, redundant channels of high range (1500 - 2500 psi) pressurizer pressure indication (A,B,C, and D P-102) are routed separately in containment such that the 20-foot minimum separation is maintained. Low range pressurizer pressure transmitter (P-118) and wide range channels (P-105 and P-115), however, do not completely meet the requirements. Wide range transmitters PT-105 and PT-115 are separated by approximately 16 feet. Electrical penetrations used for these two transmitters are separated by approximately 16 feet. The remainder of cable in containment for these loops meets the 20 foot minimum separation criteria. However, this minimum separation of 20 feet is not in all cases free of intervening combustibles. In general the combustible material is IEEE-383 qualified cable, much of which is enclosed in rigid steel conduit.

10) Pressurizer heaters and associated power cables are located in containment. With the exceptions of the immediate vicinity of the pressurizer vessel itself, within the pressurizer bay, and at the electrical penetrations, the separation between redundant trains of these cables meets the requirements of Appendix R. There is a minimum separation of 26 feet between redundant cables throughout the rest of their respective lengths; however, a small amount of intervening combustibles are present.

11) Charging system isolation valves HCV-238, HCV-239, HCV-247, and HCV-248 and their associated control cables are located in containment on the basement level near cold legs 1A and 2A. Separation between redundant trains is such that a minimum of 20 feet is maintained. However, this minimum separation of 20 feet is not in all cases free of intervening combustibles. In general the combustible material is IEEE-383 qualified cable, much of which is enclosed in rigid steel conduit.

B. Planned Corrective Actions

The District has investigated the above mentioned areas of noncompliance with the requirements of 10 CFR 50, Appendix R, Section III.G.2 and plans to perform the following modifications to bring the Fort Calhoun Station into compliance:

1) Auxiliary Pressurizer Spray Valves (see item A.7 above)

The District plans to install a radiant energy shield between redundant auxiliary pressurizer spray valves HCV-240 and HCV-249, and a shield between their associated junction boxes, JB-103C and JB-252C. Additionally, a radiant energy shield will be installed on the existing platform at elevation 1022'-0" between column line 14 and column line 1 (see P&ID 11405-A-7) where separation is less than 20 feet and no other barrier which could serve as a thermal energy shield is provided. This will protect redundant electrical penetrations C9 (HCV-240) at elevation 1015'-9" and E9 (HCV-249) at elevation 1024'-4". Additional protection such as a fire-wrap or a thermal energy shield will be provided for the 28-foot run of redundant cables so as to comply with the requirements of Section III.G of Appendix R.

2) Pressurizer Level Indication (see item A.8 above)

The District plans to reroute cable 3473A for LT-101Y in containment. This reroute of cable will ensure that redundant trains of pressurizer level indication maintain the required 20-foot separation throughout this fire area with the exception of the location of the electrical penetrations. At this location a radiant energy shield will be installed on the existing platform at elevation 1013'-0" between column line 1 and column line 3 (see P&ID 11405-A-6) where separation is less than 20 feet and no other barrier which could serve as a thermal energy shield is provided. This will protect redundant electrical penetrations B5 (LT-101X and LT-101Y) at elevation 1008'-0" and C4 (LT-106) at elevation 1015'-0".

3) Pressurizer Pressure Indication (see item A.9 above)

The District plans to install a radiant energy shield on the existing platform at elevation 1013'-0" (see P&ID 11405-A-6) near column line 5 beneath existing instrument rack AI-127C which holds transmitter PT-115 at approximate elevation 1015'-0". This shield will separate redundant transmitters PT-115 from PT-105 which is mounted on column line 5 (approximately 3 feet from AI-127C) at approximate elevation 1001'-0". Additionally, the radiant energy shield at elevation 1013'-0" discussed in Section B.2, above, will protect redundant electrical penetrations A4 (PT-105) at elevation 1003'-8" and D5 (PT-115) at elevation 1019'-8".

4) Pressurizer Heaters (see item A.10 above)

The radiant energy shield at elevation 1013'-0" discussed in B.2, above, will also separate redundant electrical penetrations D1 (heater groups P1 and 2) and D2 (group 1) at elevation 1019'-8" from penetrations A1 and A2 (groups P2, 3, and 4) at elevation 1003'-8". An exemption from Section III.G.2 of Appendix R is requested in Section C for the area directly beneath the pressurizer where the pressurizer heater cables converge.

5) An exemption from Section III.G of Appendix R is requested in Section C for those areas where 20 feet or more of separation is maintained, but some intervening combustibles may be present. This exemption is requested for each of items 4) thru 11) of Section A, above.

It is expected that the modifications will be installed within 30 days following the end of the scheduled 1985 refueling outage. When these modifications are completed, and when the requested exemptions are granted, the Fort Calhoun Station will be in compliance with the requirements of Appendix R in Fire Area 30.

C. Exemption Requests from Section III.G of 10 CFR 50, Appendix R

The District requests an exemption, pursuant to Sections 50.12(a) and 50.48(c) of 10 CFR, from the requirements of Section III.G.2 of Appendix R. Specifically, exemption is requested from the requirements that further fire protection features be provided for the two areas of noncompliance in Fire Area 30, the Containment Building, of the Fort Calhoun Station.

The two areas of noncompliance are:

(a) Directly beneath the pressurizer vessel, item A.10, at elevation 1014' where redundant trains of pressurizer heater cables converge. This area is completely inside the pressurizer bay where the only combustibles are these cables, the insulation of which is qualified to a test comparable to IEEE-383. Due to the intermixing of the redundant cables as they lead to the individual pressurizer heaters, no possible physical means exist to provide additional physical separation or protection.

(b) In the cases stated above, items A.4 through A.11, where there exists at least 20 feet of separation between redundant cables, but some intervening combustibles may be present.

The requirements are unnecessary to assure the capability to safely shut down the plant in the event of any credible fire in this fire area for the following reasons:

1) In the containment building it is virtually impossible to maintain 20 feet of separation free of intervening combustibles. The combustibles are limited to cable insulation, lubricating oil, and charcoal filters as described in Attachment 2. In addition, there

are small quantities of material in the form of rubber hoses and plastic bags containing tools in various locations in containment. The locations of these materials are such that they do not represent a significant fire hazard. The most severe single postulated fire is a lubricating oil fire in the basement of either steam generator cell and has a maximum duration of 28 minutes. Any cable located in either of these cells has a redundant cable located in the other cell, thereby separated by 3-hour rated concrete walls. Therefore, the worst case fire which could affect redundant trains separated by at least 20 feet with intervening combustibles is a cable tray fire of 19 minutes duration.

(2) The cables used in containment have been qualified to IEEE-383 tests or equivalent. Therefore, in the event of a fire in containment, it is extremely unlikely that these cables would sustain combustion and even more unlikely that they would propagate a flame. The possibility that a flame could propagate more than 20 feet and disable redundant cables is almost negligible.

3) As described in the attached pages of the original Fort Calhoun fire hazards analysis, this fire area is provided with adequate fire detection and protection systems. Combustible loading in the first area of concern is minimal. The three postulated fires described in the analysis are not near this area and do not have the capability to disable these redundant trains of safe shutdown equipment.

4) The containment building is a controlled access area and during power operation few containment entries are permitted, thus minimizing any introduction of transient combustibles. Due to this and the existing detection systems, a fire will be detected in its initial stages and will be suppressed manually by the plant fire brigade. Therefore, any credible fire of sufficient magnitude to damage redundant cables or components is extremely unlikely.

5) It is the District's engineering judgment that the modifications planned for this fire area in conjunction with the existing fire protection features in the containment building will achieve a level of safety equivalent to that provided by Section III.G.2 of Appendix R. Further modifications will not significantly increase plant safety.

Based on the above, the District requests an exemption from the requirements of those portions of Section III.G of Appendix R which require that additional fire protection features be provided for Fire Area 30 at the Fort Calhoun Station.