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Docket No. 50-331

APR 26 1983

Mr. Duane Arnold
 Chairman of the Board and Chief
 Executive Officer
 Iowa Electric Light and Power Company
 P. O. Box 351
 Cedar Rapids, Iowa 52406

Dear Mr. Arnold:

SUBJECT: EXEMPTION REQUESTS - 10 CFR 50.48 FIRE PROTECTION AND APPENDIX R
 TO 10 CFR PART 50

Re: Duane Arnold Energy Center

The Commission has issued the enclosed Exemption from certain requirements of Section 50.48 and Appendix R to 10 CFR Part 50 for the Duane Arnold Energy Center. This action is in response to your request submitted by letter dated June 22, 1982.

In your letter, you requested exemptions from the requirements of Section III.G of Appendix R for the reactor building torus area, north and south CRD module areas, reactor building RHR valve rooms, control room, lower switchgear room, battery rooms and essential switchgear rooms.

Based on our evaluation, we find that the level of protection currently provided in these areas is equivalent to the level of fire protection required by Section III.G and, therefore, exemption from the requirements of Section III.G is granted.

The remaining areas for which you requested exemptions in your June 22, 1982, letter will be addressed in a future action.

A copy of the Exemption is being filed with the Office of the Federal Register for publication.

Sincerely,

Original signed by
 D. B. Vassallo

Domenic B. Vassallo, Chief
 Operating Reactors Branch #2
 Division of Licensing

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Enclosure: Exemption

cc w/enclosure
 See next page

OFFICE	DL:ORB#2	DL:ORB#2	DL:ORB#2	DL:AD:OR	DL:DIR	OELD	DL:ORB#5
SURNAME	SNorris	FAPicella	DVassallo	GLamas	DEisenhut	W. Stuebler	T. Wambach
DATE	3/18/83	3/23/83	4/4/83	4/6/83	6/1/83	4/19/83	4/4/83

Mr. Duane Arnold
Iowa Electric Light & Power Company

cc:

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Harold F. Reis, Esquire
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James G. Keppler
Regional Administrator, Region III
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799 Roosevelt Road
Glen Ellyn, IL 60137

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of) Docket No. 50-331
)
IOWA ELECTRIC LIGHT AND POWER)
COMPANY, CENTRAL IOWA POWER)
COOPERATIVE, AND CORN BELT)
POWER COOPERATIVE)
(Duane Arnold Energy Center)

EXEMPTION

I.

Iowa Electric Light and Power Company, et al. (the licensee) is the holder of Facility Operating License No. DPR-49 which authorizes the operation of the Duane Arnold Energy Center at steady state reactor power levels not in excess of 1658 megawatts thermal. The facility consists of a boiling water reactor located at the licensee's site near Palo in Linn County, Iowa. The license provides, among other things, that it is subject to all rules, regulations and Orders of the Commission now or hereafter in effect.

II.

Section 50.48 of 10 CFR Part 50 requires that licensed operating reactors be subject to the requirements of Appendix R of 10 CFR Part 50. Appendix R contains the general and specific requirements for fire protection programs at licensed nuclear facilities. On February 17, 1981, the fire protection rule for nuclear power plants, 10 CFR 50.48 and Appendix R, became effective. This rule required all licensees of plants licensed prior to January 1, 1979, to submit by March 19, 1981: (1) plans and schedules for meeting the applicable requirements of Appendix R, (2) a design description of any modifications proposed to provide alternative safe shutdown capability pursuant to Paragraph II.G.3 of Appendix R, and (3) exemption requests for which the tolling provision of Section 50.48(c)(6) was to be invoked.

The licensee responded to these requirements by letter dated March 19, 1981, and supplemented its response by information contained in letters dated July 3, 1981, and June 22, 1982.

In these submittals, the licensee requested certain exemptions from the requirements of Section III.G of Appendix R to 10 CFR Part 50. Section III.G of Appendix R requires that one train of cables and equipment necessary to achieve and maintain safe shutdown be maintained free of fire damage by one of the following means:

- a. Separation of cables and equipment and associated non-safety circuits of redundant trains by a fire barrier having a 3-hour rating. Structural steel forming a part of or supporting such fire barriers shall be protected to provide fire resistance equivalent to that required of the barrier;
- b. Separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area; or
- c. Enclosure of cables and equipment and associated non-safety circuits of one redundant train in a fire barrier having a 1-hour rating. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area.

If these conditions are not met, Section III.G.3 requires alternative shutdown capability independent of the fire area of concern.

1. The licensee requested an exemption from the provisions of Section III.G

of Appendix R for the reactor building torus area (fire zone 1-A) to the extent that it requires automatic fire detection and fire suppression throughout the fire area to protect redundant trains of safe shutdown related cables and equipment.

The licensee justified the exemption by stating that, with the exception of the redundant cables in the northwest half of the area, the separation distance between all other division one and division two cables in conjunction with the low combustible loading in the area reduces the probability of a fire causing damage to both trains. The licensee further contends that due to the low quantity of combustibles in the area, a potential fire could not be expected to propagate beyond the area of ignition.

Where redundant cables are located in close proximity, one-hour rated fire barriers, fire detections, and automatic suppression will be installed to provide the level of safety mandated by Appendix R.

We have reviewed the licensee's submittal and agree with the licensee's evaluation that the area does not comply with Section III.G because automatic fire detection and fire suppression is not available throughout the area. However, we find that the proposed means of protection and low quantity of combustibles in the area and the space between redundant components provides reasonable assurance that safe shutdown related cables will be maintained free of fire damage.

Therefore, we conclude that with the proposed modifications, the level of safety provided in the torus area will be equivalent to the technical requirements of Section III.G.2 of Appendix R and the licensee's request should be granted.

2. The licensee has requested an exemption from the provisions of Section III.G of Appendix R for the reactor building north and south CRD module areas (fire zones 2A and 2B).

The licensee has justified the exemption request by stating that, because of the design of the scram system, any power interruption to the electrical solenoid controlling control rod motion after fire exposure will be an open or short circuit and will activate the scram signal and de-energize the solenoid, thus effecting a safe shutdown.

We have reviewed the licensee's submittals and agree with the licensee's evaluation that the area does not comply with Section III.G of Appendix R because the scram solenoid cables do not have one of the three specified fire protection measures. We find, however, that a fire which causes an open or short circuit will not adversely affect safe shutdown and although individual scram solenoids could remain energized from a hot short, the probability of a significant number of control rods being affected in this way is low.

Therefore, we conclude that the alternate form of protection provided by the design of the scram solenoid system ensures a level of safety equivalent to the technical requirements of Section III.G of Appendix R and that the licensee's request for exemption should be granted.

3. The licensee has requested an exemption from the provisions of Section III.G of Appendix R for the reactor building RHR valve rooms (fire zone 2-D) to the extent that it requires 20 feet of separation without intervening combustibles between redundant trains.

The licensee has justified the exemption by stating that the area contains the RHR system injection valves and redundant trains of cables to the valves will be enclosed in a one-hour rated fire barrier and protected by fire detection and automatic suppression. The redundant injection valves will also be protected by fire detection and automatic suppression but will be enclosed in one-hour rated fire barriers. It is not considered practical to enclose the valves inside a fire rated barrier.

We have reviewed the licensee's submittals and agree with its evaluation that the area does not comply with Section III.G because it is not provided with protection for the RHR injection valves. However, the fire load in the area is low (425 BTU/sq. ft.). The fire load, if totally consumed, would correspond to a fire severity less than one minute on the ASTM E-119 standard time temperature curve. Due to the considerable heat sink provided by the concrete floor and walls, the probability is low that a fire could damage the injection valves before the actuation of the detection and suppression systems. One-hour rated barriers enclosing the cables to the equipment provide added margin of safety.

Therefore, we conclude that with the proposed modifications listed above the level of safety for this area will be equivalent to the technical requirements of Section III.G of Appendix R and the request for exemption should therefore be granted.

4. The licensee has requested an exemption from the provisions of Section III.G of Appendix R for the control room (fire zone 12A) to the extent that it requires a fixed fire suppression system in the area.

The licensee has justified the exemption by stating that the control room has a fire detection system, hose station, and fire extinguisher. In addition, an alternate safe shutdown system is also available independent of control room. The control room is continuously manned and the fire load is low.

We have reviewed the licensee's submittals and agree with the licensee's evaluation that this area does not comply with Section III.G because it is not provided with a fixed fire suppression system. However, since the fire hazard is light and the control room continuously manned, there is reasonable assurance that a fire would be promptly extinguished.

Therefore, we conclude that the installation of a fixed fire suppression will not significantly increase the level of fire protection in the control room and the request for exemption should therefore be granted.

5. The licensee has requested an exemption from the provision of Section III.G of Appendix R for the boundaries of fire areas to be separated by three-hour rated barriers.

The licensee has justified the exemption by stating that the 1979 fire hazard analysis was accepted as meeting staff guidelines and divisional boundaries of less than three hours were accepted on the basis of the combustible loading in the adjacent areas.

We have reviewed the licensee's submittal and agree with the licensee's evaluation that the areas do not comply with Section III.G because five of the fire boundaries contain ventilation duct penetrations protected by one and a half-hour rated fire dampers.

However, the equivalent fire severity based on the combustibile loading in the lower switchgear room (area 7B) is 0,35 hour, in the battery rooms (areas 10B and 10D) 0.52 hour, in the essential switchgear rooms (areas 10E and 10F) 0.18 and 0.23 hour, respectively. A fire in any of these areas would be comfortably less than the rating of the damper and therefore, the one and a half-hour rated fire dampers will provide adequate protection.

We conclude, therefore, that the level of fire protection provided by the fire area boundaries for the lower switchgear room (fire area 7B), the battery rooms (fire areas 10B and 10D) and the essential switchgear rooms (fire areas 10E and 10F) provide a level of safety equivalent to the technical requirements of Appendix R and the licensee's request for an exemption should be granted in these areas.

III.

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 or the common defense and security and is otherwise in the public interest.

Therefore, the Commission hereby approves the following exemption requests:

Exemption is granted from the requirements of Section III.G of Appendix R of 10 CFR Part 50 for the following areas to the extent described in Section II of this exemption:

1. Reactor building torus area (fire zone 1A)
2. North and south CRD module areas (fire zones 2A and 2B)
3. Reactor building RHR valve rooms (fire zone 2D)
4. Control room (fire zone 12A)
5. Lower switchgear room (fire area 7B), battery rooms (fire areas 10B and 10D), and essential switchgear rooms (fire areas 10E and 10F)

The NRC staff has determined that the granting of these exemptions will not result in any significant environmental impact and that pursuant to 10 CFR 51.5(d)(4), an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with this action.

FOR THE NUCLEAR REGULATORY COMMISSION


Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland
this 26th day of April 1983.