

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION



In the Matter of
ROCHESTER GAS AND ELECTRIC
CORPORATION
(R. E. Ginna Nuclear Power Plant)

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Docket No. 50-244

EXEMPTION

I.

Rochester Gas and Electric Corporation (the licensee) is the holder of Facility Operating License No. DPR-18 which authorizes operation of R. E. Ginna Nuclear Power Plant (the facility) located in Wayne County, New York. This license provides, among other things, that it is subject to all rules, regulations and Orders of the Commission now or 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 nuclear power plant. By letter dated October 4, 1984 and supplemented on January 16, 1985, the licensee requested twelve exemptions from the requirements of Section III.G of Appendix R.

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Section III.G.2 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; (c) Enclosure of cable 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 an alternative shutdown capability independent of the fire area of concern. It also requires that a fixed suppression system be installed in the fire area of concern if it contains a large concentration of cables or other combustibles. These alternative requirements are not deemed to be equivalent; however, they provide equivalent protection for those configurations in which they are accepted.

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III.

Refueling Water Storage Tank (RWST)

The licensee requested an exemption from the technical requirements of Section III.G.2 to the extent that it requires a continuous fire-rated barrier between redundant shutdown systems in the Auxiliary Building Fire Areas ABBM and ABI. The RWST extends through the concrete floor/ceiling that provides the common boundary between Fire Area ABBM and ABI leaving a 6-inch gap around the circumference of the tank. An 8-foot concrete block wall partially circles the gap on the upper side of the barrier.

The only shutdown-related systems that are vulnerable to fire damage in these two fire areas are emergency switchgear bus 14, which is located in Fire Area ABI, and emergency switchgear bus 16, located in Fire Area ABBM. Each bus is approximately 8-feet high and is located about 7 feet from the RWST gap at its closest point.

The fire loading within area ABBM consists of cable insulation, charcoal and transient combustibles. The fire loading within area ABI is of no concern for this exemption because fire would not propagate downward through the gap. Existing fire protection includes area-wide fire detection systems, preaction-type sprinkler systems, manual hose stations and portable fire extinguishers.

The technical requirements of Appendix R are not met because the redundant shutdown system on elevations of interest in the Auxiliary Building are not separated and protected as delineated in Sections III.G.2.a, b, or c.

The licensee justifies the exemption on the basis of the low fire loading, existing fire protection and the physical configuration of fire areas.

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Based on our evaluation, we conclude that the licensee's alternate fire protection configuration will achieve an acceptable level of safety equivalent to that provided by Section III.G.2.

Because of the presence of an area-wide fire detection system, we have reasonable assurance that a fire will be detected in its initial stages, before significant propagation occurs. The fire would then be extinguished by the plant fire brigade using the existing manual fire fighting equipment or by the preaction type sprinkler system that is presently installed. With the exception of the gap at the RWST, the construction of the floor/ceiling is continuous and fire-rated. Because of the gap, smoke and hot gases from a fire might filter up into area ABI. However, the block wall at the gap will tend to channel the products of combustion up and away from the redundant bus. The floor-to-ceiling height in Area ABI at the RWST is in excess of 50 feet. Therefore, any products of combustion rising up through the gap will dissipate in the large ceiling area and will not pose a significant threat to the bus. Therefore, the licensee's request for exemption at the common boundary between Fire Areas ABBM and ABI at the RWST should be granted.

Auxiliary Building Fire Area ABBM, Control Complex Fire Area CC, Control Building Fire Area BRIB, Emergency Diesel Generator 1B Vault, and Screen House Building

The licensee requested exemptions from the technical requirements of Section III.G.3 to the extent that it requires the installation of a complete area-wide fixed fire suppression system in an area for which an alternate shutdown capability has been provided.

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Fire Area ABBM consists of two zones, ABM and ABB. Zone ABM is the mezzanine level of the Auxiliary Building. Zone ABB is the basement level of the Auxiliary Building. The perimeter construction of the fire area is continuous and 3-hour fire-rated except for 2 open stairs, an open hatch and the gap around the RWST. Most penetrations of the fire area boundary construction are protected to provide a 3-hour rating. The licensee committed in the Appendix R Report to protect all other penetrations so as to achieve a 3-hour rating. At the stairways and hatchway the licensee committed to install close-spaced automatic sprinklers designed to discharge water in a "curtain" fashion so as to prevent fire spread through the opening.

Safety-related equipment which is located in the fire area consists of the 480V ac switchgear bus 16; MCCs 1D and 1M; both bus 14 and 16 emergency diesel generator power feeds; the safety injection and RHR pumps and their respective cooling units; and the RHR heat exchangers, control valves and flow instrumentation.

Existing fire protection includes an area-wide fire detection system, preaction sprinkler systems, manual hose-stations and portable fire extinguishers. In addition to the "water curtains" and fire barrier improvements previously identified, the licensee also committed in the Appendix R Report to protect the power feed and control circuits to charging pump 1A and the emergency diesel generator 1A power feed to bus 14 by a 1-hour fire-rated barrier.

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For the other vulnerable shutdown-related systems, the licensee has provided an alternate shutdown capability which will enable the plant to reach and maintain cold shutdown if fire damages redundant cables or components.

Fire Area CC consists of 4 zones: Zones CR, AHR, BR1A and RR. Zone RR is protected by a complete Halon fire suppression system and, therefore, the exemption pertains to the remaining zones.

Fire Zone CR is the Control Room. It contains all the control panels and power control systems for plant operations and is manned on a 24-hour basis.

Fire Zone AHR is the Air Handling Room for the Control Room and the Computer Room. It contains the air handling unit and return air fan for the Control Room, with control and instrument cable.

Fire Zone BR1A is the Train A Battery Room. It contains the 125V dc battery 1A, inverters, main dc distribution panel 1A, battery charger 1A, battery disconnect switches and main fuse cabinet 1A.

Fire Zone RR is the Relay Room. It contains redundant shutdown-related relays, instrumentation, control racks and cabinets.

Existing fire protection includes area-wide fire detection systems; an automatic deluge fire suppression system for the cable trays along the north wall of Zone AHR; a Halon fire suppression system in the Relay Room; and portable fire extinguishers and manual hose stations.

The licensee has provided an alternate shutdown capability (Zones CR, RR and AHR) and redundant shutdown capability (Zone BR1A) that is physically and electrically independent of this fire area.



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Fire Area BR1B is designated as Battery Room 1B and contains the 125 dc battery 1B, inverters, main dc distribution panel 1B, battery charger 1B, battery disconnect switches and main fuse cabinet 1B.

The perimeter walls and floor/ceilings of this fire area are constructed of reinforced concrete or concrete block possessing a 2-or 3-hour fire rating. All openings in these barriers, except for the 1½-hour rated access doors, are protected by fire dampers or penetration seals with a fire rating equivalent to the rating of the barrier.

Existing fire protection includes an area-wide fire detection system, manual hose stations and portable fire extinguishers.

In the Appendix R Report, the licensee also committed to protect the train A power feeds to buses 14 and 16, the dc conductor supplying the emergency diesel generator 1A dc distribution panel from Battery Room 1A, and the conductor for the Auxiliary Building distribution panel 1A with a 1-hour fire-rated barrier.

For all of the other vulnerable redundant shutdown systems within this location, the licensee has identified a redundant capability or provided an alternate shutdown capability that is independent of the fire area.

The emergency diesel generator (EDG) 1B Vault fire area contains perimeter walls and floor/ceilings constructed of reinforced concrete with a fire rating in excess of 3 hours. The only access to the fire area is provided through a metal checker-plate manhole cover which is bolted to the floor of the vertically adjoining fire area.



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This area contains the 480V ac bus 14 and 16 power feeds, the dc power feeds and control circuits for emergency diesel generators 1A and 1B, along with 480V ac bus 17 power feed, and the control cables for 480V ac buses 17 and 18. The redundant service water pumps are powered from buses 17 and 18, all of which are located in the Screen House. The power and control feeds for EDG 1A are separated by a fire barrier.

Existing fire protection includes an area-wide fire detection system, manual hose stations and portable fire extinguishers.

For those redundant shutdown systems that have not been separated by the above referenced fire barrier, the licensee has provided an alternate shutdown capability that is physically and electrically independent of the fire area.

The Screen House Building fire area is a 2-floor structure, physically separated from the rest of the plant. It houses the circulating water equipment, service water pumps, fire pumps, plant auxiliary boiler, and 480V ac buses 17 and 18 that supply the power to this equipment.

Existing fire protection includes an area-wide fire detection system, partial "wet-pipe and deluge" sprinkler protection, manual hose stations and portable fire extinguishers.

The licensee has provided an alternate shutdown capability for the redundant shutdown systems in this area that is independent of the Screen House.

The technical requirements of Appendix R have not been met because these fire areas have not been provided with a fixed fire suppression system as stipulated in Sections III.G.2 and III.G.3.

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The licensee justifies the exemptions in these areas on the ability of the perimeter construction to confine the effects of the fire to the immediate fire area until either the plant fire brigade arrived or the partial automatic fire suppression systems actuated, and the fire is extinguished. Also, the fire loading in these areas is low-to-moderate. Where concentrated combustibles exist, the hazard is mitigated by a fire suppression system in that area. Redundant shutdown systems are either protected by fire barriers or the licensee has identified a redundant capability or provided an alternate shutdown system that is physically and electrically independent of the fire area.

Based on our evaluation, we conclude that the licensee's alternate fire protection configuration will achieve an acceptable level of fire safety equivalent to that provided by Section III.G.

These locations are all equipped with early-warning fire detection systems. We, therefore, have reasonable assurance that a potential fire will be detected in its formative stages before significant propagation or temperature rise occurs. The fire will then be extinguished by the fire brigade using manual fire fighting equipment or by the partial automatic fire suppression systems that are presently installed.

If the fire should damage unprotected components of redundant shutdown systems, the licensee will utilize the alternate shutdown capability that is independent of the fire area to achieve and maintain safe shutdown conditions. Therefore, the licensee's request for exemptions in the aforementioned areas should be granted.



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Intermediate Building, North Section

The licensee requested an exemption from the technical requirements of Section III.G.2 to the extent that it requires that redundant shutdown systems be separated by more than 20 feet free of intervening combustibles. The licensee also requested an exemption for the same location from the requirements of Section III.G.3 to the extent it requires a fixed fire suppression system in an area for which an alternate shutdown capability has been provided.

The Intermediate Building, North Section (IBN) is a zone within a larger fire area (ABI) which includes the South Section of the Intermediate Building, the Auxiliary Building Operating Floor and the Nitrogen Storage Building. Within the overall fire area, the licensee has assessed compliance with our regulations and has identified two deviations from Section III.G, both of which are located within Zone IBN.

The location contains cables and components associated with the auxiliary feedwater system, reactor control rod drive, ventilation equipment, main steam safety and isolation valves and the remote shutdown panel.

Existing fire protection includes a fire detection system, partial manual and automatic sprinkler systems, manual hose stations and portable fire extinguishers. In the Appendix R Report, the licensee committed to install additional fire detectors so as to achieve complete area-wide coverage. The licensee also committed to protect steam generator 1B pressure indication circuits with a 1-hour fire barrier.



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With the exception of the steam generator pressure transmitters themselves, all other redundant shutdown systems in fire area ABI are either protected and separated according to Section III.G.2, or an alternate shutdown capability is provided which is independent of the fire area. The above referenced transmitters are separated by a distance of 75 feet. Intervening combustibles consist of cables in trays. The trays are protected by an automatic fire suppression system as previously discussed.

The technical requirements of Appendix R have not been met in the north section of the Intermediate Building (IBN) because the space between redundant steam generator pressure transmitters contain cable insulation (Section III.G.2) and a fixed fire suppression system has not been installed per (Section III.G.3).

The licensee justifies these exemptions on the bases of the limited fire load, the sprinkler protection for cable trays, the existing and proposed fire protection, the separation between redundant transmitters and the availability of an alternate shutdown capability for vulnerable redundant shutdown systems.

Based on our evaluation, we conclude that the licensee's proposed fire protection configuration will achieve an acceptable level of fire safety equivalent to that provided by Section III.G.

Until the fire is extinguished, the perimeter walls and floor/ceilings of the fire area would limit the spread of products of combustion. If the fire damages redundant shutdown system that have not been adequately separated or protected, the licensee would rely on the alternate shutdown

capability to achieve and maintain safe shutdown. Therefore, the licensee's request for exemptions in the Intermediate Building, North Section, should be granted.

Battery Room 1A and 1B

The licensee requested an exemption from the technical requirements of Section III.G.2 to the extent that it requires that structural steel which forms a part of the barrier be protected to provide fire resistance equivalent to that of the barrier.

Battery Rooms 1A and 1B are situated side by side along the south wall of the Turbine Building. Battery Room 1A is part of the larger Control Complex Fire Area CC. Battery Room 1B is part of Control Building Fire Area BR1B. The walls, floors and ceilings are of 2-hour rated construction or better, except for the exposed structural steel supporting the ceiling.

Existing fire protection includes a smoke detection system in each room along with manual hose stations and portable fire extinguishers outside the entrances to these rooms. In the Appendix R Report, the licensee committed to protect the exposed steel in Battery Room 1B with material that has a 1-hour fire-rating. The exposed steel in Battery Room 1A will not be protected because the floor/ceiling is not relied upon to separate redundant shutdown systems in adjoining fire areas.

The technical requirements of Section III.G.2 have not been met because the protection provided by the exposed steel which supports the ceiling of Battery Room 1B is not equivalent in fire rating to the ceiling itself.



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There is no deviation from Section III.G.2 in Battery Room 1A because the exposed structural steel does not form a part of a fire barrier that separates redundant shutdown systems.

The licensee justifies the exemption on the basis of the low fire loading, existing fire protection and the ability of the proposed fire-proofing to withstand the effects of a fire pending extinguishment.

Based on our evaluation, we conclude that the licensee's alternate fire protection configuration will achieve an acceptable level of fire safety equivalent to that provided by Section III.G.2.

Because of the presence of an early-warning fire detection system, we do not expect a total room burn-out. A potential fire will be detected in its initial stages before significant temperature rise occurs. We, therefore, have reasonable assurance that the fire will be extinguished by the fire brigade before it becomes a significant threat to the integrity of the fire barriers in Battery Room 1B. Therefore, the licensee's request for exemption in Battery Rooms 1A and 1B should be granted.

Cable Tunnel and Emergency Diesel Generator Vault

The licensee requested an exemption from the technical requirements of Appendix R to the extent that it requires either a 1-hour or 3-hour fire-rated barrier between redundant shutdown divisions.

The Cable Tunnel (Fire Area CT) is a reinforced concrete structure approximately 9 feet wide by 7 feet high. It contains redundant cables associated with normal shutdown systems. However, the licensee has provided an alternate shutdown capability that is independent of this area.

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Except where the Cable Tunnel interfaces with the Air Handling Room (AHR), Intermediate Building, North Section (IBN), and the mezzanine level of the Auxiliary Building (ABBM), the boundary fire barriers of this fire area are of continuous 3-hour rated construction. The common wall at the AHR is about 63 ft². It is constructed of a sheet of 20-28 gauge sheet metal, 5½ inches of ceramic fiber insulation, and a sheet of 20-28 gauge sheet metal. All cable penetrations of the barrier have been sealed with a fire-rated silicone based penetration sealant.

The common wall at the IBN is about 15 feet wide by about 23 feet in height. It is constructed of gypsum wall board and internal metal studs in a configuration that has a 1-hour fire rating. All cable penetrations of the barrier have been sealed with a fire-rated silicone foam. A 1½-hour fire-rated door provides access into the Cable Tunnel through this barrier.

The common wall at ABBM is similar to that at AHR except that 3 inches of ceramic fiber insulation is used in the core. A door is also located in this barrier. It is sealed shut and is constructed of 3 layers of 12 gauge sheet metal sandwiched by 2 inches and 2½ inches of insulating blanket material on the Auxiliary Building and Cable Tunnel sides of the center sheet, respectively.

Existing fire protection includes area-wide fire detection systems on both sides of the unrated barriers; and automatic deluge water spray system in the Cable Tunnel; automatic preaction sprinkler systems on the opposite side of the barriers in AHR, IBN, and ABBM, as described in the Appendix R Report, manual hose stations and portable fire extinguishers.

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The Emergency Diesel Generator Vault 1B fire area contains the circuits associated with the operation of both diesel generators. An existing full-height sheet metal enclosure separates the redundant circuits for emergency diesel generator (EDG) 1A from those of EDG 1B.

The sheet metal enclosure consists of two sheets of 16 gauge galvanized steel separated by 7½ inch wide 20 gauge galvanized steel channels. The steel channels sectionalize the space between the two layers into "cells" no greater than 450 square inches in area. Each of these sections is filled with a fire rated silicone foam in sufficient depth to achieve a 3-hour rating.

Existing fire protection includes an early warning fire detection system, manual hose station and portable fire extinguishers as delineated in the Appendix R Report. At our request, the licensee committed in the Report to apply a listed "fire-proofing" material on the exposed metal surfaces of the barrier to prevent heat from being conducted through the barrier to the unexposed side. The material will be installed to a thickness sufficient to achieve at least a 1-hour rating.

The technical requirements of Appendix R are not met in these areas because redundant shutdown divisions are not separated by 1-hour and 3-hour fire rated barriers as stipulated in Section III.G.2.a, and III.G.2.c.

The licensee justifies the exemptions in these two areas on the basis of the ability of the fire barrier to provide sufficient passive protection until a potential exposure fire is extinguished.

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Based on our evaluation, we conclude that the licensee's alternate fire protection configuration will achieve an acceptable level of fire safety equivalent to that provided by Section III.G.2.

These locations are all provided with area-wide fire detection systems as previously described. This provides an early fire warning capability that will enable the plant fire brigade to respond quickly and suppress the fire manually before significant fire propagation occurs. The fire hazards in these areas are well within the capability of the brigade to deal with using portable fire extinguishers or manual hose stations.

If rapid temperature rise occurs at the Cable Tunnel before the arrival of the fire brigade, the existing automatic sprinkler systems will activate to control the fire; reduce room temperature and protect the barrier from the effects of the fire. We, therefore, conclude that the barriers at the Cable Tunnel will not be subjected to conditions that would cause them to fail before the fire is put out.

In the Emergency Diesel Generator Vault 1B, the licensee has utilized a silicone foam in the construction of the fire barrier that has passed the ASTM E-119 fire exposure test for 3-hours. The licensee committed to protect the steel with a U.L. listed fire proofing, which provides us with reasonable assurance that conducted heat will not pose a threat to the shutdown-related cables within the barrier.

Therefore, the licensee's request for exemptions in the Cable Tunnel and Emergency Diesel Generator Vault 1B should be granted.



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One-hour Rated Fire Barriers

The licensee requested an exemption from the technical requirements of Section III.G.2 of Appendix R to the extent that it requires a 1-hour fire-rated barrier to protect one shutdown division. The licensee requested this exemption because in certain locations the fire-rated barrier material that will be provided will not be installed in the same configuration as that which was subjected to an ASTM E-119 fire exposure test.

The licensee's request for exemption from Section III.G.2 related to the installation of a 1-hour fire barrier is not needed because we agree with the licensee's evaluation that the material when installed will achieve a 1-hour fire-rating.

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 or the common defense and security and is otherwise in the public interest. Therefore, the Commission hereby grants the exemption requests identified in Section III above.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of these exemptions will have no significant impact on the environment (50 FR 11274, March 20, 1985).

A copy of the Safety Evaluation dated March 21, 1985, related to this action is available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C. and at the local public document room located at the Rochester Public Library, 115 South



Avenue, Rochester, New York 14610. A copy may be obtained upon request addressed to the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Licensing.

This Exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

for Frank J. Miraglia
Frank J. Miraglia, Deputy Director
Division of Licensing
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland
this 21st day of March 1985.

