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the southern electric system

NED-83-275

April 28, 1983

Director of Nuclear Reactor Regulation
Attention: Mr. John F. Stolz, Chief
Operating Reactors Branch No. 4
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

NRC DOCKETS 50-321, 50-366
OPERATING LICENSES DPR-57, NPF-5
EDWIN I. HATCH NUCLEAR PLANT UNITS 1, 2
CLARIFICATION OF REQUESTS FOR EXEMPTIONS
FROM 10 CFR 50.48 AND APPENDIX R

Gentlemen:

The draft Safety Evaluation Report (SER) transmitted with your letter dated January 20, 1983, denied seven Georgia Power Company (GPC) exemption requests. A meeting with the NRC staff was held on March 30, 1983, to discuss the denied exemptions and other aspects of the Appendix R compliance program at GPC. The Staff requested that any additional submittals to be made by GPC be transmitted to the NRC within 28 days of that meeting. This letter is submitted pursuant to that request.

As discussed with the NRC project manager for Plant Hatch, the material in this letter has not been developed in the detail of that contained in the "Response to 10 CFR 50.48 and Appendix R" submitted to the NRC by letter dated July 1, 1982. GPC will submit a revised version of that response by May 30, 1983. The revised response will contain those details that cannot be fully developed within the 28-day time restriction.

Reactor Building Exemption Requests:

A006
Six of the denied requests were for exemption from the separation criteria of paragraph III.G.2 of Appendix R for three elevations of the Unit 1 reactor building and the corresponding areas of Unit 2. In denying the exemptions, the draft SER noted that these areas were not equipped with area-wide fire suppression systems, that only the 130-foot elevation is equipped with a fire detection system, and that redundant divisions are neither separated by 20 feet with no intervening combustible material nor protected by a 1-hour fire rated barrier. The draft further noted:

"The fire protection requirements of Section III.G represent an aggregate, comprised of active and passive

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components. The two forms of protection work synergistically to provide reasonable assurance that one train of the safe shutdown systems is free of fire damage. With the exception of the partial smoke detection systems on elevation 130 feet, these zones have no active fire protection. The partial smoke detection systems will provide reasonable assurance of early fire awareness in the immediate areas where the detectors are installed, but not in the unprotected locations. Consequently, a fire could occur and propagate for a significant period of time until discovered and efforts to suppress it begin."

During the March 30 meeting the NRC staff acknowledged the difficulty in achieving full compliance in a boiling water reactor facility such as Plant Hatch. The Staff proposed two alternatives for attaining an acceptable degree of compliance:

- (a) Wrapping of one complete train of equipment with a 1-hour fire rated barrier, installing barriers around major components that cannot be wrapped, and providing partial smoke detection for the area.
- (b) Division of the reactor building into fire areas by utilizing a water curtain system - defined by the NRC staff as an open head water spray system initiated by a cross-zoned smoke detection system.

The difficulties in the installation and maintenance of a barrier system have led GPC to favor a definition of fire area boundaries utilizing a water system to prevent the spread of fire across the boundary.

As noted in the draft SER, the fire area definition in GPC's July 1, 1982, submittal utilized five fire sectors on elevation 130 of the reactor building. To some extent the NRC staff's objections to the submittal involved the number of fire sectors. At this time, the reactor buildings are undergoing a reanalysis to redefine the fire areas. The redefined fire areas will divide the reactor building along its east-west centerline with the southern half designated as a pathway 1 fire area and the northern half designated as a pathway 2 area for Unit 1. Unit 2 is approximately a mirror image of Unit 1 with the pathways reversed. It is GPC's intent that each reactor building be divided into a minimum of two fire areas. If such a division should prove impossible, GPC will make other appropriate fire area subdivisions. Such new subdivisions will be subject to the same boundary definition criteria that are applied to the two areas currently being developed.

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The water suppression systems to be utilized to separate the fire areas will cover the areas of the building in which two trains of redundant safe-shutdown equipment are located. The coverage area will extend from the east-west centerline of the reactor building into each fire area to a distance of 20 feet beyond the last redundant opposite train component - for instance, from the east-west centerline northward (into the pathway 2 area) a minimum of 20 feet beyond the redundant pathway 1 component that extends farthest into the area. The shutdown panels are not considered in the selection of the "opposite train equipment" as they are not utilized for shutdown following a reactor building fire. In those areas where the system serves only as an area boundary and no opposite train equipment exists, the area of coverage shall be at least 20 feet wide. The sprinkler systems will not cover the electrical switchgear and panels that could be damaged by inadvertent actuation of the sprinklers. Draft curtains will be installed at the ceilings as required to limit the spread of smoke across the area boundary prior to system initiation. Existing support members will be utilized if possible to constitute all or part of these draft curtains.

The present intent is to separate the entire building into a minimum number of fire areas, such that open hatchways between floors will not constitute penetrations of fire area boundaries. Should it be determined by analysis to be necessary to utilize a floor as a fire area boundary, a water suppression system may be proposed to provide the fire area definition at the hatchway.

The possibility of an inadvertent actuation of the water curtain has been investigated by GPC. The potential problems associated with such an incident include local flooding, a backlog of water to be processed by radwaste, and possible unit shutdown to complete radwaste processing of the water. Since a closed head sprinkler system will reduce the potential for inadvertent actuation, GPC intends to utilize a closed head sprinkler design.

GPC has analyzed the impact of a closed head system with respect to three concerns expressed by the NRC staff:

- (a) The ability of electrical cables to withstand elevated temperatures prior to sprinkler head opening;
- (b) The effect of smoke on opposite train equipment;
- (c) The effect of smoke from the fire area on the ability of plant operators to take required action in the adjacent area.

Regarding the effect of heat on the cables, the temperature at which the sprinkler head will open will be fifty or more degrees Fahrenheit lower than the temperature the cables can withstand for an extended time without loss of insulation integrity.

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The effect of smoke on opposite train equipment will not be significant because the potentially sensitive equipment is located in metal cabinets or is similar to equipment that is part of the environmental qualification program under I&E Bulletin 79-01B. The smoke protection afforded by these cabinets is substantial and is judged to be superior to that which would be afforded by a radiant heat barrier which would be employed in the wrapping alternative as proposed by the NRC staff in the March 30, 1983, meeting.

The operator actions for plant shutdown following a fire in the reactor building are primarily taken from the control room. Those manual valve operations which may be required are either not needed for a period of several hours after unit trip or the manual action is taken outside the reactor building. While GPC acknowledges that obscuration due to smoke is a potential problem, the portable smoke removal equipment already provided as part of our response to APCS 9.5-1, Appendix A will be adequate for smoke removal prior to entry into the area by an operator.

Both acceptable alternatives outlined by the NRC staff require the utilization of a smoke detection system. Georgia Power Company proposes to install a partial smoke detection system on the 158 foot elevation. The system will cover the entire area covered by the proposed sprinkler system and will include detectors on both sides of the proposed draft curtain.

A fire detection system is proposed for the two sprinklered areas of the torus room. The proposed system will extend throughout the sprinklered areas. The environment in the torus area is such that smoke detectors cannot be used. The torus area is subjected to conditions of high humidity that would cause a very high incidence of false alarms for a smoke detection system. Therefore, a fire detector system is proposed for the sprinklered areas of the torus.

To summarize the reactor building exemption request, GPC proposes to redefine the fire areas in the reactor building such that the north half of each building is one fire area and the south half is another. The division between the building halves will be via a closed head wet pipe sprinkler system on the east side of the 158 elevation (Units 1 and 2), the east side of the 130 elevation (Units 1 and 2), outside the labyrinth entrances to the steam chase (Unit 1), and on the east and west sides of the torus area (Units 1 and 2). Further, GPC proposes to install a partial smoke detection system on the 158 foot elevation and a partial fire detection system in the torus area.

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Control Building Corridor Exemption Request:

The July 1, 1982, submittal requested an exemption from the requirement for a 1-hour barrier and suppression system for two Direct Current (D.C.) distribution panels located in the D.C. switchgear hallway of Unit 2. This request was denied in the January 20, 1983, draft SER. Since the time of the July 1, 1982, submittal, the newly developed design for the Analog Trip Transmitter System (ATTS) modification includes two new D.C. distribution cabinets to be installed to supply power to the new ATTS cabinets. In order to meet the design requirements of ATTS and resolve the Appendix R exemption, the two D.C. distribution panels presently located in the Unit 2 hallway will be used to supply one division of ATTS and the two new cabinets will be used to supply the redundant division of ATTS. These new cabinets will be located in a separate area from the D.C. switchgear hallway to meet the separation requirements of Appendix R. With this modification, an exemption to Appendix R, Section III.G.2 will not be required for the D.C. switchgear hallway of Unit 2 associated with protection of the redundant divisions of D.C. distribution panels. However, further analysis is underway to determine if an exemption to Section III.G.2 will be required to allow use of the existing water suppression system to obtain the necessary separation between pathway 1 and 2 cables. This request for exemption will be included in the May 30, 1983, update of the Plant Hatch response to 10 CFR 50.48 and Appendix R.

Schedule Exemption Request:

An exemption from the implementation schedule of 10 CFR 50.48 was requested by GPC in the July 1, 1982, submittal. A detailed justification of the proposed schedule will be provided as a separate correspondence.

Scaffolding:

The installation of the proposed sprinkler and smoke detection systems and the wrapping of cables in the reactor building will necessitate the installation of large amounts of scaffolding around or over safety-related equipment with the unit in operation. While GPC has concluded that this work can be performed safely, concerns about this practice have been raised by the NRC field inspectors. GPC is not requesting an exemption from any regulations for the scaffold installation, but we request NRC's concurrence in our conclusion that the scaffolding usage is an acceptable approach to the timely installation of Appendix R related modifications.

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Corrections to Draft SER:

GPC has reviewed the draft SER for accuracy and has noted the following:

1. SER Section 3.2.2 - Page 10

- a. The smoke detection system provided for the reactor building 130 foot elevation is provided throughout the area rather than partial coverage as indicated.
- b. The proposed 1-hour fire barrier to be provided for one safe shutdown pathway in the reactor building 130 foot elevation and torus area for both Units 1 and 2 is intended to cover the required raceways throughout the analyzed fire areas rather than limiting the barrier to that portion of the raceway that is within 20 feet of its redundant counterpart.

2. SER Section 3.2.5 - Page 12

Remarks concerning Section 3.2.2 above apply.

3. SER Section 4.2 - Page 15

The safe shutdown equipment located in the Unit 2 station battery room consists of one safety division of station batteries and redundant circuits for the drywell air system rather than the service air system.

4. SER Section 6.1 - Page 22

This section provides clarification of Appendix R issues and states that GPC has relied upon partial fire detection and fire suppression systems to achieve compliance with Section III.G.2 and has assumed that IEEE qualified cable is noncombustible. It is GPC's position that the insulation on IEEE qualified cable is nonpropagating rather than noncombustible.

Corrections to July 1, 1982, Submittal

During the March 30 meeting GPC notified the Staff that certain corrections to the July 1, 1982, submittal were needed. These are:

1. July 1, 1982, Submittal - Enclosure 3 - Section 4.2.5

During the continued review of the status of the fire protection at Plant Hatch, it has been noted that the July 1, 1982, Appendix R exemption

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request contained a request for an exemption of the "submarine-type" door on the Unit 2 station battery room 2B. There are actually three additional battery rooms which also have "submarine-type" water-tight doors. The Control Building Station Battery Rooms 2A (for Unit 2), 1A, and 1B (for Unit 1) are all completely enclosed by three-hour rated walls with the exception of the water-tight door. Rooms 1A and 2A contain only shutdown path 1 equipment of the respective units while room 1B contains only shutdown path 2 equipment. The combustible loading for these rooms is approximately 26,000 Btu/sq ft for cable insulation, 3.6 Btu/sq ft per hour for hydrogen gas, and 2450 Btu/sq ft for battery casings. Replacing these doors with a fire-rated door would degrade plant safety because the water-tight doors are necessary to protect the station batteries from a circulating water flood. Therefore, the exemption requested in Section 4.2.5.5 from the requirement of Section III.G.2.A for the water-tight door will be expanded to include these three additional water-tight doors.

2. July 1, 1982, Submittal - Enclosure 3 - Sections 4.1.1 and 4.1.2

The July 1, 1982, Appendix R exemption request stated that the walls surrounding the Unit 1 4160-volt Transformer Room and the Unit 1 West 600-volt Switchgear Room on elevation 130 feet were constructed for 3-hour fire resistance. Further investigation has shown that these walls, as well as walls associated with the East 600-volt Switchgear Room, the East D.C. Switchgear Room, and the West D.C. Switchgear Room, are of at least a 2-hour fire resistance construction, but cannot be classified as 3-hour fire resistance construction. The walls for the corresponding rooms for Unit 2 are also of minimum 2-hour fire resistance construction. The affected walls are indicated on Figures 4-1 and 4-9 from the July 1, 1982, submittal. The combustible loading in these rooms is relatively small and ranges from negligible in the 4160-volt transformer rooms to 47,520 Btu/sq ft in the West D.C. Switchgear Rooms for both units. These combustible loadings would result in a fire severity rating of less than 1 hour. In addition, these rooms are provided with full smoke detection. Therefore, an exemption from the requirements of 10 CFR 50.48 Appendix R, Section III.G.2.A will be requested for the 2-hour fire resistant walls in the Control Building. The wall between the Unit 2 Oil Conditioner Room and the West D.C. and 600-volt Switchgear Rooms is presently a 2-hour wall and will be upgraded to a 3-hour fire resistance construction.

3. July 1, 1982, Submittal - Enclosure 2

Enclosure 2 to the July 1, 1982, submittal stated that GPC anticipated the completion of the physical and procedural modifications required to provide isolation of the high pressure-low pressure boundary valves from their power feeds during plant power operation by December 30, 1983. Further design work has indicated that all of the physical

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modifications will not be completed by this date. These modifications will be completed on a schedule consistent with the Appendix R modifications for the affected fire areas.

4. July 1, 1982, Submittal - General Comments

The proposed additional fire detection and suppression systems will be installed at Plant Hatch following the "Special Hazards" design basis technique allowed by the National Fire Protection Codes. This technique will utilize a combination of NFPA 13, 15, 72A, 72B, 72C, 72D, and 72E to ensure the maximum effectiveness of the system to limit the fire hazard at Plant Hatch and to take into account the unique structural configuration and protection problems inherent in a power plant. These codes and regulations are basically tailored for protection of rooms or areas with relatively regular surfaces and features.

This is a situation seldom realized in the highly congested conditions encountered in the majority of the rooms in a power plant. In recognition of such conditions and of the special hazards encountered in a nuclear power plant, sound engineering judgement must be exercised in the design and installation of its fire protection systems rather than routine, absolute compliance with rules which are not always appropriate to the situation.

Occasionally, minor deviations from the codes, principally in sprinkler head or detector placement relative to the ceiling, must be taken because of congestion, consisting of cable trays, piping, ducting, etc., in the area of a suppression system. Such deviations are taken only when they will result in equal or superior protection to that which would result from an inflexible conformance to codes or regulations, if such were possible.

Additional revisions to the July 1, 1982, response to 10 CFR 50.48 and Appendix R to correct minor errors and figure revisions will be incorporated into the submittal document in the May 30 update.

Clarification of Compliance

Finally, GPC was notified in the March 30 meeting that those areas of the plant which GPC deemed in compliance with Appendix R will be inspected against criteria to be issued by the Staff. One portion of these criteria addresses the extent of suppression system coverage necessary to meet Appendix R. Certain fire areas were analyzed based upon a fire area boundary that was consistent with the general philosophy outlined in our submittal.

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Since the Staff did not accept GPC's fire area boundary criteria, a reanalysis of the entire plant to locate other areas requiring an exemption request is underway. While the detailed justification for the exemption requests cannot be prepared until the May 30 submittal, Enclosure 1 provides a listing of fire areas that do not meet the Staff's criteria for full compliance with Appendix R, a brief description of the reason for noncompliance, and as much justification information as could be completed in the limited time available.

If you should have any questions concerning this information, please contact this office.

Yours very truly,



L. T. Gucwa

WEB/JNM/mb

Enclosure

xc: H. C. Nix, Jr.
J. P. O'Reilly (NRC Region II)
Senior Resident Inspector

Enclosure to letter to NRC dated April 28, 1983
Subject: Clarification of Requests for Exemptions
from 10 CFR 50.48 and Appendix R

ENCLOSURE 1

ADDITIONAL EXEMPTION REQUESTS

The following exemption requests were identified as a result of the reevaluation performed following the March 30 meeting. A detailed justification of each request will be included in the May 30, 1983, revision to Georgia Power Company's July 1, 1982, submittal.

UNIT 1

1.1 East Cableway 130' El. - Unit 1

Exemption is requested for the non-3-hour fire wall between the east cableway and condenser bay and the open end between the east cableway and the turbine working floor.

1.2 Reactor Building El. 164' Units 1 and 2

A 3-hour wall exists between the reactor building and turbine building. However, this wall is constructed with blow-out panels which are not fire rated. The blow-out panels were installed for the purpose of steam venting. Exemption is requested for these panels.

1.3 Control Building Working Floor El. 112' - Unit 1

This area is surrounded by 3-hour rated walls except for the elevator shaft and stairwell walls which are 2-hour rated with 1 1/2-hour rated doors. An exemption for these walls and doors is requested.

1.4 Control Building East Corridor El. 112' - Unit 1

This area is surrounded by 3-hour rated walls except for the south end which is open to the turbine building (passageway, pipes and cables). There is a staircase located in this zone with a ceiling slab-mounted ionization smoke detector. An exemption for this wall and open stairway is requested.

1.5 Turbine Building East Cableway El. 130' - Unit 1

This area is surrounded by 3-hour rated walls except for a portion of the west wall and the north wall separating this zone from the condenser area. An exemption for these walls is requested.

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from 10 CFR 50.48 and Appendix R

UNIT 2

2.1 Control Building Corridor El. 130'

This area is surrounded by 3-hour fire rated walls except for the east portion of the south wall of the zone which is open to the Unit 2 control building switchgear hallway. The north side of the west end of this zone is separated from a freight elevator and an enclosed stairwell by 2-hour fire rated walls with 1 1/2-hour fire doors on the openings. An exemption for these walls and doors is requested. General area sprinkler coverage is excluded from the corridor area in H.P. bathrooms area, H.P. decon room area and HVAC room. An exemption from area wide fire suppression is requested for these areas.

2.2 Turbine Building Passageway El. 112' - Unit 2 (Below East Cableway)

This area is surrounded by 3-hour rated walls except the west side of this zone which is separated from the main condenser area with a concrete wall and the south end which is not enclosed by a 3-hour rated wall. There is a stairwell located in the south end of this zone which is enclosed by a 2-hour fire rated wall and a 1 1/2-hour fire rated door on the opening. An exemption for these walls and door is requested.

2.3 Turbine Building West Cableway El. 112' - Unit 2

The northeast portion of this zone separating the control building has a 3-hour rated wall. All other areas of this zone are not protected by 3-hour rated walls. An exemption for these walls is requested.

2.4 Turbine Building Main Condenser Area El. 112' - Unit 2

This zone is protected with a 3-hour fire rated wall separating the control building. All other areas of this zone are not protected with 3-hour rated walls. Bordering the southeast wall of this zone is a stairwell enclosed by a 2-hour fire rated wall with a 1 1/2-hour fire rated door on the opening. An exemption for these walls and door is requested.

2.5 Turbine Building Switchgear Area El. 130' - Unit 2

This zone is not protected by a 3-hour fire rated wall. This zone is separated from an enclosed stairwell by 2-hour fire rated walls with a 1 1/2-hour fire rated door. An exemption for these walls and doors are requested.

2.6 Reactor Building Standby Gas Treatment and HVAC Room El. 185' - Unit 2

This zone is surrounded by 3-hour fire rated walls except the north wall separating the heating and ventilating room from the stairway. An exemption for these walls is requested.