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Public Service
Electric and Gas
Company

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December 31, 1986
NLR-N86202

Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
7920 Norfolk Avenue
Bethesda, MD 20014

Attention: Mr. Vincent S. Noonan, Director
PWR Project Directorate #5
Division of PWR Licensing A

Gentlemen:

FIRE PROTECTION - 10 CFR 50 APPENDIX R EXEMPTION REQUEST
SALEM GENERATING STATION
UNIT NOS. 1 AND 2
REQUEST FOR ADDITIONAL INFORMATION

A conversation was held recently with Mr. J. Stang of your staff to clarify Public Service Electric and Gas's (PSE&G) position regarding sealing of cable tray ends relative to our outstanding Appendix R exemption requests. In that conversation, PSE&G stated its intent to fully protect control cabling to ensure minimum system operability of the diesel-generators in Fire Area 1FA-AB-100C. In our January 17, 1986 letter, page 3 of Enclosure 2, we inadvertently stated that the tray ends would be wrapped where permissible due to thermal loading considerations. This should be amended to say that diesel generator control power cabling adequate to ensure minimum system operability requirements will be completely protected by a one hour fire barrier in Fire Area 1FA-AB-100C. Attachment 1, per Mr. Stang's request, is a description of the three diesel generator control cabling routes in Fire Area 1FA-AB-100C. The description includes separation distances between trays carrying the redundant diesel generator cables. As stated in our January 17, 1986 letter, a schedule for implementation will be provided upon approval of the exemption requests.

PSE&G representatives stated that the other areas mentioned in the "Open Ended Cable Tray Wraps" Section, page 3 of Enclosure 2 to the January 17, 1986 letter would either be completely protected by a one hour barrier or protected by a combination of

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partial 1 hour protection, and detection and automatic suppression. The particular exemption requests for each area were discussed with Mr. Stang, who stated the measures described in the exemption requests were acceptable.

Also attached are revisions to previously submitted exemption requests for the following areas:

- Generic Exemption Request for doors, dampers and penetration seals (Attachment 2).
- Fire Area 1FA-AB-64A (Attachment 3).
- Fire Area 1FA-AB-64B (Attachment 4).

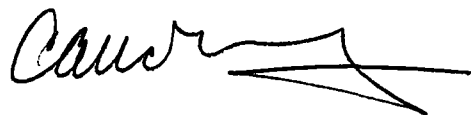
Revision to the generic exemption request is required based on a recent update to the Salem Fire Hazards Analysis (FHA). The revised FHA indicated that fire loads in some areas were no longer below the 1 hour loading specified in our previous exemption request. A description of the affected areas is included in the revised exemption request attached.

Revisions are also being provided for fire areas 1FA-AB-64A and 1FA-AB-64B to indicate added levels of protection.

Additionally, note that PSE&G had previously committed in our letter dated April 5, 1984 to provide transfer switches for Diesel Generator operation by the end of the 6th refueling outage for Unit 1. The installation of the transfer switches has not been fully implemented. Isolation transfer switches for control circuitry have been installed. Completion of the effort involves addition of transfer switches for control power and field flashing power. This is currently scheduled for completion by March 31, 1987.

Should you have any questions, please feel free to contact us.

Sincerely,



Mr. Vincent S. Noonan

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C Mr. D. C. Fischer
Licensing Project Manager

Mr. T. J. Kenny
Senior Resident Inspector

FIRE AREA 1FA-AB-100C

The information below supplements the January 17, 1986, submittal.

As previously noted in PSE&G's January 17, 1986, submittal, the subject fire area is defined as the area between Columns 14.0 and 11.8, and between 8 feet west of Line FF and 8 feet west of Line PP.

This area contains demineralizers, filters, and pumps for the Chemical and Volume Control and Waste Disposal systems. In addition, this area contains the Chemistry Laboratory (Counting Room). The Primary Sampling Laboratory is contained only in Unit 1.

The area is also typified by an internal labrynth of rooms with mostly floor to ceiling walls. No credit is taken for this arrangement since the walls are not qualified three-hour barriers.

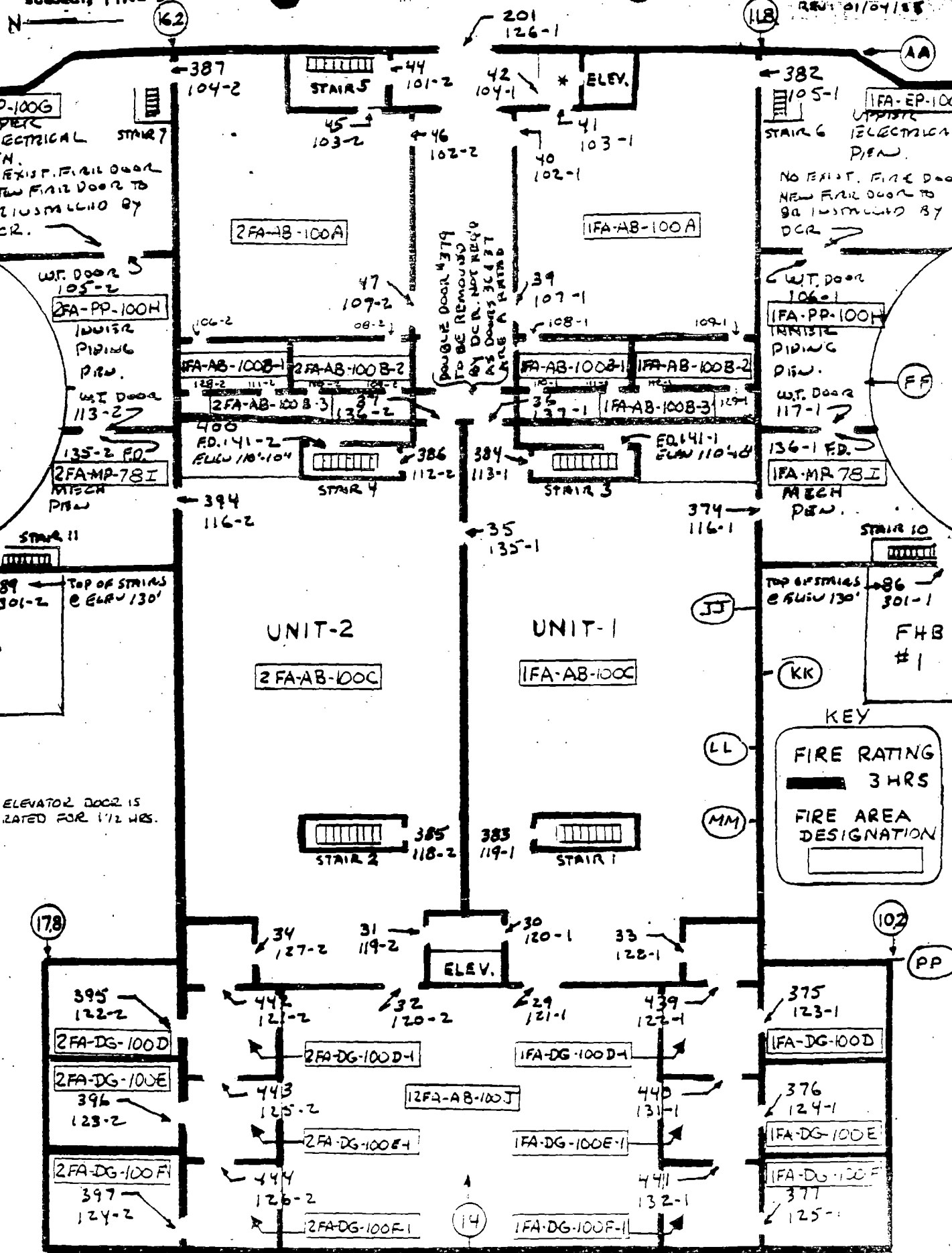
The cabling in question (Diesel Generator) runs generally lengthwise from 8 feet west of Line FF to 8 feet west of Line PP. Cabling for Trains A and B run in close proximity to each other through the area to the KK Line with Train A running along the Column 14 border. Train B then diverges from Train A and eventually converges with Train C at the LL Line. Train C runs lengthwise through the area generally parallel to and approximately 10 feet North of Column 11.8. Train C is separated from Trains A and B by approximately 20 feet or more from 8 feet west of Line FF to Line LL. All three trains converge as cabling enters the Diesel Generator Areas.

One cable tray (1A216) not associated with the Diesel Generators traverses the entire fire area perpendicular to the subject trays at the JJ Line. Tray 1A216 contains approximately thirty-two (32) instrumentation cables.

In light of the above and the exemption requested in PSE&G's January 17, 1986, letter, Diesel-Generator cabling required to meet minimum system operability requirements will be completely protected with a 1 hour fire barrier throughout this fire area.

SUBJECT: FIRE DOOR NUMERICAL DESIGNATIONS LOCATED AT LEVEL 100'

DATE 12/11/84
REV 01/04/85



KEY

FIRE RATING
 [Thick line] 3 HRS
 [Thin line] 1/2 HRS

FIRE AREA DESIGNATION
 [Box] 2FA-AB-100A
 [Box] IFA-AB-100A

* ELEVATOR DOOR IS RATED FOR 1 1/2 HRS.

GENERIC EXEMPTION REQUEST

1. A generic exemption is requested from the requirements of 10CFR50 Appendix R Section III.G.2a for the use of 1-1/2 hour rated doors and dampers, 1 hour rated ventilation ducts and ventilation duct penetration seals and non-rated equipment hatches in 3 hour barriers.

This Generic Exemption Request addresses all 1-1/2 hour rated fire doors and dampers, 1 hour rated ventilation ducts and duct penetration seals and non-rated hatches in the station. Specific exemption requests for individual items are not addressed in each fire area.

The technical justification for this exemption request is as follows:

1. In several locations throughout the station, 1-1/2 hour rated fire doors and dampers are used in 3 hour barriers to separate fire areas. The attached plan drawings show the location of fire doors in the Auxiliary Building. The fire hazards analysis performed at Salem demonstrated that a potential fire in any fire area would have a duration of less than one hour. This exemption request was previously granted by the Staff in a letter dated September 16, 1982.

As a result of the most recent fire hazard analysis revision we have identified six fire areas that have fire loadings that equal or exceed 1 hour. These areas are as follows:

FIRE AREA	LOCATION	FIRE LOAD
1FA-AB-100A	Relay Room El. 100	3 hrs. 58 min.
12FA-AB-100A	El. 100 Corridor Btwn Col. A-A & West of Col. F-F	2 hrs. 43 min.
1FA-EP-78C	Lower Elect. Pen. El. 78	2 hrs. 58 min.
1FA-DG-84D	No. 11 Diesel F.O. Tank Rm.	16 hrs. 13 min.
1FA-DC-84E	No. 12 Diesel F.O. Tank Rm.	16 hrs. 13 min.
1FA-AB-64C	Security Battery Rm. El. 64	2 hrs. 8 min.

The Branch Technical Position 9.5-1 requires that; "Floors, walls and ceilings enclosing separate fire areas should have minimum fire rating of 3 hours. Penetrations in these fire

barriers, including conduits and piping should be sealed or closed to provide a fire resistance rating at least equal to that of the barrier itself."

"If Barrier fire resistance cannot be made adequate, fire detection and suppression should be provided, such as:

- (i) Water curtain in case of fire
- (ii) Flame retardant coatings
- (iii) Additional fire barriers."

In an effort to comply with these requirements we propose to:

- a. Change the doors in walls bounding these areas to 3 hour fire resistance rating, commensurate with safety and security requirements. Where it is not possible to qualify a door because of its size, a certificate of compliance to three hour design will be required of the manufacturer.
- b. In fire area 1FA-AB-100A (Relay Room) there is area wide detection and automatic suppression with Halon 1301. The fire dampers in the ventilation system are fire rated at 1-1/2 hours*. We propose no further modifications to this area.
- c. In fire area 12-FA-AB-100A (El. 100 corridor), the doors bounding this fire area will be changed to 3 hour fire rating and area wide detection will be installed. This area is heavily traveled as it is the main access way into the Radiologically Controlled Areas of the Auxiliary Building. Two hose stations are present in this area. We propose no further modifications to this area.
- d. In fire area 1-FA-EP-78C (Lower Elect. Pen.), 1-1/2 hour rated fire door will be replaced with a 3 hour fire rated door. Automatic detection exists, and the manually discharged CO₂ system will be changed to automatic Halon 1301. The fire dampers in the ventilation system are fire rated for 1-1/2 hours*. We propose no further changes for this area.
- e. In fire areas 1-FA-DG-84D and 1-FA-DG-84E (Diesel Fuel Oil Tank Rooms), the areas are protected with automatic detection and two suppression systems. The door to each fire area is a 3 hour rated door and the fire dampers are rated at 1-1/2 hours*. We propose no further changes in these areas.
- f. In fire area 1-FA-AB-64C (Security System Battery Room), the 1-1/2 hour fire rated door will be replaced with a 3 hour rated door. In addition, a new opening will be made in the wall to provide makeup air. This opening will be protected with a 3 hour fire rated damper. Automatic detection and suppression will also be added.

2. Equipment hatches are located at the west end of the Auxiliary Building on Elevations 84', 100' and 122'. Equipment hatches are also located at the east end of the Auxiliary Building on Elevation 64', in the Electrical Penetration Area on Elevation 78', in the Mechanical Penetration Area on Elevation 78' and on Elevation 84' outside the 460V/230V Switchgear Room. Only the hatch at the west end of the Auxiliary Building on Elevation 84' has redundant equipment on both sides of the hatch. A water curtain system or a 3 hour rated coating will be installed to prevent the spread of fire from one elevation to another via this hatch. Equipment hatches are also located on Elevation 55' and 45' are included in the same fire area, no credit is taken for these hatches being a rated fire barrier. The hatches are constructed of 3/8" steel plate.
3. The stairway walls are 3 hour rated. All stairway doors are rated for 1-1/2 hours. Ventilation ducts in the stairways will be provided with a fire damper that is rated for 3 hours. The ventilation duct penetrations will be sealed to provide a minimum of a one hour fire rating. All pipe penetrations in the stairway walls will be sealed to provide a 3 hour barrier.

Except for the areas described above the fire loadings in plant fire areas do not exceed one hour. Fire doors in these areas are 1-1/2 hour rated doors. Therefore, we request that the Generic Exemption for the use of 1-1/2 doors in 3 hour barriers be granted subject to the exceptions described above.

4. The elevator at the west end of the Auxiliary Building is separated from all of the fire areas by a 3 hour rated wall, a 1-1/2 hour rated external elevator door and a 1-1/2 hour rated vestibule door. As such, it is not considered part of the fire area. There is also an elevator at the east end of the Auxiliary Building. The concrete elevator enclosure is rated for 3 hours. The external elevator door is rated for 1-1/2 hours. Since the elevator shafts are isolated from all fire areas by 3 hour rated walls with 1-1/2 hour rated doors, the elevator shafts cannot be a medium to spread a fire between fire areas.
5. Ventilation duct penetrations through 3 hour rated fire walls which define fire areas will be sealed to provide a 1 hour rating. Where physically possible 1-1/2 hour rated fire dampers* have been installed in the ducts. There are limited cases where it is physically impossible to install a fire damper in the duct.

The National Fire Protection Association (NFPA) Code 90A-1981 "Standard for the Installation of Air Conditioning and Ventilating Systems" states that "Approved fire dampers shall be provided where ducts or grills penetrate partitions required to have a fire resistance rating of 2 hours or more." The text refers to a figure that shows fire dampers are not required in ducts that penetrate 1 hour rated walls, only walls rated for 2 or more hours require a fire damper.

An article was written in "The Construction Specifier" April 1984 by Richard G. Gewain entitled "Fire Research for Steel HVAC Systems." Reference is made to the Thermal Insulation Manufacturers Association (TIMA) fire tests performed at Underwriters Laboratories in December 1982. Mr. Gewain's conclusions deduced from these tests were, "Steel ducts...remained intact on both sides (the fire exposed and unexposed sides) of the wall. By maintaining its structural integrity in the one-hour rated partition opening, the steel duct acted as a fire stop against the passage of flames and hot gases for one hour-with or without fire dampers. Steel ducts without a fire damper provide the same fire protection as Underwriters Laboratories listed fire dampers, fire doors and wired glass fire windows - to restrict the passage of hot gases and flames." This provides additional evidence for NFPA 90A to maintain its provision that no fire dampers are required where steel ducts penetrate walls having a one hour fire resistance rating.

In light of the TIMA fire studies and the NFPA codes, PSE&G recognizes the ductwork to provide a one hour fire barrier throughout the Salem Station.

- * The dampers provided at Salem Generating Station are of a design found by experience to be more reliable than other 3 hour designs available in that they close without distortion against a full head of air flowing in the system. At the time of their installation (1979-80) they were the only seismically qualified fire dampers available.

The manufacturer of the current dampers (PREFCO) has informed us that the same design of damper, Model 5010, has passed a 3 hour fire test and now is rated as a 3 hour damper rated for use in the vertical position in ducts not exceeding 30 inches by 30 inches in dimensions. It is this design and model of damper that is used as the 1-1/2 hour rated seismically qualified dampers in the ventilation system. The manufacturer also has informed us of its plans to test all configurations of their 1-1/2 hour classified dampers to the 3 hour criteria.

FIRE AREA 1FA-AB-64A

Additional review of the tray wrap and barrier configuration in this fire area has revealed that the Train B switchgear and associated cabling is protected similar to the Train A switchgear and cabling. Minimal additional tray wrap would be required to elevate the level of protection for Train B to that which was noted for Train A in our January 1986, exemption request letter. Therefore, it is our intent to provide the same level of protection for Train B in this fire area as was discussed for Train A in the January 1986, exemption request letter.

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FIRE AREA 1FA-AB-64B

In addition to the present and committed-to fire protection features for this fire area, PSE&G is currently planning to protect the cabling for an additional Service Water pump with a complete one hour fire barrier.

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