



Carolina Power & Light Company

APR 15 1982



Office of Nuclear Reactor Regulation
ATTN: Mr. Harold R. Denton, Director
United States Nuclear Regulatory Commission
Washington, D.C. 20555

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 AND 50-324
LICENSE NOS. DPR-71 AND DPR-62
SUPPLEMENTAL TECHNICAL JUSTIFICATION FOR EXEMPTION
TO 10CFR PART 50, APPENDIX R

Dear Mr. Denton:

By petition dated March 6, 1981, Carolina Power & Light Company (CP&L) requested exemption for its Brunswick Steam Electric Plant (BSEP) from certain procedural and substantive requirements of the Nuclear Regulatory Commission's fire protection rule, 10CFR § 50.48 and Appendix R to 10CFR Part 50.

Your letter of November 10, 1981 granted exemption to the requirement for a fixed fire suppression system in the BSEP control room. However, you stated the Staff would be considering separately our exemption request to the last paragraph of Section III.G.3 to 10CFR Part 50, Appendix R. In part, this paragraph requires installation of fixed fire suppression systems in the cable spreading rooms.

To assist the Staff's continuing review on this exemption request, we are enclosing technical justification supplemental to that provided to the Staff in our petition of March 6, 1981.

Should you have any questions, please contact our staff.

Yours very truly,

E. E. Utley
Executive Vice President
Power Supply and
Engineering & Construction

MSG/lr (4655)
Enclosure

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SUPPLEMENTAL TECHNICAL JUSTIFICATION
FOR EXEMPTION TO
10CFR PART 50, APPENDIX R, SECTION III.G.3

SUMMARY

Carolina Power & Light Company's (CP&L) Brunswick Steam Electric Plant, Unit Nos. 1 and 2, (BSEP) possesses fire protection safety features which either meet or exceed the specific requirements of Sections III.G.1 and III.G.2 of Appendix R to 10CFR Part 50. BSEP can achieve hot and/or cold shutdown independently of the cable spreading room and meets the fire barrier separation criteria of Section III.G.2(a). Indeed, although it is not required to do so, BSEP also meets the requirements of the first paragraph of Section III.G.3 in that alternative shutdown has been provided. Under these circumstances, the installation of a fixed automatic fire suppression system in the cable spreading room would not enhance overall fire protection safety at BSEP and could be potentially detrimental to facility safety. For these reasons, the exemption from the last paragraph of Section III.G.3 as requested in CP&L's petition of March 6, 1981 should be granted. The installation of an automatic fire suppression system would require extensive manpower resources to analyze, design, procure, and install a system that would provide the desired results without adversely impacting the safe shutdown equipment. The installation of a fixed automatic fire suppression system could also divert CP&L and NRC efforts from ongoing TMI-related modifications while not adding to the protection of the health and safety of the public. Set forth below is additional technical justification which demonstrates that the existing cable spreading configuration provides protection of the public health and safety equivalent to that which would be provided by meeting the specific requirements of the last paragraph of Section III.G.3.

APPENDIX R, 10CFR PART 50, SECTION III.G.1 REQUIREMENT

- I. Appendix R, 10CFR Part 50, Section III.G.1, states, "Fire protection features shall be provided for structures, systems and components important to safe shutdown. These features shall be capable of limiting fire damage so that:
 - a. one train of systems necessary to achieve and maintain hot shutdown conditions from either (emphasis added) the control room or emergency control station(s) is free of fire damage; and
 - b. systems necessary to achieve and maintain cold shutdown from either (emphasis added) the control room or emergency control station(s) can be repaired within 72 hours."

II. BSEP Demonstrated Compliance with Section III.G.1

BSEP has a remote shutdown system consisting of several emergency control stations including a Remote Shutdown Panel and requisite systems (e.g. control and power circuits, power sources, instrumentation, pumps and heat exchangers) to achieve and maintain hot and/or cold shutdown conditions independent of the cable spreading room. In addition, the emergency control stations are separated from the cable spreading room by at least one three-hour fire barrier. In the unlikely event of a fire in the cable spreading room, hot and/or cold shutdown controls can be transferred to the emergency control stations independent of the cable spreading room.

With respect to the aforementioned conditions, BSEP meets Appendix R, 10CFR Part 50, Section III.G.1 for the cable spreading room.

III. APPENDIX R, 10 CFR PART 50, SECTION III.G.2 REQUIREMENT

Appendix R, 10CFR Part 50, Section III.G.2 states, in part, except as provided for in paragraph G.3 where cables or equipment, including associated non-safety circuits that could prevent operation or cause maloperation due to hot shorts, open circuits, or shorts to ground, of redundant trains of systems necessary to achieve and maintain hot shutdown conditions are located within the same fire area outside of primary containment, one of the following means of ensuring that one of the redundant trains is free of fire damage shall be provided:

- a. separation of cables and equipment and associated non-safety circuits of redundant trains by a fire barrier having a 3-hour rating.

IV. BSEP Demonstrated Compliance with Section III.G.2

The BSEP cable spreading room does contain cables of redundant trains of safe shutdown equipment. However, as stated in paragraph II, above, hot and/or cold shutdown can be achieved independently of the cable spreading room, and therefore, these cables are not necessary to achieve and maintain hot shutdown conditions. The independent emergency control stations can achieve safe shutdown and meet the fire barrier separation criteria of Section III.G.2(a).

V. APPENDIX R, 10CFR PART 50, SECTION III.G.3 REQUIREMENT

Appendix R, 10CFR Part 50, Section III.G.3 states, "Alternative or dedicated shutdown capability and its associated circuits², independent of cables, systems or components in the area, room or zone under consideration, shall be provided:

- a. Where the protection of systems whose function is required for hot shutdown does not satisfy the requirements of paragraph G.2 of this section; or
- b. Where redundant trains of systems required for hot shutdown located in the same fire area may be subject to damage from fire suppression activities or from the rupture or inadvertent operation of fire suppression systems.

In addition, fire detection and a fixed fire suppression system shall be installed in the area, room, or zone under consideration."

VI. BSEP Demonstrated Compliance with the first paragraph of Section III.G.3

CP&L, by virtue of this submittal, has demonstrated compliance with Appendix R, 10CFR Part 50, Sections III.G.1 and III.G.2. It is not necessary, therefore, to demonstrate compliance with the first paragraph of Section III.G.3. CP&L does, however, meet the requirements of the first paragraph of Section III.G.3 in that an alternative shutdown system has been provided. Under these circumstances, the installation of a fixed automatic fire suppression system in the cable spreading room would not enhance overall fire protection safety at BSEP and could be potentially detrimental to facility safety. For these reasons, the exemption from the last paragraph of Section III.G.3 as requested in CP&L's petition of March 6, 1981 should be granted. Set forth below is additional technical justification which demonstrates that the existing cable spreading configuration provides protection of the public health and safety equivalent to that which would be provided by meeting the specific requirements of the last paragraph of Section III.G.3.

²Alternative shutdown capability is provided by rerouting, relocating or modifying of existing systems; dedicated shutdown capability is provided by installing new structures and systems for the function of post-fire shutdown.

VII. BSEP Demonstrated Equivalence of Protection

All cabling in the cable spreading room has an insulation system that is self-extinguishing, non-propagating and meets or exceeds the requirements of IEEE-383. In addition, all cabling in the cable spreading room has been coated with a flame retardant coating. The flame retardant coating and insulation system of the cabling will significantly reduce the probability of ignition and will retard the spread of fire and reduce the heat release rate in the unlikely event that a fire should occur.

Major equipment in the cable spreading room includes two MCCs, two 480-volt unit substations and a tracking rectifier. Administrative controls, including restricted personnel access and weekly inspections, are used to control personnel traffic and the introduction of combustibles and ignition sources to the cable spreading room.

Personnel access to the area is controlled by the security computer system. Only personnel who have received a security clearance and have satisfactorily completed the BSEP general training program are allowed access without escort. Control of combustibles is discussed later.

a. Cable Spreading Room Arrangement

The cable spreading room is configured as shown in Figure 1. In area A of the cable spreading room, the Division I and Division II cable trays are parallel with eighteen feet of horizontal separation. The only intervening combustibles are the cables in three stacks of non-divisionalized cable trays. The minimum separation distance between any of these trays is three and one half feet horizontal. The bottom tray in each of these tray stacks is at least sixteen feet above the floor. In three locations a stack of non-divisionalized cable trays passes under divisionalized trays at a 90 degree angle. These stacks are located so that the top tray is two feet four inches below the lowest of the other trays and the bottom tray of each stack is over nine feet above the floor level. This area is accessed by plant personnel for only one of two reasons: to pass between the Radwaste Building and the Control Room or Turbine Building and to perform maintenance or modification work. The maintenance work consists of electrical equipment maintenance (e.g., cleaning switchgear, lubricating two sump pump motors utilizing grease) and occasional painting of the non-galvanized metal surfaces (e.g., doors). In neither case are large quantities of flammable or combustible liquids utilized in this area, nor are flammables or combustibles transported through the area since the two adjacent areas are directly accessible from outside. The quantity of flammable liquid utilized in the painting evolutions is insufficient to affect both divisions, assuming that the liquid was spilled and ignited. The modification work encountered in this area consists almost exclusively of cable pulling and wiring changes. The fixed combustibles in this area consist primarily of electrical cable jackets with a small loading of electrical equipment components.

In area B (the area above the battery room ceiling) the separation of the two sets of divisionalized trays is more congested with a number of trays of opposite division crossing each other. Separation at crossings is maintained at a minimum of eighteen inches vertical separation. In such cases, the bottom of the crossing tray and the top of the crossed tray are fitted with metal coverings for a distance of at least five feet on each side of the intersection. This more congested area is located fifteen feet above the cable spreading room floor and is accessible only through the use of portable ladders. Thus, the only personnel accessing this area do so for accomplishing specific tasks such as cable pulling during modification work and the routine inspection of the area's fire barrier penetration seals. None of the work performed in this area involves the usage of flammable or combustible liquids or the introduction of any combustible other than electrical cables and the ropes used in pulling it. The only fixed combustibles located in this area are the jackets of the cable.

The location, spacing, and height of the installed cable trays are such that for anticipated transient fire loads, the development of a fire which would endanger both safety divisions is highly remote.

b. Work Control

All work performed in the cable spreading room is controlled in a number of ways. The performance of any work must be approved by the duty shift foreman (SRO licensed). All welding, cutting, grinding and similar heat-generating work is controlled by a permit system administered by inspectors trained by the plant fire protection engineer. All cable spreading room plant modification packages also receive a fire hazard review performed by the plant fire protection engineer. Administrative procedures limit the usage of combustible materials and control ignition sources. The effectiveness of these controls and compliance with their provisions are verified on a routine and continuing basis through a system of inspections and reviews.

In the unlikely event a fire should occur, the following manual fire suppression systems are available in the cable spreading room:

- two CO₂ hose reels and,
- hand- and wheel- type fire extinguishers.

In addition, the following fire protection equipment and administrative procedures are provided:

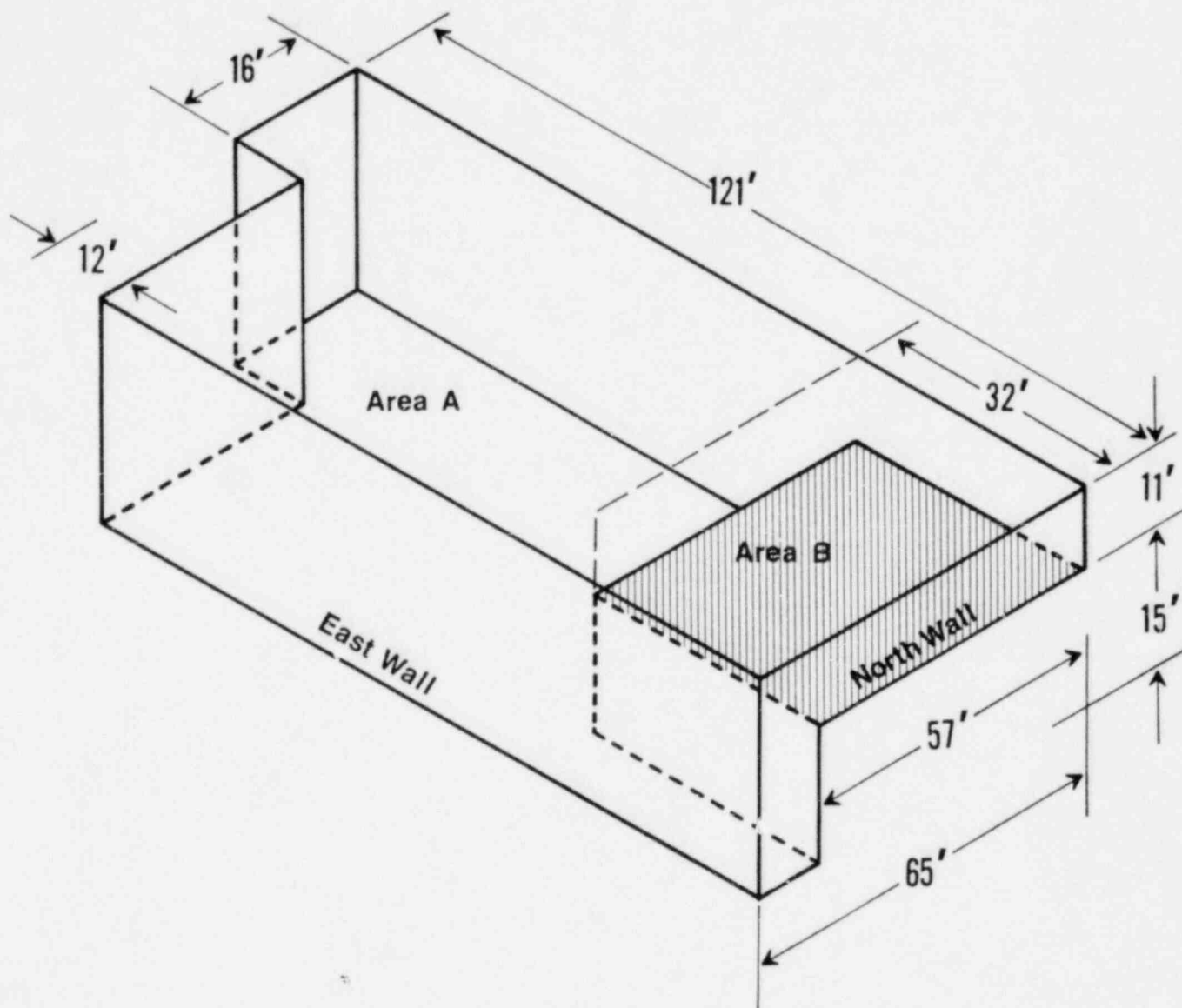
- a manual hose station located at two entrances to the cable spreading room (stairwell and Radwaste Building entrance).

- an automatic fire detection system is installed throughout the cable spreading room. This installation utilizes highly sensitive ionization detectors throughout. The detection circuitry is electrically supervised with all alarm and/or trouble indications being audibly and visually annunciated in the BSEP control room.
- emergency control stations, independent from the cable spreading rooms, will allow the plant to achieve and maintain hot and/or cold shutdown conditions (see paragraph II). Procedures have been established to transfer required controls to the emergency control station in the event of fire to the cable spreading room and attendant loss of normal control.
- the fire brigade with available equipment is capable of extinguishing any credible fire.

VIII. Summary of Justification for Exemption from Appendix R, 10CFR Part 50, Section III.G.3

CP&L has demonstrated compliance with Sections III.G.1, III.G.2 and the first paragraph of III.G.3 of Appendix R to 10CFR Part 50. BSEP can achieve hot and/or cold shutdown independently of the cable spreading room and meets the fire barrier separation criteria of Section III.G.2(a). These facts plus the configurations and controls described in paragraph VII demonstrate protection of the public health and safety equivalent to that which would be provided if the specific requirements of the last paragraph of Section III.G.3 were met. Under these circumstances, the installation of an automatic fire suppression system will not enhance fire protection safety at BSEP. The installation of an automatic fire suppression system with the necessary seismic supports in the cable spreading room would require extensive manpower to analyze, design, procure, and install a system that will provide the desired results without adversely impacting the safe shutdown equipment. The installation of an automatic fire suppression system in the cable spreading room and the resulting drain of manpower resources on CP&L and its contractors could seriously impact on-going modification efforts such as TMI-related modifications, implementation of IE Bulletin 79-01B and off-gas and torus modifications. Installation of an automatic fire suppression system could, therefore, be potentially detrimental to facility safety.

In conclusion, it is emphasized that the addition of an automatic fixed fire suppression system in the cable spreading room will not add to the public health and safety since the equipment and cabling in the cable spreading room is not necessary to achieve and maintain a hot and/or cold shutdown condition.



NOTE:

Unit 1 Cable Spread Room is a mirror image of Unit 2, if the mirror is located in the plane of the north wall.

**Brunswick Steam Electric Plant
Unit 2**

Cable Spread Room

Figure 1