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 RECIP. NAME: HENDRIE, J. M. RECIPIENT AFFILIATION: Commissioners

SUBJECT: Requests exemption from requirements of 10CFR50.48 & App R to 10CFR50, including installations of fire suppression sys in control room & lube oil collection sys. Imposition of 50.48C schedules will create risk of safety degradation.

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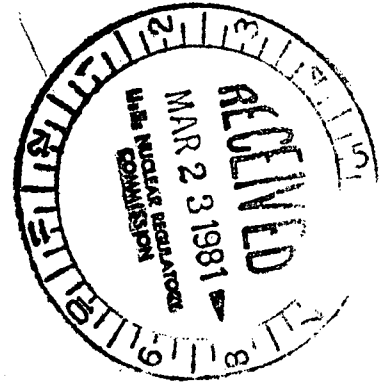


Carolina Power & Light Company
March 11, 1981

File: NG-3514(R)

Serial: NO-81-448

Honorable Joseph M. Hendrie
Acting Chairman
United States Nuclear Regulatory Commission
Washington, D. C. 20555



H. B. ROBINSON STEAM ELECTRIC PLANT
UNIT NO. 2
DOCKET NO. 50-261
LICENSE NO. DPR-23
PETITION OF CAROLINA POWER & LIGHT COMPANY
FOR EXEMPTIONS FROM CERTAIN REQUIREMENTS OF
10 CFR §50.48 AND APPENDIX R TO 10 CFR PART 50

Dear Mr. Hendrie:

Pursuant to 10 CFR §50.12(a) and §50.48(c), Carolina Power & Light Company ("CP&L" or "the Company") hereby petitions the Nuclear Regulatory Commission ("NRC" or "the Commission") for exemption from certain of the requirements of 10 CFR §50.48 and Appendix R to 10 CFR Part 50 (sometimes referred to collectively herein as the fire protection rule) with respect to the H. B. Robinson Steam Electric Plant Unit No. 2 ("Robinson"). The specific provisions of 10 CFR §50.48 from which exemption is sought are set out in Part I below. Technical and other support for the relief requested in Part I is provided in Parts II and III.

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I. SPECIFIC RELIEF REQUESTED¹A. Primary Relief Requested

With respect to the requirements of Section III.G, III.L, and III.M of Appendix R:

(1) CP&L requests exemptions from the requirements of §50.48(c) in the following respects:

(a) Extend from March 19, 1981 to July 1, 1981 the date for:

(i) Submittal of plans and schedules for any modifications necessary to achieve compliance with Section III.G.2 of Appendix R and design descriptions of alternative or dedicated shutdown systems to comply with Sections III.G.3 and III.L, if such are necessary;

¹ CP&L intends to meet the remaining requirements of §50.48 and Appendix R in accordance with the schedules established in §50.48(c).

By seeking the particular relief requested in this petition and in presenting technical and legal justifications for such relief, CP&L is not abandoning or waiving any of its claims or rights asserted in or arising out of the action pending in the Court of Appeals for the District of Columbia Circuit in Connecticut Light and Power Company, et al v. NRC, No. 81-1050. Any commitments made by CP&L in the instant petition are made conditionally, subject to a determination by the Court as to the validity of the provisions of the fire protection rule which are being challenged in that litigation.

- (ii) Filing requests for additional exemptions from Sections III.G and III.L pursuant to §§50.12(a) and 50.48(c)(6)².
- (b) Extend from February 17, 1981 to July 1, 1981 the date from which the installation schedules established in §50.48(c)(2) and (3) are calculated, with leave to request an additional extension of time on or before July 1, 1981 if such additional extension is found to be necessary.
- (2) CP&L requests an exemption from the last paragraph of Section III.G.3 of Appendix R to the extent that it requires the installation of a fire suppression system in the control room.
- (3) CP&L requests an exemption from Section III.L.3 of Appendix R to the extent that it appears to require that a cold shutdown condition (i) be achieved within 72 hours, and (ii) be achieved without the availability of offsite power³.

²In the event that CP&L's request for exemption from Section III.M of Appendix R set forth in Part IA(1)(4) below is not granted, CP&L's requests for relief contained in this Part IA(1)(a)(i) and (ii) apply also with respect to Section III.M.

³CP&L will meet the provision of Section III.G of Appendix R which requires that systems necessary to achieve and maintain cold shutdown from either the control room or emergency control stations be capable of being repaired within 72 hours.

- (4) CP&L requests an exemption from Section III.M.2 of Appendix R to the extent that it would require that the difference between the temperature levels for the unexposed side of the cable penetration seals and the cable insulation ignition temperature for PVC be greater than that which was recorded during qualification testing.
- (5) CP&L renews its request for an exemption from Section III.0 of Appendix R as set forth in its letter to Mr. Steven A. Varga, Chief, Operating Reactors Branch No. 1, NRC, dated January 19, 1981, and incorporates by reference the January 19, 1981 letter as well as the Company's letter to Richard H. Vollmer, Director, Division of Engineering, Office of Nuclear Reactor Regulation, NRC, dated November 26, 1980. CP&L requested an exemption from the provision of Section III.0 of Appendix R which requires the installation of a lube oil collection system.

B. Alternative Relief

In the alternative, CP&L requests an exemption from all provisions of Section III.G, III.L, and III.M of Appendix R, except to the extent that current plant configurations and procedures comply with those sections.

II. TECHNICAL AND LEGAL JUSTIFICATIONS FOR RELIEF REQUESTED

A. Background

On November 19, 1980 the Commission promulgated the final fire protection rule, the effective date of which is February 17, 1981. With the exception of the three backfit requirements set forth in Sections III.G, III.J and III.O of Appendix R, §50.48(b) provides, in the pertinent part, that Appendix R is inapplicable to a facility licensed prior to January 1, 1979

. . . to the extent that fire protection features proposed or implemented by the licensee have been accepted by the NRC staff as satisfying the provisions of Appendix A to Branch Technical Position BTP APCSB 9.5-1 reflected in staff fire protection safety evaluation reports issued prior to the effective date of this rule . . .

At Robinson, CP&L has satisfied and has received a Safety Evaluation Report ("SER") for all of the provisions of Appendix A to BTP 9.5-1 with the exception of those relating to (a) the lube oil shielding system; (b) electrical cable penetrations; and (c) auxiliary shutdown system⁴. In response to Appendix A to BTP 9.5-1, the Company has completed a detailed fire hazard analysis. Fire zones were established and combustible loads analyzed within these zones. Fire barriers and fire suppression equipment have been added in selected areas, as required, and existing cables serving redundant hot shutdown equipment have

⁴The staff issued the SER for Robinson and supplements thereto on February 28, 1978, September 5, 1979 and December 8, 1980.

been rerouted to avoid common fire zones. Additional control stations have been added outside the control room. Additional Primary Plant Instrument (PPI) readouts were included on these panels. Local controls were provided on a switchgear mimic bus control panel for all circuit breakers which are required for supply of power to hot shutdown related switchgear. These modifications provide the capability to achieve hot standby status from outside the control room with a postulated fire in any fire zone including the control room, the cable spread room, the emergency switchgear room and the battery room. A Dedicated Shutdown Bus has been installed for use in the event of a loss of offsite power concurrent with the postulated fire. The bus is powered by a new, dedicated 2450 KW diesel generator and can be fed from the dedicated diesel or from the existing 480 V distribution system. In making these improvements, CP&L has spent approximately \$12 million, 45,500 engineering manhours and in excess of 200,000 direct construction labor manhours.

B. Description of Undertaking by CP&L Necessary to Ascertain Compliance with Sections III.G and III.L of Appendix R and to Prepare Plans and Schedules, Design Descriptions and Technical Justifications for Exemptions

Section III.G of Appendix R entitled "Fire Protection of Safe Shutdown Capability" requires that fire damage be limited so that one train of systems necessary to achieve and maintain hot shutdown conditions is free of fire damage, and it provides

four alternatives for meeting that requirement. In addition, Section III.G requires that systems necessary to achieve and maintain cold shutdown be capable of being repaired within seventy-two(72) hours.

Section III.L appears to require an alternative or dedicated shutdown system capable of achieving and maintaining cold shutdown conditions within 72 hours with and without the availability of offsite power⁵.

According to the schedule established in §50.48(c), CP&L would be required to complete by March 19, 1981 all of its analyses of Robinson systems to determine to what extent its previously completed and approved fire protection modifications meet the requirements of Sections III.G and III.L; to develop technical justifications to support requests for such exemptions from Sections III.G and III.L as CP&L believes to be warranted following the analyses⁶; to determine whether any modifications will be necessary to achieve compliance with Sections III.G and III.L; to develop all plans and schedules for any modifications

⁵It should be noted, however, that in a meeting between the NRC staff and CP&L held on February 19, 1981, the staff advised CP&L that it was not the Commission's intention to require anything in Section III.L beyond what is required by Section III.G.

⁶In the February 19, 1981 meeting with CP&L, the NRC technical staff indicated that exemptions should be available for many plant areas based upon the recent and extensive SER review.

During the first phase of its program, CP&L, through an architect-engineer, must perform a review of all areas which potentially do not satisfy the criteria of Sections III.G and III.L. An engineer cognizant in both nuclear and fire safety disciplines will evaluate the effects of fires involving transient and in situ combustibles on safe shutdown ability. When conditions dictate, CP&L must determine the feasibility of installing barriers and/or suppression systems in the area. In

[Footnote continued from previous page]

Any circuits that have enclosures (e.g., raceway panel or junction box) in common with alternative or dedicated shutdown system cables when the dedicated or alternative shutdown system cables are not protected from electrical failure in the circuits of concern by coordinated circuit breakers or similar devices.

In a letter dated February 20, 1981, to all power reactor licensees with plants licensed prior to January 1, 1979 from Darrell G. Eisenhut, Director, Division of Licensing, Office of Nuclear Regulation, NRC, the term "associated circuits" is defined in substantially identical terms.

Second, the Staff has indicated that a "fire area" as that term is used in Appendix R means that portion of a building or plant that is separated from other areas by rated boundary barriers which may include fire doors, fire dampers, penetration seals or closures and fireproofed support members all having a fire resistance rating equal to that required of the fire barriers.

At the February 19, 1981 meeting, the staff agreed with CP&L that, assuming the definition of "fire area" set forth above, the following principles are applicable:

In conducting the fire hazard analysis, a fire area may be sub-divided into one or more "fire zones" for purposes of hazard identification. (A "fire zone" is considered to be the zone of influence of the maximum credible fire.) Based upon this evaluation, protection will be designed to protect against the hazard in the zone. If a fixed type of suppression system is required, it will be provided for the "fire zone" only.

necessary to satisfy Section III.G.2 and to prepare and submit design descriptions for an alternative or dedicated shutdown system to satisfy Sections III.G.3 and III.L, if such a system is necessary.

It is essential to understand the complexity of the tasks at hand which CP&L has already initiated and which will require substantial human and financial resources. Specifically, CP&L estimates that it will require until July 1, 1981 to meet its obligations for submittal to the Commission of plans and schedules for any modifications necessary to meet the requirements of Section III.G.2 and of technical justification for any additional exemptions from Sections III.G and III.L. CP&L estimates that it will also require until July 1, 1981 to prepare design descriptions of any necessary alternative or dedicated shutdown systems necessary to meet Sections III.G.3 and III.L⁷.

⁷The program of analysis and design described below has been formulated upon certain key assumptions which CP&L believes to be correct based upon interpretations of Appendix R which the NRC staff has communicated to CP&L. First, at the meeting between the staff and CP&L on February 19, 1981, the staff advised CP&L that, as used in Sections III.G.2, III.G.3 and III.L of Appendix R, "associated circuits" are:

Any circuits that have a power source in common with the alternative or dedicated shutdown equipment when the power source to the alternative or dedicated shutdown equipment is not protected from electrical failure in the circuits of concern by coordinated circuit breakers, fuses, or similar devices.

Any circuits that are connected to circuits of equipment which would adversely affect shutdown capability (e.g., RHR/RCS Isolation Valves) if the equipment were to operate in a spurious or uncontrolled manner.

order to prepare a conceptual design of any modifications necessary to correct deficiencies or to justify an exemption from the requirements of Sections III.G and III.L, it will be necessary for CP&L to evaluate the numerous possible effects upon other safety related systems or equipment. CP&L must assure itself that none of those potential impacts will be adverse.

It must be considered that the designing and installation of fire protection features in an operating plant present problems and considerations not encountered when such features are incorporated in the initial design stages of a plant. Chief among these problems and considerations are the existing conditions and installations in the plant.

For example, before an automatic suppression system can be designed and installed, it is necessary to determine whether there will be interferences such as ventilation ducts and pipes between the system discharge devices and the hazard against which protection is being sought. Often this cannot be determined from blueprints but, rather, requires onsite inspection by the designer. The presence of interferences may require a change in the design which will, in turn, have a direct impact upon the hydraulics and proper operation of the systems.

Other concerns when considering such a system are the protection of safety-related equipment from inadvertant operation

or pipe rupture; the adequacy of floor drains; any impact upon the radioactive waste processing system, and whether the design, construction, preventive maintenance and corrective maintenance of the suppression system will create unacceptable exposure to radiation of personnel under ALARA principles.

The consideration of all of these factors when designing and installing such a system in an operating plant requires substantially more time than is required during a plant's initial design stages.

When considering the feasibility of installing barriers and in designing such modifications, it is necessary to consider issues such as impact of a barrier on ventilation; to ensure accessibility to equipment for purposes of operation and for performing maintenance; to ensure that the barrier will not have an adverse impact on safety-related equipment during abnormal conditions such as a seismic event; and to consider the impact of a barrier on cable ampacity ratings.

Before recommending the rerouting of cables, CP&L must ensure that the cable will be separated from safety-related and safe shutdown equipment; consider voltage drop; ensure proper sealing of barrier penetrations; consider the core bore impacts upon structures; ensure that cable tray and conduit loading limitations are not exceeded; and determine whether rerouting will require a breach of secondary containment and, therefore, a plant outage.

In the second phase of the program, it will be necessary to identify all equipment which could impair safe shutdown were it to operate in a spurious or uncontrolled manner, and to ensure that redundant systems or equipment are available to prevent or mitigate such events. Having completed such analyses, CP&L will prepare conceptual designs of modifications it deems appropriate to correct any identified deficiencies.

In the third phase of the program CP&L will review the existing coordination study to assure that all circuits are properly protected by coordinated fuses and circuit breakers.

CP&L has just learned that the staff has recently specified the information that it will require in evaluating design descriptions of alternative and dedicated shutdown equipment⁸. It will now be necessary for CP&L to analyze these information requests and to consider each of them when performing its analyses.

After these studies have been completed, CP&L must prepare and submit to the Commission its plans and schedules for any modifications necessary to satisfy Section III.G.2, its technical justifications for any exemptions from Sections III.G and III.L which are warranted and the design descriptions of any alternative or dedicated shutdown systems which may be necessary to satisfy Sections III.G.3 and III.L.

⁸The information sought is described in Enclosures 1 and 2 of the February 20, 1981 letter to licensees from Mr. Eisenhut.

CP&L estimates that it will require 3500 manhours to complete all of the work above described.

CP&L wishes to point out that in addition to this work, CP&L personnel are also engaged concurrently in a number of other projects which have been required by the Commission and which require substantial commitments of resources. These activities include environmental qualification of electrical equipment, emergency planning and TMI-related modifications.

As an example of the demands which are being imposed upon CP&L's resources simultaneously with the demands of the fire protection rule, CP&L has expended 16,000 manhours in 1980 on work related to emergency planning and expects to require an additional 16,000 manhours for such work in 1981. During the first several months of 1981, CP&L must work at an intensive pace in order to prepare for its emergency exercise at Robinson and to ensure implementation of the revised emergency plans at both CP&L nuclear plants by April 1, 1981. Thus, some of the most critical months for performance of its responsibilities concerning emergency planning are the very months when CP&L would be required to prepare its plans and schedules, technical justification for exemptions, and design descriptions under the current schedule of the fire protection rule.

In addition, with respect to its obligations to respond to IE Bulletin 79-01B regarding environmental qualification of electrical equipment, CP&L and its consultants have expended

approximately 21,500 manhours at CP&L's Brunswick plant as of January 1, 1981. CP&L estimates that it and its consultants will incur future expenditures of 151,500 manhours and \$5.7 million at Brunswick before this work has been completed. At Robinson, CP&L has spent approximately 4500 manhours as of January 1, 1981 and expects to spend an additional 2000 manhours for such work during 1981. CP&L estimates that it will spend in excess of \$1,000,000 at Robinson in satisfying Commission requirements concerning this issue.

CP&L has also devoted substantial resources to fulfill its obligation to make TMI-related modifications. CP&L spent \$4.3 million at the H. B. Robinson Plant in 1980 and expects to spend \$4.6 million there in 1981. Through 1980, CP&L has spent \$4.6 million and expects to spend \$9.5 million in 1981 at the Brunswick plant. In addition, CP&L's 1982 budget includes \$17 million for TMI-related work for both plants. Efforts to resolve the TMI issues will require substantial amounts of manpower at the Brunswick and H. B. Robinson plants and in the CP&L general offices⁹.

Taking into account the magnitude of the work involved in all of these projects and the finite number of people who are qualified to perform all of these necessary tasks, CP&L estimates that it will be able to submit to the Commission its plans and

⁹ See Attachment A for a summary of the manpower commitments which CP&L has made for work relating to the TMI modification program.

schedules for any modifications necessary to meet the requirements of Section III.G; technical justification for exemptions from Sections III.G and III.L; and its design descriptions of any alternative or dedicated shutdown systems necessary to satisfy Sections III.G.3 and III.L by July 1, 1981.

C. Imposition of the §50.48(c) Schedules Upon CP&L Will Create Substantial Risk of Degradation of Safety at Robinson

It is imperative that the Commission recognize the substantial risk to public safety that will be created if CP&L is compelled to meet the schedules presently established in §50.48(c). Every aspect of the program described in Part B above is essential to a proper evaluation of Robinson against the criteria of Sections III.G and III.L of Appendix R. It is physically impossible to compress a project of that magnitude into the 30 days allotted in §50.48(c). It should be obvious that to even attempt such a feat will require drastic short-cutting of many features of the program outlined above. None of these elements can be slighted, however, if CP&L is to perform a sound, reliable analysis.

Pursuant to Commission requirements, CP&L may not install any modification at Robinson until it has performed numerous safety reviews. Unless CP&L is given adequate time within which to perform these reviews, there will be an inevitable risk of degradation of safety at the plant. Under present site procedures, required reviews include:

- (1) A technical review which is performed by an independent engineer for the purpose of assuring completeness of the modification package and the technical accuracy of the design or design verification for safety-related design documents in accordance with ANSI N45-2.11 and Appendix B to 10CFR Part 50.
- (2) A quality assurance review which is performed by CP&L QA personnel for the purpose of assuring that necessary hold points, controls and procurement requirements have been included in the modification package.
- (3) An ALARA review which is performed by the plant ALARA specialist for the purpose of assuring that the design and installation procedures to be employed are such that radiation exposure of personnel will be maintained as low as reasonably achievable.
- (4) A fire hazards analysis which is performed by the Plant Fire Protection Engineer for the purpose of determining the impact of the modification upon fire protection capability and to verify inclusion of appropriate fire prevention or control measures.
- (5) A safety review which is conducted by the Plant Nuclear Safety Committee (PNSC) for the purpose of assuring that plant nuclear safety will not be adversely affected by the modification.

- (6) An inservice inspection (ISI) review which is performed by the inservice inspection specialist to assure that the applicable provisions of Section XI of the ASME Code have been met.
- (7) Management reviews and approvals which are performed by the Project Engineer, the Engineering Supervisor, the Manager-Technical and Administration, and by the General Manager.

As noted above, CP&L is engaged, pursuant to Commission directives, in extensive improvement programs of great significance to public safety pursuant to Commission mandated schedules¹⁰. These safety related programs must be pursued by CP&L simultaneous with the performance of its obligations under the fire protection rule. Substantial work on TMI-related issues, emergency planning and environmental qualification of safety grade electrical equipment pursuant to IE Bulletin 79-01B has been ongoing throughout 1980 and must continue at least throughout 1981.

It would be imprudent to require CP&L to perform all of this work, including its obligations under Appendix R, under the current NRC mandated schedules. When one adds the limits of CP&L's financial and human resources to the factor of time,

¹⁰See discussion supra at pp. 13-14.

one recognizes the risk that the public safety may be seriously impaired unless CP&L is permitted to perform all of its obligations in accordance with a rational, achievable schedule of priorities.

The schedules set forth in §50.48(c) with respect to fire protection modifications are unrealistic and unachievable in the context of all other ongoing modification activities. To impose those schedules upon CP&L will create an unnecessary risk that the safety of the public will be seriously impaired.

CP&L must emphasize that it has made a significant number of fire protection improvements at Robinson and has received an SER for all but three items of Appendix A to BTP 9.5-1. These fire protection features are entirely adequate to protect the health and safety of the public. As was pointed out by the Commission as recently as October 19, 1980 in the context of the Fire Protection Schedules for Operation Nuclear Plants, 45 Fed. Reg. 71569 (October 29, 1980):

Extensive fire protection measures have already been implemented at all operating plants No public health and safety interest would be served by forcing only those licensees unable to meet deadlines preceding the effectiveness of the final rule to shut down for the brief interim. To the contrary, the fire protection measures already implemented give reasonable assurance that all operating nuclear plants may continue to operate safely even though the final rule will require additional fire protection measures at many plants.

Beyond these fire protection systems, there are significant additional safety features installed at Robinson¹¹.

¹¹See Attachment B for a summary of such safety features.

Clearly then, the granting of CP&L's request for an exemption from the schedules established in §50.48(c) will in no way adversely affect the health and safety of the public. To the contrary, for all of the reasons set forth above, to impose the current schedules upon CP&L will create an unnecessary risk that the safety of the public will be seriously impaired.

D. Exemption from Provisions of §50.48 and Section III.G of Appendix R Related to Fire Suppression Systems in the Control Room is Warranted

CP&L believes that the fire protection features which are currently installed in the Robinson control room are equal in effectiveness to a fixed fire suppression system and, therefore, requests an exemption from the requirement to install fixed suppression systems in this area.

In addition, CP&L requests the right to seek any further exemption from fire suppression requirements with respect to other areas at Robinson which CP&L believes to be justified after completion of its analyses and preparation of its plans and schedules for necessary modifications. The fire protection features which CP&L has installed in the control room at Robinson and which are described below have been approved by the staff in its Safety Evaluation Report.

- The control room is continually manned.
- Fire detection equipment has been installed generally throughout the control room including in cabinets.

- High risk areas for combustibles such as computer rooms have been separated from the control room by 3-hour fire barriers.
- Portable fire extinguishers are immediately available to operating personnel.
- The number of potential fire sources has been minimized.
- A dry standpipe and hose station, charged by a dry pipe valve, with controls at the hose station has been installed.
- A self-closing Class C fire door has been installed at the entrance to the kitchen and a single station smoke detector has been installed in the kitchen.
- A 2-1/2 gallon pressurized water extinguisher has been added.
- Circuits have been modified as necessary to assure that a fire in the control room cannot disable the proposed auxiliary shutdown system.

In addition, CP&L has installed an auxiliary shutdown system, independent of the control room, capable of achieving and maintaining hot shutdown. This system is currently under NRC review.

In view of these approved fire protection features, fixed fire suppression systems in the control room would not meaningfully enhance fire protection safety at Robinson. Indeed, potentially serious conditions would be likely to arise as a result of effects of water upon sensitive equipment and likely creation of interference with the operator's ability to react effectively to the ongoing emergency. In this respect, installation of a fire suppression system may actually be detrimental to overall safety at Robinson.

E. An Exemption from Provisions of §50.48 and Section III.L of Appendix R Which Appear to Require that Cold Shutdown be Achieved Within Seventy-Two Hours and without the Availability of Offsite Power is Warranted

The literal language of Section III.L appears to require that a licensee provide alternative or dedicated shutdown capability to achieve cold shutdown within 72 hours and without the availability of offsite power. If such is the intent underlying this provision, CP&L believes that the imposition of this requirement upon CP&L could create a substantial risk to the overall safety at Robinson.

The licensing basis for Robinson is hot shutdown. The capability of achieving cold shutdown within 72 hours and without the availability of offsite power is outside the licensing basis for Robinson. The current capability to achieve and maintain hot shutdown at Robinson, therefore, provides adequate protection of the public safety.

Moreover, at the February 19, 1981 meeting between the NRC staff and CP&L, the staff advised CP&L that it was not the Commission's intention in promulgating Section III.L to require that cold shutdown be achieved within 72 hours with or without the availability of offsite power. Rather, the staff advised, Section III.L's requirements on this issue are intended to be identical to those contained in Section III.G. Section III.G requires that systems necessary to achieve and maintain cold

shutdown from either the control room or emergency control stations be capable of being repaired within 72 hours. CP&L will meet this requirement of Section III.G.

Because the procedure set out in Section III.G is adequate for Robinson and in view of the staff's advice that Section III.L was not intended to require anything beyond what is required by Section III.G, CP&L believes that it should be granted this request for exemption from the literal requirement of Section III.L.

F. An Exemption from the Provisions of Section 50.48 and Section III.M.2 of Appendix R is Warranted

Section III.M establishes three acceptance criteria against which cable fire barrier penetration seals are to be tested¹².

¹²The three acceptance criteria are:

1. The cable fire barrier penetration seal has withstood the fire endurance test without passage of flame or ignition of cables on the unexposed side for a period of time equivalent to the fire resistance rating required of the barrier;
2. The temperature levels required for the unexposed side are analyzed and demonstrate that the maximum temperature is sufficiently below the cable insulation ignition temperature; and,
3. The fire barrier penetration seal remains intact and does not allow projection of water beyond the unexposed surface during the hose stream test.

Prior to the promulgation of Appendix R, CP&L caused to be performed the fire testing of penetration seals representative of those installed at Robinson. In response to specific NRC staff questions contained in the fire protection Safety Evaluation Report for Robinson, CP&L caused additional testing to be performed by Southwest Research Institute (SWRI) and advised the staff that CP&L would respond to those questions upon obtaining the test results. CP&L has recently received those test results and submits as an Attachment C to this petition CP&L's responses to outstanding NRC questions contained in the SER for this item. Also submitted as Attachment C are the Final Test Reports of SWRI¹³.

The test results demonstrate that the penetration seals meet the acceptance criterion of Section III.M.1 in that there was no passage of flame or ignition of cable on the unexposed side of any penetration during the 3-hour test.

Criterion III.M.3 was met in that the fire barrier penetration seal remained intact and did not allow projection of water beyond the unexposed surface during the hose stream test.

With respect to Criterion III.M.2, temperature levels recorded for the unexposed side of the penetration seals reached 829°F. The cable insulation ignition temperature is 850°F. The cable insulation did not reach ignition temperature.

¹³Penetration Seals, H. B. Robinson Unit 2, Project No. 03-6155, Final Reports by Michael D. Pish, et al, Southwest Research Institute, December 22, 1980, Report 1 (Slab 2) and Report 2 (Slab 3).

CP&L submits that in view of all of the test results, the presently installed penetration seals essentially satisfy the criteria of Section III.M.

Moreover, CP&L believes that to require CP&L to replace the currently installed penetration seals may be detrimental to overall safety at Robinson. Because a large number of cables, including safety-related cables, pass through a small penetration area, it is essential that contact with those cables be minimized in order to reduce the risk of damage to the safety-related cables.

Because the presently installed penetration seals essentially satisfy the criteria of Section III.M and because replacement of these seals creates a risk that safety related cables could be damaged, CP&L believes that an exemption from Section III.M as requested herein is justified and should be granted.

G. Additional Justification for Exemptions Requested

CP&L believes that it was not, and is not, the Commission's intention in promulgating the fire protection rule to force any licensee to install a dedicated shutdown system regardless of the fire protection features at the particular facility. Yet such will be the inevitable consequence should the schedules of §50.48(c) be imposed. This is so because the 30 days allotted in §50.48(c) are simply insufficient to enable licensees to perform the analyses necessary to prepare necessary plans and schedules or to develop the technical justification to support

an exemption from the various provisions of the fire protection rule. The unreasonableness of the schedules of §50.48(c), if rigidly imposed, becomes most apparent when one compares the incredibly short time which is allowed for the installation of all of the modifications which could be necessary to meet Sections III.G.2 with the 30 months subsequent to NRC approval authorized for installation of a dedicated shutdown system. If the right to pursue the options offered by Section III.G.2 and the right to seek exemptions from the fire protection rule are to be more than illusory, the Commission must have intended to provide the staff a realistic opportunity to review each facility on a case-by-case basis, evaluating a particular licensee's technical justifications for exemptions; and to provide licensees sufficient time within which to develop sound plans, schedules and designs of modifications where further upgrading short of a dedicated system is necessary.

III. TECHNICAL AND LEGAL JUSTIFICATIONS FOR ALTERNATIVE RELIEF

In the alternative, CP&L requests an exemption from all of the provisions of Sections III.G, III.L and III.M. CP&L believes that it is entitled to such an exemption on the ground that the fire protection measures prescribed in those Sections would not, if installed at Robinson, enhance safety at the plant in any meaningful way and would actually create a substantial risk of degradation of overall plant safety.

As CP&L has discussed at length above, Robinson has been issued a substantially complete fire protection Safety Evaluation Report. The SER stands as proof that the fire protection systems and equipment at Robinson provide the protection necessary to protect the health and safety of the public. CP&L is aware of no evidence to support a conclusion that compliance with Sections III.G, III.L and III.M will substantially enhance fire protection capability at Robinson.

Moreover, since fire protection measures currently installed at Robinson are sufficient to protect the public health and safety, to require CP&L to meet the literal provisions of Sections III.G, III.L and III.M would be inconsistent with ALARA principles and, therefore, detrimental to the safety of Robinson personnel. CP&L could not reach compliance with those Sections without significantly increasing the man-rem exposure of plant personnel. Such an increase in total man-rem exposure is not defensible where, as with the fire protection modifications, the modifications at issue will not contribute significantly to safety.

With respect to Robinson, Sections III.G, III.L and III.M are "backfit" provisions. Before imposing the requirements of those Sections upon CP&L, the Commission had an obligation to make a record of findings sufficient to support a conclusion that modifications necessary to meet those requirements, if installed at Robinson, would provide "substantial, additional protection which is required for the public health and safety or the common defense and security." To CP&L's knowledge, the Commission has made no such findings as required by §50.109¹⁴.

¹⁴Section 50.48 cannot fairly be said to have amended §50.109 in that the record shows no such intent and no opportunity was provided for comment on such amendment. The Commission, of course, is required to follow its own regulations whether acting by rule or by adjudication of individual rights.

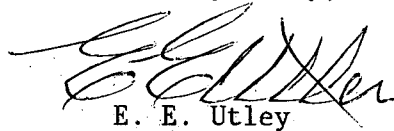
It was the duty of the Commission to evaluate the impact that backfit items would have upon safety at any particular operating nuclear facility in light of the fire protection features already installed or committed to be installed at that facility. In the case of Robinson for which a substantially complete SER has been issued, CP&L submits that such a comparative analysis would have revealed that the Section III.G, III.L and III.M modifications would not provide substantial additional protection of the public health and safety.

In the absence of the requisite findings, imposition of the requirements of Sections III.G, III.L and III.M upon CP&L would amount to a denial of CP&L's constitutional rights to procedural and substantive due process and would constitute a violation of the Administrative Procedure Act and the Commission's own regulations. The injury which CP&L would suffer as a consequence would be enormous in view of the extraordinary costs which would necessarily be incurred in connection with efforts to analyze, design, procure and install such modifications as might be necessary to meet Section III.G.

Finally, as pointed out in Part II.G above, because the fire protection measures currently installed at Robinson are sufficient to protect the public health and safety, to require CP&L to meet the literal provisions of Sections III.G, III.L and III.M would be inconsistent with ALARA principles and, therefore, detrimental to the safety of Robinson personnel.

For the reasons set forth above, CP&L should be granted an exemption from Section III.G, III.L and III.M of Appendix R.

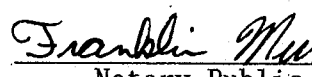
Yours very truly,


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

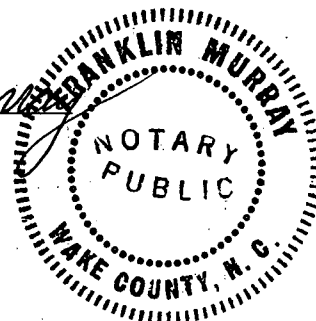
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Attachments

Sworn to and subscribed before me this 13th day of March, 81
1981.


Notary Public

My Commission expires: October 4, 1981



ATTACHMENT A

SUMMARY OF MANHOURS COMMITTED BY CP&L
FOR TMI RELATED ACTIVITY

H. B. Robinson Plant

TMI Task Force Site Manager - 1 man full-time since October 1979

Project Managers - 1 CP&L engineer full-time

Contractor Engineers - 8 engineers - November to December, 1979
7 engineers - January to March, 1980
8 engineers - April to June, 1980
7 engineers - July to December, 1980
5 engineers - January to March, 1981

Future - 1 full-time CP&L engineer

Brunswick Steam Electric Plant

TMI Task Force Site Manager - 1 man full-time since October, 1979

Project Managers -

1 CP&L engineer from October 1979

to present

(part-time - 5 hours/week)

1 CP&L operator from July 1980 to

present

(part-time - 30 hours/week)

Contractor Engineers -

4 engineers - November 1979 to June 1980

5 engineers - July 1980 to February 1981

Future -

1 full-time and 1 to 2 part-time

CP&L engineers

6 contractor engineers full-time

General Office

1. April to May 1979
(Corporate Investigative
Team)

10 CP&L engineers full-time

3 Contractor engineers part-time

2 CP&L engineers part-time

2. TMI Project Coordination

June to September 15, 1979 - 1 CP&L
engineer full-time

September 15, 1979 to September 1980 -

3 CP&L engineers full-time

September 1980 to present - 2 CP&L

engineers full-time

3. Future -
- 1 CP&L engineer full-time
 - 1 CP&L engineer part-time (10 hours per week)

NOTE: All of the above TMI man-hours are conservative as they do not include: construction supervision and CP&L construction forces; cost control and procurement activities; plant maintenance, I&C, mechanics, health physics and other support personnel; middle and senior level management effort; clerical resources; manpower resources of vendors and A-Es in performing analytical studies and designing plant modifications offsite.

ATTACHMENT B

DESCRIPTION OF SAFETY FEATURES OF EACH BUILDING/AREA AT H. B. ROBINSON
STEAM ELECTRIC PLANT UNIT NO. 2

A. Cable Spread Rooms

1. Cables are coated with fire proofing material to prevent propagation between cable trays.
2. Alternative shutdown capability is provided.
3. Fire detection equipment is installed.
4. A halon suppression system is provided for use in areas of high cable concentration.
5. Manual fire fighting equipment is available in the immediate vicinity.
6. Transient combustibles are administratively controlled in the area.
7. Three (3) hour fire barriers have been installed to provide adequate protection of areas.

B. Control Room

- The control room is continually manned.
- Fire detection equipment has been installed generally throughout the control room including in cabinets.
- High risk areas for combustibles such as computer rooms have been separated from the control room by 3-hour fire barriers.
- Portable fire extinguishers are immediately available to operating personnel.
- The number of potential fire sources has been minimized.
- An auxiliary shutdown system independent of the control room is provided.
- A dry standpipe and hose station, charged by a dry pipe valve, with controls at the hose station has been installed.
- A self-closing Class C fire door has been installed at the entrance to the kitchen and a single station smoke detector has been installed in the kitchen.

- A 2-1/2 gallon pressurized water extinguisher has been added.
- Circuits have been modified as necessary to assure that a fire in the control room cannot disable the auxiliary shutdown system.

C. Reactor Auxiliary Building

1. Fire zones have been separated by 3-hour fire barriers.
2. Additional suppression systems have been installed in accordance with fire code criteria to protect specific areas. They are as follows:
 - a. A sprinkler at the lower elevation provides protection for air compressors.
 - b. A sprinkler at the upper elevation provides protection against combustibles in the solid waste handling room.
 - c. A CO₂ system protects cable concentrated in the cable vaults.
 - d. A halon system protects vital electrical switchgear.

3. Additional detectors have been installed throughout the building.
4. Hose stations have been installed to provide additional manual protection in all fire zones throughout the building.
5. Electrical penetrations were upgraded and cables are coated with a fire proofing material to prevent propagation between trays.

D. Reactor Containment Building

1. A standpipe system has been provided in accordance with fire codes for manual protection throughout the building.
2. Sprinkler systems have been installed in accordance with fire codes at each reactor coolant pump and the electrical penetration area.
3. Fire detectors have been installed in other areas containing combustibles.

ATTACHMENT C

CAROLINA POWER & LIGHT COMPANY'S RESPONSES TO NRC STAFF QUESTIONS REGARDING ELECTRICAL CABLE PENETRATIONS

On February 21, 1980, the NRC requested additional information concerning SER Item 3.1.24 "Electrical Cable Penetrations." On March 18, 1980, CP&L advised the NRC that a test program would be required to respond to their questions. On December 5, 1980, CP&L provided the NRC with a preliminary copy of the test results. The final test reports entitled "Penetration Seals, H. B. Robinson Unit 2" are submitted as a part of this Attachment.

In order to fully address the staff's concerns, a comprehensive program was undertaken, consisting of penetration seal design review, in-plant inspection, as-built detailed documentation, seal design upgrade, and actual fire testing. This effort culminated with the following outputs:

- Complete documentation of existing plant penetration seals (installed in wall and floor blockouts). This documentation consists of detailed plan and section views of each penetration, accompanied by photographs of the as-built seals. Documentation of the conduit seals had been provided earlier by the conduit seal installation contractor.

- Results of a completed test program which addressed penetration seals representative of those installed in the plant, including "worst-case" seals. Cable used in the tests were representative of actual plant cable.

The test program subjected two test slabs to ASTM-E-119 3-hour tests in the "floor" penetration configuration. In this way, all seal designs qualified for floor installation are also qualified for the less severe wall installation.

Most of the seals tested represent an upgrade of the existing seal design. The upgraded configuration, which may be considered asymmetrical in nature, was tested in both directions in a worst-case assembly. The design successfully passed the 3-hour test and hose stream test in both orientations.

The existing blackout seal design, however, was tested and several penetrators approached the temperature rise criterion at 2 hours, 20 minutes. The assessment of the nature of this temperature rise and resultant conclusions are addressed in the text of the Test Slab 3 test report.

The specific information requested by the NRC and CP&L's responses are set forth below:

- (1) The results of tests or analyses that will establish the effects on the fire rating of penetration seals of the maximum pressure differential a fire barrier in the plant is expected to experience.

Response to Question 1

The test furnace used was operated at a slight positive pressure during each test. However, a significant differential pressure was not applied to the test slabs because quantitative acceptance criteria had not been defined at the time these tests were conducted. Additionally, CP&L was advised by telephone on September 19, 1980 that the NRC did not require differential pressure testing on the type of seals installed at H. B. Robinson.

- (2) The results of tests or analyses that can establish the fire rating of asymmetric penetration seals in the untested direction.

Response to Question 2

The penetration survey and documentation effort has shown that the existing electrical penetration seals are symmetrical in nature. However, many of the tested "upgraded" seal designs may be considered to be asymmetrical. Consequently, this design was tested in both directions to verify its 3-hour rating regardless of orientation.

- (3) The density of ceramic fire insulation, the type and percent fill of cables and the size of conduits used in the test as compared with those in the plant to demonstrate that the test arrangement is representative of the worst case configuration existing in the plant.

Response to Question 3

As described above, extensive documentation was developed for the existing electrical penetrations. This documentation describes in detail the penetration (blockout) size, wall thickness, number, type, and size of penetrators, cable types and percent fill, and existing penetration seal and cable coatings. It was found, however, that the density of ceramic fiber insulation installed in the penetration seals was not quantitatively controlled. In constructing the test sample of the existing seal design, this "loose" fill of ceramic fiber was duplicated to simulate actual plant conditions.

This documentation was then used to develop the test plan for each test slab. In Appendix I of each test report, Tables 1 and 2 provide a description of existing penetrations and a crossreference between test penetrations and actual plant penetrations. In this way, each plant penetration seal is shown to be qualified by a specific representative test sample.

The test program was directed predominantly at the blockout-type penetration seals. These seals are penetrated by cable trays, conduits, cable bundles, and piping. Where required, conduit penetrators were sealed using a silicone foam sealing system equivalent to that used at H. B. Robinson. All conduits sealed in this manner passed the 3-hour fire test on all acceptance criteria. The conduits employed in the tests were representative of the largest conduits (5-inch) installed at Robinson, and include worst-case cable loading conditions.

Examination of the H. B. Robinson conduit seal documentation has indicated that the installed silicone seals are symmetrical with respect to sealant material and construction. Documentation of the existing SF-20 silicone foam conduit seals was provided by BISCO, the contractor responsible for the sealant installation.

BISCO has conducted an extensive fire testing program in order to establish qualification of various proprietary seal designs. Conduit seal designs similar to those at H. B. Robinson have been qualified in 3-hour fire tests and subsequent hose-stream tests. The qualified systems employ BISCO SF-20 silicone foam, with seal dimensions and sealant densities equivalent to those used at H. B. Robinson.

Supporting documentation for these responses is contained in the Final Test Reports submitted as part of this Attachment C.