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October 3, 1988

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USNRC

UNITED STATES NUCLEAR REGULATORY COMMISSION
BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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(Seabrook Station, Units 1 & 2))

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Docket Nos. 50-443 OL-1
 50-444 OL-1
 ONSITE EMERGENCY
 PLANNING & TECHNICAL
 ISSUES

NEW ENGLAND COALITION ON NUCLEAR POLLUTION'S
OPPOSITION TO APPLICANTS' MOTION FOR SUMMARY
DISPOSITION OF NECNP CONTENTION I.B.2.

Introduction

The New England Coalition on Nuclear Pollution ("NECNP") hereby submits its opposition to Applicants' motion for summary disposition of NECNP's Contention I.B.2, with respect to environmental qualification of RG-58 coaxial cable and substitute cable. NECNP contends that three major issues remain unresolved and must be litigated with respect to this contention. First, have Applicants identified all RG-58 cables which should be qualified because they are routed with other safety cable through a harsh environment, and thereby could cause those safety cables to fail during an accident? Second, for those applications, is RG-58 environmentally qualified? Finally, have Applicants demonstrated that RG-59 cable is environmentally qualified for purposes of replacing RG-58 cable in the 12 specific applications in which it has been substituted?¹

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¹ This last issue has been precluded from litigation by the Board's orders of July 23 and August 1, 1988.

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ARGUMENT

Applicants have moved for summary disposition of Contention NECNP I.B.2, based on a series of alternative claims. First, Applicants contend that RG-58 cable has been demonstrated to be environmentally qualified by recent qualification tests. Second, they claim that RG-58 cable is qualified by virtue of its similarity to RG-59 cable. Finally, Applicants argue that they have replaced all RG-58 cable that might otherwise need to be qualified with RG-59 cable.

As discussed below, Applicants fail to demonstrate, for any one of their three theories, that there exist no genuine issues of material fact in this case. Thus, Applicants' motion for summary judgment must be denied.

I. Applicants Have Not Demonstrated that RG-58 Coaxial Cable is Environmentally Qualified.

Contrary to Applicants' claims, the recently supplied report on environmental qualification testing of RG-58 cable, NTS Acton Test Report No. 24843-89N-2 (Attachment B to Woodward Affidavit) [hereafter "NTS Report"] does not support a conclusion that the cable is qualified.

During the margin transient portion of the recent test of RG-58 cable, with the test instrumentation at ambient temperatures, the in-line 1 ampere fuse that measures leaking/charging current repeatedly failed. Woodward Affidavit at 6, NTS Report at 10-10. According to Applicants, maintaining voltage and current without blowing that fuse is one of the test measurements that demonstrate the cable's "ability to carry current and load

during environmental exposure with no insulation failure resulting in a short to ground." Woodward Affidavit par. 4. It is thus uncontroverted that the test specimens did not remain energized throughout the duration of the test. Woodward Affidavit at 7. At the same time (during the margin transient), measured insulation resistance values for many of the cables fell to zero. NTS Report Data Sheets, dated 6/13/88.

Following these repeated failures, the test circuitry and monitoring equipment were moved into an air conditioned space. Thereafter, Applicants claim the in-line fuse did not blow for the remainder of the test. Woodward Affidavit at 7.

However, after moving the test setup to an air conditioned space, Applicants did not restart the test procedures from the beginning. The margin transient was not repeated with the new setup, but rather the test was continued with the second (LOCA) transient. Applicants claim, without support, that the second, LOCA test transient was "more than adequate to demonstrate cable qualification for specific plant conditions." Id. This conclusion is not at all clear from the evidence presented.

Even after moving the test setup to an air conditioned space, during the second (LOCA) transient, insulation resistance readings of zero were again recorded for three out of four test specimens. NTS Report Data Sheets, dated 6/15/88, t = 17.4 hours. The zero readings were recorded when the specimens were energized with potentials of both 500 volts DC and 100 volts DC.

Id. One of eight specimens still showed an IR reading of zero about one hour later, at $t = 18.3$ hours.

These data strongly contradict Applicants' claim that "all IR measurements stabilized" after the test setup was moved to an air conditioned space. Woodward Affidavit at 7. Contrary to the assertions in the Woodward Affidavit at par. 9d, it is manifest from Applicants' submissions that insulation failure did occur during the test (IR readings of zero both during the margin transient with test instrumentation at ambient temperatures and during the second transient with test instrumentation at air conditioned temperatures). It is also clear that a short to ground did occur, that the cable did not carry continuous voltage throughout the test, and that the leaking/charging current did exceed one ampere (the in-line 1-amp fuse that measures these parameters repeatedly below when the test setup was at ambient temperatures). If a few tens of degrees difference in the temperature of the test instrumentation makes the difference between apparent failure and success, the demonstrated margin of safety is obviously very slim.

II. Tests of RG-59 Coaxial Cable Do Not Demonstrate That RG-58 Cable is Environmentally Qualified.

In ALAB-875, the Appeal Board reversed the Licensing Board's Partial Initial Decision on the issue of environmental qualification because Applicants had failed to demonstrate that RG-58 cable was qualified by virtue of its comparability to RG-59 cable. On numerous later occasions, the Appeal Board rejected

efforts by Applicants to demonstrate the qualification of RG-58 cable through comparison with RG-59 cable. See ALAB-891, 27 NRC at 343-45, 351. In their summary judgment motion, Applicants renew their allegation that the cables are similar, but provide no new information to support their position. Instead, they present a muddle of irrelevant information that sheds no light on the issue.

First, Applicants err in relying on the cables' color-coding system as evidence of their similarity. The color codes are intended to provide information regarding the applications of cables, not their characteristics. The fact that the color of the RG-58 cable jacket shows it to be non-safety related is irrelevant to the question of its constitutional similarity to RG-59 cable. Similarly irrelevant is Applicants' assertion that the cable was designated Operability Code A (i.e. safety related) as a conservative measure. The operability code tells nothing about the characteristics of the cable.

While their argument is not clear, Applicants also seem to contend that the question of the similarity between the cables is irrelevant. Applicants apparently believe that 10 CFR § 50.49 does not apply at all to the RG-58 cable, since no safety-related applications have been identified.

For two reasons, Applicants are in error. First, Applicants misconstrue NRC regulations, which require environmental qualification not only of safety-related equipment, but nonsafety-related equipment "whose failure under postulated

environmental conditions could prevent satisfactory accomplishment of safety functions" during an accident. 10 CFR §§ 50.49(a), (b)(2). As Applicants have already implicitly conceded through their decision to replace 12 cables, nonsafety-related cables routed with safety cables through a harsh environment should be environmentally qualified.

Second, while Applicants have replaced 12 of the RG-58 cables located in a harsh environment with RG-59 cable, there remains a dispute as to whether Applicants have identified all cables that should be replaced. Applicants thus far have physically confirmed the in-plant locations only of the ends of the "spare" RG-58 cables. By their own admission, they have not "walked down" the cables from end to end to confirm that they are in fact routed as their documentation indicates is the case.²

The history of nuclear power plant construction is replete with countless instances of plants not being built in conformity with their documentation.³ Similarly, discrepancies in quality

² Applicants' Responses to NECNP Third Round Interrogatories 12, 13 and 14.

³ See, e.g., IE Information Notice No. 85-66, Discrepancies Between As-Built Construction Drawings and Equipment Installations, August 7, 1985. (Over 7300 discrepancies and errors between as-built field configurations and associated design and construction drawings and specifications at Fermi Unit 2; supports not added to nitrogen supply line at Rancho Seco, although records indicated it had been done and inspected; similar problems identified at 10 other facilities between 1982 and 1985 by Construction Appraisal Team inspections.) A copy of IE Information Notice No. 85-66 is attached.

control documentation at nuclear plants have been extremely widespread.

Thus, Applicants' claims that their cable-routing diagrams prove the actual routing of the relevant cables throughout the plant cannot simply be accepted as established fact. The possibility that some of the unreplaced RG-58 cables could actually be routed other than as indicated in "as-built" drawings, i.e., through harsh environments, cannot be considered remote. Applicants should establish the actual routing of each RG-58 cable by physical walkdowns.

Finally, Applicants argue that NECNP may not be heard to criticize the adequacy of support for statements made in NECNP Exhibit 4, the equipment qualification file, because it introduced the file into evidence "for the truth of the matters asserted" therein. As NECNP explained, however, the offer was also made for the purpose of "fleshing out the basis upon which these representations are made regarding the qualification of the equipment." Tr. at 460, September 30, 1986. In NECNP's view, it was necessary to include the entire equipment qualification file in the record in order to demonstrate that nowhere in that file did Applicants perform a technical comparison of the unqualified RG-58 cable with the qualified RG-59 cable.⁴

⁴ Moreover, aside from the ultimate conclusion that the RG-58 cable is qualified, NECNP has challenged few if any of the assertions made in Exhibit 4. We did not dispute IT&T's "confidence" in the qualification of the cable; but rather challenged the basis for it. Throughout the litigation, we have used the equipment qualification file to show that the assertions made therein, even if true, do not support a finding that the equipment is qualified. It should be noted that NECNP's position has been

III. Applicants Have Not Demonstrated That RG-59 Cable Is an Acceptable Substitute for RG-58 Cable.

Applicants claim that RG-59 cable is a technically acceptable substitute for RG-58 cable in the 12 applications where Applicants have identified a need for qualified equipment. NECNP does not dispute the technical acceptability of the RG-59 cable to operate in a normal environment. However, NECNP continues to assert that RG-59 cable has not been demonstrated to be environmentally qualified for the 12 applications. Because Applicants have failed to describe specific performance criteria for the RG-58 cable, it is impossible to tell whether the testing data for the substitute RG-59 demonstrate that it will remain qualified during an accident.

We have been precluded from litigating this issue, however, by the Board's orders of June 23, 1988, and August 1, 1988. Thus, NECNP's position is repeated here only for purposes of preserving NECNP's appellate rights.

(continued)

thoroughly vindicated in this regard.

Conclusion

For the foregoing reasons, Applicants' motion for summary disposition of contention I.B.2 should be denied.

Respectfully submitted,

Dean R. Tausley for

Diane Curran
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2001 "S" Street N.W. Suite 430
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(202) 328-3500

October 3, 1988

CERTIFICATE OF SERVICE

I certify that on October 3, 1988, copies of the foregoing pleading were served by overnight mail or first-class mail on all parties to this proceeding, as designated on the attached service list.

Dean R. Tausley for
Diane Curran

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

August 7, 1985

IE INFORMATION NOTICE NO. 85-66: DISCREPANCIES BETWEEN AS-BUILT CONSTRUCTION
DRAWINGS AND EQUIPMENT INSTALLATIONS

Addressees:

All nuclear power reactor facilities holding an operating license (OL) or a construction permit (CP).

Purpose:

This information notice is to alert recipients of a potentially significant generic problem regarding as-built construction drawings not correctly or completely reflecting equipment installations. Modifications of existing installations also may be susceptible to the problems discussed in this information notice. It is expected that recipients will review the information for applicability to their facilities and consider actions, if appropriate, to preclude a similar problem occurring at their facilities. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

Fermi Unit 2

During routine NRC prelicensing inspections of as-built design and construction drawings and specifications at Fermi Nuclear Power Plant Unit 2, from April 1984 to October 1984 several discrepancies in the electrical and instrumentation and control (I&C) installations were discovered, which construction and preoperational testing had not identified.

In response to the NRC findings at Fermi, the licensee conducted an approximately 100 percent reinspection of electrical and I&C installations. That inspection effort resulted in the identification of over 7300 discrepancies and errors between as-built field configurations and associated design and construction drawings and specifications. There were 154 discrepancies which, if left uncorrected, could result in the loss or incorrect function of a safety-related component or system. Examples of these discrepancies were wiring errors, unidentified jumpers, wrong tubing connections, and wrong installed components. There were 300 discrepancies that had correct design documents but incorrect installations that could impair safe operations.

Examples of these discrepancies were ungrounded cable shields, missing hardware, and wrong nameplates. There were 1900 discrepancies which had correct as-built hardware but deficient drawings. Examples of these discrepancies included wiring installed that was not shown on the applicable drawing, wiring details that differed from the installation drawing, and incorrect cable numbers on the drawings. There were 5000 additional minor discrepancies which would not have impacted or impaired safe plant operations directly such as incorrect wire tags, equipment layouts that did not match the drawings, and inconsistencies in wire tagging methods. Extensive actions by the applicant were necessary to correct the most significant discrepancies before an operating license was issued by the NRC.

Rancho Seco

A reactor coolant system high point vent line addition was made at Rancho Seco during the 1983 refueling outage as part of the TMI required modifications. Part of the modification included adding cross bracing and revising supports for the adjacent nitrogen supply line. Although records indicate this work had been done and inspected it had actually not been performed. In addition, a removable piping spool piece used to isolate the nitrogen supply was not replaced by a rigid piece as required. The resulting unsupported 4 foot length of 1 inch diameter pipe caused a fatigue failure at a high point vent weld resulting in a 20 gallon per minute non-isolatable primary coolant leak. This event is similar to previous discrepancies identified between the as-built and as-designed piping systems at a number of nuclear power plants that led to issuance of IE Bulletin 79-14, "Seismic Analyses for As-Built Safety-Related Piping Systems." Resolution of the actions requested by that bulletin has resulted in extensive reanalysis and/or modifications of piping systems in many nuclear power plants.


Construction Appraisal Team Inspections

A number of problems with construction activities which may lead to discrepancies between equipment installations and as-built drawings were identified by NRC Construction Appraisal Team (CAT) inspections at 10 facilities from September 1982 to January 1985.

Discussion:

To assure that an adequate level of safety exists or will exist at all nuclear power plants, it is required that all safety related as-built design and construction drawings match the plant hardware. Requirements and measures to control documents are identified in 10 CFR 50, Appendix B; NUREG-0800, Standard Review Plan, Rev. 2 of Section 17.1; ANSI N45.2-1977, Section 7; and ANSI N.8.7-1976, Section 5.2.15, as applicable.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the Regional Administrator of the appropriate regional office or this office.


Edward L. Jordan, Director
Division of Emergency Preparedness
and Engineering Response
Office of Inspection and Enforcement

Technical Contact: James C. Stewart, IE
(301) 492-9061

Attachments:

1. Discrepancies Identified During Construction Appraisal Team Inspections
2. List of Recently Issued IE Information Notices

Discrepancies Identified During Construction Appraisal Team Inspections

During the Braidwood CAT inspection the NRC team noted a failure to annotate unincorporated design changes on controlled design documents. The most significant finding in this area was design change documents written against superseded revisions of the approved drawings; this resulted in a pipe support being installed and inspected to other than the latest approved design.

Programmatic concerns were noted by the NRC team in two areas during the Shearon Harris CAT inspection: (1) lack of verification of piping and pipe support/restraint location to original design requirements and (2) lack of an ongoing program to effectively identify and resolve hardware clearance problems early in the construction process. Both of these concerns involve practices that could result in extensive inspection, analyses, and rework efforts very late in the construction schedule.

The River Bend CAT inspection noted that numerous cable tray supports did not meet the drawing configurations that were utilized for determining support loading. The applicant failed to consider the generic implications of identified deficiencies. Improper or inadequate fastener locking was identified, including unbent or missing cotter pins, no staking of threads, loose or missing locknuts, and inadequate lock wiring. These deficiencies indicated both inadequate field quality control (FQC) inspection and alteration of completed and accepted work by construction personnel.

The Nine Mile Point 2 CAT inspection identified problems in the document control program that indicated the crafts and inspectors may not have been using the latest design documents in the performance of their work. Inspection reports often did not reflect the drawing revision to which the installation was inspected. Adding to the document control problem was the high rate of design change initiation and the inability to maintain and revise construction drawings in a timely manner to reflect such changes. The NRC CAT inspectors identified that over 30 percent of all design change documents resulted from errors or inadequate information provided on previously issued changes. Furthermore, rather than taking measures to identify the reasons for the high change notice generation rate, a procedural requirement for incorporation of changes in drawings had simply been circumvented by the licensee to allow construction to continue without timely design change update.

The results of the Comanche Peak CAT inspection indicated a breakdown in fabrication, installation, and inspection in the HVAC area. The licensee's quality assurance program had not ensured that certain hanger, support, electrical and mechanical equipment was installed to the latest design documents, and commensurately that the appropriate inspection was conducted to the latest design documents.

LIST OF RECENTLY ISSUED
IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
85-65	Crack Growth In Steam Generator Girth Welds	7/31/85	All PWR facilities holding an OL or CP
85-64	BBC Brown Boveri Low-Voltage K-Line Circuit Breakers, With Deficient Overcurrent Trip Devices Models OD-4 and 5	7/26/85	All power reactor facilities holding an OL or CP
85-63	Potential for Common-Mode Failure of Standby Gas Treatment System on Loss of Off-Site Power	7/25/85	All power reactor facilities holding an OL or CP
85-62	Backup Telephone Numbers to the NRC Operations Center	7/23/85	All power reactor facilities holding an OL and certain fuel facilities
85-61	Misadministrations to Patients Undergoing Thyroid Scans	7/22/85	All power reactor facilities holding an OL and certain fuel facilities
85-60	Defective Negative Pressure Air-Purifying, Fuel Facepiece Respirators	7/17/85	All power reactor facilities holding an OL or CP
85-59	Valve Stem Corrosion Failures	7/17/85	All power reactor facilities holding an OL or CP
85-58	Failure Of A General Electric Type AK-2-25 Reactor Trip Breaker	7/17/85	All power reactor facilities designed by B&W and CE holding an OL or CP
85-57	Lost Iridium-192 Source Resulting In The Death Of Eight Persons In Morocco	7/16/85	All power reactor facilities holding an OL or CP; fuel facilities; and material licensees

OL = Operating License
CP = Construction Permit

STATEMENT OF MATERIAL FACTS IN DISPUTE

1. During the margin transient portion of the recent test of RG-58 cable at ambient temperatures, the in-line 1 ampere fuse that measures leaking/charging current repeatedly failed. Woodward Affidavit at 6, NTS Acton Test Report No. 24843-89N-2 (Attachment B to Woodward Affidavit)[hereafter "NTS Report"], at 10-10. At the same time (during the margin transient), measured insulation resistance values for many of the cables fell to zero. NTS Report Data Sheets, dated 6/13/88. The test specimens did not remain energized throughout the duration of the test. Woodward Affidavit at 7. The test circuitry and monitoring equipment were moved into an air conditioned space following the margin transient. Thereafter, Applicants claim the in-line fuse did not blow for the remainder of the test. Woodward Affidavit at 7.

2. After moving the test setup to an air conditioned space, Applicants did not restart the test procedures from the beginning. The margin transient was not repeated with the new setup, but rather the test was continued with the second (LOCA) transient. Applicants claim, without support, that the second, LOCA test transient was "more than adequate to demonstrate cable qualification for specific plant conditions." Id.

3. Even after moving the test setup to an air conditioned space, during the second (LOCA) transient, insulation resistance readings of zero were again recorded for three out of four test specimens. NTS Report Data Sheets, dated 6/15/88, t = 17.4 hours. The zero readings were recorded when the specimens were energized with potentials of both 500 volts DC and 100 volts DC. Id.

4. The data noted in paragraph 3 belie Applicants' claim that "all IR measurements stabilized" after the test setup was moved to an air conditioned space. Woodward Affidavit at 7.

5. Contrary to the assertions in the Woodward Affidavit at par. 9d, it is manifest from Applicants' submissions that insulation failure did occur during the test (IR readings of zero both during the margin transient with test instrumentation at ambient temperatures and during the second transient with test instrumentation at air conditioned temperatures); moreover, it is clear that a short to ground did occur, that the cable did not carry continuous voltage throughout the test, and that the leaking/charging current did exceed one ampere (the in-line 1-amp fuse that measures these parameters repeatedly blew when the test setup was at ambient temperatures).

6. The color coding of cable at Seabrook is intended to provide information regarding the applications of cables, not their characteristics. See Bergeron affidavit at par. 2, which describes the color coding only in relation to safety classification of cable. The fact that the color of the RG-58 cable jacket shows it to be non-safety related is irrelevant to the question of its technical similarity to RG-59 cable.

7. The assertion that RG-58 cable was designated Operability Code A (i.e. safety related) as a conservative measure, even if true, tells nothing about the characteristics of the cable.

8. NRC regulations requires environmental qualification not only of safety-related equipment, but nonsafety-related equipment

"whose failure under postulated environmental conditons could prevent satisfactory accomplishment of safety functions" during an accident. 10 CFR §§ 50.49(a), (b)(2).

9. As Applicants have already implicitly conceded through their decision to replace 12 cables, nonsafety-related cables routed with safety cables through a harsh environment should be environmentally qualified.

10. Applicants thus far have physically confirmed the in-plant locations only of the ends of the "spare" RG-58 cables at Seabrook. By their own admission, they have not "walked down" the cables from end to end to confirm that they are in fact routed as their documentation indicates is the case. Applicants' Responses to NECNP Third Round Interrogatories 12, 13 and 14.

11. The history of nuclear power plant construction is replete with countless instances of plants not being built in conformity with their documentation. See, e.g., IE Information Notice No. 85-66, Discrepancies Between As-Built Construction Drawings and Equipment Installations, August 7, 1985 (attached) (Over 7300 discrepancies and errors between as-built field configurations and associated design and construction drawings and specifications at Fermi Unit 2; supports not added to nitrogen supply line at Rancho Seco, although records indicated it had been done and inspected; similar problems identified at 10 other facilities between 1982 and 1985 by Construction Appraisal Team inspections.) Similarly, discrepancies in quality control documentation at nuclear plants have been extremely widespread.

12. Thus, Applicants' claims that their cable-routing diagrams prove the actual routing of the relevant cables throughout the plant cannot simply be accepted as established fact. The possibility that some of the unreplaced RG-58 cables could actually be routed other than as indicated in "as-built" drawings, i.e., through harsh environments, cannot be considered remote.

13. Applicants should establish the actual routing of each RG-58 cable by physical walkdowns.