

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)	
)	Docket Nos. 50-443 OL-01
PUBLIC SERVICE COMPANY OF)	50-444 OL-01
NEW HAMPSHIRE, <u>et al.</u>)	On-site Emergency Planning
)	and Safety Issues
(Seabrook Station, Units 1 and 2))	

AFFIDAVIT OF HAROLD WALKER AND AMRITPAL S. GILL

Harold Walker and Amritpal S. Gill, being first duly sworn, hereby affirm that the responses to the questions set forth herein are correct to the best of their knowledge and belief:

Q1: Gentlemen, by whom and in what capacity are you employed?

A1: (Walker) My name is Harold Walker. I am employed by the U.S. Nuclear Regulatory Commission as a Senior Reactor Systems Engineer in Section B of the Plant Systems Branch, Division of Engineering and Systems Technology, Office of the Nuclear Reactor Regulation.

(Gill) My name is Amritpal S. Gill. I am employed by the United States Nuclear Regulatory Commission as a senior electrical engineer in the Electrical Systems Branch, Division of Engineering and Systems Technology, Office of Nuclear Reactor Regulation.

Q2: Have you prepared a statement of your professional qualification?

A2: (Walker, Gill) Yes, statements of our professional qualifications are attached as exhibits to this affidavit.

Q3: Gentlemen, what is the purpose of this affidavit?

A3: (Walker, Gill) This affidavit explains why Applicants' September 9, 1988 Motion For Summary Disposition of remanded NECNP Contention I.B.2, which challenges the environmental qualification of RG-58 coaxial cable, should be granted. In this affidavit, we explain why there are no genuine issues as to any material facts regarding this contention.

Q4: Gentlemen, have you reviewed the "Statement Of Material Facts Not In Dispute" attached to Applicants' Motion for Summary Disposition?

A4: (Walker) I have reviewed and agree with Statement of Material Facts Nos. 14, and 18 through 21. I have reviewed Statements of Material Facts Nos. 1 through 8 and 15 through 17 and have no basis for disagreeing with any of them.

(Gill) I have reviewed Statements of Material Facts Nos. 9 through 13 and have no basis for disagreeing with any of them.

Q5: Gentlemen, does the Staff have a position as to whether RG-58 coaxial cable is environmentally qualified?

A5: (Walker) Yes. It is the Staff's position that the record contains substantial and reliable information which demonstrates that RG-58 coaxial cable is environmentally qualified for use at the Seabrook Station. There are three independent bases upon which the Licensing Board can find that RG-58 coaxial cable satisfies the environmental qualification requirements contained in 10 C.F.R. § 50.49. First, RG-58 coaxial cable is sufficiently similar to RG-59 coaxial cable so that, as permitted by 10 C.F.R. § 50.49(f)(2), the environmental qualification test results for the RG-59 cable can serve to establish the qualification of the RG-58 cable. Second, an environmental qualification test recently was conducted on RG-58 coaxial cable, the

results of which clearly establish that the cable meets all applicable environmental qualification requirements. Third, the record establishes that of the 126 RG-58 coaxial cables installed in the Seabrook Station, only 12 of them are located in harsh environments. Because the requirements of 10 C.F.R. § 50.49 do not apply to electrical equipment items located in mild environments, only these 12 cables must be environmentally qualified. These cables have been replaced with environmentally qualified RG-59 coaxial cables. However, in light of the satisfactory environmental qualification test of RG-58 coaxial cable, it is permissible to use RG-58 cable for these 12 applications.

The Staff has long considered the RG-58 coaxial cable installed in the Seabrook Station to be in compliance with 10 C.F.R. § 50.49. The Staff's initial conclusions on this matter were documented in an April 10, 1986 letter from the NRC to Applicants, in Supplement 5 to NUREG-0896, which was issued July 1986, and in my affidavit of December 11, 1987, which is attached to the "NRC Staff Response To Memorandum Of Licensing Board And New England Coalition On Nuclear Pollution Regarding Environmental Qualification Of RG-59 Coaxial Cable." Additionally, on two other occasions, the Staff submitted affidavits in this proceeding elaborating the reasons why it considers the RG-58, and RG-59, coaxial cable installed in the Seabrook Station to be in compliance with the regulatory requirements set forth in 10 C.F.R. § 50.49. See Affidavit of Harold Walker and Anritpal S. Gill (February 17, 1988); Affidavit of Harold Walker

(July 27, 1988); see also NRC Staff Response To NECNP's First Set Of Interrogatories On NECNP Contention I.B.2 (July 20, 1988).

Q6: Mr. Walker, please explain in detail why you believe that the record demonstrates that RG-58 coaxial cable meets the environmentally qualifications requirements of 10 C.F.R. § 50.49.

A6: The Staff's initial review of the environmental qualification of RG-58 coaxial cable installed at Seabrook occurred during an audit of the Seabrook environmental qualification program conducted by me between February 24 and 27, 1986. The purpose of this audit was to determine whether the documents in the electrical equipment environmental qualification files (EQF) maintained by Applicants supported the qualification status assigned by Applicants. This audit included file No. 113-19-01 which is the qualification file for RG-58 coaxial cable. The audit did not identify any environmental qualification deficiencies related to RG-58 cable. As noted above, the results of the audit were documented in the April 10, 1986 letter from the NRC to Applicants and in Section 3.11.4 of Supplement 5 to NUREG-0896, which was issued in July 1986. The Staff again reviewed environmental qualification file No. 113-19-01 as part of NECNP Exhibit 4 (NECNP Ex. 4 already has been received in evidence). In this review the Staff concluded that RG-58 coaxial cable is environmentally qualified in accordance with 10 C.F.R. § 50.49(f)(2) by virtue of its "similarity" to RG-59 coaxial cable.

The Staff's conclusion that RG-58 cable meets the environmental qualification requirements of 10 C.F.R. § 50.49 included a review of

the test report for RG-59 cable (see NECNP Exhibit 4, Ref. 2). This test report demonstrates that RG-59 cable is environmentally qualified. See Gill/Walker Affidavit, attached to February 17, 1988 NRC Staff Response To NECNP Motion To Reopen Record. The Staff concluded that RG-58 cable is sufficiently similar to RG-59 for purposes of section 50.49(f)(2) because the cables' materials, construction, and manufacturer are the same, as is the cable type (i.e., both are single conductor). See NECNP Exhibit 4; Walker Affidavit, attached to December 11, 1988 NRC Staff's Response To Memorandum Of Licensing Board And New England Coalition On Nuclear Pollution Regarding Environmental Qualification Of RG-58 Coaxial Cable.

It should be emphasized that "similarity" for purposes of section 50.49(f)(2) does not require that components, such as cables, be identical. Instead, it is the Staff's practice to review the environmental qualification files of components to determine whether there is reasonable assurance that the test results for one component, in this case RG-59 coaxial cable, will be representative of another component, in this case RG-58 coaxial cable. Consequently, as a result of reviewing Environmental Qualification File No. 113-19-01, the Staff concluded that RG-59 coaxial cable is environmentally qualified by test in accordance 10 C.F.R. § 50.49(f)(1) and that RG-58 coaxial cable is environmentally qualified by similarity in accordance with 10 C.F.R. § 50.49(f)(2).

Q7: Mr. Walker, Applicants contend that only 126 RG-58 coaxial cables were installed in the Seabrook Station, and that of these, only 12

are subject to the environmental qualification requirements set forth in 10 C.F.R. § 50.49. Do you agree with these assertions?

A7: (Walker) Yes, I do. As I pointed out in my July 27, 1988 affidavit, earlier this year Applicants conducted a review of its records relating to RG-58 coaxial cable which revealed that 126 RG-58 cables had been installed at the Seabrook Station. The Staff is satisfied that the methodology used by Applicants to identify these cable installations and thus has reasonable assurance that Applicants have succeeded in identifying and locating all of the installed RG-58 cables. The Staff also accepts the methodology by which Applicants assigned each of the 126 RG-58 cable to one of the five category groupings. Further, based upon a review of the information submitted by Applicants, the Staff is persuaded that of the 126 RG-58 coaxial cables, the requirements of 10 C.F.R. § 50.49 are inapplicable to 114 of them. See June 17, 1988 Applicants' Reply To NRC Staff and NECNP's Response To Applicants' Suggestion Of Mootness, and Affidavit of Richard Bergeron (May 19 and 26, and June 17, 1988).

As noted in my July 27, 1988 affidavit, the Staff agrees with Mr. Bergeron, Applicants' expert, that the 19 RG-58 cables used as spares need not be environmentally qualified because they are not "important to safety" as that phrase is defined in section 50.49(b). The Staff also agrees with Mr. Bergeron that the 76 RG-58 cables located in mild environments are not subject to the requirements of 10 C.F.R. § 50.49. Similarly, the Staff agrees with Mr. Bergeron that the nine RG-58 cables in mild environment within the nuclear island and routed with other non-safety related cables outside the nuclear island are

not required to be environmentally qualified in accordance with 10 C.F.R. § 50.49. Last, the Staff agrees with Mr. Bergeron that the 10 RG-58 cables routed with other non-safety related cables outside the nuclear island are not required to be qualified in accordance with 10 C.F.R. § 50.49.

Applicants' review indicated that the balance of the installed RG-58 cables (12 in number) were located in a harsh environment and thus subject to the environmental qualification requirements of 10 C.F.R. § 50.49. (10 C.F.R. § 50.49(b)(2)). These cables, however, now have been replaced with environmentally qualified RG-59 coaxial cables. The Staff believes that the evaluation conducted by Applicants in determining whether RG-59 is a functionally acceptable replacement for RG-58 is adequate. This "functional acceptability" evaluation is described and explained in the Affidavit of Gerald A. Kotkowski, attached to Applicants' May 19, 1988 "Suggestion Of Mootness." It is also the Staff's position that Applicants now have adequately identified the specific uses of RG-58 coaxial cable at Seabrook. This position is based on the Staff's review of Applicants' method of identifying and tracking cable at Seabrook and a review of the service environmental charts.

Q8: Mr. Walker, on August 4, 1988, Applicants submitted to the Licensing Board and the parties the results of environmental qualification tests conducted on RG-58 coaxial cable by NTS of Acton, Massachusetts. What is the significance of the information provided by Applicants?

A8: (Walker) The significance of the test results provided by Applicants is that they provide an additional and independent reason for

concluding that RG-58 coaxial cable satisfies the requirements of 10 C.F.R. § 50.49. The Staff has completed its review of the test methodology and the NTS test results and agrees with Applicants' conclusion that RG-58 coaxial cable is environmentally qualified for use at the Seabrook facility.

Q9: Please describe the environmental qualification test of RG-58 coaxial cable conducted by Applicants.

A9: (Walker) The tests were conducted by NTS, of Acton, Massachusetts. The testing was conducted in accordance with IEEE standard 383-1974 "IEEE Standard for Type of Class 1E Electric Cables, Field Splices, and Connections for Nuclear Power Generating Stations." This standard is endorsed by NUREG-0588 and the Staff considers the applicable requirements of 10 C.F.R. § 50.49 to be satisfied if a successful test is conducted in accordance with the guidelines of the IEEE 383-1974 Standard.

The tests included both aged and unaged RG-58 coaxial cable samples or specimens. An "aged specimen" is one that has been subjected to thermal and radiation aging in order to place it in an end-of-life condition before testing. In accordance with IEEE 383-1974 and 10 C.F.R. § 50.49(e), the specimens were subjected to thermal aging, radiation exposure, Loss of Coolant Accident (LOCA) simulation, and Post LOCA simulation.

Q10: What were the purpose and results of the tests?

A10: (Walker) The purpose of the test was to demonstrate the ability of the coaxial cables to perform satisfactorily during and following exposure to postulated in-service and end-of-life accident environment simulation. The acceptance criteria were the requirements of IEEE Standard 383-1974. The test specimens were considered to have met the requirements of IEEE Standard 383-1974 Section 2.4, if they (a) remained energized with client specified potential and current during the steam, chemical, and high-humidity exposure (b) passed a final bend test at a diameter 40 times the cable diameter and an AC high-potential-withstand test of 80v per mil of insulation thickness. Item (a) above was considered to have been met if the total leakage/charging current of the specimens connected to an energizing source for potential did not exceed approximately 1.0 amp.

For instrumentation cable such as RG-58, in addition to items (a) and (b) above, the staff typically requires the demonstration of at least one megohm (i.e., 10^6 ohms) of insulation resistance (IR) during accident simulation. If IR falls below one megohm the applicant should explain why that condition is acceptable. An acceptable explanation may be developed around the particular use of the cable. In this case, for example, an explanation that includes a determination that the only function of this cable is to remain intact (i.e., no short to ground) during a design basis event is an acceptable explanation. This is acceptable because IR values lower than one megohm do not necessarily indicate failure, but rather serve

to define the limits and conditions under which the cable being tested can be used with predictable results.

The specimens in this test maintained specified voltage and current throughout the test and passed a final bend test and an ac high-potential-withstand. In addition, insulation resistance was maintained at an acceptable level as indicated by the readings recorded periodically throughout the test.

The success of these tests demonstrate that RG-58 coaxial cable is environmentally qualified in accordance with 10 C.F.R. § 50.49. In addition, these results confirm the Staff's previous conclusions that RG-58 coaxial cable is environmentally qualified in accordance with the requirements of 10 C.F.R. § 50.49.

Q11: Applicants have stated that none of the 126 RG-58 coaxial cables which have been installed (12 of which have been replaced with RG-59 cables) are connected to any of the devices included within the Safe Shutdown Instrumentation System (SSI). Do you agree that the Applicants' conclusion is reasonable based on your understanding of the review conducted by the Applicants?

A11: (Walker) Yes, the Applicants' have developed a computerized approach to identify and maintain cable routes and termination locations for each uniquely identified plant cable, including all RG-58 coaxial cable installed at Seabrook. In addition, the Applicants have conducted a design review and a physical walkdown which confirmed the precise locations and interfaces of all RG-58 coaxial cable. This overall approach, I believe provides sufficient assurance that the location and use of RG-58 coaxial cable have been identified. I


believe the method for determining the location of cable, the design review, and the walkdown is sufficient to provide reasonable assurance that none of the 126 RG-58 coaxial cable which has been installed are connected to any of the devices included within the SSI.

Q12: Mr. Gill, Applicants maintain that RG-59 coaxial cable is a technically acceptable substitute for RG-58 coaxial cable. Do you agree with this position?

A12: (Gill) I have reviewed the evaluation conducted by Applicants to determine whether RG-59 coaxial cable is a functionally adequate substitute for the 12 RG-58 coaxial cables that were installed in harsh environments. As a result of that evaluation, Applicants concluded that RG-59 was an acceptable substitute for RG-58 coaxial cable. As I indicated in the Staff's July 20, 1988 response to Interrogatory 11 of NECNP' First Set Of Interrogatories To The NRC Staff On NECNP Contention I.B.2, the Staff has no concern regarding the adequacy of Applicants' review or with the conclusions reached as a result of that review. It is worth noting, as the Staff observed in further response to that interrogatory, that "[t]he functional adequacy of RG-59 coaxial cable as a replacement for RG-58 coaxial cable is not germane to the environmental qualification issue. It is the responsibility of Applicants to conduct adequate evaluations of all nonsafety applications for functional requirements and compatibility." Applicants have discharged this responsibility satisfactorily.

Q13: Gentlemen, does this complete your affidavit?

A13: (Walker, Gill) Yes it does.


Harold Walker


Ametrak Gill

Sworn to and subscribed before me
this 3rd day of October 1988:


My Commission expires: July 1, 1994

STATEMENT OF
PROFESSIONAL QUALIFICATIONS
OF
AMRITPAL S. GILL

I am a Senior Electrical Engineer in Section B of the Electrical Systems Branch, Division of Engineering and Systems Technology, Office of Nuclear Reactor Regulation, United States Nuclear Regulatory Commission. My duties include serving as a principal reviewer in the area of electrical power systems and the associated instrumentation and controls needed for safe operation and safe shutdown of nuclear reactors. Prior to this assignment, I was an electrical engineer in the Electrical, Instrumentation and Control System Branch where I reviewed safety issues relating to electrical components, equipment and systems needed for safe operation and shutdown of nuclear facilities. Prior to being assigned to the Electrical Instrumentation and Control Systems Branch, I was an electrical engineer in the Power System Branch where my duties included performing technical reviews, analyses and evaluations of the adequacy of electrical equipment, apparatus and components for safe operation and safe shutdown of nuclear power plants. I have been performing these duties since joining NRC in 1982.

I hold a B.E. degree in electrical engineering and M.Sc. degree in electrical engineering. I am a registered professional engineer in the State of Maryland. I am an associate professor and lecturer (part-time) at George Washington University where I teach electrical engineering courses to graduate and practicing engineers. I have written a text book,

Electrical Equipment Testing and Maintenance, published by Reston Publishing Co. (Prentice Hall), 1982.

Prior to joining the NRC, I worked for 17 years in the private sector, including an electrical power company where my duties included the selection and development of specifications for electrical systems, equipment and apparatus. I also performed evaluations and testing of electrical equipment and components used for electrical systems.

STATEMENT OF
PROFESSIONAL QUALIFICATION
OF
HAROLD WALKER

I am a Reactor Engineer in Section B of the Plant Systems Branch, Division of Engineering and Systems Technology, Office of Nuclear Reactor Regulation, United States Nuclear Regulatory Commission. My duties include serving as a principal reviewer in the area of nuclear plant protection to assure against various hazards and certain aspects of containment, radioactive waste processing and other support systems assigned to the Branch. Prior to this assignment I was a Mechanical Engineer in the Electrical, Instrumentation and Control Systems Branch where I reviewed the integrity, operability and functional capability of mechanical and electrical equipment, mechanical components, and supports needed for safe operation and safe shutdown of nuclear facilities.

Prior to being assigned to the Electrical Instrumentation and Control Systems Branch, I was a Mechanical Engineer in the Equipment Qualification Branch where my duties included performing technical reviews, analyses and evaluations of the adequacy of the environmental qualification of electrical and mechanical equipment whose failure, due to such environmental conditions as temperature, humidity, pressure and radiation, could adversely affect the performance of safety systems. I was previously a Materials Engineer in the Materials Engineering Branch where my duties and responsibilities involved the review and evaluation of materials performance from the standpoint of operability and functional capability and integrity under normal, abnormal, and accident loading

conditions, and analyzing fracture toughness of reactor vessel materials, including specific data to assure that the materials will behave in a non-brittle manner.

Prior to my position in the Materials Engineering Branch, I was a Materials Engineer in the Engineering Branch, Division of Operating Reactors. My duties and responsibilities included the review of operating problems to determine whether safety requirements were being satisfied and to assure that operating problems were corrected, with due regard for safety and environmental protection.

Prior to my position in the Engineering Branch, I was a ACRS Fellow at the Advisory Committee on Reactor Safeguards. My duties included collecting and consolidating information pertaining to non-destructive testing methods.

I hold a B.E. degree in mechanical engineering from the City College of the City University of New York and I have taken graduate courses at the University of Pittsburgh.

Prior to joining the NRC, I was an engineer at Westinghouse Research Corporation in Pittsburgh, Pennsylvania where my duties included the application of the state of the art fracture mechanics as well as the study of structural integrity of materials in various environments and under various loading conditions.

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
)
PUBLIC SERVICE COMPANY OF)
NEW HAMPSHIRE, et al.)
(Seabrook Station, Units 1 and 2))

OFFICE OF THE SECRETARY
DOCKETING & SERVICE
Docket Nos. 50-443 OL-01**
50-444 OL-01
On-site Emergency Planning
and Safety Issues

CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC STAFF RESPONSE TO APPLICANTS" MOTION FOR SUMMARY DISPOSITION OF NECNP CONTENTION I.B.2 (RG-58 COAXIAL CABLE)" in the above-captioned proceeding have been served on the following by deposit in the United States mail, first class, or as indicated by an asterisk, by deposit in the Nuclear Regulatory Commission's internal mail system, or as indicated by double asterisk by use of express mail service, this 3rd day of October 1988:

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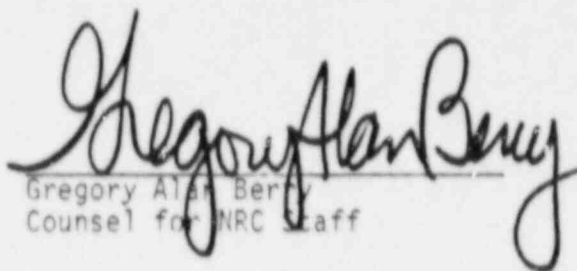
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