

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
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)

Docket Nos. 50-443
50-444

AFFIDAVIT OF GREGORY C. MINOR
REGARDING ENVIRONMENTAL QUALIFICATION
OF ELECTRIC VALVE OPERATORS
CS-HCV-189, CS-HCV-190, AND RC-V81

Gregory C. Minor, being duly sworn, deposes and says:

1. I am a consulting engineer with MHB Technical Associates in San Jose, California.
2. I have worked for over 20 years in the nuclear industry in a variety of positions including the design, manufacturing, construction, maintenance and analysis of nuclear plants, systems and components. A list of my professional qualifications is attached to this affidavit.
3. I have reviewed the NRC Staff's affidavit of April 20, 1983, concerning qualification of electric valve operators at the Seabrook nuclear power plant.
4. Unqualified valve operators CS-HCV-189/ CS-HCV-190, and RC-V81 (items 13 and 14 of the Staff affidavit) are located in series on the same letdown line. Safety grade containment

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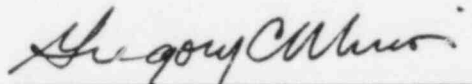
isolation valve CS-V149 is also located on this line. See FSAR Figure 9.3-13.

5. The NRC Staff states that the systems associated with electric valve operators CS-HCV-189, CS-HCV-190, and RC-V81 are not relied upon during post-accident operations. NRC Staff Affidavit at 5. Those electric valve operators, however, could be relied upon if feed and bleed were used as a means of cooling the reactor during an accident. Under those circumstances, the containment isolation valve, CS-V149 could not be relied upon because it is capable only of stopping, not controlling, coolant flow. Instead, electric valve operators CS-HCV-189, CS-HCV-190, and RC-V81 would be called upon to control the "bleeding" of hot reactor coolant from the letdown line.

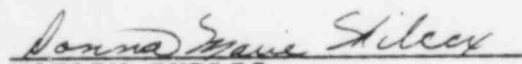
6. The Westinghouse Owners Group Emergency Response Guidelines are being used as the basis for the development of the Seabrook Station Emergency Operating Procedures. Letter from J. DeVincentis, Yankee Atomic Electric Co., to D.G. Eisenhower, NRC, dated April 14, 1983. Enclosure at 3. Those emergency response guidelines rely on the feed and bleed mechanism for reactor cooling following safety injection. They also rely on balancing of charging and letdown flows to equilibrate primary and secondary steam generator pressures during steam generator tube rupture accidents.

6. Since feed and bleed may be relied on at Seabrook for

cooling the reactor following certain accident conditions, the failure of electric valve operators CS-HCV-189, CS-HCV-190, and RC-V81 could prevent desired modes of cooling and thereby impact the functioning of safety related equipment. Therefore these electric valve operators must be considered important to safety under the definition of 10 C.F.R. § 50.49(b)(2), and must be environmentally qualified pursuant to 10 C.F.R. § 50.49(a).


GREGORY C. MINOR

Subscribed and sworn to before me this 11th day of May, 1983.


NOTARY PUBLIC

My Commission expires 7/31/87.

STATEMENT OF MATERIAL FACTS REGARDING ELECTRIC VALVE
OPERATORS SA-SV-4A/B AS TO WHICH THERE IS A
GENUINE ISSUE TO BE HEARD

1. In its evaluation of valve operators SA-SV-4A/B, the Staff states both that "there are no components that require air to perform their safety function" and that "all safety related air operated valves will fail in the safe position." This implies a contradiction because the air supply does serve safety related valves. Failure of the air supply (in a high or low condition) could provide an excessive pressure on the safety related valve operators and related equipment or a misleading indication of valve status to the operator.

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OF ELECTRIC VALVE OPERATORS SA-SV-4A/4B

Gregory C. Minor, being duly sworn, deposes and says:

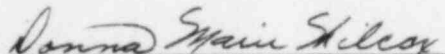
1. I am a consulting engineer with MHB Technical Associates in San Jose, California.
2. I have worked for over 20 years in the nuclear industry in a variety of positions including the design, manufacturing, construction, maintenance and analysis of nuclear plants, systems and components. A list of my professional qualifications is attached to this affidavit.
3. I have reviewed the NRC Staff affidavit concerning environmental qualification of electric valve operators at Seabrook.
4. In its evaluation of valve operators SA-SV-4A/B, the Staff states both that "there are no components that require air to perform their safety function" and that "all safety related air operated valves will fail in the safe position."

This implies a contradiction because the air supply does serve safety related valves. Failure of the air supply (in a high or low condition) could provide an excessive pressure on the valve operator and related equipment or a misleading indication of valve status to the operator. These conditions do not appear to be fully evaluated by the Staff (NRC Staff Affidavit @ p. 5). The Staff affidavit does not support a finding that containment service air system electric valve operators SA-SV-4A/4B are not important to safety.



Gregory C. Minor

Subscribed and sworn to before me this 11th day of May ,
1983.



NOTARY PUBLIC

My Commission expires 7/31/87.

PROFESSIONAL QUALIFICATIONS OF GREGORY C. MINOR

GREGORY C. MINOR
MHB Technical Associates
1723 Hamilton Avenue
Suite K
San Jose, California 95125
(408) 266-2716

EXPERIENCE:

1976 - PRESENT

Vice-President - MHB Technical Associates, San Jose, California.
Engineering and energy consultant to state, federal, and private organizations and individuals. Major activities include studies of safety and risk involved in energy generation, providing technical consulting to legislative, regulatory, public and private groups and expert witness in behalf of state organizations and citizens' groups. Was co-editor of a critique of the Reactor Safety Study (WASH-1400) for the Union of Concerned Scientists and co-author of a risk analysis of Swedish reactors for the Swedish Energy Commission. Served on the Peer Review Group of the NRC/TMI Special Inquiry Group (Rogovin Committee). Actively involved in the Nuclear Power Plant standards Committee work for the Instrument Society of America (ISA).

1972 - 1976

Manager, Advanced Control and Instrumentation Engineering,
General Electric Company, Nuclear Energy Division, San Jose,
California.

Managed a design and development group of thirty-four engineers and support personnel designing systems for use in the measurement, control and operation of nuclear reactors. Involved coordination with other reactor design organizations, the Nuclear Regulatory Commission, and customers, both overseas and domestic. Responsibilities included coordinating and managing the design and development of control systems, safety systems, and new control concepts for use on the next generation of reactors. The position included responsibility for standards applicable to control and instrumentation, as well as the design of short-term solutions to field problems. The disciplines involved included electrical and mechanical engineering, seismic design and process computer control/programming.

1970 - 1972

Manager, Reactor Control Systems Design, General Electric Company,
Nuclear Energy Division, San Jose, California.

Managed a group of seven engineers and two support personnel in the design and preparation of the detailed system drawings and control documents relating to safety and emergency systems for nuclear reactors. Responsibility required coordination with other design organizations and interaction with the customer's engineering personnel, as well as regulatory personnel.

1963 - 1970

Design Engineer, General Electric Company, Nuclear Energy Division,
San Jose, California.

Responsible for the design of specific control and instrumentation systems for nuclear reactors. Lead design responsibility for various subsystems of instrumentation used to measure neutron flux in the reactor during startup and intermediate power operation. Performed lead system design function in the design of a major system for measuring the power generated in nuclear reactors. Other responsibilities included on-site checkout and testing of a complete reactor control system at an experimental reactor in the Southwest. Received patent for Nuclear Power Monitoring System.

1960 - 1963

Advanced Engineering Program, General Electric Company; Assignments
in Washington, California, and Arizona.

Rotating assignments in a variety of disciplines:

- Engineer, reactor maintenance and instrument design, KE and D reactors, Hanford, Washington, circuit design and equipment maintenance coordination.
- Design engineer, Microwave Department, Palo Alto, California. Worked on design of cavity couplers for TWT's.
- Design engineer, Computer Department, Phoenix, Arizona. Design of core driving circuitry.
- Design engineer, Atomic Power Equipment Department, San Jose, California. Circuit design and analysis.
- Design engineer, Space Systems Department, Santa Barbara, California. Prepared control portion of satellite proposal.

- Technical Staff - Technical Military Planning Operation. (TEMPO), Santa Barbara, California. Prepare analysis of missile exchanges.

During this period, completed three-year General Electric program of extensive education in advanced engineering principles of higher mathematics, probability and analysis. Also completed courses in Kepner-Tregoe, Effective Presentation, Management Training Program, and various technical seminars.

EDUCATION

University of California at Berkeley, BSEE, 1960.

Advanced Course in Engineering - three-year curriculum, General Electric Company, 1963.

Stanford University, MSEE, 1966.

HONORS AND ASSOCIATIONS

- Tau Beta Pi Engineering Honorary Society.
- Co-holder of U.S. Patent No. 3,565-760, "Nuclear Reactor Power Monitoring System," February, 1971.
- Member: American Association for Advance of Science.
- Member: Nuclear Power Plant Standards Committee, Instrument Society of America.

PERSONAL DATA

Born: June 7, 1937
 Married, three children
 Residence: San Jose, California

PUBLICATIONS AND TESTIMONY

1. G.C. Minor, S.E. Moore, "Control Rod Signal Multiplexing," IEEE Transactions on Nuclear Science, Vol. NS-19, February, 1972.
2. G.C. Minor, W.G. Milam, "An Integrated Control Room System for a Nuclear Power Plant," NEDO-10658, presented at International Nuclear Industries Fair and Technical Meetings, October, 1972, Basle, Switzerland.
3. The above article was also published in the German Technical Magazine, NT, March, 1973.
4. Testimony of G.C. Minor, D.G. Bridenbaugh, and R.B. Hubbard before the Joint Committee on Atomic Energy, Hearings held February 18, 1976, and published by the Union of Concerned Scientists, Cambridge, Massachusetts.
5. Testimony of G.C. Minor, D.G. Bridenbaugh, and R.B. Hubbard before the California State Assembly Committee on Resources, Land Use, and Energy, March 8, 1976.
6. Testimony of G.C. Minor and R.B. Hubbard before the California State Senate Committee on Public Utilities, Transit, and Energy, March 23, 1976.
7. Testimony of G.C. Minor regarding the Grafenrheinfeld Nuclear Plant, March 16-17, 1977, Wurzburg, Germany.
8. Testimony of G.C. Minor before the Cluff Lake Board of Inquiry, Regina, Saskatchewan, Canada, September 21, 1977.
9. The Risks of Nuclear Power Reactors: A Review of the NRC Reactor Safety Study WASH-1400 (NUREG-75/0140), H. Kendall, et al, edited by G.C. Minor and R.B. Hubbard for the Union of Concerned Scientists, August, 1977.
10. Swedish Reactor Safety Study: Barsebäck Risk Assessment, MHB Technical Associates, January, 1978. (Published by Swedish Department of Industry as Document SdI 1978:1)
11. Testimony by G.C. Minor before the Wisconsin Public Service Commission, February 13, 1978, Loss of Coolant Accidents: Their Probability and Consequence.
12. Testimony by G.C. Minor before the California Legislature Assembly Committee on Resources, Land Use, and Energy, AB 3108, April 26, 1978, Sacramento, California.

PUBLICATIONS AND TESTIMONY

13. Presentation by G.C. Minor before the Federal Ministry for Research and Technology (BMFT), Meeting on Reactor Safety Research, Man/Machine Interface in Nuclear Reactors, August 21, and September 1, 1978, Bonn, Germany.
14. Testimony by G.C. Minor, D.G. Bridenbaugh, and R.B. Hubbard, before the Atomic Safety and Licensing Board, September 25, 1978, in the matter of the Black Fox Nuclear Power Station Construction Permit Hearings, Tulsa, Oklahoma.
15. Testimony of G.C. Minor, ASLB Hearings Related to TMI-2 Accident, Rancho Seco Power Plant, on behalf of Friends of the Earth, September 13, 1979.
16. Testimony of G.C. Minor before the Michigan State Legislature, Special Joint Committee on Nuclear Energy, Implications of Three Mile Island Accident for Nuclear Power Plants in Michigan, 10/15/79.
17. A Critical View of Reactor Safety, by G.C. Minor, paper presented to the American Association for the Advancement of Science, Symposium on Nuclear Reactor Safety, January 7, 1980, San Francisco, California.
18. The Effects of Aging on Safety of Nuclear Power Plants, paper presented at Forum on Swedish Nuclear Referendum, Stockholm, Sweden, March 1, 1980.
19. Minnesota Nuclear Plants Gaseous Emissions Study, MHB Technical Associates, September, 1980, prepared for the Minnesota Pollution Control Agency, Roseville, MN.
20. Testimony of G.C. Minor and D.G. Bridenbaugh before the New York State Public Service Commission, Shoreham Nuclear Plant Construction Schedule, in the matter of Long Island Lighting Company Temporary Rate Case, September 22, 1980.
21. Testimony of G.C. Minor and D.G. Bridenbaugh before the New Jersey Board of Public Utilities, Oyster Creek 1980 Refueling Outage Investigation, in the matter of Jersey Central Power and Light Rate Case, February 19, 1981.

CERTIFICATE OF SERVICE

I certify that on May 12, 1983, NECNP MOTION TO FILE OUT OF TIME ANSWER TO NRC STAFF AFFIDAVIT REGARDING ENVIRONMENTAL QUALIFICATION OF ELECTRIC VALVE OPERATORS and NECNP ANSWER TO NRC STAFF AFFIDAVIT REGARDING ENVIRONMENTAL QUALIFICATION OF ELECTRIC VALVE OPERATORS were served by first-class mail or as otherwise indicated on the following:

*Helen Hoyt, Esq., Chairperson
Atomic Safety and Licensing Board
Panel
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Rep. Roberta C. Pevear
Drinkwater Road
Hampton Falls, NH 03844

*Dr. Emmeth A. Luebke
Administrative Judge
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Phillip Ahrens, Esq.
Assistant Attorney General
State House, Station #6
Augusta, ME 04333

*Dr. Jerry Harbour
Administrative Judge
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Robert A. Backus, Esq.
111 Lowell Street
Manchester, NH 03105

Atomic Safety and Licensing Board
Panel
U.S. Nuclear Regulatory Commission
Washington, DC 20555

**Thomas G. Dignan, Esq.
R. K. Gad, III, Esq.
Ropes and Gray
225 Franklin Street
Boston, MA 02110

Atomic Safety and Licensing Appeal
Board Panel
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dr. Mauray Tye, President
Sun Valley Association
209 Summer Street
Haverhill, MA 01830

Docketing and Service
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Roy P. Lessy, Jr. Esq.
Robert G. Perlis, Esq.
Office of the Executive
Legal Director
U.S. Nuclear Regulatory
Commission
Washington, DC 20555

Maynard B. Pearson
Director of Civil Defense
Town Hall
Amesbury, MA 01913

Mr. Angie Machiros
Chairman
Board of Selectmen
Town of Newbury
Newbury, MA 09150

Anne Verge, Chair
Board of Selectman
Town Hall
South Hampton, NH 03842

Jo Ann Shotwell, Esq.
Assistant Attorney General
Department of the Attorney
General
1 Ashburton Place, 19th Floor
Boston, MA 02108

John B. Tanzer
Town of Hampton
5 Morningside Drive
Hampton, NH 03842

Edward F. Meany
Town of Rye
155 Washington Road
Rye, NH 03870

*Ruthanne G. Miller, Esq.
Law Clerk to the Board
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Richard E. Sullivan, Mayor
City Hall
Newburyport, MA 01950

Alfred V. Sargent, Chairman
Board of Selectmen
Town of Salisbury, MA. 01950

Diana P. Randall
70 Collins Street
Seabrook, NH. 03874

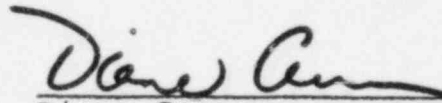
George Dana Bisbee, Esq.
Edward L. Cross, Jr., Esq.
Asst. Atty. Generals
State House Annex
Concord, NH 03301

Letty Hett, Selectman
Town of Brentwood
RFD Dalton Road
Brentwood, NH 03833

Sandra Gavutis
Town of Kensington
RFD 1
East Kensington, NH 03827

Diana P. Sidebotham
R.F.D.2
Putney, VT 05346

Donald E. Chick
Town Manager
10 Front Street
Exeter, NH. 03833


Diane Curran

- * Hand Delivery
- ** Express Mail