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March 14, 1988

OFFICE OF THE SECRETARY  
DOCKETING DIVISION

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

JUDGE IVAN W. SMITH, CHAIRMAN  
JUDGE JERRY HARBOUR  
JUDGE GUSTAVE A. LINENBERGER, JR.

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In the Matter of )	
Public Service Co. of New Hampshire, )	Docket No. 50-443-OL
et al. )	50-444-OL
(Seabrook Station, Units 1 & 2) )	Offsite Emergency
_____ )	Planning Issues

TESTIMONY OF DR. JOAN HOCK, JOSEPH H. KELLER AND  
WILLIAM R. CUMMING ON BEHALF OF THE FEDERAL EMERGENCY  
MANAGEMENT AGENCY ON SHELTERING/BEACH POPULATION ISSUES

INTRODUCTION OF WITNESSES

(Dr. Hock) I am the Chief of the Technological Hazards Division, Office of Natural and Technological Hazards Programs, State and Local Programs and Support Directorate, Federal Emergency Management Agency (FEMA).

(Keller) I am employed by Westinghouse Idaho Nuclear Company as a Fellow Scientist at the Idaho National Engineering Laboratory, a Department of Energy Laboratory.

(Mr. Cumming) I am an attorney in the Program Law Division of the Office of General Counsel, FEMA.

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(Hock, Keller, Cumming) Our Statements of Professional Qualifications are included in this testimony as Attachments A, B, and C, respectively.

#### BACKGROUND

(Hock, Keller, Cumming) Our testimony addresses several issues. The first is whether the requirement for a range of protective actions specified in Planning Standard J of NUREG 0654/FEMA REP 1, Rev. 1, applies uniformly to each special population within the EPZ. A closely related issue is whether the requirement for a range of protective actions has been met with respect to the summer beach population in the New Hampshire portion of the EPZ. We also consider the issue of whether the decision by the State of New Hampshire not to shelter the summer beach population except in very limited circumstances is supported by a technically appropriate basis.

(Hock, Cumming) The NRC Staff has advised FEMA that it does not interpret its regulations to require sheltering for each segment of the EPZ population. In the Supplemental Testimony which was prefiled on January 25, 1988, FEMA stated:

(a) that it is appropriate to consider further the adequacy of the emergency response plan for the transient population of the beaches within the Seabrook Emergency Planning Zone (EPZ) during the summer, that is, from May 15 to September 15, as indicated in the New Hampshire Radiological Emergency Response Plan (NHRERP); (b) that the requirement of NUREG 0654/FEMA REP 1, Rev. 1, for a "range of protective actions" may or may not be satisfied by evacuation alone; (c) that FEMA cannot conclude that the NHRERP is adequate with respect to that beach population until it is clear that the State of New Hampshire has considered the use of sheltering for the transient beach population and explains what use, if any, it intends to make of sheltering. This latter point

should not be interpreted to mean that FEMA has imposed a requirement that sheltering be available. If the State of New Hampshire intends not to employ sheltering for the transient beach population (which is not presently clear from the NHRERP), then FEMA expects the State to develop the rationale for such a choice and provide it to FEMA for review.

The SEMA Supplemental Testimony of January 25, 1988, is attached as Attachment D. The materials submitted by the State of New Hampshire make it clear that it has considered the use of sheltering for the transient beach population and explains what use, if any, it intends to make of sheltering. It also provides a rationale for the State's choice which is technically supportable. As a consequence, FEMA now finds that the provisions in the NHRERP regarding planning elements J.9. and J.10.m. of NUREG 0654/FEMA REP 1, Rev. 1, are adequate with respect to the summer beach population.

The prefiled Testimony dated September 11, 1987, is outdated. We adopt the FEMA Supplemental Testimony filed on January 25, 1988, to the extent that it is consistent with this testimony and incorporate it by reference. The focus of this testimony is primarily two-fold: our position is based on both legal and technical considerations.

(Cumming) Legal considerations were a very important influence. In the discussion which follows, my purpose is not to present a legal argument, but to present as accurately as I can the history of how FEMA developed its position. For this reason, I will follow a chronological sequence.

In a memo to the Regional Assistance Committee dated December 31, 1985, Edward A. Thomas, Chief of the Natural and Technological Hazards Division, Region 1, FEMA, identified the summer beach population within the EPZ as a special planning issue.

The June 18, 1986, letter from the Chief Hearing Counsel of the NRC Staff to the General Counsel of FEMA, which has been served on the parties to this litigation, dealt in part with the question of minimum dose reduction. It expressed the position that no pre-set minimum dose reduction was required for offsite emergency plans to be acceptable and that such plans were intended to cope with a range of accidents, not a single accident.

The Commission ruled, on July 24, 1986, in the Long Island Lighting Company (Shoreham) case (24 NRC 22, 29 (CLI-86-13 1986)) that emergency planning requirements do not require that an adequate plan achieve a pre-set minimum radiation dose savings or a minimum evacuation time for the plume exposure pathway emergency planning zone in the event of a serious accident; rather they attempt to achieve reasonable and feasible dose savings under the circumstances.

On February 18, 1987, Dr. Robert Bores, Technical Assistant, Division of Radiation Safety and Safeguards, NRC Region I, King of Prussia, Pennsylvania, sent a letter to Edward A. Thomas expressing the view that the NHRERP does achieve significant dose savings for the transient beach population and that there are a number of special circumstances which work together to lessen the risk. At the next meeting of the Regional Assistance Committee (RAC), in April, 1987, a consensus was reached that the issue had been adequately treated in the NHRERP. FEMA was prepared to endorse that position in testimony before this ASLB.

The proposed rule change dealing with the evaluation of utility-sponsored emergency response plans, published by the NRC at 52 Fed. Reg. 6980 (March 6,

1987), included a comment that offsite emergency response plans in general were not to be judged by any specific quantitative standard. This view was reiterated with the publication of the final rule change at 52 Fed. Reg. 42,078 (November 3, 1987).

Dr. Bores's letter of June 4, 1987, to Edward Thomas essentially repeated the views stated in the earlier letter, but the most notable difference was the omission of any reference to the containment structure at Seabrook Station. The foreknowledge that this second letter would be sent prompted FEMA to review the beach population issue. This letter was delivered to Mr. Thomas only hours before FEMA's Statement of Position was filed and served on the parties.

On June 4, 1987, FEMA filed a Statement of Position which took the position that, until the beach population issues were resolved, it could not make a finding of reasonable assurance.

The testimony which FEMA prefiled on September 11, 1987, reiterated the position taken on June 4.

At the start of the current hearings in this case on October 4, 1987, Sherwin Turk, Counsel for the NRC Staff, filed a proposed rebuttal plan with this Board, outlining the testimony which the NRC was considering offering. It included a statement that NRC's regulations were not contravened by the absence of shelter for the beach population.

On October 15, 1987, Dr. Bores sent to Sherwin Turk an account of the RAC meeting of July 30, 1987 in which he expressed the view that the lack of a reference to the Seabrook containment in his letter of June 4, 1987 made no

difference in the technical rational or conclusions.

On November 6, 1987, the ASLB heard arguments on the admissibility of testimony of Stephen C. Sholley, et al. At that time, counsel for the NRC cited the material published with the final rule at 52 Fed. Reg. 42,078 (November 3, 1987) and the Commission's ruling in the Shoreham case (24 NRC 22, 29 (CLI-86-13 1986)).

On November 16, 1987, this Board ruled from the bench that the proffered testimony of Stephen C. Sholley, et al., was not admissible, citing as controlling the Commission's ruling in the Shoreham case (24 NRC 22, 29 (CLI-86-13 1986)).

On November 30, 1987, Sherwin Turk wrote to Stephen Olesky, Deputy Attorney General of the Commonwealth of Massachusetts, and indicated his perception that FEMA's prefiled testimony was based on an erroneous legal standard.

On January 7 and 8, 1988, the RAC met and the majority of the RAC endorsed the views stated in Dr. Bores's letter of June 4, 1987.

FEMA filed its Supplemental Testimony on the Sheltering/Beach Population Issues on January 25, 1988.

On February 11, 1988, the State of New Hampshire submitted to FEMA a Response to FEMA's Supplemental Testimony. This was followed by additional material on February 19, 1988.

On February 18, 1988, Sherwin Turk sent a letter to H. Joseph Flynn, FEMA counsel, affirming FEMA's understanding that NRC Staff's interpretation of its regulations did not require sheltering for all accidents at all times and at

all locations within the plume exposure EPZ.

The RAC met and discussed the state of the plans for the summer beach population on February 29, 1988. The majority reaffirmed its position that the NHRERP was adequate in its treatment of the summer beach population.

Over the period encompassed by the foregoing discussion, it became increasingly clear to FEMA that to require sheltering for the transient beach population as a condition of a finding of reasonable assurance is inconsistent with the precept that emergency planning requirements do not require that an adequate plan achieve a pre-set minimum radiation dose savings or a minimum evacuation time. This testimony reflects that realization as well as deference to the NRC Staff on its interpretation of the requirement for a range of protective actions. FEMA agrees with that interpretation.

#### TECHNICAL APPROPRIATENESS ANALYSIS

(Hock, Keller) On page 2 of the prefiled Supplemental Testimony of January 25, 1988, FEMA stated that it expected the State to consider the use of sheltering for the transient beach population and explain what use, if any, it intends to make of sheltering.

On February 11, 1988, Richard H. Strome, Director of the Office of Emergency Management of the State of New Hampshire wrote to Mr. Henry G. Vickers, Regional Director of FEMA Region I, enclosing a document entitled "New Hampshire Response to FEMA Supplemental Testimony" which presented the State's justification for choosing to use shelter in the beach areas only in limited circumstances. In essence, the justification is that sheltering for

the transient beach population is a protective action of limited usefulness in realizing dose savings, regardless of the season (page 1) and that the public is much more likely to be afforded meaningful dose reductions by moving out of the EPZ than by moving to a shelter within the EPZ (page 2).

The February 11th submission considers an evacuation of the general beach population in the vicinity of the plant as a protective action strategy at the Alert level. In the case of transit dependent transients, temporary sheltering as it is outlined in the proposed plan changes is sensible because it does not delay their evacuation.

(Keller) The response by New Hampshire to the FEMA Supplemental Testimony is adequate in concept. The transient beach population is treated as a special population and the special considerations afforded this special population include precautionary actions such as early beach closure at Emergency Classification Levels (ECLs) prior to the necessity for considerations of protective actions for the general public.

ECLs range from Notification of Unusual Event (the least severe) through Alert, Site Area Emergency, and General Emergency (the most severe). The current NHRERP calls for beach closure to be considered at the Alert ECL and implemented no later than the Site Area Emergency ECL. For these ECLs there will be no significant doses associated with beach closure as a precautionary action.

It is FEMA's understanding of NRC's current guidance and internal response procedures, as stated in NUREG 1210, that initial protective action decisions for areas near the site should be based on plant status without

inclusion of calculations of projected doses unless a release of radioactive material is already underway. The basis for the immediate evacuation of the close-in areas without dose calculations is based on the fact that, unless a release of radioactive material is underway, there is little or no likelihood of having reliable predictive information needed to perform dose projection calculations. The information necessary to make an accurate calculation would include the projected duration of a release, the time at which such a release would begin, and the magnitude of a projected release.

In addition, in severe accident sequences the total dose potential is comprised of several components. These are the direct exposure from immersion in the plume, cloud-shine from a plume overhead, exposure from inhalation of the plume, and ground-shine from deposited radionuclides. The exact relationship among the various components will vary with time and distance from the point of release; however, in severe accident sequences the ground-shine component is most likely to be the major contributor to total dose if no protective actions are taken.

In those cases, if the dose reduction strategy is sheltering first followed by an evacuation after plume passage, the total dose reduction would not be as great as that for the immediate evacuation strategy. The sheltering part of the strategy reduces dose primarily from the plume immersion and inhalation component. In the New Hampshire submission, the dose reduction factor ascribed to the available shelters is 0.9. That means that an individual inside such a shelter would receive 90% of the plume immersion dose he or she would receive without shelter. Another way of expressing this

measurement is to say that a building with a dose reduction factor of 0.9 provides a dose reduction of 10%.

The dose reduction for the inhalation dose is greater than 10%, but approaches zero depending on the rate at which outside air, the plume, infiltrates the shelter. It is generally accepted that after two hours, the effectiveness of a shelter to reduce the inhalation exposure begins to degrade. For the "unwinterized" structures in the New Hampshire beach areas, this degradation would likely begin much sooner. During the evacuation after plume passage, the individual previously in shelters would still receive the ground-shine dose, potentially the major component. Therefore, sheltering followed by evacuation is likely to be a less effective means of achieving dose reduction than evacuation alone, particularly for severe accident sequences.

In the immediate evacuation case, as stated above, the dose reduction involves the ground-shine component. The exact dose reduction which would result in most cases is difficult to predict due to the many potential combinations of the geometries of the plume and the evacuation routes. In the extremely rare case where the evacuation routes coincide with the plume path, an estimate of the dose reduction can be made. Because of the dispersion and dilution of the plume as it moves downwind from the point of release, the dose rate decreases with distance. The rate at which the dose rate decreases as a function of distance ( $r$ ) from the source can be approximated by an inverse power series ( $r^{-a}$ , where  $a$  varies between 1.5 and 3 depending on the atmospheric stability class). Generally speaking, the closer an area is to

the point of release, the greater the potential dose savings to be achieved by early evacuation.

By implementation of the immediate evacuation strategy, dose reduction greater than those to be derived from a "shelter first-evacuate later" concept can be obtained by movement of the population relatively short distances even in the extremely unlikely case where the plume track and the evacuation routes coincide.

#### CONCLUSION

(Hock, Cumming) The requirement for a range of protective measures has been satisfied even though the State of New Hampshire has chosen not to shelter the summer beach population except in very limited circumstances. With respect to the summer beach population, the planning elements J.9. and J.10.m. of NUREG 0654/FEMA REP 1, Rev. 1, have been met. There exists a technically appropriate basis for the choice made by the State of New Hampshire not to shelter the summer beach population except in very limited circumstances. At the same time, whenever this choice is incorporated into the NHRERP, implementing detail will be necessary.

ATTACHMENT A

Dr. Joan C. Hock

4982 Sentinel Dr.  
Sumner, Md. 20816  
Telephone: 202-673-5390

Top level Ph.D. economist and policy formulator in commercial and industrial sectors. Currently U.S. Government Director for an economic impact assessment program. Formerly Division Director and Chief Economist for Assistant Secretary, Dept. of Energy and International Trade Administration on economic issues affecting the international position of U.S. industry.

Highlights:

- . For the National Oceanic and Atmospheric Administration, a U.S. Government program, provides environmental assessments to more than 100 countries, directs environmental data into economic management and decisionmaking, and develops environmental forecasts that involve the processing of more than a billion bytes of data annually.
- . Spokesperson for the Department of Commerce (DOC) on environmental issues surrounding economic development in Africa, Asia, and South America.
- . Presented Congressional testimony to the Science and Technology Committee and Joint Economic Committee, as well as to international audiences at the International Monetary Fund, World Bank, United Nations, and Organization for Economic Cooperation and Development (OECD) on economic development and environmental monitoring.
- . Broad executive experience in international trade issues, U.S. representative to OECD and Berlin Summit. Presented economic development issues from private sector perspective.

Experience:

National Oceanic and Atmospheric Agency (NOAA)., 1980 to date.

Director of Assessment and Information Services. June 1980 to date.

Prepared multi-million dollar reimbursable assessment project including interagency negotiations, Congressional liaison activities, contracts, and user relations. Directed more than 70 employees and participated in top management decision-making in an organization with 12,000 employees and a

\$1 billion annual budget. Designed data processing system to retrieve digital and analog data for operational economic assessments for State Department and designed configuration of personal computer software system to train economists and scientists in 29 countries.

International representative for the U.S. Government on issues surrounding space programs and computer systems at the Bonn and Berlin Summit Meetings. Led U.S. delegations to over 20 countries and chaired seminars for scientists and policy makers at the United Nations, Economic and Social Commission Asia and the Pacific, Food and Agriculture Organization, United Nations Development Program, World Bank, and the International Monetary Fund.

Department of Energy, 1975-1980.

Division Chief Regional Assessment Program. August, 1978 to June, 1980.

Responsible for broadly based econometric analysis covering the status and projected performance of U.S. energy producers. Coordinated research on trends and outlooks for U.S. petroleum and coal industry with those parts of DOE and other agencies responsible for domestic policy. Supervised major engineering and economic assessment program involving management supervision of five energy research laboratories.

Branch Chief. Industry and Residential Energy Program,  
Assistant Secretary for Conservation and Renewable Energy.  
October, 1975 to August, 1978.

Research and modeling experience in trend analysis for U.S. industry. Developed a collaborative research program with DOE and industry to address risk and uncertainty issues associated with innovative U.S. technologies and products. Coordinated program results with parts of DOE and other agencies responsible for domestic policy development and multi-sectoral matters affecting international position of U.S. energy industry. Represented Department to Energy Committee, OECD.

Department of Commerce, 1972-1974.

Chief Economist. Domestic and International Business Administration, (DIBA). October, 1972 to May, 1974.

Directed broadly based econometric models with Data Resources Inc. (DRI), Wharton, Battelle covering the status and

performance of U.S. industry. Directed economic studies and cross-sectoral econometric forecasts to determine the economic impact of regulation on U.S. industries, anticipate international problems of U.S. industries, and determine the market advantage to foreign producers.

PROFESSIONAL AND ACADEMIC QUALIFICATIONS:

Wharton Graduate School of Arts and Sciences, University of Pennsylvania, 1968-1973, Ph.D. Economics 1973. Presidential Fellow 1970-1973.

University of Illinois, Graduate School of Arts and Sciences, 1966-1968, Scholarship 1966-1968, M.A. Economics and Planning 1968.

American University, School of Government and Public Administration, 1964-1966, B.A. Economics and Public Administration with Academic Honors 1966.

Outstanding Professional Evaluations - 1983, 1984, 1985 with bonuses.

Member, Western Economics Association, 1968 to date.

Member, Regional Science Association, 1970 to date.

PUBLICATIONS AND OTHER DISTINCTIONS:

1973. Ph.D. Dissertation: The Economics of the Electric Industry, University of Pennsylvania.

1974. The International Effects of Environmental Regulations on International Trade, DIBA, DOC.

1984. "Global Monitoring of Environmental Resources", International Technology Journal, Enschede, Netherlands.

1985. Earth Observations: Technology, Economics and International Cooperation, National Academy of Engineering and Resources for the Future Symposium, Explorations in Space Policy: Emerging Economic and Technical Issues.

1986. "Preliminary Notes on Geographic Information Systems", International Technology Journal, Enschede, Netherlands.



JOSEPH H. KELLER  
PROFESSIONAL QUALIFICATIONS

Education:

Bachelor of Science in Chemistry, Washington College,  
Chestertown, MD, 1956.

Master of Science in Inorganic Chemistry, Pennsylvania State  
University, University Park, PA, 1958.

Graduate Assistant in Chemistry, Pennsylvania State University,  
University Park, PA, 1958-61.

Professional Positions: 1961-1966

Assistant Professor of Chemistry at Idaho State University,  
Pocatello, ID. Responsibilities included teaching courses in  
freshman chemistry, quantitative analysis, instrumental analysis,  
advanced inorganic chemistry and laboratory radiochemistry.

8/66 - 10/73

Employed at the Idaho National Engineering Laboratory in Idaho  
Falls, ID (then called the National Reactor Testing Station).  
The site is government owned and administered by the Department  
of Energy Research and Development Agency. I was employed by one  
of the operating contractors, initially Idaho Nuclear Corp.  
followed by Allied Chemical Corp. My position was a technical  
one in the research and development area of fission product  
behavior and properties.

10/73 - 6/74

Employed as research scientist by Nuclear Environmental Services  
division of SAI, Inc., Idaho Falls, ID. responsibilities  
included contract support on performance gaseous rad waste  
processing equipment in a BWR and analysis of sources of implant  
radiation exposure to workers.

6/74 - 12/78

Employed as scientific and engineering supervisor by Allied  
Chemical Corporation at the Idaho National Engineering  
Laboratory. Responsibilities included supervision of a research  
laboratory involved with analysis of fission product levels in  
irradiated nuclear fuel specimens and analysis of the fission  
product content of samples of the worlds 1st known natural  
fission reactor and the supervision of an analysis laboratory for  
environmental samples. Conducted contract research in support of  
NRC.

Evaluated soil to vegetation transfer of stable cesium and strontium.

Reviewed current state of knowledge on scavenging in the environment airborne radiiodine by rain or snow.

Testified as FEMA witness at Indian Point and Shoreham ASLB hearing.

Adjunct faculty member at FEMA Emergency Management Institute.

Publications:

J. H. Keller, F. A. Duce, and P. O. Cartan, "Retention of Iodine on Selected Particulate Filters and a Porous Silver Membrane Being Considered for the LOFT Maypack", IN-1078, May 1967

W. J. Maeck, D. T. Pence, and J. H. Keller, "A Highly Efficient Inorganic Adsorber for Airborne Iodine Species (Silver Zeolite) Development Studies", IN-1224 October 1968

R. L. Nebeker, J. H. Keller, L. T. Lakey, D. E. Black, W. P. Palica, and R. E. Schindler, "Containment Behavior of Xenon and Iodine Under Simulated Loss-of-Coolant Accident Conditions in the Contamination-Decontamination Experiment", IN-1394, June 1971

B. Weiss, P. G. Voilleque, J. H. Keller, B. Kahn, H. L. Kreiger, A. Martin, and C. R. Phillips, "Detailed Measurements of  $^{131}\text{I}$  in Air, Vegetation, and Milk Around Three Operating Reactor Sites", NUREG-75/021, March 1975

W. J. Maeck, F. W. Spraktes, R. L. Tromp, and J. H. Keller, "Analytical Results, Recommended Nuclear Constants and Suggested Correlations for the Evaluation of OKLO Fission Product Data", at IAEA International Symposium on the Oklo Phenomenon, Liberville, Gabon, IAEA-SM-204/2, June 1975

W. J. Maeck, W. A. Enel, L. L. Dickerson, J. E. Delmore, J. H. Keller, E. A. Duce, and R. L. Tromp, "Discrepancies and Comments Regarding  $^{239}\text{Pu}$  Thermal Fission Yields and the Use of  $^{148}\text{Nd}$  as a Burnup Monitor", ICP-1092, December 1975

N. D. Dyer, E. B. Neischmidt, J. H. Keller, and B. G. Motes, "Procedures Source Term Measurement Program", TREE-1178, October 1977

N. D. Dyer, J. H. Keller, R. L. Bunting, B. G. Motes, S. T. Croney, D. W. Akers, C. V. McIsaac, T. E. Cox, R. L. Kynaston, S. W. Duce, D. R. Underwood, J. W. Tkachyk, "In-Plant Source Term Measurements at Ft. Calhoun Station-Unit 1", NUREG/CR-1040, July 1978

12/78 - present

Employed as scientist by Allied Chemical Corp., Exxon Nuclear Idaho Co., Inc. (after 7/3/79), and Westinghouse Idaho Nuclear Company, Inc. (after 3/1/84), at the Idaho National Engineering Laboratory. Responsibilities include research and development contract support to NRC and FEMA.

Attended FEMA orientation training course on Radiological Emergency Preparedness Planning for DOE Contract Personnel.

Experience:

Prove existence of previously unrecognized airborne radioiodine species to be hypoiodous acid.

Developed sampling device to differentiate various chemical forms of airborne radioiodine.

Developed inorganic adsorbent to retain airborne radioiodine.

Measured gaseous fission products in effluents and process streams in 5 BWR's stations.

Performed effluent and environmental measurements to assess iodine-grass-cow-milk dose pathway at BWR's.

Made effluent and environmental measurements of radioiodine at a pharmaceutical plant to assess environmental impact.

Analyzed fuel specimens to determine accurately the fission yields in the fast flux region of the neutron spectrum.

Analyzed fuel specimens to establish breeding or conversion ratio in Th-U fuels from the light water breeder program.

Developed a sampling device for airborne  $^{14}\text{C}$  and  $^3\text{H}$  in nuclear plant effluents and process streams.

Participated in environmental program to measure movement of radionuclides through process equipment in PWR's so that the predictive models can be evaluated.

Responsible for technical evaluation of commercial BWR off-gas systems.

Evaluated applicability of off-site, real-time instrumentation to determine the magnitude of unmonitored releases in accident situations.



## WILLIAM R. CUMMING

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### PROFESSIONAL QUALIFICATIONS

Offer over fifteen years experience in a series of increasingly significant public policy positions where legal/administrative knowledge was used to achieve priority management objectives. Areas of expertise include:

*Legal Administration* — History of success in coordinating difficult policy and legal issues . . . expert in developing systems and procedures for detecting and controlling fraud and abuse of governmental programs . . . experienced in developing legal frameworks for new programs and decentralizing activities.

*Management/Administration* — Successful in undertaking many new, understaffed, mission-oriented assignments and achieving management objectives in both civilian and military settings; . . . broad background in program development . . . knowledge of contracting and procurement law . . . skilled in handling debarment and suspension of contractors and program participants.

*Personnel Supervision* — Supervised groups ranging from 5 to 130 . . . experienced in designing training and program materials . . . skilled in handling employee and union relations . . . successful in developing program alternatives to conserve personnel resources . . . effective at motivating staff members to deliver maximum performance levels.

### PROFESSIONAL EXPERIENCE

#### OFFICE OF THE GENERAL COUNSEL FEDERAL EMERGENCY MANAGEMENT AGENCY

1979 to Present

##### **Assistant General Counsel (Projects) (1986 to Present)**

Responsible for development of legal positions related to planning, preparedness response and mitigation for both peacetime and wartime civil emergencies and integration into existing National Security institutions.

- Coordinate Technical Assistance to the Associate General Counsel for Litigation, General Law, Insurance and Mitigation; the Assistant General Counsel and the Regional Counsel.
- Conceive and implement legal policies and procedures related to warning systems, communications, population relocation, protection and damage assessment to be utilized during disasters and National Security Emergencies.
- Coordinate legal plans to assure continuity of the Federal Civil Government in a wide range of National Security Emergencies.
- Develop legal plans for the protection of industry, post-attack recovery and economic stabilization during National Security Emergencies and disasters.
- Develop legal authorities for emergency evacuation and sheltering decisions.
- Senior attorney responsible for legal aspects of agency telecommunications policies, including AT&T consent order impact on National Security Emergencies.
- Provide legal advice and technical support to State and Local governments, on emergency preparedness.
- Develop legal systems to prevent fraud, waste and abuse in programs.

##### **Associate General Counsel (Litigation) (1980 to 1985)**

Supervised all attorneys performing litigation services for the Director and General Counsel of the Federal Emergency Management Agency.

- Supervised an average open caseload of 300 defensive and affirmative cases in various state and federal trial and appellate courts; savings to government exceeded \$85 million.
- Established and coordinated Regional Counsels.
- Determined trial and appellate recommendations and strategy for FEMA; coordinated with Department of Justice on cases having government wide impact.

**PROFESSIONAL EXPERIENCE** . . . *Continued*

**Assistant General Counsel (Insurance) (1979 to 1980)**

Provided legal advice to the Federal Insurance Administration (FEMA) including responsibility for preparation and sign-off of legal opinions, regulations and conduct of litigation; defended over 700 claims with many individual cases exceeding \$5 million in potential liability.

**DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT**

1974 to 1979

**Attorney-Advisor, Supervisory Trial Attorney  
Office of the Associate General Counsel for Regulatory Programs**

Supervised six attorneys; prepared all appropriate pleadings, motions and appellate briefs in cases related to HUD programs in federal trial and appellate courts. Reviewed, drafted and commented on legislation.

**INTERNAL REVENUE SERVICE**

1970 to 1974

**Senior Tax Law Specialist (Projects Section)  
Estate and Gift Tax Branch (1973 to 1974)**

Prepared numerous private and published revenue rulings which determined IRS position concerning income, estate, gift and fiduciary returns.

**Special Advisor to the Assistant Commissioner (Stabilization) 1972**

Developed regulations of the Pay Board, Price Commission and Rent Advisory Board; served as the Assistant Commissioner's liaison with these organizations on enforcement issues.

**Tax Law Specialist, Various Branches under Assistant Commissioner (Technical) (1970 to 1971)**

**EDUCATION**

**Juris Doctor, 1967**  
University of Virginia

**Bachelor of Arts, History, Magna Cum Laude, 1964**  
Lehigh University

**MILITARY**

United States Army, 1967 to 1970; Commissioned 1968  
1LT Field Artillery Highest Rank  
Nuclear Weapons Unit Commander 1968 to 1969  
Staff Officer, Intelligence and Operations 1969 to 1970  
Overseas Service, Federal Republic of West Germany  
Decorations: Army Commendation Medal

**LEGAL**

Admitted to Virginia State Bar; admitted to practice before the Virginia Supreme Court and United States Tax Court.

*References Available Upon Request*



RELATED CORRESPONDENCE

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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In the Matter of	)	
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Public Service Co. of New Hampshire,	)	Docket No. 50-443-OL
et al.	)	50-444-OL
	)	Offsite Emergency
(Seabrook Station, Units 1 & 2)	)	Planning Issues
_____	)	

SUPPLEMENTAL TESTIMONY OF DAVE McLOUGHLIN,  
EDWARD A. THOMAS, AND WILLIAM R. CUMMING ON  
BEHALF OF THE FEDERAL EMERGENCY MANAGEMENT  
AGENCY ON SHELTERING/BEACH POPULATION ISSUES

I. Introduction.

The Federal Emergency Management Agency (FEMA) offers this testimony to supplement its earlier proposed testimony on Revised Town of Hampton Contention VIII to Revision 2, SAPL Contention 16, and NECNP Contention RERP-8 in order to reflect the use which FEMA has made of the advice given by the Regional Assistance Committee (RAC) and to clarify its reasons for adopting its position on the "Sheltering" or "Beach Population" issues. The Witnesses are Dave McLoughlin, Deputy Associate Director, State and Local Programs and Support Directorate, FEMA; Edward A. Thomas, Director, Natural and Technological Hazards Division, FEMA Region I; and William R. Cumming, Assistant General Counsel, Program Law Division, Office of General Counsel, FEMA. Statements of the professional qualifications of Dave McLoughlin and William R. Cumming are attached to this Supplemental Testimony.

Briefly put, FEMA's position is (a) that it is appropriate to consider further the adequacy of the emergency response plan for the transient population of the beaches within the Seabrook Emergency Planning Zone (EPZ) during the summer, that is, from May 15 to September 15, as indicated in the New Hampshire Radiological Emergency Response Plan (NHRERP); (b) that the requirement of NUREG 0654/FEMA REP 1, Rev. 1, for a "range of protective actions" may or may not be satisfied by evacuation alone; (c) that FEMA cannot conclude that the NHRERP is adequate with respect to that beach population until it is clear that the State of New Hampshire has considered the use of sheltering for the transient beach population and explains what use, if any, it intends to make of sheltering. This latter point should not be interpreted to mean that FEMA has imposed a requirement that sheltering be available. If the State of New Hampshire intends not to employ sheltering for the transient beach population (which is not presently clear from the NHRERP), then FEMA expects the State to develop the rationale for such a choice and provide it to FEMA for review.

## II. History of FEMA's Consideration of the Beach Population Issue.

FEMA's concern about the issue of protective measures for the summer beach population has a rather long history. On December 9, 1985, the State of New Hampshire submitted the New Hampshire Radiological Emergency Response Plan (NHRERP) which later became known as "Revision 0". On December 31, 1985, Edward A. Thomas, Chairman of the Region 1 Regional Assistance Committee, sent a memo to all of the members of the RAC asking for their comments on the beach population issue.

A full field exercise of Rev. 0 was conducted on February 26, 1986. A FEMA Exercise Report was issued in June, 1986. The State of New Hampshire submitted Revision 1 of the NHRERP on June 3, 1986, and a FEMA/RAC review of the plan was completed on June 24, 1986. Revision 2 of the NHRERP was submitted September 8, 1986; the FEMA/RAC Review was provided to the State of New Hampshire on December 12, 1986.

On February 18, 1987, Dr. Robert Bores, Technical Assistant, Division of Radiation Safety and Safeguards, NRC, King of Prussia, Pennsylvania, sent a letter to Edward A. Thomas, which expressed the views of the NRC as to the adequacy of the NHRERP with respect to the summer beach population. The issue of the beach population was discussed at length at the RAC meeting of April 15, 1987. At that meeting, the RAC reached a consensus that the issues identified in FEMA's memorandum of December 31, 1985, were resolved.

At the direction of the Atomic Safety Licensing Appeal Board, FEMA prepared a statement of its position on the contentions pending in this hearing to be filed by June 4, 1987. While that statement of position was in preparation, FEMA was advised that NRC was withdrawing Dr. Bores's letter and would substitute a different letter which omitted any reference to the containment structure at Seabrook Station. This second letter was delivered to FEMA on June 4, 1987. On that basis, FEMA took a position that it could not conclude that the plan was adequate with respect to the beach population. This change was the subject of extended discussion at the RAC meeting on July 30, 1987. FEMA continued to hold this position and incorporated it into its prefiled testimony of September, 1987.

In September, 1987, the proposed testimony of the Applicant included a number of documents, including a Shelter Survey which was offered as the basis

for potential changes in the NHRERP. The State of New Hampshire submitted these documents to FEMA for review by the RAC, and on September 30, 1987, advised FEMA that the Shelter Survey was not considered part of the NHRERP, but was submitted for the purpose of receiving technical assistance, as provided in 44 C.F.R. § 350.6. FEMA has requested comments from the RAC members, but only two agencies have responded to date, the NRC and the Department of Transportation.

At the meeting of January 7 and 8, 1988, a majority of the RAC members endorsed views contained in the June 4, 1987, letter from Dr. Bores. At the same time, those RAC members agreed that the NHRERP was currently adequate but would be enhanced by a development of a sheltering option for the transient beachgoers.

Since September, 1987, FEMA has been evaluating its prefiled testimony and the positions of the NRC and other RAC members. Dr. Bores's letter of June 4, 1987, expressed the view that the NHRERP is adequate with respect to the transient beach population and supports a finding of reasonable assurance that adequate protective measures can be taken to protect the public in the event of an accident at Seabrook Station. It also advances the position that the NHRERP does achieve significant dose savings for the transient beach population and that there are a number of special circumstances which work together to lessen the risk of injury. The June 4, 1987, letter from Dr. Bores, in combination with the June 18, 1986, letter from the Chief Hearing Counsel of the NRC Staff to the General Counsel of FEMA, the preamble to NRC's final rule on evaluation of utility sponsored emergency response plans (52 Fed. Reg. 42,078 (November 3, 1987)), and the rebuttal plan filed by the NRC in this hearing, persuades FEMA that the NRC interprets its own regulations not to require sheltering for all segments of the EPZ.

### III. The Range of Protective Actions Issue.

At the RAC meeting of January 7 and 8, 1988, Dr. Bores, the NRC representative, expressed the view that the emergency planning guidance of NUREG 0654/FEMA REP 1, Rev. 1, applies to the entire spectrum of accidents, to the entire population of the EPZ, all of the time. It was the NRC's view that FEMA's position on the summer beach population was too narrowly focused. FEMA has considered that position, but has decided that it is appropriate to consider further the provisions in the NHRERP for the transient beachgoers.

In FEMA's view, as the Federal agency with specialized knowledge of emergency response planning, the NHRERP is not adequate with respect to the transient beach population because Planning Standards J.9. and J.10.m. of NUREG 0654/FEMA REP-1, REV. 1, (November 1980) have not been met.

Planning Standard J.9. states:

Each State and local organization shall establish a capability for implementing protective measures based upon protective action guides and other criteria. This shall be consistent with the recommendations of EPA regarding exposure from passage of radioactive airborne plumes, (EPA 520/1-75-001) and with those of DHEW (DHHS)/FDA regarding radioactive contamination of human food and animal feeds as published in Federal Register of December 15, 1978 (43 FR 58790).

Planning Standard J.10. states:

The organization's plans to implement protective measures for the plume exposure pathway shall include:

....

m. The bases for the choice of recommended protective actions from the plume exposure pathway during emergency conditions. This shall include expected local protection afforded in residential units or other shelter for direct and inhalation exposure as well as evacuation time estimates.

FEMA interprets these provisions as requiring consideration of more than a single protective measure.

FEMA notes that the NHRERP includes no explicit consideration of sheltering for the transient beach population. The Shelter Survey which the State of New Hampshire has submitted to FEMA for technical assistance may be interpreted as a preliminary step in the development of a plan for sheltering beachgoers, but the current plan considers only one protective measure for the transient beach population, namely evacuation. The guidance of NUREG 0654/FEMA REP 1, Rev. 1, contemplates that emergency responders will ordinarily be called upon to make an informed and reasoned choice among available protective measures. As it presently stands, the NHRERP provides neither an adequate description of how a sheltering option might be used nor a rationale for not having the option available for the transient beach population. For these reasons, FEMA concludes that Planning Standards J.9. and J.10.m. have not been met with respect to the transient beach population.

#### IV. The Reasonable Assurance Issue.

The overall question of whether FEMA is prepared to make a finding that there is reasonable assurance that adequate protective measures can be taken to protect the public in the event of an accident presents an entirely separate issue. FEMA employs the terms "Adequate" or "Inadequate" in the context of RAC reviews of emergency response plans to indicate whether specific planning elements of NUREG 0654/FEMA REP 1, Rev. 1, have been satisfied. FEMA does not make findings of reasonable assurance as to specific parts of a plan but rather for the plan as a whole. A single plan "Inadequacy" will not, by itself, automatically prompt a negative finding (that is, that the plan does not provide reasonable assurance). In contrast, FEMA's guidance defines exercise "Deficiencies" so that a single deficiency

precludes a finding of reasonable assurance. This distinction between exercise "Deficiencies" and plan "Inadequacies" is consistent with the Memorandum of Understanding between FEMA and the NRC.

FEMA interprets its regulations to mean that it must determine first whether radiological emergency response plans comply with NUREG 0654/FEMA REP 1, Rev. 1 (44 C.F.R. § 350.5(a)) and secondly whether such plans "adequately protect the public health and safety by providing reasonable assurance that appropriate protective measures can be taken offsite in the event of a radiological emergency" (44 C.F.R. § 350.5(b)). In FEMA's view, a finding or determination that State and local plans provide reasonable assurance is a matter of professional judgment. In this case, FEMA's decision not to make an overall finding of reasonable assurance stems from the many "Inadequacies" identified in the RAC Review of the plan and "Deficiencies" identified in the Exercise Report and not just the lack of explicit consideration in the NHRERP of the possibility of sheltering for the transient beach population.

#### V. The Dose Savings Issue.

While FEMA and the RAC have not completed the technical assistance review of the Shelter Survey requested by the State of New Hampshire, the Survey does not provide the details FEMA would expect to find in a plan. The discussion of the planning basis in NUREG 0654/FEMA REP 1, Rev. 1, establishes that the objective of emergency response planning is dose savings although it does not call for specific quantitative levels of protection to be achieved. It seems to be generally accepted that the plan, however judged, ought to take advantage of every readily available opportunity to reduce dose. Therefore, the State of New Hampshire should fully consider whether there might be opportunities for additional dose savings through sheltering of the transient beach population.

FEMA's Supplemental Testimony  
on Shelter Issues, page 7.

RELATED CORRESPONDENCE

March 14, 1988  
DOCKETED

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

OFFICE OF THE  
DOCKETING CLERK  
BRANCH

JUDGE IVAN W. SMITH, CHAIRMAN  
JUDGE JERRY HARBOUR  
JUDGE GUSTAVE A. LINENBERGER, JR.

_____ )	
In the Matter of )	
Public Service Co. of New Hampshire, )	Docket No. 50-443-OL
et al. )	50-444-OL
(Seabrook Station, Units 1 & 2) )	Offsite Emergency
_____ )	Planning Issues

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing Testimony of Dr. Joan Hock, Joseph H. Keller, and William R. Cumming on Behalf of the Federal Emergency Management Agency on Sheltering/Beach Population Issues have been served on the following by Express Mail service on this 14th day of March, 1988.

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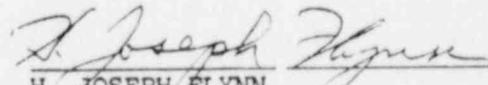
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