

LILCO, October 12, 1982

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	
	)	
LONG ISLAND LIGHTING COMPANY	)	Docket No. 50-322 (OL)
	)	(Emergency Planning--
(Shoreham Nuclear Power Station,	)	Phase I)
Unit 1)	)	

TESTIMONY OF ROGER E. LINNEMANN AND  
MICHAEL L. MIELE FOR THE LONG ISLAND LIGHTING  
COMPANY ON PHASE I EMERGENCY PLANNING CONTENTION 2(A) --  
ADEQUATE MEDICAL SERVICES

PURPOSE

The purpose of this testimony is to establish that LILCO has provided Central Suffolk Hospital as the primary facility for treatment of contaminated, injured individuals, and the Hospital of the University of Pennsylvania (HUP) as a backup hospital for definitive care, in compliance with NUREG-0654 IV.L, 10 C.F.R. § 50.47(b)(12), and 10 C.F.R. § 50, Appendix E, Items IV.E.5 through 7. Although it is unlikely that Central Suffolk would be evacuated in an emergency, other hospitals could be used to care for contaminated injured individuals. Because of the nature of the medical and emergency

care provided by Central Suffolk, it is unnecessary to hurry individuals to Philadelphia. HUP's facilities are uniquely suited to provide long-term care to a radiation exposed patient.

ATTACHMENTS

Attachment 2(A)-1	Professional Qualifications of Roger E. Linnemann
Attachment 2(A)-2	Professional Qualifications of Michael L. Miele
Attachment 2(A)-3	Letter of Agreement between LILCO and Cental Suffolk Hospital
Attachment 2(A)-4	Letter of Agreement between LILCO and RMC

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ON PHASE I EMERGENCY PLANNING CONTENTION 2(A) --  
ADEQUATE MEDICAL SERVICES

- Q1. Please state your names and business addresses.
- A1. My name is Roger E. Linnemann; my address is Radiation Management Corporation (RMC), 3508 Market Street, Philadelphia, Pennsylvania, 19104.
- My name is Michael L. Miele; my address is Shoreham Nuclear Power Station, Post Office Box 628, Wading River, New York, 11792.
- Q2. Please state your professional qualifications.
- A2. [Linnemann] I am Vice-Chairman and President of Medical Services of Radiation Management Corporation (RMC). My professional qualifications are attached to

this testimony (Attachment 2(A)-1). My familiarity with the issues surrounding medical services stems from my years of experience in the United States Army Medical Corps in evaluating plans and procedures for handling large numbers of contaminated injured individuals on the battlefield; my years of training medical and hospital personnel in the United States Army; my involvement in dealing with offsite contamination at Palomaris, Spain and at Three Mile Island; and my work with Radiation Management Corporation, developing medical plans and designing comprehensive medical services for nuclear reactors.

[Miele] I am the Health Physics Engineer for the Shoreham Nuclear Power Station. My professional qualifications are attached to this testimony (Attachment 2(A)-2). My familiarity with the issues surrounding medical services stems from my training and work as a Health Physics Engineer, and from my previous position as the Vice-Chairman of the Emergency Planning Task Force. In that position, I took a lead role in the selection of primary and backup medical services, and had a continuing involvement in the training, drills, facilities, and equipment of these medical services.

Q3. Are you familiar with Suffolk County Contention EP 2(A)?

A3. [Linnemann, Miele] Yes.

Q4. What does that contention say?

A4. [Linnemann, Miele] Suffolk County Contention 2(A) contains a preamble and two subparts, as follows:

A. Suffolk County contends that LILCO, by designating Central Suffolk Hospital as the primary medical facility to treat contaminated injured individuals (Plan at 6-16), and further by designating University Hospital in Philadelphia, Pennsylvania for backup medical treatment (Plan at 6-16) has failed to provide adequate medical services for contaminated injured individuals as required by 10 C.F.R. § 50.47(b)(12), 10 C.F.R. Part 50, Appendix E, Items IV.E.5-7, and NUREG-0654 Items K and L for the following reasons:

1. Central Suffolk Hospital may itself become subject to radiological exposure and/or evacuation given its location approximately ten miles from the Shoreham Site (Plan at 6-16).
2. University Hospital is too distant to provide timely treatment of contaminated individuals.

Q5. What seems to be the essence of this contention?

A5. [Linnemann, Miele] In 2(A)(1), the County appears to be contending that Central Suffolk Hospital is inadequate for use during an emergency because it is within

the emergency planning zone and therefore may be evacuated. In EP 2(A)(2), the County appears to be contending that, because of the University of Pennsylvania Hospital's distance from Shoreham, LILCO will be unable to provide for timely treatment at that hospital.

Q6. Are you familiar with the regulatory requirements and guidelines cited in 2(A)?

A6. [Linneman and Miele] Yes.

Q7. What do those regulations and guidelines say?

A7. [Linneman, Miele] Title 10 C.F.R. § 50.47(b)(12) provides:

Arrangements are made for medical services for contaminated injured individuals.

Title 10 C.F.R. Part 50, Appendix E, Items IV.E.5 through 7 provide:

5. Arrangments for the services of physicians and other medical personnel qualified to handle radiation emergencies on site;
6. Arrangements for transportation of contaminated injured individuals from the site to specifically identified treatment facilities outside the site boundary; and
7. Arrangements for treatment of individuals injured in support of

licensed activities on the site at treatment facilities outside the site boundary.

NUREG-0654 Items K and L provide:

- K. Means for controlling radiological exposures in an emergency are established for emergency workers. The means for controlling radiological exposure shall include exposure guidelines consistent with EPA emergency workers and lifesaving activity protective action guides.
- L. Arrangments are made for medical services for contaminated injured individuals.

NUREG-0654, Items K and L, contain many subparts, none of which have been cited by the County in the contention. In addition, Item K deals with radiological exposures for emergency workers, and therefore is not appropriately cited in this contention.

- Q8. With regard to contention EP 2(A)(1), what is the primary facility for treatment of contaminated injured individuals from Shoreham?
- A8. [Miele] Central Suffolk Hospital, located approximately 10 miles from Shoreham, is the primary facility for treatment of contaminated injured individuals.
- Q9. Has LILCO obtained a written agreement from Central Suffolk regarding treatment of contaminated injured individuals?

A9. [Miele] Yes. The agreement with Central Suffolk to receive and treat injured persons who are contaminated with radioactive materials is included in the Shoreham Emergency Plan at Appendix B (Attachment 2(A)-3 to this testimony).

Q10. What other arrangements have been made for medical support?

A10. [Linnemann] Backup medical services, support, and definitive care will be provided by Radiation Management Corporation (RMC) in its affiliation with the Hospital of the University of Pennsylvania in Philadelphia, Pennsylvania.

Q11. Are there written agreements to this effect?

A11. [Miele] Yes. A copy of the letter of agreement between RMC and Long Island Lighting Company is found at Appendix B of the Shoreham Emergency Plan (Attachment 2(A)-4 to this testimony).

Q12. Do the regulatory requirements and guidelines cited by the County, or any other requirements or guidelines, require LILCO to have a hospital located outside the ten-mile emergency planning zone for emergency treatment and decontamination?



A12. [Linnemann, Miele] No.

Q13. What type of patients would be handled at Central Suffolk Hospital?

A13. [Linnemann, Miele] The primary purpose of Central Suffolk Hospital is to handle treatment of seriously ill or injured employees of Shoreham Nuclear Power Station. LILCO has ensured that this primary responsibility can be carried out, even for injured employees with radioactive contamination.

Q14. What is radioactive contamination?

A14. [Linnemann, Miele] Radioactive contamination is the presence of loose radioactive materials on a person's body.

Q15. Why do you think it is important to have a hospital close by for the treatment of contaminated injured individuals?

A15. [Linnemann, Miele] It is important because good medical practice and planning dictate that a seriously ill or injured patient should be taken to the closest hospital capable of providing the necessary treatment. In the case of Shoreham, that hospital is Central Suffolk Hospital.

Q16. What does experience show is the most likely use for the local support hospital?

A16. [Linnemann] Experience shows that any injury involving a contaminated individual would occur outside of an emergency situation at the plant. In my 14 years of medical services involving experience with some twenty nuclear power plant sites around the country, contaminated injured individuals have been sent to the local hospitals such as Central Suffolk Hospital on 17 occasions. In each instance, the patient was sent to the hospital because he was seriously injured or ill. Contamination was at nuisance levels; none of these injuries occurred during an emergency at the site. In all but two instances, only one individual was involved; in two instances, two individuals were involved.

The most likely use of Central Suffolk's facilities for contaminated injured would be during the course of normal work, when, for example, a person working in the plant might suffer a broken leg and be contaminated as well. As with any hospital emergency facility, effective use of Central Suffolk by Shoreham requires a hospital that is close by and easily accessible.

Q17. Do you anticipate that Central Suffolk Hospital would be evacuated?

A17. [Linnemann, Miele] No.

Q18. What is your basis for this opinion?

A18. [Linnemann, Miele] First, it is highly unlikely that enough radiation could be released in a short enough time at the distance of Central Suffolk Hospital to constitute a threat to life. Second, evacuation of acute care hospitals is not something to be taken lightly, because of the increased risk to seriously ill patients in, for example, intensive care, surgery, and post-op. To accept this risk, it would have to be counter-balanced by extremely high levels of radiation that would equally threaten life, before one would recommend evacuation of an acute care hospital. As stated above, it is highly unlikely that those levels of radiation would ever reach Central Suffolk Hospital, given its location in relation to Shoreham.

Q19. In the event Central Suffolk Hospital is unavailable, for whatever reason, how would contaminated injured individuals be treated?

A19. [Linnemann, Miele] If Central Suffolk Hospital is unavailable, injured individuals will be sent to the

nearest available hospital capable of rendering emergency care for the nature of the illness or injury.

Q20. What is the general industry practice in fulfilling NUREG-0654 guidelines on setting up local hospitals to treat contaminated injured individuals?

A20. [Linnemann] The practice in the industry is to select a hospital near the plant and capable of providing the required services.

Q21. You said that in EP 2(A)(2), the County contends that Hospital of the University of Pennsylvania (HUP) is too distant from Shoreham to provide timely treatment of individuals. Is University Hospital the backup hospital for Shoreham Nuclear Power Station?

A21. [Miele] Yes.

Q22. What is the difference between the treatment provided by HUP and Central Suffolk?

A22. [Linnemann, Miele] Central Suffolk Hospital serves as the local support hospital for contaminated injured victims, providing decontamination, lifesaving activities and patient stabilization. In the event that a victim requires more definitive evaluation and treatment (long-term care), the individual may be sent to HUP.

Q23. What type of patient do you anticipate treating at HUP?

A23. [Linnemann] The patient that would be sent to HUP would be one with a severe total or partial body radiation exposure, both of which cause the patient to develop a serious clinical course within several days, or more likely, weeks.

Q24. How soon do you think such a patient should be sent to HUP?

A24. [Linnemann] Because radiation injury unfolds over time, the patient's traumatic injury or illness can be treated and stabilized at Central Suffolk Hospital. Over the course of those next few days, medical personnel at Central Suffolk Hospital, in conjunction with consultants from RMC, perform an initial evaluation of the patient's total exposure. Following this evaluation, a decision is made whether the patient should be transferred to HUP. Should the total dose require it, the patient is transported in a comfortable and unhurried fashion.

In conjunction with Radiation Management Corporation (RMC), HUP has the capability to evaluate the patient's level of radiation exposure, and the facilities to treat the anticipated clinical course of the radiation

exposure, such as isolation facilities, white cell transfusion, bone marrow transplants, chromosome analysis, etc.

Q25. How will persons needing medical attention at HUP be transported to the hospital?

A25. [Linnemann] Patients will be transported by air or surface transportation, whichever is most appropriate.

Q26. Please summarize your testimony.

A26. LILCO has provided Central Suffolk Hospital as the primary facility for treatment of contaminated, injured individuals, and the Hospital of the University of Pennsylvania (HUP) as a backup hospital for definitive care, in compliance with NUREG-0654 IV.L, 10 C.F.R. § 50.47(b)(12), and 10 C.F.R. § 50, Appendix E, Items IV.E.5 through 7. Although it is unlikely that Central Suffolk would be evacuated in an emergency, other hospitals could be used to care for contaminated injured individuals. Because of the nature of the medical and emergency care provided by Central Suffolk, it is unnecessary to hurry individuals to Philadelphia. HUP's facilities are uniquely suited to provide long-term care to a radiation exposed patient.

PROFESSIONAL QUALIFICATIONS

ROGER E. LINNEMANN, M.D.

Vice Chairman

RADIATION MANAGEMENT CORPORATION

My name is Roger E. Linnemann and my business address is Radiation Management Corporation (RMC), 3508 Market Street, University City Science Center, Philadelphia, Pennsylvania 19104. I am presently Vice Chairman and Chief Medical Officer of Radiation Management Corporation. I have held this position since 1981.

I was awarded my B.A. (cum laude), and my B.S. and M.D. degrees from the University of Minnesota, Minneapolis in 1952 and 1956 respectively. I completed my internship at Walter Reed Army Hospital in Washington, D.C. in 1957. From 1962 to 1965 I served my residency in Radiology, also at Walter Reed Army Hospital.

I received certifications from the American Board of Radiology in 1964 and the American Board of Nuclear Medicine in 1972. I am licensed to practice medicine in Pennsylvania, Illinois and Minnesota.

In 1961 I attended a Nuclear Weapons Orientation Course at Sandia Base, New Mexico. I conducted research on the "Medical Aspects of Nuclear Warfare" at the Walter Reed Army Institute

of Research in 1962. From 1963 to 1965 I studied Russian at the U.S. Department of Agriculture Graduate School (Evening) in Washington, D.C.

From 1957 to 1961 I was stationed in Europe as a General Medical Officer. Upon returning to the United States, I worked from 1961 to 1962 as a Research Associate in the Department of Radiobiology, Walter Reed Army Institute of Research. In this capacity, I investigated the use of anti-radiation drugs in the treatment of cancer.

From 1965 to 1968 I was again employed by the U.S. Army and stationed in Europe, first as a Commanding Officer, Nuclear Medicine Research Department, and subsequently as a Radiological Health Consultant, U.S. Army-Europe. I was responsible for plans, procedures and training of military hospitals and personnel in the evaluation, evacuation and treatment of radiation casualties. In January of 1966 I was sent to Palomaris, Spain, for evaluation of medical and environmental aspects of the mid-air collision involving nuclear weapons.

From January to August 1968 I held the position of Assistant Professor, Radiology, University of Minnesota School of Medicine. This position entailed investigating the use of isotopes in kidney function evaluation. From 1968 to 1969 I was employed by Philadelphia Electric Company as a Nuclear



Medicine Consultant. I then served as an Assistant Professor of Clinical Radiology at the University of Pennsylvania School of Medicine from 1969 to 1974. In 1974 the University of Pennsylvania School of Medicine granted me the position of Clinical Associate Professor of Radiology, a position which I still hold. In addition, I became a Visiting Associate Professor of Clinical Radiology at Northwestern University Medical School in 1977. I continue to hold this position.

From 1969 to 1981 I served as President/Chief Executive Officer of Radiation Management Corporation. Since 1981 I have been Vice Chairman and Chief Medical Officer at RMC.

I have held numerous professional appointments, including the following:

1979-present	<u>Health Physics Society Standards Committee</u>
1978-present	<u>General Dynamics Electric Boat Division Radiological Health Consultant</u>
1978-present	<u>Edison Electric Institute Utility Radiation Standards Group</u>
1973-present	<u>University of Pennsylvania Radiation Safety Committee</u>
1973-present	<u>The Atomic Industrial Forum, Inc. Public Affairs &amp; Information Committee</u>
1970-present	<u>The American Nuclear Society Subcommittee for Writing Emergency Procedures Standards</u>
1969 & 1975	<u>Atomic Energy Commission ad hoc Committee on Medical Aspects of Radiation Accidents</u>

- 1966-present American College of Radiology:
- 1969-present - Commission on Radiologic Units, Standards and Protection
  - 1969-present - Committee on Radiation Exposure of Women
  - 1969-present - Committee on Radiological Aspects of Disaster Planning
  - 1967-1978 International Affairs Committee
- 1965-1968 U.S. Delegate to NATO Radiation Protection Committee & Medical Aspects of Nuclear Warfare Committee
- 1971-present Department of Defense & Environmental Protection Agency Medical Liaison Officer's Network (MLOr.)-State of Pennsylvania Representative

My professional affiliations include memberships in the American College of Radiology, American Public Health Association, Society of Nuclear Medicine, American Medical Association, Philadelphia Roentgen Ray Society, Pennsylvania Medical Society, College of Physicians of Philadelphia, Radiological Society of North America, Inc., American Institute of Physicists/American Association of Physicists in Medicine, American College of Nuclear Physicians, American Council on Germany, and Union League of Philadelphia.

In 1968 I was awarded the United States Army Legion of Merit; in 1968 the University of Minnesota's National Research Council honored me as a Radiological Research Scholar; and in 1978 I became an Honorary Member of the Association of Medicine & Security, Madrid, Spain.

I have made numerous presentations relating to my professional endeavors and achievements since 1967. These include:

- 1980 Korea Women's Association (Seoul, Korea) presented paper, "Energy: The Basis for Health in Developing and Developed Countries," at International Symposium on the Expulsion of Environmental Pollution
- 1980 Korean Association for Radiation Protection (Seoul, Korea) presented seminar on emergency management of radiation injuries
- 1980 Ministry of Health (Madrid, Spain) presented paper, "Definitive Treatment of Radiation Injuries," at First Seminar on Assistance to Those Wounded by Radioactive Elements and Ionizing Radiations
- 1979 Reinisch-Westfalisches Elektrizitätswerk (Essen, Germany) presented paper, "Energy: The Basis for Health in Developing and Developed Countries," at The Seventh Energy Workshop
- 1978 The Swedish State Power Board (Vallingby, Sweden) presented seminar, "Management and Treatment of Radiation Injuries", and conducted radiation emergency medical exercise at the Ringhals Nuclear Power Plant
- 1978 Deutsche Gesellschaft für Wiederaufarbeitung (Hannover, Germany) appeared before the Prime Minister and Parliament of Lower Saxony as an International expert to testify on the safety of a reprocessing plant at Gorleben, Germany

- 1978 International Atomic Energy Agency  
(Vienna, Austria) presentation at  
Symposium on Late Effects of Ionizing  
Radiation
- 1978 Asociaton de Medicina y Seguridad en  
el Trabajo de Unesa para la Industria  
Electrica (Madrid, Spain) presented  
one-day seminar entitled, "Primary  
Management of Radiation Injury"
- 1977 International Atomic Energy Agency  
(Vienna, Austria) presented paper,  
"Emergency Medical Assistance Programs  
for Nuclear Power Reactors," at  
Symposium on Handling of Radiation  
Accidents
- 1967 University of Freiburg Institute of  
Radiobiology (Freiburg, Germany)  
presented seminar on diagnosis and  
treatment of radiation injuries

I have also testified on numerous occasions on matters of which I am professionally knowledgeable. In 1979 I testified at the Northeast Utilities Service Company Nuclear Power Station Operating License Hearings. Again in 1970 I testified at the Baltimore Gas & Electric Company Calvert Cliffs Nuclear Power Plant Operating License Hearings. I testified for LILCO in 1971 at the Long Island Lighting Company Shoreham Nuclear Power Station Operating License Hearings. In 1979 I testified at both the Florida Power & Light Company Turkey Point Nuclear Station Operating License Hearings and the Gorleben Nuclear Fuels Reprocessing Plant Hearings before the Prime Minister and Parliament of Lower Saxony, Hanover, Germany.

Currently in progress, I am testifying in hearings concerning John Benek v. Pennsylvania Power Company, et al. # 199 of 1977 Eminent Domain; Pennsylvania Power and Light Company Susquehanna Steam Electric Station Operating License Hearings; Florida Power & Light Company Turkey Point Steam Generator Repair Hearings; and Southern California Edison Company Emergency Planning Hearings for the San Onofre Nuclear Generating Station.

I have published extensively since 1961. The following comprises a list of my publications:

Linnemann, Roger E. "Berlin: The Young-Old City." Senior Citizen (September 1961).

Linnemann, Roger E. "This Way to Berlin." The American Benedictine Review: 14 No. 4 (December 1963).

Linnemann, Roger E. "The Acute Radiation Syndrome and its Impact on the Chain of Evacuation." Medical Bulletin, U.S. Army Europe: 22, No. 12 (December 1965).

Linneman, Roger E. and Robert T. Wangemann. "Medical Support of Nuclear Weapons Accidents." Medical Bulletin, U.S. Army Europe (November 1967).

Linneman, Roger E. and O. Messerschmidt. "Erholungsvorgaenge bei Grosstieren nach Ganzkoerperbestrahlung," :dem 6, Jahrbuch von der vereinigung Duetscher Strahlenschutztaerzte (1968).

Linnemann, Roger E. "Command Radiation Guidance." Military Medicine: 33, pp. 771-716 (September 1968).

Loken, Merle K., Linnemann, Roger E. and George S. Kush. "Evaluation of Renal Function Using a Scintillation Camera and Computer." Radiology: 93, No. 1, pp. 85-94 (July 1969).

Linnemann, Roger E., Loken, Merle K. and Colin Markland. "Computerized Compartmental Rencgrams to Study Kidney

Function." Journal of Urology: 103, pp. 533-537 (May 1970).

Linnemann, Roger E. and J.W. Thiesen. "Regional Approach to the Management of Radiation Accidents." Journal of the American Public Health Association: 61, No. 6, pp. 1229-1235 (June 1971).

Linnemann, Roger E. and Robert H. Holmes. "Nuclear Accidents and Their Management." Emergency Medical Care, pp. 281-292, Spitzer, Stanley and Wilbur W. Oaks (eds.) New York: Bruner and Stratton, Inc. (1971).

Linnemann, Roger E., Rasmussen, N.C. and F.K. Pittman. Nuclear Energy: Issues and Answers. Atomic Industrial Forum, Inc., in cooperation with Pennsylvania Power & Light Company (April 1973).

Linnemann, Roger E. "Accentuate the Positive." Trial: 10, No. 4, p. 13 (July/August 1974).

Linnemann, Roger E. "Accentuate the Positive." Congressional Record: 109, pp. 4964-4967. Washington, D.C. United States of America Proceedings and Debates of the 93rd Congress, Second Session (July 23, 1974).

Linnemann, Roger E. and J.W. Thiessen. Editorial, "In Defense of Radiation and Cells." The New York Times (May 23, 1974).

Linnemann, Roger E. Nuclear Radiation and Health. Springville, NY Nuclear Fuel Services, Inc. (September 23, 1974).

Linnemann, Roger E. Editorial, "In Defense of Nuclear Power Plants," The Philadelphia Inquirer, p. 11A (March 6, 1975).

Linnemann, Roger E. "Nuclear Power Plants Pose Minimal Health Risks," Perspective. News Bureau of the University of Pennsylvania, Philadelphia, PA (February 1975).

Linnemann, Roger E. "Medical Aspects of Power Generation." Impulse. Massachusetts: Electrical Council of New England (June 1975).

Linnemann, Roger E. "Bugs in the Nuclear Fuel Cycle." Spectrum, p. 59, Gadi Kaplan (ed.) Piscataway, NJ: The Institute of Electrical and Electronic Engineers, Inc. (September 1975).

Linnemann, Roger E. and Fred A. Mettler, Jr. "Emergency Medical Assistance Programs for Nuclear Power Reactors." International Atomic Energy Agency Symposium on the Handling of Radiation Accidents, IAEA-SM-215/22, Vienna, Austria (1977).

Linnemann, Roger E. "Why ALARA?" Transactions of 1979 American Nuclear Society Conference, Atlanta, GA (June 3-7, 1979), Vol. 32, TANS AO 32 1 832 ISSN 0003-018x (1979).

Linnemann, Roger E., Hackbarth, C.J. and Ray Crandall. "The Contaminated and Injured Patient." Proceedings of Twenty-fourth Annual Meeting of the Health Physics Society, July 9-13, 1979 (Philadelphia, PA).

Linnemann, Roger E. "The Three Mile Island Incident in 1979: The Utility Response." The Medical Basis for Radiation Accident Preparedness, K.F. Hubner and S.A. Fry (eds.), Elsevier/North-Holland, pp. 501-509 (1980).

Linnemann, Roger E. "Initial Management of Radiation Injuries." Journal of Radiation Protection, 5, No. 1, pp. 11-25 (December 1980).

Linnemann, Roger E. "Facilities for Handling the Contaminated Patient." Radiation Accident Preparedness: Medical and Managerial Aspects, Science-Thru-Media Company: New York (1980).

Linnemann, Roger E. "A Systems Approach to the Initial Management of Radiation Injuries." Systems Approach to Emergency Medical Care, Appleton-Century-Crofts: New York (1980).

Linnemann, Roger E., Stephen M. Kim and Frazier L. Bronson. "Three Mile Island: Medical and Public Health Aspects of a Radiation Accident." Journal of Radiation Protection, 6, No. 1, pp. 45-52 (October 1981).

PROFESSIONAL QUALIFICATIONS

MICHAEL L. MIELE

Health Physics Engineer

LONG ISLAND LIGHTING COMPANY

My name is Michael Miele. My business address is Long Island Lighting Company, P.O. Box 628, Wading River, New York. I am employed by Long Island Lighting Company (LILCO) as the Health Physics Engineer at the Shoreham Nuclear Power Station (Shoreham). I have been employed by LILCO since 1970.

I received a Bachelors degree in Mechanical Engineering from City College of New York in 1970; a Master of Science degree specializing in Radiological Health from the University of Michigan in 1974; and a Master of Business Administration from Adelphi University in 1977.

As the Health Physics Engineer of Shoreham, I am responsible for the supervision of engineers, consultants, foremen, and technicians as part of the overall direction of the Station's Health Physics activities, including the radiological safeguarding of plant personnel and the public, planning and implementing the ALARA program, detecting and controlling radiation for plant surveillance, operations and maintenance functions,



and shipping, receiving, controlling and procuring licenses for all radioactive materials. My duties include directing radiation protection training programs for Health Physics personnel as well as other plant and temporary people, administrating records and reports on personnel exposure, and supervising radiological surveys, respiratory protection and bioassay. Other tasks include controlling the selection and set-up of laboratory and counting room facilities, portable survey equipment, and area and process monitors; formulating, developing and implementing Health Physics programs and procedures to insure regulatory compliance; and overseeing the Industrial Hygiene program of occupational and environmental testing, surveys, and inspections for noise levels, toxic materials and other hazards.

Over the years I have been involved in a variety of training assignments, including positions at Iowa Electric's Duane Arnold Energy Center, James A. Fitzpatrick Nuclear Station, Nine Mile Point Nuclear Station, the Savannah River Plant, and the Boston Edison Pilgrim Nuclear Power Station. These assignments gave me valuable practical experience in staffing, training, and qualifying personnel; coordinating ALARA programs; using dose control, dosimetry and whole body counting; supervising personnel decontamination; implementing radiation

shielding startup testing and chemistry and radiochemistry startup testing; and coordinating radwaste operations and disposal.

I am past president of the Greater New York Chapter of the Health Physics Society, and hold a guest engineer appointment from Brookhaven National Laboratory. I am a member of the National Health Physics Society, the EEI Health Physics Committee, the EEI Standards Task Force, the American Industrial Hygiene Association, and the New England Health Physicists.

I was certified by the American Board of Health Physics in 1980.

AGREEMENT  
between  
LONG ISLAND LIGHTING COMPANY  
and  
CENTRAL SUFFOLK HOSPITAL

AGREEMENT

This Agreement, made as of the *6* day of *November* 1980, by and between CENTRAL SUFFOLK HOSPITAL, a New York not-for-profit corporation located at 1300 Roanoke Avenue, Riverhead, New York (hereinafter, "Central Suffolk" or "hospital"), and LONG ISLAND LIGHTING COMPANY, a New York corporation with a principal address at 250 Old Country Road, Mineola, New York (hereinafter "LILCO"):

W I T N E S S E T H :

Central Suffolk hereby agrees for itself and its assigns to act as the primary care facility for LILCO's Shoreham Nuclear Power Station in the Town of Brookhaven, New York, for as long as the Station is operated as a nuclear facility. As the primary care facility, Central Suffolk undertakes to:

- 1) treat injured or injured and radiologically contaminated individuals from the Shoreham Station;
- 2) dedicate an area adjacent to the existing physical therapy section in the hospital for the treatment of such individuals;
- 3) solicit proposals from qualified contractors to construct the above-described dedicated area in the hospital and award a commitment to the lowest evaluated proposal submitted;
- 4) secure all necessary permits and approvals for construction of the dedicated area described above;
- 5) supervise construction of the dedicated hospital area; and

6) have certain of its hospital personnel participate in training programs and periodic training exercises as required by LILCO.

In consideration of the foregoing undertakings from Central Suffolk, LILCO hereby agrees for itself and its assigns to:

1) provide architect's drawings and written specifications to Central Suffolk on a no cost basis for the construction of the above-described hospital area;

2) pay costs, up to \$65,000, for the construction of the dedicated hospital area. Any costs beyond this amount shall be reviewed with LILCO before they are authorized by Central Suffolk. Administrative, overhead and clerical costs of Central Suffolk and LILCO are not included as part of the foregoing construction costs and shall be the separate responsibility of each party to this Agreement;

3) allow Central Suffolk to utilize the dedicated area in the hospital during normal operations, provided that the area is kept free from encumbrances or uses that would inhibit its immediate conversion, upon notice from LILCO, to the primary care facility described above;

4) provide necessary training for specified hospital personnel; and

5) pay to Central Suffolk an annual retainer of \$5,000 as compensation for the time and expenses to be incurred by its staff in participating in the above-mentioned training, the first such payment to be made in the year of the first training exercises.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by their duly authorized representatives as of the day and year first above written.

CENTRAL SUFFOLK HOSPITAL  
By *Hubert V. [Signature]*  
Exec. Vice President  
Name and Title

Sworn to before me this  
6 day of November, 1980.

*Kathryn M. Wilder*

KATHRYN M. WILDER  
NOTARY PUBLIC, State of New York  
No. 52-4492614  
Qualified in Suffolk County  
Commission Expires March 30, 1982

LONG ISLAND LIGHTING COMPANY  
By *R. Gummingsall Jr*  
R. Gummingsall, Jr.  
Vice President-Operations  
Name and Title

Sworn to before me this  
3 day of September, 1980.

*Genevieve T. Fales*

GENEVIEVE T. FALES  
NOTARY PUBLIC, State of New York  
No. 30-6245400  
Qualified in Nassau County  
Commission Expires March 30, 1982

November 20, 1978

Mr. James Rivallo  
 Superintendent  
 Shoreham Nuclear Power Station  
 Long Island Lighting Company  
 175 E. Old Country Road  
 Hicksville, New York 11801

SUBJECT: Emergency Medical Assistance Program

RMC

Dear Mr. Rivallo:

This confirms an agreement between Radiation Management Corporation (RMC) and Long Island Lighting Company, wherein RMC agrees to furnish certain services to nuclear generating stations operated by Long Island Lighting Company. These services comprise a program that is identified by RMC as an Emergency Medical Assistance Program (EMAP). With regard to Shoreham Nuclear Power Station Unit No. 1, the EMAP contains the following provisions:

1. Semi-annual review of plant and hospital procedures, equipment and supplies; one of these audits will be in conjunction with (6.) below;
2. Twenty-four-hour-per-day availability of expert consultation on management of radiation accidents;
3. Availability of Bioassay Laboratory for evaluation of radiation accidents;
4. Twenty-four-hour-per-day access to a Radiation Emergency Medical Team consisting of a physician, certified health physicist, and technicians with portable instrumentation to location of accident victim;
5. Availability and access to a medical center equipped for the definitive evaluation and treatment of radiation injuries;
6. Annual training for the plant, ambulance and hospital personnel who may be directly or indirectly involved in the execution of the radiation medical emergency program;
7. Preparation of an "accident" scenario for use as a training aid in a radiation medical emergency drill;
8. Coordination of a radiation medical emergency drill based on the scenario; umpired, videotaped and critiqued by RMC;

continued ....

radiation  
 management  
 corporation

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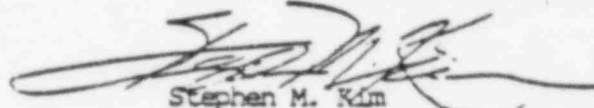


9. Submission of two Drill Evaluation Reports; one relating to the observations made at the station, and another relating to observations made at the hospital; and ...
10. Participation in an annual one-day seminar in Philadelphia on the management of radiation accidents for physicians. Each plant may send one physician, and each utility company may send one physician.

ACCIDENT RESPONSE

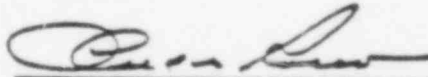
Consultation and laboratory services by RMC personnel are at no charge, except incremental costs associated with consultative activities, such as travel, lodging and other related expenses.

RADIATION MANAGEMENT CORPORATION



Stephen M. Kim  
EXECUTIVE VICE PRESIDENT

Attest:



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Fred G. Rocco  
Vice President, Technical Services

SMK:lw