

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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Before the Atomic Safety and Licensing Board

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

TESTIMONY OF ROBERT M. KASCSAK, JOAN F. ETZWEILER, JAMES F. GLEASON,  
ROBERT J. NAJUCH, WILLIAM R. SHOSHO, AND NEWELL R.  
WOODWARD FOR THE LONG ISLAND LIGHTING COMPANY ON SC  
CONTENTION 8/SOC CONTENTION 19(h) -- ENVIRONMENTAL QUALIFICATION

1. Q. Please state your names and business addresses.

(Kascsak) My name is Robert M. Kascsak. My business address is Long Island Lighting Company, 175 East Old Country Road, Hicksville, New York, 11801.

(Etzweiler) My name is Joan F. Etzweiler. My business address is Long Island Lighting Company, 175 East Old Country Road, Hicksville, New York, 11801.

(Gleason) My name is James F. Gleason. My business address is Wyle Laboratories, 7800 Governor's Drive West, Huntsville, Alabama, 35807.

(Najuch) My name is Robert J. Najuch. My business address is Stone & Webster Engineering Corporation, 245 Summer Street, Boston, Massachusetts, 02210.

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(Shosho) My name is William R. Shosho. My business address is Stone & Webster Engineering Corporation, 245 Summer Street, Boston, Massachusetts, 02210.

(Woodward) My name is Newell K. Woodward. My business address is EDS Nuclear, 225 Broad Hollow Road, Melville, NY, 11747.

2. Q. Please briefly summarize your qualifications to testify about LILCO's Environmental Qualification (EQ) Program?

A. (Kascsak). As Manager of Nuclear System Engineering Division I provide management and technical support for the SNPS EQ Program to the Shoreham Project Organization. The Division contains an Equipment Qualification Group which is an "ad hoc" group established to address equipment qualification for SNPS. The Division also contains the Nuclear Systems Section which provides technical support in concert with EDS Nuclear and Stone & Webster. A complete statement of my professional qualifications appears on pages 23-24.

(Etzweiler). I have been LILCO's lead engineer for Shoreham equipment qualification since 1980. I work in the Nuclear System Engineering Division of the

Nuclear Engineering Department and my responsibilities include engineering aspects of equipment qualification, technical and licensing guidance to Project Engineering and direction and coordination of consultants. A complete statement of my professional qualifications appears on pages 25-26.

(Gleason). I am Deputy Director of Wyle's Nuclear Engineering Services Division. Wyle is under contract to Stone & Webster, for Engineering Services in support of Shoreham's Equipment Qualification Program. Wyle reviewed qualification documents and provided supplemental documents and analyses, including extrapolation of partial type test data and aging analyses for safety-related equipment installed at Shoreham. A complete statement of my professional qualifications appears on pages 27-30.

(Najuch). I am the Principal Mechanical Engineer in the Power Division assigned to the Shoreham Project at Stone & Webster Engineering Corporation. I have been involved in the coordination and development of the Environmental Profiles to be used for the Shoreham EQ program as well as coordination of the review process used in the selection of safety-related electrical equipment to be entered into the EQ program. A

complete statement of my professional qualifications appears on pages 31-32.

(Shosho). I am a Principal Electrical Engineer with Stone & Webster and have been involved full time with the Shoreham BOP equipment qualification effort since March, 1981. My responsibilities have included preparation of the Environmental Qualification Report submittals to NRC, participation in NRC site audits, review and assessment of qualification documents, and setting up new equipment qualification test programs. A complete statement of my professional qualifications appears on pages 33-35.

(Woodward). I am the EDS Nuclear Project Engineer for the environmental qualification of electrical equipment at Shoreham within the NSSS scope of supply. I have held this position since the NSSS documentation evaluation program inception in January, 1981. A complete statement of my professional qualifications appears on pages 36-37.

3. Q. What is the purpose of your testimony?

A. The purpose of this testimony is to address SC Contention 8 and SOC Contention 19(h), which are substantially identical and which are repeated verbatim



in Attachments 1 and 2 hereto. Each of these contentions alleges five deficiencies in Shoreham's Environmental Qualification (EQ) Program:

- (a) The limited test conditions posed in the Shoreham environmental qualification program are not sufficiently conservative;
- (b) Equipment has been qualified by grandfathering to older, less stringent standards;
- (c) The list of emergency equipment to be qualified is incomplete;
- (d) There has been an inadequate demonstration that all safety-related equipment has been properly qualified to meet aging and other life requirements; and
- (e) There is insufficient information to evaluate the overall adequacy of Shoreham's satisfaction of environmental qualification requirements for safety-related equipment.

The County and SOC have withdrawn parts (a) and (b), so this testimony focuses on parts (c), (d) and (e).<sup>1/</sup>

This testimony will describe the Shoreham EQ program and show that it provides assurance that all

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<sup>1/</sup> For convenience, this testimony will refer only to SC Contention 8(c) through (e), but is equally applicable to SOC Contention 19(h)(3) through (5).

safety-related electrical equipment located in potentially harsh environments will maintain functional operability as required to mitigate consequences of a postulated accident and to bring the plant to safe shutdown afterwards. This testimony will also show that the program meets applicable regulatory requirements.

4. Q. What regulatory requirements form the basis for the Shoreham Environmental Qualification Program?

A. NRC Memorandum and Order CLI-80-21, 11 NRC 707(1980), articulated basic Commission requirements for environmental qualification of safety-related electrical equipment to confirm that it will remain functional under postulated accident conditions. It also provides that NUREG-0588 forms the requirements which applicants for license must meet in order to satisfy 10 CFR 50 Appendix A, General Design Criterion (GDC) 4. Specifically, NUREG-0588 provides guidance concerning the qualification of Class 1E (electrical safety-related) equipment. The Shoreham EQ program was designed to satisfy these requirements.

5. Q. Are you familiar with SC Contention 8(c)?

A. Yes, SC and SOC contend that the list of emergency equipment to be qualified is incomplete.

6. Q. What regulations govern the scope of environmental qualification programs?

A. The scope of Shoreham's program was determined in accordance with NRC Memorandum and Order CLI-80-21 and NUREG-0588. LILCO complies by including the following equipment in its EQ program:

- 1) All safety-related electrical equipment located in potentially harsh environments resulting from a design basis accident and required to operate or to not fail in a manner detrimental to plant safety during or after such an environment.
- 2) Sensing devices located in potentially harsh environments for display instruments which monitor the condition of the plant during and after postulated accidents pursuant to Regulatory Guide 1.97. Revision 2 of this Guide has not been totally implemented for Shoreham. Additional items of equipment will be environmentally qualified as required by the Regulatory Guide.

7. Q. How was it determined what safety-related electrical equipment existed at Shoreham?

A. Safety-related electrical equipment was identified through a detailed examination of applicable project documents, including: flow diagrams, specifications, electrical one-line diagrams, logic diagrams, elementary drawings, instrument loop diagrams, and general arrangement drawings. There were four types of reviews:

- 1) Review of system flow diagrams, related system descriptions, equipment within each system, and related FSAR sections to identify safety-related electrical equipment.
- 2) Review of elementary, logic and loop diagrams for each Class 1E electrical equipment item on flow diagrams to identify safety-related electrical equipment.
- 3) Review of electrical one-line diagrams to identify electrical equipment which distributes safety-related power to safety-related electrical systems.
- 4) Review of specifications to identify auxiliary electrical components.

8. Q. How was this equipment evaluated for incorporation in Shoreham's EQ program?

A. Safety-related (Class 1E) electrical equipment at Shoreham was classified into one of four operability codes:

- a. Equipment assigned an operability code "A" must perform its required safety function(s) in the environment dictated by the zone in which the equipment is located.
- b. Equipment assigned an operability code "B" does not have an active safety function during the postulated accident conditions, but is connected to Class 1E power systems and has a potential to fail in a manner detrimental to plant safety or accident mitigation.
- c. Equipment assigned an operability code "C" does not have a safety function and does not fail in any manner that would affect the safe shutdown of the plant.
- d. Equipment that will not experience environmental conditions of design basis accidents.

9. Q. Which equipment was incorporated into the qualification program?

- A. Equipment classified into Operability Codes A or B was included in the EQ program documentation evaluation program because its failure due to harsh environment could inhibit accident mitigation.

10. Q. Is the list of equipment required to be qualified in the Shoreham program documented?

- A. Yes. The equipment list is set forth in the Environmental Qualification Status Report (EQSR) (Appendix F of the Environmental Qualification Report for Class 1E Equipment (EQR)).

11. Q. Has the NRC Staff evaluated the adequacy of the EQSR?

A. Yes. The EQSR and the list of corresponding systems have been reviewed by the NRC as part of LILCO's submittal on environmental qualification and found to be acceptable.

12. Q. Where has the NRC Staff approval been documented?

A. The Shoreham SSER Input, November 23, 1982 states, at Paragraph 3.11.3.1:

Completeness of Safety-Related Equipment: The applicant was directed to (1) establish a list of systems and components that are required to prevent or mitigate the consequences of a LOCA or an HELB and (2) identify components needed to perform the function of safety-related display instrumentation, post-accident sampling and monitoring, and radiation monitoring.

The applicant's systems list in the environmental qualification program was compared to Table 3.2.1-1 of the FSAR. The subset of systems from Table 3.2.1-1 which are required for emergency shut-down or accident mitigation was reviewed by the staff and found to be acceptable. The staff also reviewed and found acceptable based on an audit review the applicant's operability times, Class 1E safety functions, and required accidents for selected systems and components.

In addition, the Staff reviewed the list of equipment in a harsh environment and determined which systems in the master list (harsh and mild) had been omitted. The omissions were adequately explained as systems located only in a mild environment.



13. Q. Are any other steps being performed to assure completeness?

A. Yes, to provide additional assurance that all required safety-related equipment had been identified, a confirmatory review of the Emergency Procedures is being performed to confirm that all safety-related electrical equipment located in potentially harsh environments, identified in the Emergency Procedures and relied upon for the mitigation of a postulated accident, has been included within the Shoreham EQ Program.

14. Q. Contention 8(d) alleges that there has been inadequate demonstration that all safety-related equipment has been qualified to meet aging and other life requirements. Is the allegation true?

A. No. Shoreham has properly qualified its equipment to meet the requirement of aging, which inherently includes the concept of life requirements.

15. Q. What is aging?

A. Aging refers generally to the degradation of the equipment due to normal environmental conditions during equipment service life.

16. Q. Where are the requirements related to the aging of environmentally qualified safety-related equipment established?

A. Requirements for aging are described in NUREG-0588, which defines two categories of equipment. Category I provisions apply to equipment qualified in compliance with IEEE STD 323-1974, "IEEE Standard for Qualifying Class IE Equipment for Nuclear Power Generating Stations." Category II provisions govern equipment qualified in compliance with IEEE STD 323-1971, "IEEE Trial-Use Standard: General Guide For Qualifying Class 1E Electric Equipment For Nuclear Power Generating Stations." No Regulatory Guide has ever been issued specifically implementing IEEE STD 323-1971. Regulatory Guide 1.89, which adopted IEEE STD 323-1974 in most respects, applies to plants whose construction permit safety evaluation reports were issued after July 1974. Shoreham's CP SER was issued before that date. By Memorandum and Order CLI-80-21, Shoreham is required to meet the NUREG-0588 Category II requirements for equipment purchased through May 23, 1980 and to meet the Category I requirements for equipment acquired after that date unless sound reasons are shown to the contrary.

17. Q. How do the requirements for considering effects of aging differ between Categories I and II of NUREG-0588?

A. The Category I position requires that aging effects be considered and included in a qualification program so that test specimens are placed in a simulated end-of-life condition prior to accident testing. The Category II position requires that qualification programs address aging to the extent that materials susceptible to aging effects are identified, and inspection and replacement schedules are established. The inspection and replacement schedules provide assurance that the safety-related equipment will be maintained in a condition consistent with the condition at the time of qualification testing. Category II also requires that qualification programs committed to conform to IEEE STD 382-1972 (for valve operators) and IEEE STD 334-1971 (for motors) consider aging to the same extent as Category I positions.

18. Q. What aging effects are considered when evaluating equipment to the Category II position of NUREG-0588?

A. The aging effects considered are time/temperature (thermal), radiation, and cyclic, if applicable.

19. Q. How are these aging effects evaluated?

Q. For the determinations of time/temperature effects, an age sensitivity analysis is performed to evaluate the expected life of equipment. In most cases, this analysis is based on actual type-testing. Metals are judged to be age-insensitive for time/temperature effects, as are non-metals which are made from stable materials and have been demonstrated by testing to be insensitive to these effects. For non-metallic materials sensitive to aging, the expected life of these materials is determined by analytical methods. The preferred method for radiation aging is type-testing. However, in some cases, type-testing was not available to qualify the device for its required radiation dose. In those cases, an analysis of the materials used in the tested equipment has been performed to determine the sensitivity of those materials (based on previous testing experience) to its applicable radiation environment. The radiation tolerance of the most sensitive material was assumed to be the radiation tolerance of the entire tested equipment. Radiation qualification by analysis of materials for functional threshold dose levels is not used as sole radiation qualification for equipment in the primary containment. Cycle aging applies to

equipment which has moving parts subject to wear, such as electro-mechanical equipment. Cycle requirements were met by establishing the cycle life by test or assessment.

20. Q. Summarize how aging is considered for all safety-related equipment at Shoreham.

A. In summary, if the qualification for the accident conditions for safety-related equipment satisfies IEEE STD 323-1971, then aging is addressed by assessment. The purpose of this assessment is to determine age sensitive materials and to establish inspection and replacement intervals to assure the integrity of the equipment. For the remainder of the safety-related equipment, the accident testing is performed on the safety-related equipment after it has been placed in its end-of-life condition, and thus satisfies IEEE STD 323-1974.

Both methods result in essentially the same assurance that safety-related equipment will perform as required for its installed life.

21. Q. What program is in place to ensure that age sensitive materials are periodically inspected and/or replaced?

- A. This assurance is provided by the Shoreham surveillance and maintenance programs. In particular, the preventive maintenance program will ensure periodic inspection and replacement as needed of age-sensitive materials. The identification of materials to be included in the program is contained in the qualification documentation packages. The Staff has reviewed the plan for surveillance and maintenance and found it acceptable. The implementation of these programs is a license condition proposed by the SER Input, Nov. 23, 1982.
22. Q. SC Contention 8(e) alleges that there is "...insufficient information to evaluate the overall adequacy of Shoreham's satisfaction of environmental qualification requirements for safety-related equipment." Do you agree?
- A. No. The listing of information, correspondence, audits and meetings in Attachment 3 illustrates that LILCO has provided and continues to provide detailed information on the Shoreham EQ Program. In addition, the Environmental Qualification Report for Class 1E Equipment (EQR) addresses scope, methodology, environmental conditions required for qualification of component evaluation, and final documentation of the qualification for each Class 1E component. The scope and



level of detail undertaken in this program are explained in the EQR. The program begins with the identification of equipment required to be qualified. Upon a component's, or series of components', incorporation into the program, the pertinent qualification documents are reviewed to determine qualification status.

23. Q. How are these qualification documents reviewed?

A. Equipment qualification documents are reviewed with respect to the following requirements:

- a. maximum postulated service conditions to which equipment is subjected,
- b. design basis events (LOCA, MELB, HELB) which equipment is to mitigate,
- c. operability requirements including operating time, or the time during which the equipment is required to perform a function so as to mitigate the consequences of the design basis event,
- d. qualification methodology,
- e. aging considerations, and
- f. margins.

If equipment has been successfully tested for an environmental profile which has been demonstrated to meet or exceed postulated service conditions and the qualification report is acceptable, the equipment is considered qualified.

24. Q. How is the review process documented?

A. This review is documented on the Environmental Qualification Report Evaluation Form (EQREF) and the Environmental Qualification Summary Sheet (EQSS). Sample EQREF and the EQSS are in the EQR. The results are tabulated in the computerized Environmental Qualification Status Report (EQSR). The EQSR is contained in Appendix F of the EQR.

25. Q. How is final qualification documented?

A. The Shoreham equipment environmental qualification program culminates in detailed documentation packages which include or provide references to applicable test reports and all other qualification data, such as supporting calculations and analyses. The packages also include the record and results of the evaluation of the adequacy of the Shoreham equipment. LILCO assures the adequacy of the documentation packages not only by providing direction to the contractors, but also by reviewing and providing comments on draft packages before they are issued to the Shoreham file.

26. Q. What steps are taken if qualification documents do not support complete qualification of individual equipment items?

A. In this case, additional data are acquired and evaluated until qualification is complete. This process includes activities described in the EQR, Sections 1 and 4, and may be summarized as follows:

Step 1: Identification of deficiencies.

Step 2: Investigation of alternatives to resolve deficiencies. Examples of such alternatives are:

- a. performing additional environmental testing or analysis,
- b. modifying the equipment design or material selection,
- c. further analyzing the equipment's environment and/or its function to refine the adverse service conditions that pertain to the actual location and use of the component,
- d. providing enclosure or shielding,
- e. relocating in a less severe environmental zone,
- f. selecting better qualified equipment as replacement.

Step 3: Decision as to which alternative to pursue.

Step 4: Implementation of decision.

Step 5: Evaluation of results, leading to either determination that the equipment has been qualified or reiteration of the process beginning with Step 1.

27. Q. For components whose qualification documentation is not complete at the time of issuance of an Operating License, what steps are taken pending completion of the EQ program?

A. Justifications for Interim Operation (IJs) have been provided for each such component within the scope of the EQ program, and are contained in Appendix H to the EQR. These IJs provide assurance that Shoreham can be safely operated pending completion of the EQ program.

28. Q. When will the qualification be complete for all equipment?

A. The NRC Staff's SER input forwarded by memorandum dated November 23, 1982 proposes an Operating License condition requiring completion of this process for all equipment items prior to startup after the first refueling outage. LILCO's program is directed toward meeting that schedule. Several tracking mechanisms

assist LILCO in assuring that progress continues in a timely manner. These include:

- 1) The computerized Environmental Qualification Status Report, Appendix F of the EQR. This document shows the environmental qualification status for individual equipment items.
- 2) Approximately monthly written reports from LILCO's contractors who are assisting in the program. These reports show the activities, status, progress and plans for logical groupings of equipment items.

29. Q. Do the provisions of the final Environmental Qualification rule approved by the Nuclear Regulatory Commission on January 6, 1983 affect the environmental qualification program for Shoreham?

A. LILCO has included all pertinent safety-related electrical equipment and post-accident monitoring equipment within the scope of the EQ program at Shoreham. LILCO believes that its EQ program also meets the aging and other requirements of the new rule. The new rule, at Paragraph (b)(2), also introduces an additional set consisting of nonsafety-related equipment whose failure under postulated environmental conditions could prevent satisfactory accomplishment

of specified safety functions by safety-related equipment. The design philosophy of Shoreham has been intended to preclude the existence of any such equipment, so that any equipment which would otherwise fall into this category has either been classified as safety-related or been suitably isolated from safety circuits. This design philosophy means that there should be no nonsafety-related electric equipment at Shoreham within the scope of Paragraph (b)(2) of the new rule.

30. Q. What are your conclusions?

A. Our conclusions are the following:

- 1) The scope of the environmental qualification program at Shoreham is adequate.
- 2) Aging and other life requirements have been suitably provided for by the Shoreham environmental qualification program.
- 3) Sufficient information exists for evaluation of overall adequacy of Shoreham's satisfaction of environmental qualification requirements for safety-related equipment.



PROFESSIONAL QUALIFICATIONS

Robert M. Kascsak

Nuclear Systems Engineering Division Manager

Long Island Lighting Company

My name is Robert M. Kascsak. My business address is Long Island Lighting Company, 175 East Old Country Road, Hicksville, New York. I am currently the Nuclear Systems Engineering Division Manager. My responsibilities include overseeing an engineering staff organization capable of analyzing and coordinating activities associated with nuclear plant design, operation, reliability and safety, including approving Architect Engineer designs and vendor designs and developing an in-house support organization associated with future plant modifications.

I graduated from Manhattan College in 1969 with a Bachelor of Mechanical Engineering. In 1977, I received a Master of Science degree in Nuclear Engineering from Polytechnic Institute of New York. I have completed training courses in BWR and PWR technology.

I joined LILCO in 1969 as an Assistant Engineer in the Mechanical and Civil Engineering Department. I worked on various fossil fuel power station projects in the capacity of Associate and Senior Engineer, including the Northport Power Station Unit 3 and Unit 4 mechanical engineering designs. From

July 1974 to March 1975, I served as LILCO Lead Mechanical Engineer for Shoreham and for the Jamesport Nuclear Power Station. In March 1975 I joined the Shoreham Project Group as an Assistant Project Engineer, after which I assumed the responsibilities of project manager. From March 1975 to January 1979, I was Project Engineer for Shoreham. In this position I was responsible for the review and approval of design activities prepared by our Architect/Engineer, Nuclear Steam Supply Steam Vendor and LILCO in-house engineering departments.

I am a registered Professional Engineer in New York State and a member of the American Society of Mechanical Engineers.

## PROFESSIONAL QUALIFICATIONS

Joan F. Etzweiler

Nuclear Systems Engineering Division

Long Island Lighting Company

My name is Joan F. Etzweiler. My business address is Long Island Lighting Company, 175 East Old Country Road, Hicksville, New York. I am currently the lead engineer for environmental and seismic equipment qualification in the Nuclear Engineering Department. My responsibilities include engineering aspects of nuclear licensing, technical and licensing guidance to project engineering, and direction and coordination of various consultants. I was Chairman of the Shielding Committee of BWR/TMI Owners' Group, as well as a technical director of the Utility Equipment Qualification -- BWR Owners Group. I have direct responsibility for ensuring the environmental and seismic qualification of equipment.

I graduated from Massachusetts Institute of Technology in 1971, with a Bachelor of Science degree in Physics. In 1974, I received a Master of Science degree in Nuclear Engineering from the University of Wisconsin. In 1977, I received a Ph.D. in Nuclear Engineering, also from the University of Wisconsin.

Prior to coming to Long Island Lighting Company, I worked for the American Electric Power Service Corporation as an Engineer in the Nuclear Engineering Division. I was

responsible for safety review of design modifications, safety-related analysis to support licensing submittals, preparation and safety review of licensing submittals, development of a computer code for a statistical analysis to aid in compliance with technical specifications, equipment environmental qualification assessment, and in-plant and ex-plant radiation dose calculations. I worked for the University of Wisconsin as a research assistant in the Plasmic Physics Groups and also in the Fusion Feasibility Group. I also worked for the Oak Ridge National Laboratory as a research associate in the Fusion Energy Division.

I am a member of the American Nuclear Society and of the American Physical Society.

PROFESSIONAL QUALIFICATIONS

James F. Gleason

Nuclear Engineering Services Division

Wyle Laboratories

My name is James F. Gleason. My business address is Wyle Laboratories, 7800 Governor's Drive West, Huntsville, Alabama, 35807. I am currently Deputy Director of the Nuclear Engineering Services Division at Wyle Laboratories and am responsible for management of the Nuclear Engineering Services Division. My principal duties include the supervision and direction of engineers and technical personnel and I am responsible for ensuring that the technical content and preparation of nuclear qualification plans are performed in accordance with applicable U.S. Nuclear Regulatory Commission Regulations.

I am also the Program Manager and Principal Investigator on the Electric Power Research Institute (EPRI) sponsored research on the correlation of aging and seismic qualification. I am responsible for the technical content and presentation of the Nuclear Environmental Qualification Seminar. I am also responsible for the development of accelerated aging methodologies and procedures to simulate natural aging in equipment and components in addition to performing project engineering functions to support test and research programs. I graduated from Rensselaer Polytechnic Institute in 1968 with a

Bachelor of Science in Mechanical Engineering. In 1975, I received a Master of Science Degree in Industrial Engineering from Ohio State University.

As Deputy Director of the Nuclear Engineering Services Division, I participated in the management and engineering reviews of the Engineering Department, Technical Staff and Program Management Office. I developed methodologies and implemented procedures for performing engineering analyses for equipment qualification and qualification assessment activities.

Before assuming my present position at Wyle, I worked two years for Magic Chef, Inc. in The Microwave Division. I established, implemented and staffed the Quality Assurance Department, which consisted of a Quality Control Function, a Reliability Engineering Function, a Test Function, and Equipment Calibration, Maintenance, Surveillance and Repair Function and a Quality Assurance Engineering and Field Support Function. I performed the additional function of Program Manager, responsible for circuit design, mechanical design, industrial design, supervision of engineers, draftsmen, designers, technicians and clerical personnel in the development of a line of microwave ovens. In this capacity, I accomplished federal agencies' approval, UL listing and introduction into production.



Prior to Magic Chef, I worked at Industrial Nucleonics Corporation. As Manager of the Quality Assurance Department, I was responsible for preparing a budget and management of the department. I supervised the personnel, provided support and resolved quality problems in all areas of manufacturing. I developed and executed quality assurance and reliability functions for special high reliability contracts. I worked three years for SCI Systems, Inc. as systems effectiveness Engineer/Reliability Engineer. I coordinated activities of Engineering Quality Control and Reliability in the analysis of all system failures and problems.

I am a Registered Professional Engineer in California. My registration is in the field of Quality Engineering, Number 2635.

Publications:

T. Doll, M. Pfauth, J. Gleason, S. Cohen, C. Stiehl, R. Guintini and B. Hayes, "Personal Flotation Devices Research - Phase I," January 1978.

M.J. Pfauth and J.F. Gleason, "The Development of a Test Methodology for Determining the Reliability of PFD's Used in a Recreational Boating Environment," Institute of Environmental Sciences, 1978 Proceedings.

J.F. Gleason, "Reliability Assessment of Inflatable PFD's," American Society for Quality Control, 33rd Annual Technical Conference Transactions, May 1979.

J.F. Gleason, "Qualification of Some Electronic Components," ANS Topical Meeting on Thermal Reactor Safety, April, 1980.

Robert A. Hall and J.F. Gleason, P.E., "Environmental Qualification of Nuclear Power Plant Control Equipment,"

Instrumentation in the Power Industry, Vol. 23, Instrument Society of America, May, 1980.

J.F. Gleason, P.E., "Environmental Qualification of Safety-Related Equipment to NUREG-0588 and DOR Guidelines," 1981 American Power Conference Proceedings, Volume 43, American Power Conference, April 27-29, 1981.

J.F. Gleason, P.E., and K.D. Stinson, "The Application of Accelerated Aging Methodology to Post-Accident Simulations," American Nuclear Society 1981 Annual Meeting, June 1981.

J.F. Gleason, P.E., and Marge Bruce, "Radiation Procedures in Equipment Qualification," American Nuclear Society Winter Meeting, November 29 - December 3, 1981.

J.F. Gleason, P.E., "Obtaining and Maintaining NUREG-0588 Compliance," American Nuclear Society Topical Meeting on Power Plant Construction, Operation and Maintenance, Charleston, S.C., March 28-31, 1982.

J.F. Gleason, P.E., "The Effects of Aging on the Performance of Safety-Related Equipment," Presented at U.S. Nuclear Regulatory Commission Sponsored Workshop on Nuclear Power Plant Aging, Bethesda, Md., August 4, 5, 1982.

J.F. Gleason, P.E., "EPRI - Sponsored Correlation of Age-Sensitivity and Seismic Qualification," Presented at U.S. Nuclear Regulatory Commission Sponsored workshop on Nuclear Power Plant Aging, Bethesda, Md., August 4, 5, 1982.

PROFESSIONAL QUALIFICATIONS

Robert J. Najuch

Power Division

Group - Principal Mechanical Engineer

My name is Robert J. Najuch. My business address is Stone & Webster Engineering Corporation, Boston, Massachusetts. I am currently the Principal Mechanical Engineer on the Shoreham project. Responsibilities within this position include supervision and direction of technical activities for systems within the turbine generator buildings and project administration and direction of manpower within the mechanical group, and within the power division for a variety of studies within the project such as the Environmental Qualification Program and Heavy Loads study.

I graduated from Worcester Polytechnic Institute in 1974 with a Bachelor of Science Degree in Mechanical Engineering. In 1979, I received a Master of Science Degree in Mechanical Engineering from Northeastern University.

In 1974, I was assigned to the Nuclear Group Section of the Shoreham project as a Career Development Engineer. Project assignments included preparation of specifications, bid review and vendor/SWEC coordination of resulting contracts. I was also responsible for initiating requirements for maintainability/access requirements throughout the plant and

originated maintainability assessment reports to the client. From 1976 to 1978, I served LILCO as an engineer assigned to the Mechanical Group of the Shoreham project. I was responsible for system design and procurement of components in the condensate, feedwater, and condensate demineralizer systems, diesel fuel oil, plant sampling, service air/breathing air, chlorination, vacuum priming and circulating water/screenwash systems. From October, 1978 to 1981, I was an engineer assigned to the Nuclear Group for the Shoreham project. I was responsible for review and coordination of ATWS regulatory guide 1.97 and NUREG-0578 programs and coordination of selection of equipment for the Environmental Qualification Program. I was also responsible for the technical direction and supervision of personnel in the areas of post-accident sampling conceptual development and radiation protection/radiation monitoring system and FSAR revisions.

I am a registered professional engineer in the State of Massachusetts.

PROFESSIONAL QUALIFICATIONS

William R. Shosho

Electrical Engineer

Stone & Webster Engineering Corporation

My name is William F. Shosho. My business address is Stone & Webster Engineering Corporation, Boston, Massachusetts. I am currently working as a Principal Electrical Engineer assigned to the Shoreham project. In the past, I have been responsible for assembling the environmental qualification program submittal to the NRC and supervising subsequent licensing revisions to the document. My current responsibilities include: evaluating the acceptability of environmental qualification documentation for Class 1E electrical equipment located in harsh environments, implementing a qualification test program for Class 1E miscellaneous electrical components used in the Shoreham plant, and providing testing requirements and/or witnessing of environmental testing of electrical equipment including motor control centers and various instruments.

I graduated from the State University of New York in 1969 with a Bachelor of Science Degree. In 1971, I received a Master of (Electrical) Engineering Degree from Cornell University.

From 1971 to 1974, I worked on the James A. Fitzpatrick Nuclear Power Station project. As a support electrical

engineer, my responsibilities included station service calculations, panel modifications, one line diagrams, and specification and purchase of Category I Electrical Equipment including distribution transformers, motor control centers, relays, circuit breakers, and instruments. I was also responsible for coordination of engineering and field design requests. In 1974, I was assigned to the plant site where I worked as a Field Project Engineering Representative. My job responsibilities included: assisting construction completion and start-up system testing by coordinating design change requests to appropriate engineering discipline and to ensure adequate disposition and documentation of each change.

In 1974, I joined the Shoreham Project Group as a Support Electrical Engineer. I was responsible for station service and main transformers, metal-clad switchgear, turbine generator, motors and motor starters, isolated phase and metal-enclosed bus. From 1976 to 1977, I worked as an Electrical Engineer at the Shoreham site. During this period, I directed construction and design personnel in equipment installations, interfaced with equipment suppliers to remedy engineering deficiencies, and developed a testing program for high-potential proof testing of field installed medium voltage cable. In January of 1978, I assumed the position of Support Electrical Engineer in Boston. During this period, I developed the fire stop specification and evaluated operation of electrical equipment for the Power Division pipe break analysis.

I am a registered Professional Engineer in the States of  
New Hampshire and Massachusetts.



PROFESSIONAL QUALIFICATIONS

Newell K. Woodward

Supervisor of Systems Engineering Section - EDS

My name is Newell K. Woodward. My business address is EDS Nuclear, Inc., 225 Broad Hollow Road, Melville, New York. My experience at EDS includes positions as Project Manager and Project Engineer for Utility-requested electrical equipment environmental qualification programs with respect to the requirements of NUREG-0588 and I&E Bulletin 79-01B, and a mechanical equipment environmental qualification program. Efforts associated with these positions included NRC audit support and attendance for a near term operating license BWR plant, the preparation of responses to NRC and Intervenor queries, and qualification analysis and report preparation. Additionally, I have prepared Pre-Construction Safety Reports based on event and fault tree analyses for an English PWR Plant.

I completed the United States Naval Nuclear Power School and Reactor Prototype Training Course, where I studied Nuclear Engineering and reactor plant testing, maintenance, and operations. In 1980, I received a Bachelor of Science Degree from the State of Connecticut.

Prior to joining EDS, I held a position as a NSSS Design Engineer at a major PWR nuclear steam system supplier and manufacturing firm. I was responsible for the engineering

analysis and technical support of special projects relating to the design and licensing of the Nuclear Steam Supply System (NSSS), secondary feedwater and steam supply systems, and auxiliary systems' interface. I also held various positions at a major engineering-construction firm and was directly involved in the refueling, overhaul, and modification of several Navy prototype PWR plants. I held several positions at the firm including Senior Quality Control Inspector and Shift Refueling Engineer. I was responsible for monitoring and certifying reactor plant servicing procedures, nuclear and non-nuclear welding, brazing, instrumentation and control, system testing, pressure vessel and fuel lifting and handling equipment and nuclear plant materials. My initial nuclear plant experience was acquired through the United States Navy Nuclear Power Submarine Program where I was an Engineering Watch Supervisor and Machinery Division Leading Petty Officer.

I am a member of Pi Tau Sigma (National Honorary Mechanical Engineering Fraternity). I am also a member of the American Nuclear Society where I served on Standards Committee ANS 56.3.

ATTACHMENT 1

SC 8: ENVIRONMENTAL QUALIFICATIONS

Suffolk County contends that the TMI-2 accident demonstrated that the severity of the environment in which equipment important to safety must operate was underestimated and that equipment previously deemed to be environmentally qualified had failed. Shoreham's safety-related equipment has not been demonstrated to be capable of maintaining functional operability under all service conditions throughout its installed life, and during the time in which it is actually required to operate, thereby violating 10 CFR 50, Appendix A, GDC 1, 2, 4 and 23, and 10 CFR 50, Appendix B, Sections II, III and XI.

Deficiencies in the qualification of Shoreham's safety-related equipment must be eliminated before operation can be authorized. Specifically,

- (a) The limited test conditions posed in the Shoreham environmental qualification program are not sufficiently conservative;
- (b) Equipment has been qualified by grandfathering to older, less stringent standards;
- (c) The list of emergency equipment to be qualified is inadequate;
- (d) There has been an inadequate demonstration that all safety-related equipment has been properly qualified to meet aging and other life requirements; and
- (e) There is insufficient information to evaluate the overall adequacy of Shoreham's satisfaction of environmental qualification requirements for safety-related equipment.

ATTACHMENT 2

SOC 19(h): REG. GUIDE 1.89:  
ENVIRONMENTAL QUALIFICATIONS

Regulatory Guide 1.89. -- LILCO, in its response to NUREG-0588, failed to demonstrate adequate qualification of Class 1E electrical equipment as described in this regulatory guide, and as specified in IEEE Standard 323-1974. Therefore, Shoreham does not comply with 10 CFR Part 50, Appendix A, Criteria 1, 2, 4 and 23, and Appendix B, Criteria II and III, in that:

1. The limited test conditions posed in the Shoreham environmental qualification program are not sufficiently conservative;
2. Equipment has been qualified by grandfathering to older, less stringent standards. Inadequate consideration has been given to the deteriorating effects of component aging, accuracy of instrument setpoints, test documentation requirements, and tolerance margins.
3. The list of emergency operating equipment to be qualified is inadequate.
4. There has been an inadequate demonstration that all safety-related equipment has been properly qualified to meet aging and other life requirements.
5. There is insufficient information to evaluate the overall adequacy of Shoreham's satisfaction of environmental qualifications requirements for safety-related equipment.

ATTACHMENT 3

SNRC-576 5/27/81	EQ Program for Class 1E Equipment - Rev. 0.
SNRC-663 1/25/82	EQ Report for Class 1E Equipment for SNPS - Rev. 1
SNRC-704 5/17/82	EQ Report for Class 1E Equipment for SNPS - Rev. 2 and SNPS Equipment Environmental Qualifica- tion Action Plan.
SNRC-728 7/8/82	Information requested by NRC audit team for Shoreham equipment EQ during site visit 6/2-6/3/82.
SNRC-746 8/13/82	EQ Report for Class 1E Equipment for SNPS - Rev. 3
SNRC-767 9/9/82	Information requested by the NRC Staff of items relative to EQ of safety related equipment.
SNRC-783 10/29/82	Clarification requested by the NRC Staff of items relevant to EQ issue.
SNRC-768 11/3/82	EQ Report for Class 1E Equipment for SNPS - Rev. 4

NRC EQUIPMENT QUALIFICATION BRANCH AUDITS

1	April 26 - April 30, 1982
2	June 2 - June 3, 1982

MEETINGS WITH SC, LILCO AND NRC STAFF

1	October 21, 1982
2	December 8, 1982
3	December 17, 1982

LILCO, January 19, 1983

CERTIFICATE OF SERVICE

DOCKETED

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

83 JAN 21 AM 11:22  
FEDERAL BUREAU OF INVESTIGATION  
U.S. DEPARTMENT OF JUSTICE  
BRANCH

I hereby certify that copies of TESTIMONY OF ROBERT M. KASCSAK, JOAN F. ETZWEILER, JAMES F. GLEASON, ROBERT J. NAJUCH, WILLIAM R. SHOSHO, AND NEWELL R. WOODWARD FOR THE LONG ISLAND LIGHTING COMPANY ON SC CONTENTION 8/SOC CONTENTION 19(h) -- ENVIRONMENTAL QUALIFICATIONS (refiled January 19, 1983) were served upon the following by first-class mail, postage prepaid, by Federal Express (as indicated by an asterisk), or by hand (as indicated by two asterisks) on January 19, 1983:

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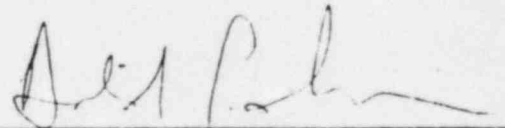
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