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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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Before the Atomic Safety and Licensing Board

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

In the Matter of)

LONG ISLAND LIGHTING COMPANY)

(Shoreham Nuclear Power Station,
Unit 1))

Docket No. 50-322-OL

AFFIDAVIT OF DALE G. BRIDENBAUGH

STATE OF CALIFORNIA)

COUNTY OF SANTA CLARA)

ss.

DALE G. BRIDENBAUGH deposes and says under oath as follows:

My name is Dale G. Bridenbaugh. A statement of my qualifications and experience has previously been provided to this Atomic Safety and Licensing Board ("Board") as part of my testimony on several Suffolk County Contentions (see Statements of Qualifications of Suffolk County Witnesses submitted on April 12, 1982).

This Affidavit relates to Suffolk County Contention 11, Passive Mechanical Valve Failure. In the Board's Partial Initial Decision of September 21, 1983, LILCO was directed to submit information on the testing of system check valves. (PID at 64). This information was filed by LILCO on November 28, 1983. It included an Affidavit by John A. Rigert describing the program for

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detection of passive mechanical check valve failures at Shoreham. See LILCO's Response to Board's Order in Partial Initial Decision Regarding Detection of Passive Mechanical Check Valve Failures, November 28, 1983. I have reviewed this filing, including its attachment, and have the following comments to which I attest:

1. LILCO has made some significant improvements in the details of and bases for the Shoreham In-Service Test Plan ("IST"). An example of such improvement is the description of the testing specified for the drywell/suppression pool vacuum breakers found on pages A-7 & 8 of Attachment 1 to Mr. Rigert's Affidavit. The position indicator description, the technical specification testing requirements, and the action to be taken if the position indicators become inoperable show that a fairly broad assessment of the consequences of failure has been conducted. I believe that similar attention should be given to some of the other valves where LILCO has reached conclusions of adequacy with no stated or detailed justification. Thus, Mr. Rigert's Affidavit contains a number of unsupported conclusions, which leave unanswered the adequacy of LILCO's detection techniques for many of the safety-related check valves at Shoreham. These include the following:

Rigert Affidavit, pp. 3 and 4, paragraph No. 3.

In this paragraph, LILCO acknowledges that forward and reverse flow testing does not necessarily detect latent passive mechanical valve failures, although, without supporting analysis, Mr. Rigert asserts that such "testing satisfies the goal of ASME XI by demonstrating that the valve will perform its intended safety function" Thus, it appears that Mr. Rigert

believes that no adverse impact on a safety function can result from a passive mechanical valve failure so long as there has been both forward and reverse flow testing. This belief is made clear by the discussion in the attachment to the affidavit. Thus, on page A-11, LILCO identifies six valves that will be subject to forward and reverse flow testing which (apparently though not stated) then require no further analysis or description. There is no other basis given for the disposition of these valves.

Without any analysis or supporting justification, this Board should not accept the proposition that forward and reverse flow testing is per se adequate to meet all requirements when it is admitted that some latent passive mechanical valve failures will not be detected by such tests. In my opinion, LILCO needs to justify why further detection techniques (such as periodic valve disassembly as mentioned in Bulletin 83-03) should not be required. What LILCO should do is identify all the possible failure detection techniques (given the valve's location, operational mode, etc.) and justify the techniques used in the ISI program by considering all relevant factors, including, for example, the safety-related function served by a particular valve, occupational exposures potentially incurred by various detection techniques, the consequences of the valve's failure, etc.

I expected that LILCO would provide such detailed justifications in its November 28 submission. However, with the exception of pages A-7 and A-8, I find LILCO's justifications largely conclusory and thus unsatisfactory from a technical point of view.

Rigert Affidavit, p. 4, paragraph 4.

LILCO here implies that reverse flow testing will confirm valve integrity because "a disassembled valve would probably allow flow through it." (emphasis added). No quantification of this probability is offered. LILCO then states similarly in paragraph 5 that the "low likelihood" of passive failure does not justify imposition of detection means. However, one of the points made in IE Bulletin 83-03 is that the internal disassembly of check valves at Dresden was not detectable by testing but only by internal inspection of the valves. No new information has been presented by LILCO addressing the concern expressed in the NRC Bulletin. Further, it is my opinion that LILCO has reached conclusions regarding the likelihood of failures or detection without providing essential factual data to support such conclusions. Thus, I find the Rigert conclusions to be unsupported.

Rigert Affidavit, p. 5, paragraph 6.

LILCO states here that forward and reverse flow testing is "clearly adequate" to detect passive failures. As expressed earlier in this affidavit, there is no foundation for this assertion. Further, it conflicts with the statement at the top of page 4 of the Rigert affidavit that two direction flow testing "does not necessarily detect latent passive mechanical valve failures." Perhaps Mr. Rigert was attempting to draw a distinction between latent passive mechanical valve failures and other passive mechanical valve failures. If so, the bases for any such distinction are never set forth.

2. Attachment 1, at pages A-2 and 3, describes 20 check valves in seawater systems that will receive no forward or reverse flow testing. Indeed, from LILCO's description at those pages, I have to conclude that these 20 valves receive no testing at all. This ASME XI non-compliance is excused by LILCO on the basis that these valves are different than those discussed in Bulletin 83-03 and because an additional 14 valves of the same design which are tested provide an "adequate sample" to detect failures in both groups. ASME XI test recommendations do not provide for sample testing but rather specify that all such safety-related valves are to be tested. LILCO provides no reasons for not testing the 20 valves and does not state the consequences of failures of these valves. In my opinion, LILCO should be required to demonstrate why these valves cannot be properly tested, or modified so that they could be tested. If there is no other way, then the testing could be waived if the consequences are shown to be acceptable. In sum, therefore, LILCO's asserted justification is completely inadequate to meet ASME requirements.

3. Attachment 1, pages A-5 and 6. LILCO here states that it "believes" that only forward flow testing will be sufficient for these 15 valves. One basis is that "industry experience shows that there is no history of these check valves failing." No information is given as to the details of that "history": how long such valves have operated, whether the Shoreham valves will be the first of that design to go into service, etc. There is thus no detailed information to substantiate the broad conclusion. Absent detailed backup for the broad conclusion, there is no

adequate justification for what LILCO "believes." Further, how does the alleged history of no failure lead to a belief that forward flow testing will reveal a passive failure? Again, broad conclusions are reached but adequate, detailed bases are not provided.

4. Attachment 1, pages A-9 and 10. These 24 valves are proposed for exclusion from quarterly ASME XI test requirements by LILCO on the basis that they will be subject to Appendix J Type C leak testing. We are not told, however, in the Rigert affidavit that Type C leak testing is only required to be performed every two years nor whether an analysis has been performed substantiating this less frequent (ASME XI is every 3 months) testing. Again, "industry experience" is invoked but not quantified. If more frequent testing is feasible, the strong preference should be to perform such testing. However, the Rigert affidavit does not even allege that more frequent testing is infeasible. Again, there is insufficient justification for the testing which is proposed.

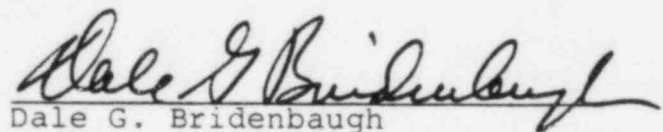
5. Attachment 1, page A-15. LILCO proposes to modify these six valves at the first refueling outage for manual exercising. Following that, the operator can note the amount of resistance to valve travel. It is not stated how that resistance will be evaluated or measured, nor is justification given for not modifying the valves before fuel load. Why doesn't LILCO propose that the plant be constructed in compliance with the code before operation begins?

6. Attachment 1, page A-16. These two valves will receive reverse flow testing by means of the Type C leak testing. Again I point out that such tests are only required every two years and do not fulfill the quarterly test recommendation. Thus, this is an instance where there is quarterly forward flow testing and reverse flow testing every two years. No justification is provided.

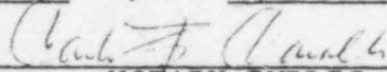
7. Attachment 1, pages A-19, 20 and 21. These 411 check valves are waived from the IST program on the basis of industry experience and functional performance monitoring. Valve F138 is further waived on the basis of having no risk to safe shutdown of the reactor. If this last statement is correct, why isn't it excluded from the IST? I conclude this is an oversimplification and that there could be a degradation of safety system performance under certain circumstances. As to industry experience, LILCO provides no quantification of the failure rate and no description of failure consequences. It is therefore not possible to evaluate the exclusion proposed by LILCO.

8. In conclusion, while I recognize that LILCO was directed by the Board to only address check valves for the resolution of this contention, I repeat the recommendation made in my previous testimony that valve failure analysis should be performed so as to identify the most critical valves in the various systems. Special care should then be given to assure that these valves have adequate position indicators and/or that they are tested in compliance with ASME XI recommended frequencies. This does not appear to have been done for all valves although I deduce from the lengthy discussion of the procedures to be used for testing and

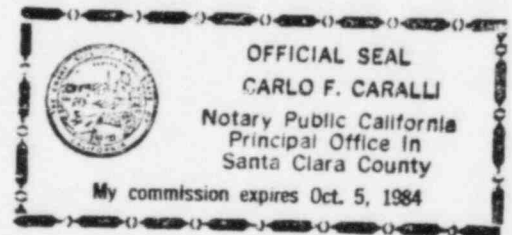
subsequent corrective action for the containment vacuum breakers found on pages A-7 and 8 of the Attachment to Mr. Rigert's Affidavit that LILCO has determined, from some unidentified selection process, that some valves need to receive extra attention. This selection process should be formalized and made visible, and consistent criteria developed and utilized. The use of unsupported conclusions, prevalent in the November 28 filing, is not adequate for the important safety decisions represented by valve reliability.


Dale G. Bridenbaugh

Subscribed and sworn to before
me this 29th day of December, 1983.


NOTARY PUBLIC

My commission expires: Oct 5, 1984



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CERTIFICATE OF SERVICE

I hereby certify that copies of the Affidavit of Dale G. Bridenbaugh related to Suffolk County Contention 11, dated December 29, 1983, with one correction noted thereon, have been served to the following this 3rd day of January 1984 by U.S. mail, first class.

Lawrence J. Brenner, Esq.
Administrative Judge
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Ralph Shapiro, Esq.
Cammer and Shapiro
9 East 40th Street
New York, New York 10016

Dr. George A. Ferguson
Administrative Judge
Atomic Safety and Licensing Board
School of Engineering
Howard University
2300 6th Street, N.W.
Washington, D.C. 20059

Howard L. Blau, Esq.
217 Newbridge Road
Hicksville, New York 11801

W. Taylor Reveley, III, Esq.
Hunton & Williams
P.O. Box 1535
707 East Main Street
Richmond, Virginia 23212

Dr. Peter A. Morris
Administrative Judge
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mr. Jay Dunkleberger
New York State Energy Office
Agency Building 2
Empire State Plaza
Albany, New York 12223

Edward M. Barrett, Esq.
General Counsel
Long Island Lighting Company
250 Old Country Road
Mineola, New York 11501

James B. Dougherty, Esq.
3045 Porter Street, N.W.
Washington, D.C. 20008

Mr. Brian McCaffrey
Long Island Lighting Company
175 East Old Country Road
Hicksville, New York 11801

Jeff Smith
Shoreham Nuclear Power Station
P.O. Box 618
North Country Road
Wading River, New York 11792

Joel Blau, Esq.
New York Public Service Commission
The Governor Nelson A. Rockefeller
Building
Empire State Plaza
Albany, New York 12223

David J. Gilmartin, Esq.
Suffolk County Attorney
H. Lee Dennison Building
Veterans Memorial Highway
Hauppauge, New York 11788

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

Docketing and Service Section
Office of the Secretary
U.S. Nuclear Regulatory Commission
1717 H Street, N.W.
Washington, D.C. 20555

Bernard M. Bordenick, Esq.
David A. Repka, Esq.
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Stuart Diamond
Environment/Energy Writer
NEWSDAY
Long Island, New York 11747

Stephen B. Latham, Esq.
Twomey, Latham & Shea
P.O. Box 398
33 West Second Street
Riverhead, New York 11901

Marc W. Goldsmith
Energy Research Group, Inc.
400-1 Totten Pond Road
Waltham, Massachusetts 02154

MHB Technical Associates
1723 Hamilton Avenue
Suite K
San Jose, California 95125

Hon. Peter F. Cohalan
Suffolk County Executive
H. Lee Dennison Building
Veterans Memorial Highway
Hauppauge, New York 11788

Ezra I. Bialik, Esq.
Assistant Attorney General
Environmental Protection
Bureau
New York State Department
of Law
2 World Trade Center
New York, New York 10047

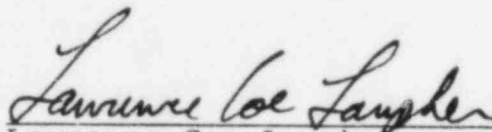
Atomic Safety and Licensing
Appeal Board
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Jonathan D. Feinberg, Esq.
Staff Counsel
New York State Public
Service Commission
3 Rockefeller Plaza
Albany, New York 12223

Stewart M. Glass, Esq.
Regional Counsel
Federal Emergency Management
Agency
26 Federal Plaza
New York, New York 10278

Gerald C. Crotty, Esq.
Counsel to the Governor
Executive Chamber
State Capitol
Albany, New York 12224

Ben Wiles, Esq.
Assistant Counsel to the
Governor
Executive Chamber
State Capitol
Albany, New York 12224



Lawrence Coe Lanpher
KIRKPATRICK, LOCKHART, HILL,
CHRISTOPHER & PHILLIPS
1900 M Street, N.W., Suite 800
Washington, D.C. 20036

DATE: January 3, 1984