



LONG ISLAND LIGHTING COMPANY

SHOREHAM NUCLEAR POWER STATION

P.O. BOX 618, NORTH COUNTRY ROAD • WADING RIVER, N.Y. 11792

Direct Dial Number

February 18, 1983

SNRC-831

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Mark II Hydrodynamic Loads Confirmatory Program
Shoreham Nuclear Power Station - Unit 1
Docket No. 50-322

- Reference 1) SSER for Seismic and Dynamic Qualification of
Safety Related Electrical And Mechanical
Equipment, dated December 27, 1982
- 2) Plant Design Assessment for SRV and LOCA Loads
Revision 5, December 1981
Shoreham Nuclear Power Station - Unit 1

Dear Mr. Denton:

In response to reference 1, item (3), LILCO hereby submits its report entitled, "Mark II Hydrodynamic Loads Confirmatory Program, Pipe Mounted Equipment Evaluation, Phase I." This report presents the current qualification levels for all motor operated valves (MOV's), on the 30 piping subsystems discussed in Reference 2, and the acceleration levels calculated for the Generic Long Term Program (LTP) confirmatory loads.

As stated in this report, all MOV's on the 30 piping subsystems have been evaluated and found to be adequately designed to accomodate the final generic (LTP) hydrodynamic loads.

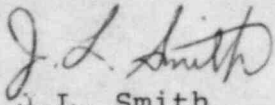
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LILCO believes this information sufficient to constitute closure of Phase I, Pipe Mounted Equipment concerns. Should you have any further questions regarding this matter, please feel free to contact this office.

Very truly yours,



J.L. Smith
Manager, Special Projects
Shoreham Nuclear Power Station

DWD:bc

Attachment

cc: J. Higgins
All Parties Listed in Attachment 1

ATTACHMENT 1

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

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

Dr. James H. Carpenter
Administrative Judge
Atomic Safety and Licensing
Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Daniel F. Brown, Esq.
Attorney
Atomic Safety and Licensing
Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

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

Herbert H. Brown, Esq.
Lawrence Coe Lanpher, Esq.
Karla J. Letsche, Esq.
Kirkpatrick, Lockhart, Hill
Christopher & Phillips
8th Floor
1900 M Street, N.W.
Washington, D.C. 20036

Mr. Marc W. Goldsmith
Energy Research Group
4001 Totten Pond Road
Waltham, Massachusetts 02154

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

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

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

Matthew J. Kelly, Esq.
State of New York
Department of Public Service
Three Empire State Plaza
Albany, New York 12223

MARK II HYDRODYNAMIC LOADS CONFIRMATORY PROGRAM
PIPE MOUNTED EQUIPMENT EVALUATION - PHASE I
SHOREHAM NUCLEAR POWER STATION - UNIT 1
LONG ISLAND LIGHTING COMPANY

The objective of this report is to present additional information on Shoreham equipment evaluation results as a supplement to the Shoreham Design Assessment Report (DAR) Revision 5 (Reference 1) Appendix L "Mark II Hydrodynamic Loads Confirmatory Program."

As stated in the DAR, the Shoreham Mark II hydrodynamic loads confirmatory program has evaluated the plant with respect to the final generic Long-Term Program (LTP) hydrodynamic loads. The LTP hydrodynamic loads, the scope and procedure of the confirmatory program, and the evaluation results have been discussed in Reference 1. The evaluation concluded that the Shoreham reactor building structures, piping, and equipment had been adequately designed to accommodate the final generic LTP hydrodynamic loads, with the exception of a number of motor-operated valves (MOVs). These MOVs are generally the same valves that had acceleration values due to the design bases hydrodynamic loads which exceeded original qualification levels.

Since the evaluation results became available, analytical efforts as well as a requalification test program have been completed to demonstrate that the integrity and operability of the valves can be assured. This report presents the current qualification levels for all MOVs on the 30 piping subsystems discussed in the DAR and the acceleration levels calculated for the LTP confirmatory loads.

As indicated in Reference 1, the Shoreham reactor building structural dynamic analysis results had clearly shown that the most significant final generic load is the CO-basic load. The load definition is a direct application of the 4TCO test data on the Shoreham pool boundary with a conservative spatial distribution. NUREG-0808 (Reference 2) has acknowledged the conservative nature of the load definition and allows credit to be taken for the pool size effect and pool temperature range (Reference 3). Shoreham has performed a plant unique assessment and concluded that a CO-basic load reduction ratio of 0.7 can be applied for the pool size effect. Shoreham has conservatively elected not to take credit for the pool temperature range effect for results reported to date.

As it was discussed throughout the DAR, the structural analyses have generally employed simplifying assumptions that are conservative in nature. An example is the treatment of axisymmetric hydrodynamic loads such as the CO-basic load definition. The support excitation to a piping subsystem that is attached to the containment wall is a one-directional radial excitation. The design analyses generally employed have been conservatively performed with the full amplitude of radial excitation applied in two perpendicular horizontal directions. This substantial conservatism in the CO-basic load analysis has been removed in the piping analyses for the 30 piping subsystem evaluated herein.

The acceleration values at the MCVs have been calculated with the Shoreham pool size effect taken into account for the CO load definition and the tangential component of excitation removed for axisymmetric loads. The results are summarized in Table 1 for the 60 MOVs on the 30 piping subsystems evaluated. Also shown are the qualification levels for both the valve operators and assemblies.

The operator qualification levels were arrived at by test. The assembly qualification levels reflect the acceleration values used in the original qualification stress analyses ratioed up by the faulted condition factor of safety.

For the 60 valves evaluated, all calculated accelerations were found to be acceptable. For one valve, 1E11*MOV-039A, the calculated horizontal acceleration exceeds the valve assembly qualification level, but the combined effect with a lower vertical acceleration results in acceptable calculated stresses.

Based on the information presented herein, it is concluded that all Shoreham equipment will be proven to be within qualification levels. Phase II of this program is underway to address all valves on the remaining piping subsystems attached to the primary containment at locations of high amplitude ARS. It is expected that the program will provide positive confirmation that the qualification of Shoreham MOVs conform with the requirements of the Mark II LTP hydrodynamic load definitions.

References:

1. Shoreham Nuclear Power Station Unit 1
Plant Design Assessment Report for SRV and LOCA
Loads, Revision 5, December 1981
2. Mark II Containment Program Load Evaluation and
Acceptance Criteria, NUREG-0808, August 1981
3. Mark II Containment Lead Plant Program Load
Evaluation and Acceptance Criteria, NUREG-0487,
Supplement 2, February 1981

TABLE 1

CONFIRMATORY VS. QUALIFICATION LEVEL ACCELERATIONS

Valve Mark No.	AX No.	CONFIRMATORY		SART No.	QUALIFICATION LEVEL			
		AT OPERATOR C.G.			OPERATOR		ASSEMBLY	
		GH	GV		GH	GV	GH	GV
1E11*MOV032A	8C-1	9.8	1.4	88AD-7	10.0	10.0	>10.0	>10.0
1E11*MOV031A	8C-1	6.9	1.2	88AD-7	10.0	10.0	>10.0	>10.0
1E11*MOV036A	8F-1	2.7	1.9	88AD-10	7.0	7.0	>7.0	>7.0
1E11*MOV037A	8F-1	4.4	4.8	88AD-9	7.0	7.0	>7.0	>7.0
1E11*MOV038A	8F-1	4.7	1.0	88AD-2	10.0	10.0	>10.0	5.2
1E11*MOV039A	8F-1	8.3	0.5	88V-16	10.0	10.0	7.4	9.5
1E11*MOV040A	8F-1	7.1	4.2	88V-20	10.0	10.0	>10.0	>10.0
1E11*MOV041A	8F-1	5.5	1.6	88V-6	10.0	10.0	>10.0	>10.0
1E11*MOV042A	8F-1	3.5	2.5	88AD-5	10.0	10.0	>10.0	>10.0
1E11*MOV035A	8G-2	1.5	1.1	88V-20	10.0	10.0	>10.0	>10.0
1E11*MOV033A	8G-2	2.3	1.3	88V-20	10.0	10.0	>10.0	>10.0
1E11*MOV034A	8G-2	1.5	1.1	88AD-6	10.0	10.0	5.5	3.9
1E11*PCV003A	8G-2	1.8	1.9	318-2	3.0	3.0	>3.0	>3.0
1E11*MOV037B	8H-1	5.3	5.6	88AD-9	7.0	7.0	>7.0	>7.0
1E11*MOV036B	8H-1	6.7	3.2	88AD-10	7.0	7.0	>7.0	>7.0
1E11*MOV050	8H-1	9.5	3.1	88V-21	10.0	10.0	>10.0	4.7
1E11*MOV040B	8H-1	9.1	3.5	88V-20	10.0	10.0	>10.0	>10.0
1E11*MOV038B	8H-1	3.8	1.1	88AD-2	10.0	10.0	>10.0	5.2
1E11*MOV039B	8H-1	4.7	3.8	88V-16	10.0	10.0	7.4	9.5
1E11*MOV053	8L-1	2.5	1.4	88V-11	10.0	10.0	8.5	5.4
1E11*MOV054	8L-1	1.7	1.0	88V-11	10.0	10.0	8.5	5.4

TABLE 1 (CONTINUED)

CONFIRMATORY VS. QUALIFICATION LEVEL ACCELERATIONS								
Valve Mark No.	AX No.	CONFIRMATORY		SQRT No.	QUALIFICATION LEVEL			
		AT OPERATOR C.G.			OPERATOR		ASSEMBLY	
		GH	GV		GH	GV	GH	GV
1E51*MOV042	2A-2	1.6	1.2	88V-2	10.0	10.0	>10.0	4.3
1E51*MOV048	2A-2	1.1	1.6	253-3	10.0	10.0	7.3	3.3
1E51*MOV041	2A-2	1.0	1.3	88V-2	10.0	10.0	>10.0	4.3
1E51*MOV047	2A-2	1.0	3.3	253-3	10.0	10.0	7.3	3.3
1E51*MOV032	2C-1	2.4	2.4	88V-6	10.0	10.0	>10.0	>10.0
1E51*MOV031	2C-1	3.2	1.5	88V-6	10.0	10.0	>10.0	>10.0
1E41*MOV042	11G-1	1.4	0.6	88V-17	10.0	10.0	3.9	3.9
1E41*MOV048	11G-1	0.7	2.5	253-3	10.0	10.0	7.3	3.3
1E41*MOV041	24A-1	3.9	1.6	88V-13	10.0	10.0	5.6	2.3
1E41*MOV047	24A-1	6.4	0.3	253-3	10.0	10.0	7.3	3.3
1B21*MOV085	25J-1	1.6	1.4	253-1	10.0	10.0	3.2	4.5
1B21*MOV083	25J-1	1.9	1.8	253-1	10.0	10.0	3.2	4.5
1B21*MOV084	25J-1	1.6	2.6	253-1	10.0	10.0	3.2	4.5
1P41*MOV033A	33A-1	0.7	0.6	197-1	8.0	8.0	>8.0	>8.0
1P41*MOV033B	33A-1	0.5	0.4	197-1	8.0	8.0	>8.0	>8.0
1P41*MOV033C	33A-1	0.8	0.4	197-1	8.0	8.0	>8.0	>8.0
1P41*MOV033D	33A-1	0.5	0.6	197-1	8.0	8.0	>8.0	>8.0
1P41*MOV042A	33A-1	1.0	1.8	197-3	8.0	8.0	6.6	6.6
1P41*MOV042B	33A-1	0.8	1.6	197-3	8.0	8.0	6.6	6.6
1E11*MOV031C	8C-1	7.5	0.6	88AD-7	10.0	10.0	>10.0	>10.0
1E11*MOV032C	8C-1	4.6	6.2	88AD-7	10.0	10.0	>10.0	>10.0

TABLE 1 (CONTINUED)

CONFIRMATORY VS. QUALIFICATION LEVEL ACCELERATIONS								
Valve Mark No.	AX No.	CONFIRMATORY		SQRT No.	QUALIFICATION LEVEL			
		AT OPERATOR C.G.			OPERATOR		ASSEMBLY	
		G _H	G _V		G _H	G _V	G _H	G _V
1E11*MOV047	8N-1	4.0	1.3	88AD-8	10.0	10.0	>10.0	>10.0
1E32*MOV021C	60A-1	1.9	1.6	253-4	10.0	10.0	8.1	8.1
1E32*MOV022C	60A-1	1.6	1.9	253-4	10.0	10.0	8.1	8.1
1B21*MOV063	60A-1	1.3	0.9	253-1	10.0	10.0	3.2	4.5
1B21*MOV068C	60A-1	1.3	0.6	253-1	10.0	10.0	3.2	4.5
1E32*MOV021D	60B-1	2.4	1.2	253-4	10.0	10.0	8.1	8.1
1E32*MOV022D	60B-1	2.1	0.7	253-4	10.0	10.0	8.1	8.1
1B21*MOV064	60B-1	1.8	1.2	253-1	10.0	10.0	3.2	4.5
1B21*MOV068D	60B-1	1.2	0.9	253-1	10.0	10.0	3.2	4.5
1E32*MOV022A	60E-1	1.5	1.1	253-4	10.0	10.0	8.1	8.1
1E32*MOV021A	60E-1	2.8	1.6	253-4	10.0	10.0	8.1	8.1
1B21*MOV061	60E-1	1.9	0.9	253-1	10.0	10.0	3.2	4.5
1B21*MOV068A	60E-1	1.4	0.7	253-1	10.0	10.0	3.2	4.5
1B21*MOV068B	60F-1	1.4	0.9	253-1	10.0	10.0	3.2	4.5
1E32*MOV021B	60F-1	2.4	2.1	253-4	10.0	10.0	8.1	8.1
1E32*MOV022B	60F-1	1.8	1.8	253-4	10.0	10.0	8.1	8.1
1B21*MOV062	60F-1	1.3	0.9	253-1	10.0	10.0	3.2	4.5
1E41*MOV049	11G-1	1.5	2.1	253-1	10.0	10.0	3.2	4.5