

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
(Shoreham Nuclear Power Station)
Unit 1))

AFFIDAVIT OF BRIAN R. MCCAFFREY
CONCERNING SOC CONTENTION 12 (PART TWO)

Brian R. McCaffrey, being duly sworn, states as follows:

1. I am Manager, Project Engineering for Shoreham for the Long Island Lighting Company. A statement of my professional qualifications is attached to LILCO's Motion for Summary Disposition of SOC Contention 3.

2. The Shoreham downcomer design has always included bracing of the downcomers. In contrast, the original design of the LaSalle and Zimmer plants did not have a downcomer bracing system. As a result of the hydrodynamic loads identified in the Mark II program, a decision was made to install a downcomer bracing system similar to Shoreham's.

3. A structural review of the downcomer bracing system response to hydrodynamic loads in combination with seismic and other design basis loads was initiated in compliance with NRC Acceptance Criteria issued in October 1978. To reduce the

impact loads on the bracing caused by water level increases during pool swell, the bracing was lowered to just above normal water level in 1979. Before deciding to reconnect the bracing system to the containment, extensive analysis was conducted. That analysis indicated that interconnection of downcomers without restraint ties to the pedestal or containment structure is the optimum configuration for Shoreham. This optimization was based on the overall stress, despite the fact that the calculated stress due to seismic loads is higher when the downcomers are disconnected. Thus, the bracing system at Shoreham was not connected to the reactor vessel pedestal. The current margin of safety (code allowable minus maximum calculated stress) for the Shoreham downcomers is approximately 70% of the maximum calculated stress.

4. The submerged structure loads described in Shoreham Design Assessment Report (DAR) Revision 4, Appendix K have been included in the assessment of the downcomer bracing. The controlling loads for downcomer bracing are pool swell loads and not submerged structure loads. This is explained in Section 8.5 of DAR Revision 4. Because this is so, the bracing system safety margins are not significantly affected by changes in the submerged structure load definitions.

5. The Shoreham SER open item on steam condensation lateral loads, SER section 1.7 (item 27), concerned Shoreham's use of the Mark II Long Term Program (LTP) methodology currently under NRC review. The NRC has already approved

interim Mark II acceptance criteria in NUREG-0487. But LILCO analyzed Shoreham using the criteria to be applied in the long term program, which, at the time the SER was issued, had not yet been approved by the NRC. Subsequently, in a Mark II Owners Group/NRC meeting on May 29, 1981, the NRC Staff indicated its intention to accept the LTP methodology for steam condensation lateral loads and to document this acceptance in a forthcoming NUREG. As noted above, Shoreham used this methodology and it shows that the Shoreham design can accommodate steam condensation lateral loads.

6. The Shoreham SER open item on steam condensation oscillation and chugging loads, SER section 1.7 (item 28), also involved Shoreham's decision to use a load definition similar to the final LTP generic load definition. Shoreham's load definition is more conservative than the NRC interim criteria and, therefore, the current analysis for Shoreham is more stringent than what now required by the Staff on an interim basis. Thus, the Shoreham design is adequate to accommodate condensation oscillation and chugging loads.

7. Another SER issue related to the downcomers involves fatigue analysis. LILCO has committed to perform such an analysis and the work is in progress. Preliminary results presented to the NRC on June 3, 1981, showed a considerable

safety margin in the fatigue usage factor. Final fatigue evaluation results are scheduled for submittal to the NRC in August 1981. Thus, fatigue failure is not a problem at Shoreham.

Brian R. McCaffrey
Manager Project Engineering,
Shoreham Nuclear Power Station
LONG ISLAND LIGHTING COMPANY

July 13, 1981