UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 46 TO PROVISIONAL OPERATING LICENSE NO. DPR-16

JERSEY CENTRAL POWER & LIGHT COMPANY

OYSTER CREEK NUCLEAR GENERATING STATION

DOCKET NO. 50-219

1.0 Introduction

By letter dated January 29, 1980, Jersey Central Power and Light Company (JCP&L) (the licensee) requested a change to Appendix A, Technical Specifications, of Provisional Operating License No. DPR-16. The proposed Technical Specification change is a result of the Mark I Containment Long Term Program (LTP) and would allow a minimum suppression chamber downcomer submergence of three feet.

2.0 Evaluation

One method of suppression pool hydrodynamic load mitigation that the Mark I Owners Group has adopted for the LTP is reducing the initial submergence of the downcomer in the suppression pool to a minimum of three feet. By shortening the length of the downcomer the pool volume (i.e., thermal capacity) of the original design would be maintained. This approach, however, raises concerns regarding the increased potential for uncovering the downcomers and steam condensation capability, both of which could lead to torus overpressurization.

The potential for downcomer uncovery is addressed in the assessment of seismic slosh. This assessment was performed at the most extreme conditions that could potentially lead to uncovering of the downcomers and was predicated on a minimum three-foot downcomer submergence.

2.1 Seismic Slosh

Seismic motion induces suppression pool waves which can (1) impart an oscillatory pressure loading on the torus shell, and (2) potentially lead to uncovering the ends of the downcomers, which would result in steam bypass of the suppression pool and potential overpressurization of the torus, should the seismic event occur in conjunction with a Loss

of Coolant Accident (LOCA). To assess these effects, the Mark I Owners Group undertook the development of an analytical model which would provide plant-specific seismic wave amplitudes and torus wall pressures. This model was based on 1/30-scale "shake test" data for a Mark I torus geometry.(2)

Based on the results of plant-specific analyses, using the analytical model, the Mark I Owners Group concluded that (1) the seismic wave pressure loads on any Mark I torus are insignificant in comparison with the other suppression pool dynamic loads, and (2) the seismic wave amplitudes will not lead to uncovering the downcomers for any Mark I plant. This conclusion was based on the maximum calculated pressure loads and the minimum wave trough depth relative to the downcomer exit.

We have reviewed comparisons of the analytical predictions with scaled-up test data, the small-scale test program, and the seismic spectrum envelope used in the plant-specific analyses. Based on this review, we conclude that the seismic slosh analytical predictions will provide reasonably conservative estimates of both the wall pressure loading and the wave amplitude, for the range of Mark I plant conditions.

Since the maximum local wall pressure were found to be less than 0.8 psi at a 95% upper confidence limit, the Mark I Owners Group has proposed that the seismic slosh loads may be neglected in the structural analysis. We agree that the seismic slosh loads are insignificant in comparison with the other suppression pool dynamic loads. On this basis, we conclude that neglecting seismic slosh loads for the plant-unique analyses is acceptable.

The results of the slosh wave amplitude predictions indicate that, within the local area of maximum amplitude and with maximum suppression pool drawdown (resulting from ECCS system flows), the slosh waves will not cause uncovering of the downcomers. We have reviewed the assumptions used in these analyses and conclude that they are sufficiently conservative. Based on the above discussion, we find the proposed change acceptable.

2.2 Condensation Capability

Condensation capability of the suppression pool is a function of the local pool temperature in the vicinity of the downcomer exit. Full Scale Test Facility (FSTF) test results(3) and foreign test(1) data have shown that thermal stratification occurs, and becomes more severe as the downcomer submergence is reduced. The most severe thermal stratification has been observed in low flow tests with a quiescent pool. However, in actual plant conditions, the Residual Heat Removal (RHR) system and Safety Relief Valve (SRV) discharge provide sufficient long-term pool mixing to minimize thermal stratification. Even with verticle thermal stratification, we have determined that the high energy reposition

is accompanied by an increased flow and mixing, which prevent over-pressurization of the torus. In addition, the analytical predictions of the torus pressure and bulk temperature response have been found to be conservative when compared with FSTF test data for plant-simulated initial conditions. The local temperature variation in the pool which has been observed in the test data is not significant to the structure, and, therefore, need not be considered in the structural analysis.

Based on this assessment, we conclude that a minimum initial downcomer submergence of three feet is acceptable, and there is sufficient conservatism in the containment response analysis techniques to accommodate the effects of thermal stratification. Therefore, we find the proposed technical specifications acceptable.

3.0 Environmental Consideration

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and pursuant to 10 CFR 51.5(d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

4.0 Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: April 23, 1980

References

1. K. W. Wong, "Mark I Containment Program Downcomer Reduced Submergence Functional Assessment Report" General Electric Proprietary Report NEDE-21885-P, June 1978.

2. S. M. Arian, "Mark I Containment Program Seismic Slosh Evaluation" GE Proprietary Report NEDE023702-P, March 1978.

3. G. W. Fitzsimmons and others, "Mark I Containment Program Full Scale Test Program Final Report" GE Proprietary Report NEDE-2453q-P, April 1979.