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

June 26, 1990

MEMORANDUM FOR: James M. Taylor, Executive Director for operations

FROM: Samuel J. Chilk, Secretary

SUBJECT: SECY-90-16 - EVOLUTIONARY LIGHT WATER REACTOR (LWR) CERTIFICATION ISSUES AND THEIR RELATIONSHIPS TO CURRENT REGULATORY REQUIREMENTS

This is to advise you that the Commission as detailed below has approved in part and disapproved in part the staff's recommendations in SECY-90-16.

I. General Issues.

A. ALWR Public Safety Goal.

The Commission (with Chairman Carr and commissioners Roberts, Curtigs and Remick agreeing) has disapproved the use of 10 per year of reactor operation as a core damage frequency for advanced designs. As noted in the SRM on SECY-89-102 (dated June 15, 1990), the Commission supports the use of 10-4 per year of reactor operation as a core damage frequency goal. Although the Commission strongly supports the use of the information and experience gained from the current generation of reactors as a basis for improving the safety performance of new designs, the NRC should not adopt industry objectives as a basis for establishing new requirements. However, if the staff in applying the criteria of 10 CFR Part 52 (and in view of the uncertainties associated with PRA'S) concludes that additional requirements are needed, based on our experiences with prior designs, in order to provide

NOTE: THIS SRM AND THE SUBJECT SECY PAPER WILL BE MADE PUBLICLY AVAILABLE 10 WORKING DAYS AFTER ISSUANCE OF THE SRM.

assurance that future designs will meet the Safety Goal Policy Statement, then the staff should provide those additional requirements to the Commission for consideration as they are identified.

Commissioner Rogers approved the staff's use of 10/5 as an expected design target for ELWR designers and endorsed a requirement that applicants be able to demonstrate that they have taken reasonable steps to reach these targets. However, he does not endorse those goals as an absolute requirement for approval of any specific design.

Consistent with the Commission's decision on SECY-89-102, the Commission approved the overall mean frequency of a large release of radioactive material to the environment from a reactor accident as less than one in one million per year of reactor operation. The Commission has not agreed on a definition of a large release and has requested a paper from the staff (See SRM from SECY-89-102).

B. Source Term.-

The Commission (with all Commissioners agreeing) has approved the staff's approach to the source term with the addition of the following element:
On an expedited basis, incorporate appropriate changes to regulations, regulatory practices, and the review process resulting from source term research.

Preventative Feature Issues.

A. ATWS.

The Commission (with all Commissioners agreeing) has approved the staff position. However, if the applicant can demonstrate that the consequences of an ATWS are acceptable the staff should accept the demonstration as an alternative to the diverse scram system.
commissioner Curtiss further believes that the staff should retain the flexibility to accept designs with non-diverse scram logic in those instances where it is demonstrated to the staff's satisfaction that the

reliability of the scram function is such that the risk from ATWS is insignificant.

B. Mid-Loop Operation.

The Commisson (with all Commissioners agreeing) has approved the staff's proposed position, with the ACRS recommendation of April 26, 1990, that four additional specific requirements be considered for mid-loop operation.

C. Station Blackout.

The Commission (with all Commissioners agreeing) has approved the staff's position that the evolutionary ALWR's have an alternate ac power source of diverse design capable of powering at least one complete set of normal shutdown loads. The staff should provide a clear definition of "diversity" so as to provide guidance on whether it means different types, different manufacturers, different models, etc. Commissioner Curtiss noted that, in his view, the clarification should focus on limiting common mode failure potential but need not go so far as to require completely different generator driver technologies (e.g. should not necessarily require both diesel and gas turbine driven generators).

D. Fire Protection.

The Commission (with all Commissioners agreeing) has approved the staff's position on fire protection as presented in SECY-90-16 and supplemented by the staff's April 27, 1990, response to the ACRS comments.

E. Interssystem LOCA.

The Commission (with all Commissioners agreeing) has approved the staff's position on intersystem LOCA provided that, as recommended by the ACRS, all elements of the low pressure system are considered (e.g. instrument lines, pump seals, heat exchanger tubes, and valve bonnets.)

III. Mitigative Feature Issues.

A. Hydrogen Generation and Control.

The Commission (with all Commissioners agreeing) has approved the staff's position that the requirements of 10 CFR 50.34(f)(2)(ix) should remain unchanged for evolutionary plants. The staff should seek additional technical information, as suggested by the ACRS, and if reconsideration is warranted the Commission should be advised.

B. Core-Concrete Interaction--Ability to Cool Core Debris.

The Commission (with all Commissioners agreeing) has approved the staff's position.

C. High Pressure Core Melt Election.

The Commission (with all Commissioners agreeing) has approved the staff's position that the ELWR designs include a depressurization system and cavity design to contain core debris. The cavity design, as a

mitigating feature, should not unduly interfere with operations including refueling, maintenance, or surveillance activities.

D. Containment Performance.

The Commission (with all Commissioners agreeing) has approved, consistent with SECY-89-102, the use of a 0.1 CCFP as a basis for establishing regulatory guidance for the ELWRs. This objective should not be imposed as a requirement in and of itself. The use of the CCFP should not discourage accident prevention and the staff should review suitable alternative, deterministically-established, containment performance objectives providing comparable mitigation capability if submitted by applicants. Any such alternatives should be submitted to the Commission following staff review.

E. ABWR Containment Vent Design.

The Commission (with all Commissioners agreeing) has approved the staff's recommended use of the containment

overpressure protection system on the ABWR, subject to the results of the comprehensive regulatory review which should fully weigh the potential "downside" risks with the mitigation benefits of the system. Staff should ensure that full capability to maintain control over the venting process is provided.

F. Equiptmentt Survivability.

The Commission (with all Commissioners agreeing) has approved the staff's position.

IV. Non-Severe Accident Issue.

A. Operating Basis Earthquake (OBE)/Safe Shutdown Earthquake (SSE) .
The Commission (with all Commissioners agreeing) has approved the staff's position.

B. Inservice Testing of Pumps and Valves.

The Commission (with all Commissioners agreeing) has approved the staff's position as supplemented in their April 27, 1990, response to the ACRS comments. The Commission notes that due consideration should be given to the practicality of designing testing capability, particularly for large pumps and valves.

The Commission also agreed that in those cases where the staff proposed requirements depart from current regulations, consideration should be given to incorporating these requirements into the regulations. (See SRM dated May 27, 1990, M90053A).

Finally, the staff is encouraged to strive to sustain the level of attention and resources that have been devoted recently to the review process for the EPRI requirements document. The recent comments of the EPRI representatives at the June 4, 1990 commission briefing suggest that such a commitment, if sustained, can be most beneficial in assisting EPRI and the NRC staff in our respective efforts to reach a common understanding on the key technical issues.

cc: Chairman Carr
Commissioner Roberts
Commissioner Rogers
Commissioner Curtiss

Commissioner Remick
OGC
ACRS
IG
ASLBP
ASLAP