Docket No. 52-001

May 31, 1994

Mr. John T. Larkins, Executive Director
Advisory Committee on Reactor Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Mr. Larkins:

SUBJECT: REVISION TO STAFF FINAL SAFETY EVALUATION REPORT (FSER) FOR THE ADVANCED BOILING WATER REACTOR (ABWR) TO DISCUSS THE CONCERN RELATED TO THE POTENTIAL FOR FUEL POOL BOILING

During the Advisory Committee on Reactor Safeguards meeting held on May 6, 1994, the staff presented the status of its evaluation of a concern related to the potential for a spent fuel pool boiling event at the Susquehanna Steam Electric Station. During the meeting, C. Michaelson requested that the staff address in its FSER how the ABWR design as described in the standard safety analysis report (SSAR) would respond to such an event and why it would have no safety significance for the evolutionary design. In response to that request, I am providing the enclosed insert which has been included in Section 9.1.3, "Spent Fuel Cooling and Cleanup System" of the FSER which is currently being processed for issuance to the Commission. The discussion concludes that the design as reflected in the SSAR precludes the loss of fuel pool cooling after a loss-of-coolant accident inside containment and is not a concern for design certification.

Sincerely,

(Original signed by)

R. W. Borchardt, Director
Standardization Project Directorate
Associate Directorate for Advanced Reactors
and License Renewal
Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc w/enclosure:
See next page

DISTRIBUTION:

Docket File	PDST R/F	DCrutchfield
PDR	WTravers	RBorchardt
JNWilson	DTang	SNinh
JMoore, 15B18	PShea	ACRS (11)
MMalloy	WDean, EDO	TBoyce

OFC	LA:PDST:ADAR	PM:PDST:ADAR	SC:PDST:ADAR	D:PDST:ADAR
NAME	PShea	CPoslusny:sg	JNWilson	RBorchardt
DATE	05/31/94	05/30/94	05/31/94	05/31/94

OFFICIAL RECORD COPY DOCUMENT NAME: ACRS.CP

020071

NRC FILE CENTER COPY

9406070275 940531
PDR ADOCK 05200001
O PDR

Mr. Joseph Quirk
GE Nuclear Energy

Docket No. 52-001

cc: Mr. Steven A. Hucik
GE Nuclear Energy
175 Curtner Avenue, Mail Code 782
San Jose, California 95125

Mr. L. Gifford, Program Manager
Regulatory Programs
GE Nuclear Energy
12300 Twinbrook Parkway
Suite 315
Rockville, Maryland 20852

Director, Criteria & Standards Division
Office of Radiation Programs
U.S. Environmental Protection Agency
401 [illegible] Street, S.W.
Wash[illegible], D.C. 20460

Mr. Sterling Franks
U.S. Department of Energy
NE-42
Washington, D.C. 20585

Marcus A. Rowden, Esq.
Fri[illegible] Frank, Harris, Shriver & Jacobson
100[illegible]nsylvania Avenue, N.W.
Suite 800
Washington, D.C. 20004

Jay M. Gutierrez, Esq.
Newman & Holtzinger, P.C.
1615 L Street, N.W.
Suite 1000
Washington, D.C. 20036

Mr. Steve Goldberg
Budget Examiner
725 17th Street, N.W.
Room 8002
Washington, D.C. 20503

Mr. Frank A. Ross
U.S. Department of Energy, NE-42
Office of LWR Safety and Technology
19901 Germantown Road
Germantown, Maryland 20874

Mr. Raymond Ng
1776 Eye Street, N.W.
Suite 300
Washington, D.C. 20086

Mr. Victor G. Snell, Director
Safety and Licensing
AECL Technologies
9210 Corporate Boulevard
Suite 410
Rockville, Maryland 20850

Mr. Joseph R. Egan
Shaw, Pittman, Potts, & Trowbridge
2300 N Street, N.W.
Washington, D.C. 20037-1138

INSERT D -

The staff identified concerns relating to the ability to cool the spent fuel if an accident occurs which renders the FPC inoperable, including a LOCA inside secondary containment. Specifically, it was postulated that if a LOCA occurred in secondary containment, the resulting environmental conditions would render the pool cooling equipment inoperable and at the same time prevent implementation of recovery actions. Should this occur, water in the spent fuel pool would boil, resulting in excessive condensation leading to flooded conditions. In addition, boiling conditions could render the Standby Gas Treatment System (SGTS) inoperable, so that any radioactive material resulting from failed fuel in the pool (due to lack of pool cooling) could be released to the environment without first being processed by the SGTS.

Subsequently, GE clarified that the ABWR design can continue spent fuel pool cooling during an accident, including a LOCA inside secondary containment, for the following reasons:

1. Safety-related equipment located inside secondary equipment is environmentally qualifed to remain functional given a pipe failure in the Reactor Water Cleanup System (CUW) inside secondary containment. Therefore, this equipment would remain available to perform its safety function

2. Pool boiling is unlikely since RHR is available to provide supplemental cooling capability before boiling conditions are reached. Two of the three RHR divisions are available to provide cooling water to the spent fuel pool from the suppression pool. Either division is sufficient to cool the pool given the worst-case heat load in the pool. Therefore, given a single failure of an RHR division, one remaining division can

Enclosure

provide pool cooling while the other provides cooling for the reactor

3. In the unlikely event that pool boiling were to occur, the resulting conditions are bounded by the worst-case environmental conditions postulated in the CUW line break discussed earlier. In addition, sufficient time is available to implement manual recovery actions (manipulation of manual valves, etc.) inside the containment well before boiling conditions develop.

4. Each division of safety-related equipment inside secondary equipment is physically and electrically separated to prevent flood conditions from affecting more than one division of safety-related equipment.

5. Although the Fuel Pool Cooling and Cleanup System (FPC) is not safety-related, alternate means of power to the system is available through the Combustion Turbine Generator (CTG), the alternate AC (AAC) power source for the ABWR design. Should a LOPP or SBO occur, the CTG can be used to provide power to the system.

Based on this information, the staff concludes that the ABWR design prevents the loss of fuel pool cooling capability as a result of a LOCA inside containment.