BALTIMORE
GAS AND
ELECTRIC

CHARLES CENTER · P. O. BOX 1475 · BALTIMORE, MARYLAND 21203

GEORGE C. CREEL
VICE PRESIDENT
NUCLEAR ENERGY
(301) 260-4455

February 2, 1990

U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit No. 1; Docket No. 50-317
Request For Additional Information - HPSI Pump Operability In MODE 3
(Tac No. 75562)

REFERENCES: (a) Letter from G. C. Creel (BG&E) to Document Control Desk (NRC), dated January 23, 1990, same subject

Gentlemen:

The following information is provided to clarify the response to Question 2, provided in Reference (a).

The procedures used to respond to abnormal or emergency conditions are symptom based procedures. The procedures address the symptoms of an event and do not follow a time line. Because of the many variables in defining a SBLOCA, the time between initiation and identification varies with each scenario. The minimum time available for operator action (18 minutes) assumes a large pipe break. This is the minimum time for all scenarios because it assumes an instantaneous blowdown of the entire reactor coolant inventory and an instantaneous refill of the vessel up to the break location, using the Safety Injection Tanks (SITs). For smaller pipe breaks, the blowdown and refill time is longer. For a SBLOCA, a review of the FSAR small break analyses from full power show at least 300,000 lbm of primary coolant are discharged through the assumed break point before the break location is uncovered. The retained water in the RCS provides the same margin as found in the LOCA analysis described in the December 20, 1989 letter. The RCS is then in approximately the same condition as that assumed as the t=0 condition (blowdown and refill complete) for the LOCA evaluation. To determine how long it would take for the RCS to blow down following a SBLOCA, extensive computer modelling would be required due to the complexities of two-phase flow in the RCS. A simplistic blowdown time was estimated assuming a constant system pressure of 2250 psia and a blowdown mass of 300,000 lbm and is tabulated below. Of course, when in the LTOP condition, the system pressure will be less than the PORV setpoint of 384 psi. Therefore, the actual times would be much

A001
1/1

longer than the operator action time calculated below.

Break Size	Approximate Operator Action Time (LOCA response time plus 300,000 lbm blowdown time)
1.0 sq.ft.	18 + 1 = 19 min
0.5 sq.ft.	18 + 2 = 20 min
0.1 sq.ft.	18 + 6 = 24 min

This information also demonstrates that the operator would have positive indication of a LOCA in progress in that over 300,000 lbm of reactor coolant would be released to the containment. This would be detected by a number of means, including containment pressure, sump level or containment temperature. Following the loss of this coolant inventory, the operator would have at least 18 minutes to respond. In all cases, there is enough time for the operator to identify and appropriately respond to plant conditions. The procedures provide the operator with specific instructions which ensure that the existing LOCA analyses are not exceeded, regardless of break size.

At the request of the NRC Project Manager, additional information is also provided to supplement our response to Question 1 from Reference (a). The staff has stated its position that 120% of fission product decay heat must be assumed in the LOCA analysis. The Project Manager requested an explanation for our use of the 110% value in our December 20, 1989 license amendment request. Our original calculation of operator action time assumed 110% of fission product decay heat based on information contained in the NRC-approved Combustion Engineering Topical Report CENPD-254, Post-LOCA Long Term Cooling Evaluation Model (section attached). The Topical Report references Branch Technical Position ASB 9-2 (attached) which gives guidance on the appropriate uncertainties to use when calculating fission product decay heat. For $t_s < 10^3$ seconds, 20% uncertainty is applied; for $10^3 < t_s < 10^7$ seconds, 10% uncertainty is applied, where t_s is defined as the time after reactor shutdown, in seconds. Because of technical specification limits on cooldown rates, it is not possible to cool the RCS to 330°F (temperature where LTOP is enabled) in less than 1000 seconds from the time the reactor is shut down. Therefore, we used an uncertainty of 10% in determining the fission product decay heat.

The information provided here and in Reference (a) has no impact on the significant hazards determination presented in the December 20 1989 submittal. The change in the minimum operator action time from 20 minutes to 18 minutes is negligible in light of the fact that both of these times well exceed the minimum 10 minutes that must be allowed for operator response. The remaining information summarizes the symptom based nature of operator actions following a LOCA and provides assurance that the operator response time is adequate for the full range of pipe break sizes.

In our December 20, 1989 submittal, we indicated that a license amendment would be needed to support entering MODE 3 on February 8. Due to the change in the outage schedule, we do not anticipate entering MODE 3 until February 28, 1990. Therefore, our request date for this amendment has changed accordingly.

Should you have any further questions regarding this matter, we will be pleased to discuss them with you.

Very truly yours,

GCC/PSF/db

Attachment

cc: D. A. Brune, Esquire
J. E. Silberg, Esquire
R. A. Capra, NRC
D. G. McDonald, Jr., NRC
W. T. Russell, NRC
J. E. Beall, NRC
T. Magette, DNR