BALTIMORE GAS AND ELECTRIC

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

ELECTRIC ENGINEERING
DEPARTMENT

April 14, 1983

Director of Nuclear Reactor Regulation
Attention: Mr. R. A. Clark, Chief
Operating Reactors Branch #3
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Calvert Cliffs Nuclear Power Plant
Units Nos. 1 & 2; Dockets Nos. 50-317 and 50-318
Updated Final Safety Analysis Report

Reference: (a) Letter from A. E. Lundvall, Jr. to R. A. Clark dated March 31, 1983.

Gentlemen:

Reference (a) forwarded Revision 1 to the Calvert Cliffs Updated Final Safety Analysis Report. In the course of reproduction, page 14.1-8, figure 14.13-6 and figure 14.13-7 were inadvertently omitted from certain copies. If necesary, please insert the enclosed replacement pages into your copy(s) of the Updated Final Safety Analysis Report at this time.

Very truly yours,

R. F. Fabrizio

R. F. Fabrizio
Senior Engineering Technician
Nuclear Licensing & Analysis Unit

cc: NRC (12 copies)
J. C. Ventura (Bechtel, 2 copies)
R. R. Mills (CE)
Prince Frederick Library
MPR Associates
M. E. Strand (NUS corp.)
Shaw, Pittman, Potts & Trowbridge
E. S. Long (Dames & Moore)
T. Magette
Dr. F. J. Munno
C. Johnson (NRC)
Dr. M. L. Roush
J. C. Braun (CE)
N. S. DeMuth (Los Alamos Nat. Lab.)
N. G. Chapman (Bechtel)
Dr. N. L. Shapiro (CE)
R. Staker
C. M. Rice
Academy of Natural Science
Dr. T. J. Burns (ORNL)

A001

code calculates the plant response for non-LOCA (Loss of Coolant Accident) initiating events for a wide range of operating conditions.

The primary system components considered in the code include the reactor vessel, the reactor core, the primary coolant loops, the pressurizer, the steam generators, and the reactor coolant pumps. The secondary system components include the secondary side of the steam generators, the steam system, the feedwater system, and the various steam control valves. In addition, the program models those plant control and protection systems needed to perform the safety analysis.

Special features incorporated into CESEC for analyzing asymmetric temperature distribution events such as a SLB are described in Reference 2.

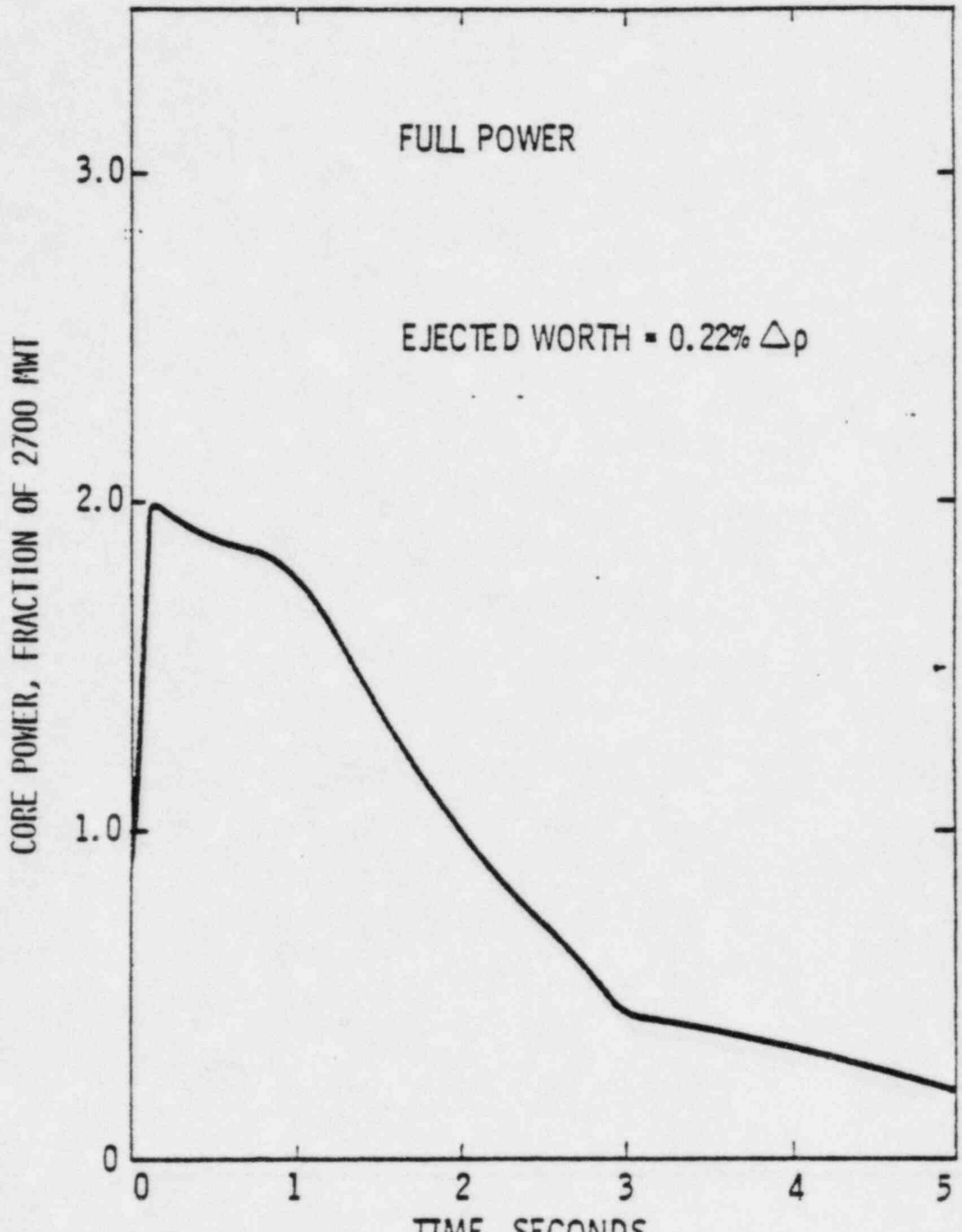
2. FIESTA

FIESTA is a one-dimensional two-group space-time computer code. The use of space-time reactivities reduces the margin requirements for transients sensitive to scram reactivity characteristics compared to the use of static reactivities which do not account for delayed neutron effects. The FIESTA code is used for these calculations instead of the HERMITE code previously approved by NRC mainly for two reasons: (1) FIESTA calculations are more rapid than HERMITE ones, and (2) FIESTA produces kinetics parameters which are readily used for point kinetics calculations.

The FIESTA code has been verified with HERMITE and with comparisons of standard benchmark problems. Although the code has been written to incorporate feedback on fuel temperature and moderator density, such feedbacks are not needed for scram reactivity calculations.

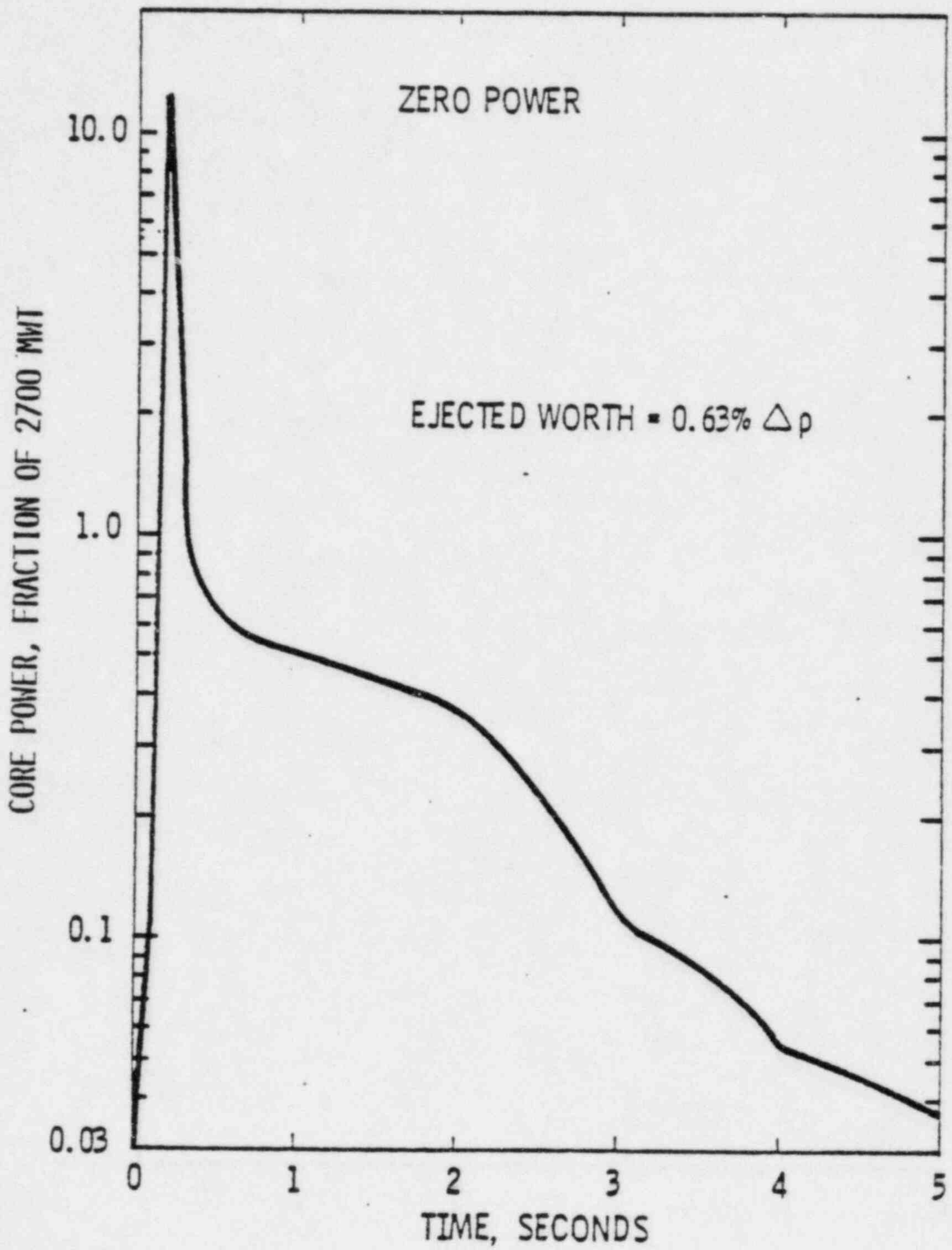
It is standard practice in the nuclear industry to calculate the time dependent reactivity insertion by calculating the critical eigenvalue as a function of rod position. This type of calculation assumes that the neutron flux shape during a scram rod insertion is equal to the critical flux shape at each rod position. Such an assumption is conservative since the critical (or static) flux shape tends to shift away from the rods more than space-time calculation would predict, and hence result in smaller reactivity insertion. The primary reason for the difference in the flux shape is that the delayed neutron precursors are distributed according to the initial neutron flux shape, and as the neutron population decreases the importance of the precursors increases. The neutron precursors provide a source of neutrons which tends to tilt the neutron flux shape toward the rods compared to static methods, and hence leads to greater reactivity insertion at intermediate rod positions.

This effect tends to become large at the end of a reactor cycle when the power shape tends to be axially flat. At certain intermediate rod positions, for example, the reactivity change predicted by static methods



REV. 1

BALTIMORE GAS & ELECTRIC CO. Calvert Cliffs Nuclear Power Plant	CEA EJECTION EVENT CORE POWER VS TIME	Figure 14.13-6



REV. 1

BALTIMORE GAS & ELECTRIC CO. Calvert Cliffs Nuclear Power Plant	CEA EJECTION EVENT CORE POWER VS TIME	Figure 14.13-7