DUKE POWER COMPANY
P.O. BOX 33189
CHARLOTTE, N.C. 28242

HAL B. TUCKER
VICE PRESIDENT
NUCLEAR PRODUCTION

TELEPHONE
(704) 373-4531

November 29, 1983

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Ms. E. G. Adensam, Chief
Licensing Branch No. 4

Re: McGuire Nuclear Station
Docket Nos. 50-369 and 50-370

Dear Mr. Denton:

This letter describes the results of three startup tests performed at McGuire Units 1 and 2 for which the test results showed minor discrepancies from the acceptance criteria established in the FSAR, Chapter 14. Attachment 1 discusses the Unit 1 Radiation Shielding Survey. Attachment 2 discusses the Unit Loss of Electrical Load Test performed for Unit 1. The Unit 2 Reactor Coolant System Flow Coastdown Test is discussed in Attachment 3.

The attachments describe the discrepancies for each test and the appropriate corrective actions to be taken. Each of the test discrepancies are considered to be minor and to have no significant effect on plant safety. In each case, the actions taken are appropriate and no additional testing is warranted. Appropriate changes will be made to the FSAR in accordance with the provisions of 10 CFR 50.59. With the completion of the Radiation Shielding Survey and the Unit Loss of Electrical Load Test, the McGuire Unit 1 Startup Test Program is completed.

Please advise, if there are any questions regarding these matters.

Very truly yours,

Hal B. Tucker

Hal B. Tucker

REH:jfw
Attachments

cc: Mr. James P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30303

Mr. W. T. Orders
NRC Resident Inspector
McGuire Nuclear Station

LTR. ENCL

ADD. REG. FILES
A. UNGARO - PSB
N. LAUBAN - RSB
R. SERBU - RAB
BRENT CHAPMAN PSLB

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Attachment 1

McGuire Nuclear Station - Unit 1
Radiation Shielding Survey

For the purpose of radiation shielding design, the McGuire Station is subdivided into radiation zones depending upon the anticipated frequency and duration of occupancy. (See FSAR Chapter 12.) The radiation shielding survey (described in FSAR Table 14.1.4-1, page 22 of 35) is intended to verify shielding effectiveness. During the radiation shielding survey for McGuire Unit 1 at 100% power level, measured radiation levels in several areas of the Auxiliary Building exceeded the design radiation levels as described in FSAR Chapter 12. This does not result in a safety concern due to the infrequent occupancy and control of personnel access to these areas. Changes to the FSAR radiation zone designations are described in the following paragraphs. Although the radiation shielding survey for Unit 2 is not complete, the changes include the corresponding Unit 2 areas since the radiation levels are expected to be similar.

Portions of Auxiliary Building Elevation 695' including the Containment Spray pump rooms, the corridor, and the sump area are shown as Zone IV on FSAR Figure 12.1.1-1. Since radiation levels were found to exceed 15 mrem/hr., these areas should be considered Zone VI. Locked doors will be installed on the entrances to the pump rooms which were found to be high radiation areas per 10 CFR 20. Access to these areas is not expected to be more frequent than access to the Residual Heat Removal pump rooms which are already considered Zone VI. The corridor and sump area have radiation levels between 15 and 100 mrem/hr. These areas can only be accessed via the spiral stairs from Elevation 716, and access is expected to be infrequent.

Valve galleries on Elevation 733 between columns KK-54 and MM-54 and between columns KK-60 and MM-60 are shown as Zone IV on FSAR Figure 12.1.1-3. The radiation levels in these areas was between 2.5 mrem/hr. and 15 mrem/hr. Thus, the valve galleries should be considered Zone V. Access to these areas is expected to be infrequent and of short duration.

FSAR Subsection 12.1.1 states that access to Zone VI areas (> 15 mrem/hr.) is physically restricted. Actually, locked doors are provided only for areas greater than 100 mrem/hr. This is acceptable because 10 CFR 20 and McGuire Technical Specifications do not require areas less than 100 mrem/hr. to be locked. Also, access to these areas is controlled by the Health Physics organization in accordance with applicable regulations and station procedures. This change will be noted in the McGuire FSAR update.

Attachment 2

McGuire Nuclear Station - Unit 1
Unit Loss of Electrical Load Test (at 100% Rated Power)

The purpose of this test and an explanation of the test method can be found in the McGuire Unit 1 Startup Report February 15, 1983 Addendum. This test was run on August 12, 1983. With the unit operating at 100% reactor power and all systems in automatic, both generator breakers were simultaneously opened. About .8 second later, the reactor tripped on Steam Generator 'A' low-low level. Steam generator narrow range levels dropped almost instantly from about 66% to 56% level. The steam generator low level reactor trip setpoint is 57% at 100% power. A turbine trip followed .2 second after the reactor trip. The drop in steam generator levels was primarily due to the collapse of voids in the steam generator due to increased steam pressure on closing of the turbine control valves. The steam generator levels did recover above the trip point after the initial steam pressure transient.

During this test, no pressurizer power operated relief valves (PORVs) or safety valves lifted. The steam generator atmospheric dump valves did not lift since they are blocked on a reactor trip. The transient was controlled by the steam generator PORVs on A, B and D steam generators, the condenser steam dump valves and the safety valves on A, C and D steam generators. All acceptance criteria listed in FSAR Chapter 14 for this test were met except for the steam generator safety valves which lifted on Steam Generators A, C and D. No plant safety limits were exceeded and no safety injection occurred.

Duke Power Company has considered alternatives to meet the acceptance criteria for this test. First, the plant could be modified by changing the setpoint on the low steam generator level reactor trip or by changing the control system response. The test could then be rerun in an attempt to meet the existing acceptance criterion that the steam generator safety valves not lift. The second and preferred alternative could be to change the acceptance criterion such that lifting of safety valves would not preclude successful completion of the test.

The first alternative has the benefit that the steam generator safety valves would not be challenged during a loss of electrical load test. There are several disadvantages that must also be considered with this alternative:

1) Changing the steam generator low-low level reactor trip setpoint would require reanalysis of accident scenarios which utilize this parameter as a protective function.

2) Secondary changes to other parameters/setpoints may be required as a result of the aforementioned setpoint change; this would broaden the reanalysis scope.

3) Several retests could be necessary to demonstrate that the changes produced the desired result and that other tests performed previously were not invalidated by the changes. This would involve transients on the unit which should be minimized to avoid unusual and unnecessary wear on equipment. Significant manpower and costs would also be involved.

Duke Power believes that the capability to withstand a loss of electrical load from 100% power without challenging the steam generator safety valves does not provide a significant benefit to public health and safety and does not justify the substantial changes described previously. The capability to withstand such a transient without any adverse consequences was demonstrated including no challenge to the pressurizer power operated relief and safety valves. Therefore, Duke Power proposes that the test be considered complete without requiring additional testing on Unit 1. Similar test results are expected on Unit 2; therefore, the same approach should be applied for Unit 2.

Attachment 3

McGuire Nuclear Station - Unit 2
Reactor Coolant System Flow Coastdown Test

One of the purposes of this test (described in FSAR Table 14.1.4-1, page 12 of 35) was to measure the rate at which reactor coolant flow rate decreases, subsequent to reactor coolant pump trips, from various flow configurations. The measurements are then compared to the analysis assumptions shown in the FSAR, Chapter 15 to ensure that the flow decrease for the first ten seconds of each transient is slower than assumed. Three of the transients tested for McGuire Unit 2 did not meet this acceptance criterion; however, subsequent reanalysis of the most limiting flow coastdown transient using as-measured data confirmed that the test results are acceptable. Other acceptance criteria were met without reanalysis. This situation was previously encountered on McGuire Unit 1 and was discussed with NRR representatives and subsequently documented in the McGuire Unit 1 Startup Report.

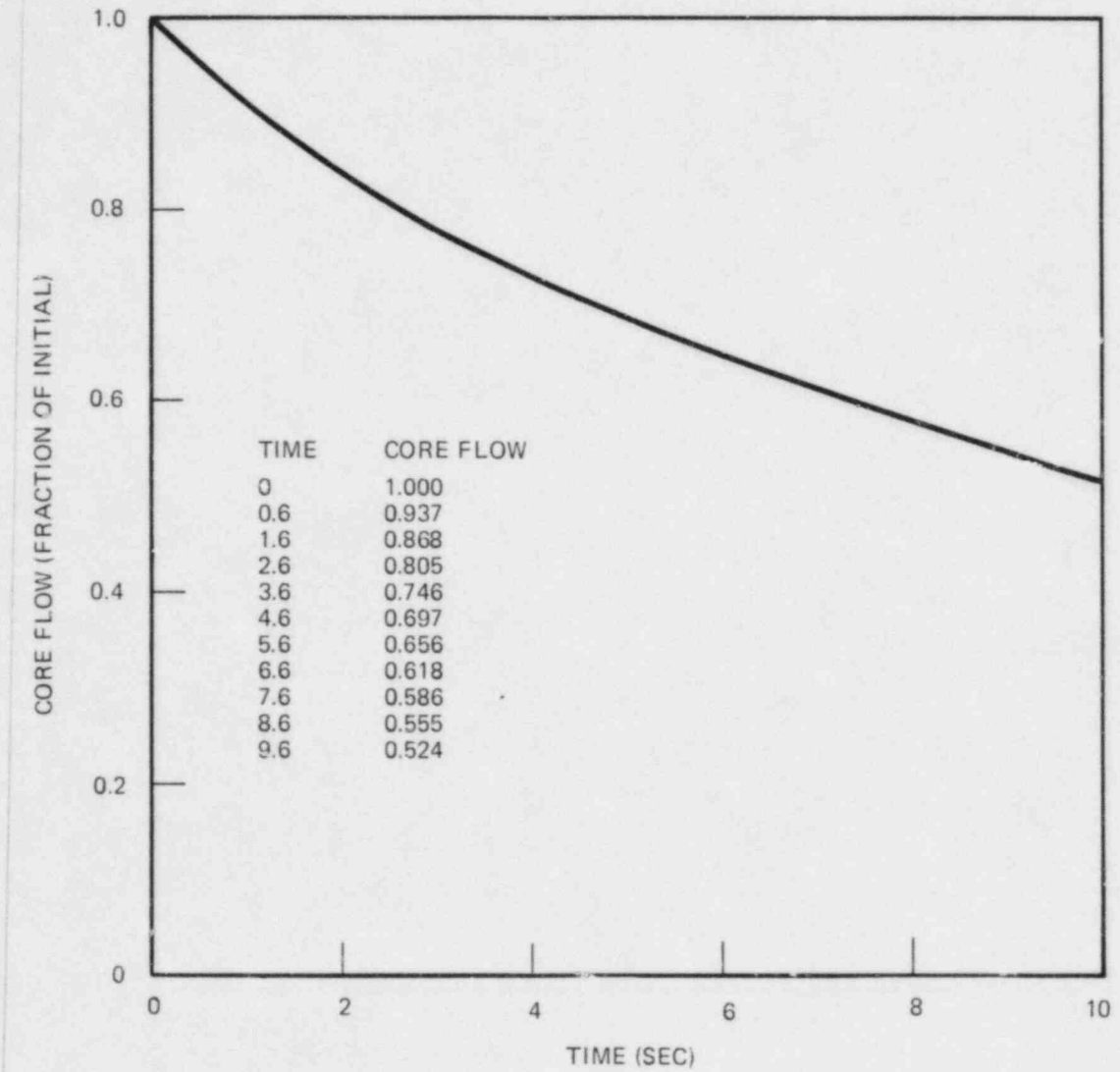
The following loss-of-flow transients were performed:

(a) 4/4 Coastdown - 4 pumps running and all 4 pumps trip
(b) 1/4 Coastdown - 4 pumps running and 1 pump trips
(c) 3/3 Coastdown - 3 pumps running and 3 pumps trip
(d) 1/3 Coastdown - 3 pumps running and 1 pump trips

The actual flow coastdowns for the 4/4, 1/4, and 3/3 cases were non-conservative compared with the flow coastdown curves in the FSAR Chapter 15 analyses. A reanalysis was performed for the 4/4 coas down, the most limiting transient, using the actual flow coastdown curve shown in Figure 1 (attached). The results of the reanalysis are shown in Figures 2 and 3 (attached). Note that the design DNBR limit of 1.30 is met in all cases.

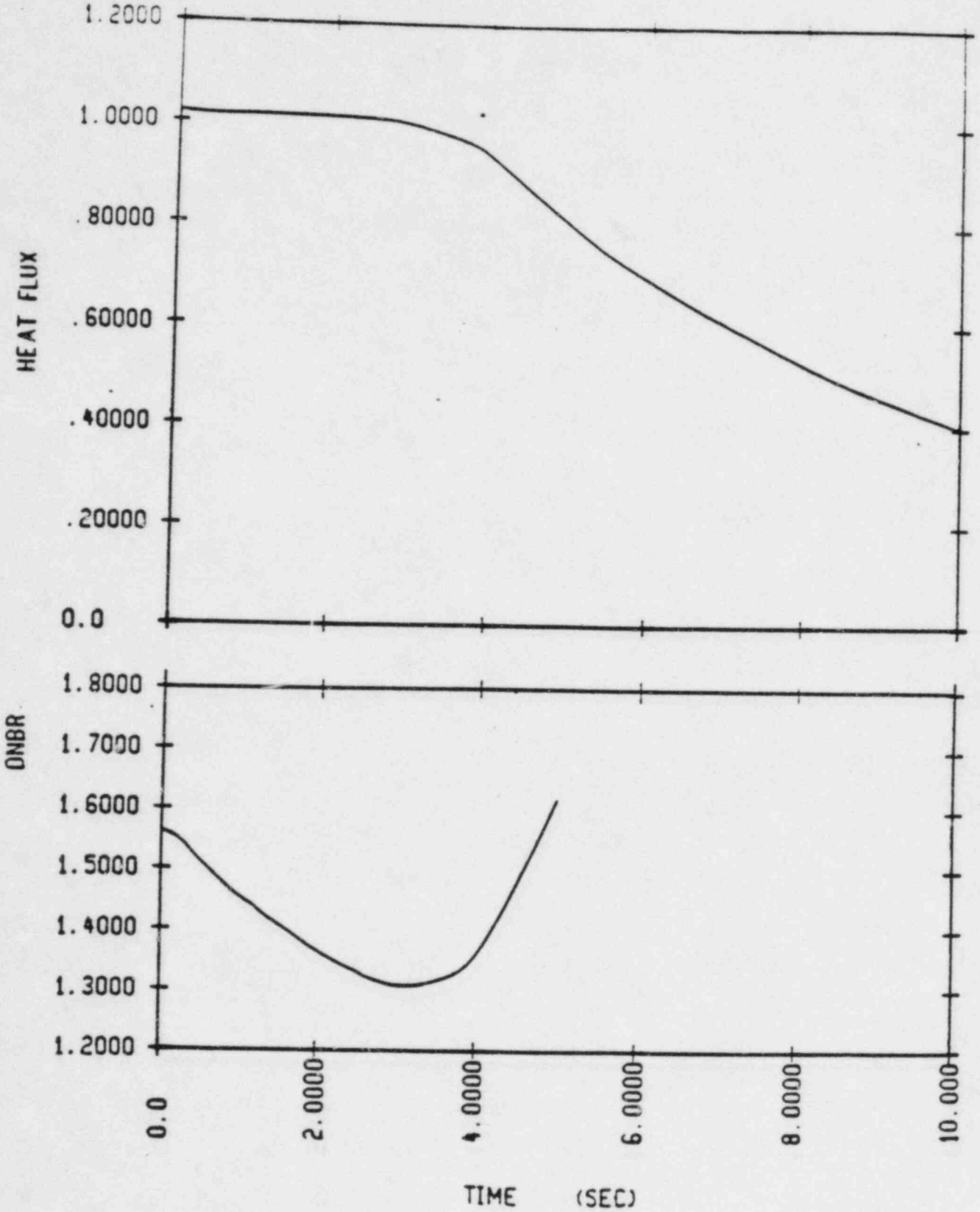
Based upon the reanalysis results, it is concluded that the test results are acceptable. No design changes are required and no additional testing is necessary.

Figure 1



McGuire Unit 2
Flow Coastdown Data

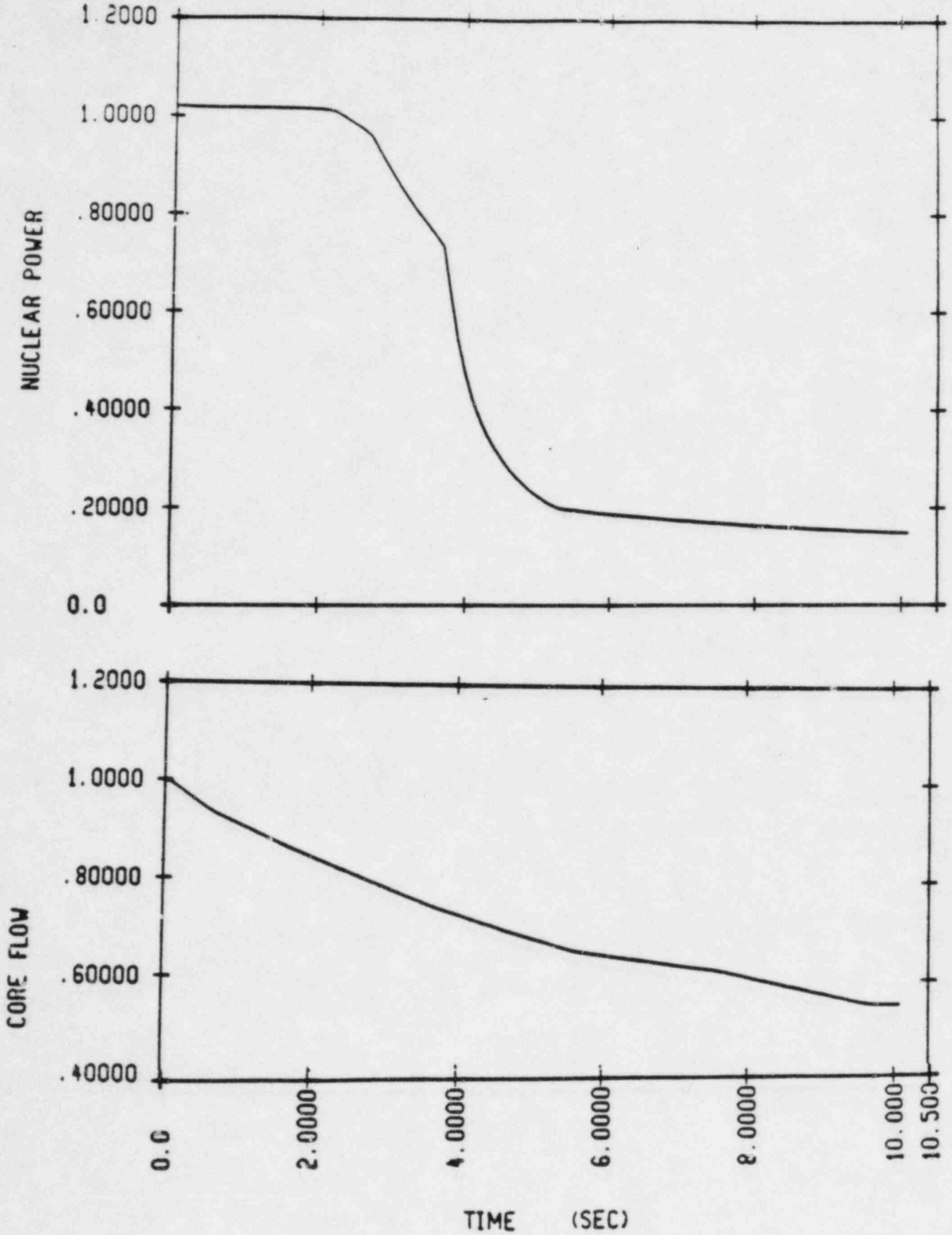
Figure 2



MCGUIRE UNIT 2

COMPLETE LOSS OF FLOW ANALYSES USING PLANT MEASURED COASTDOWN

Figure 3



MCGUIRE UNIT 2

COMPLETE LOSS OF FLOW ANALYSIS USING PLANT MEASURED COASTDOWN