Commonwealth Edison
One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

Central Files

July 18, 1980

Mr. James G. Keppler, Director
Directorate of Inspection and
Enforcement - Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

Subject: Dresden Station Units 2 and 3
Quad Cities Station Units 1 and 2
Additional Response to IE
Bulletin 80-17
NRC Docket Nos. 50-237/249 and
50-254/265

References (a): J. G. Keppler letter to C. Reed dated July 3, 1980

(b): R. F. Janecek letter to J. G. Keppler dated July 14, 1980

(c): D. L. Peoples letter to J. G. Keppler dated July 11, 1980

Dear Mr. Keppler:

This letter is to provide an additional response for Dresden Units 2 and 3 and Quad Cities 1 and 2 to IE Bulletin 80-17, transmitted by Reference (a).

Reference (b) provided our original response to Item 7 of the bulletin. In accordance with discussions with members of your Staff and the Office of Nuclear Reactor Regulation, Attachment 1 to this letter contains an analysis for Dresden 2/3 and Quad Cities 1/2 of an MSIV closure event with full ATWS. Note that this analysis is conservative in that the effects of the Isolation Condensers, RCIC, and HPCI systems have not been included.

Attachment 2 to this letter provides the results of tests required by Items 2 and 3 of the bulletin for Quad Cities Unit 2. The results of tests on Quad Cities Unit 1 which are referred to in Attachment 2 were reported in Reference (c).

JUL 28 1980

8008060 115

Please address any questions concerning this matter to this office.

Very truly yours,

Robert F. Janecek

Robert F. Janecek
Nuclear Licensing Administrator
Boiling Water Reactors

cc: Director, Division of
Reactor Operations Inspection

SUBSCRIBED and SWORN to
before me this 18TH, day
of July, 1980

Notary Public

5364A

Attachment 1

ADDITIONAL INFORMATION

ATWS WITHOUT RPT
FOR
DRESDEN UNITS 2 AND 3
QUAD CITIES 1 AND 2

Introduction

The purpose of this document is to provide additional information in the event of anticipated transients without scram (ATWS) and no recirculation pump trip (RPT). The evaluation presented herein considers the very conservative case of MSIV closure with complete failure to scram. The purpose of this analysis is to determine the reactor power level at which the peak vessel pressure reaches the assumed Service Level C limit of 1500 psig. No credit is taken for operator action to mitigate the severity of the event.

Discussion

MSIV Closure - No Scram

The MSIV closure with a postulated failure to scram provides the most severe pressure increase. The sequence of events begins with the closure of the MSIV's in 4 seconds. With closure of the MSIV's, the pressure immediately begins to rise, resulting in void collapse and a rapid increase in power.

The initial operating conditions and the assumptions used in the analysis are given in Table 1. Normal reload licensing basis values were employed to perform the analysis except for the void coefficient. The most conservative nominal 3D dynamic void coefficient throughout the remainder of the cycle was used to provide a conservative result.

The analysis was performed at selected power levels so that the power which results in 1500 psig could be determined.

For the typical case study at 80% power, the setpoint pressure of the relief valves is reached in 5.27 seconds and they open to arrest the pressure rise. Pressure continues to rise until 48 seconds into the event when it peaks and begins to decrease. The maximum pressure at the vessel bottom is 1466 psig. The time response of the transient is shown in Figure 1.

The results of the analyses are presented in Table 2. Figure 2 provides a plot of peak vessel pressure versus initial power level.

As shown in Figure 2, the peak vessel pressure will be within the assumed Service Level C limit of 1500 psig for all power levels up to 81.5% of rated power.

TABLE 1
Transient Input Parameters

Power Level (mwt)	2527
Rated Core Flow (10^6 lb/hr)	98.0
Rated Steam Flow (10^6 lb/hr)	9.77
Steam Dome Pressure (psig)	1005
Turbine Bypass Capacity (% rated steam flow)	40
Number of Relief Valves	5
Setpoints (psig)	1125
Capacity (% rated steam flow at setpoint)	27.8
Number of Safety Valves	8
Setpoint (psig)	1253
Capacity (% rated steam flow at setpoint)	50
Number of Safety/Relief Valves	N/A
Setpoint (psig)	
Capacity (% rated steam flow at setpoint)	
Void Fraction (%)	34.5
Void Coefficient (-¢/% Rg)	7.4
Doppler Coefficient (-¢/°F)	0.31

TABLE 2
MSIV Closure Without Scram Results

Power %	Peak Steamline Pressure Psig	Peak Vessel Pressure Psig
84	1520	1562
80	1425	1466
70	1301	1341

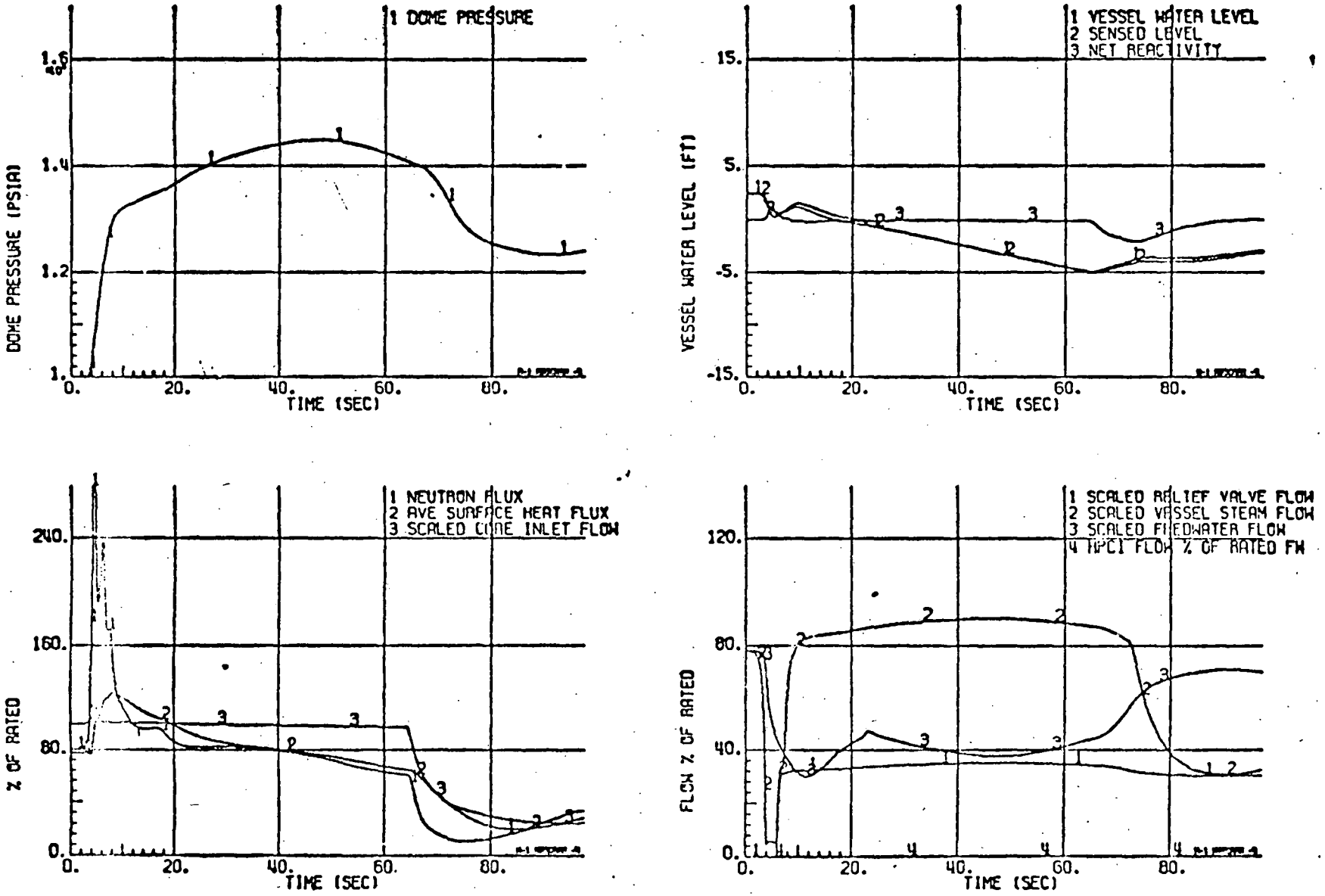

Figure 1 Time Response of MSIV Closure Event, No Scram, 80%PWR/100%FLOW

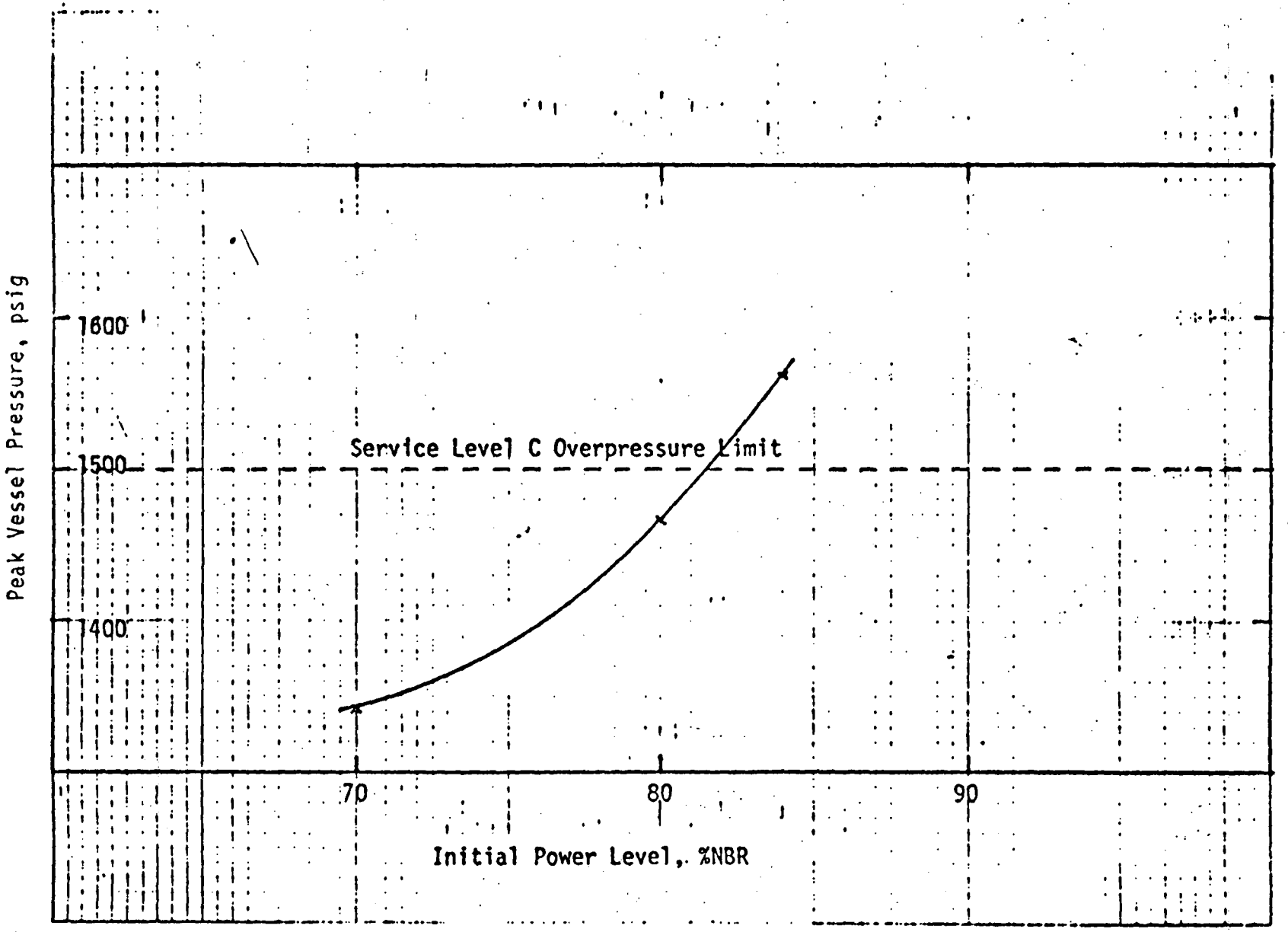

Figure 2 Peak Vessel Pressure Versus Initial Reactor Power Level

Attachment 2

QUAD-CITIES STATION RESPONSE

NRC IE BULLETIN 80-17

Item 2. Using Temporary Procedure 1358, previously written and used during Quad-Cities Unit One testing, data were collected as required on Unit Two. On July 13, 1980, a manual scram at 250 MWt and an automatic scram at 101 MWt were performed to collect data. The automatic scram was done (as on Unit One) by down-ranging the IRMs, and thereby receiving a scram from IRM upscale.

a. Thirty control rod scram insertion times were obtained utilizing a multi-pen recorder. From this information, an all-rod insert time can be estimated from the slowest of these rods.

TIMES: 3.33 sec Manual Scram
3.37 sec Automatic Scram

The identical rod was the slowest during both scrams. The times listed above are comparable to those found during Hot Scram Timing Surveillance. Computer scans of control rod positions also verified all rods were inserted past the 06 position. A visual check was also done to verify all-rods had inserted.

b. Voltage was measured across the scram solenoids while the scram signal was present. The voltages for all four groups of both channels were found to be zero. Also, the group lights on the 902-5 panel went out, which is a positive indication of loss of voltage.

c. An operator was stationed at the backup scram valves during both tests. The valves operated correctly and air was vented as designed.

d,h. The filling and venting of the instrument volume was monitored by attaching a multi-pen recorder to detect the magnetrol level switch contact actuation. The following chronology for the manual and automatic scrams is provided to indicate the events as they occurred:

MANUAL		AUTOMATIC
t = 0 sec	Reactor Scram	t = 0 sec
32 sec	SDV not drained alarm	35 sec
43 sec	SDV High Level Rod Block	47 sec
34 sec	SDV High Level Scram	37 sec
100 sec	Reset scram in Control Room	90 sec
2 min 34 sec	SDV drain opened	3 min 39 sec
2 min 58 sec	SDV not drained alarm reset	3 min 53 sec
2 min 59 sec	SDV High Level Rod Block Reset	4 min 11 sec

MANUAL		AUTOMATIC
3 min 08 sec	SDV High Level Scram Cleared	4 min 01 sec
5 min 11 sec	SDV not drained alarm came up	5 min 36 sec
5 min 49 sec	SDV High Level Scram came up	6 min 22 sec
10 min 56 sec	SDV High Level Scram Cleared	13 min 41 sec
11 min 04 sec	SDV not drained alarm reset	13 min 49 sec
15 min 04 sec	All alarms cleared	16 min 58 sec

The above data appear very similar to the data gathered during the Unit One tests. A discussion of the inconsistency of the data provided in the response to the Unit One testing (ref. letter NJK-80-238). A slow-fill test was not performed on Unit Two.

e,f. Stroke times of the vent and drain valves were obtained between the two scram tests. These times were as follows:

	OPENING	CLOSING	SCRAM CLOSING TIME
2-302-22	Less than 1 sec	2.1 sec	6.4 sec
2-302-21A	Less than 1 sec	3.5 sec	6.5 sec
2-302-21B	Less than 1 sec	3.7 sec	4.8 sec

g. A water sample was taken and analyzed for total suspended solids.

MANUAL SCRAM	10 ppm
AUTOMATIC SCRAM	Less than 1 ppm

i. As during the Unit One test, the instrument volume did not cool sufficiently between the two scrams to enable use of the procedure to check for water in the scram discharge volume. During the unit startup, the test was successfully performed.

j. A scram was not required to determine the scram reset delay times. An identical procedure was used as previously outlined in the Unit One response.

Channel A Groups 1 & 4 - - - - 16 sec
Channel A Groups 2 & 3 - - - - 16.5 sec
Channel B Groups 1 & 4 - - - - 15 sec
Channel B Groups 2 & 3 - - - - 15 sec

k. All data acquired have been reviewed, and are deemed acceptable. This data are also comparable to that acquired on July 6, 1980 for Unit One.

Item 3. At the conclusion of each of the two scrams, the vent valves were observed to open. This verification was done after the scram was cleared, the water sample taken, and the instrument volume draining was done. The scram discharge volumes were verified to be drained during the Unit Two startup.