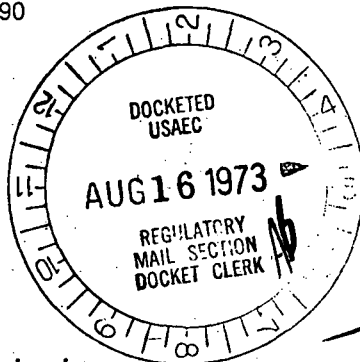



**Commonwealth Edison**

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

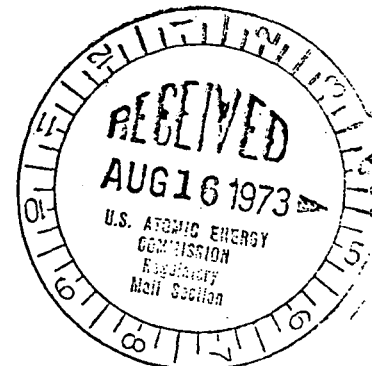


Dresden Nuclear Power Station  
 R. R. #1  
 Morris, IL 60450

August 13, 1973

50-237

50-249



WFO Ltr. #576-73

A. Giambusso  
 U.S. Atomic Energy Commission  
 Division of Compliance  
 799 Roosevelt Road  
 Glen Ellyn, IL 60137

**SUBJECT: One Percent Shutdown Margin Verification for Dresden Nuclear Power Station Units 2 and 3**

Dear Mr. Giambusso:

The special shutdown margin tests requested by Mr. D. Ziemann's letter of August 6, 1973, to Mr. J. Abel were performed on August 4, August 5 and August 6, 1973. These tests verified that the Dresden reactors are subcritical with a margin of at least 1%  $\Delta K$  with any control rod fully withdrawn and all other rods fully inserted.

The shutdown margin verification tests were performed following sufficient down time for the cores to be essentially xenon free. Every control cell was tested. A diagonally adjacent rod was withdrawn to a position calculated to have an incremental worth of 1%  $\Delta K$  with the test cell's control rod fully withdrawn. This position was calculated to be 24 for both units, with the exception of the control rods indicated in Figure 1, in which cases the position was calculated to be 48 for Unit 3. The test cell's control rod was then fully withdrawn (position 48), and the reactor was verified subcritical by observing the count rates of the incore source range nuclear instrumentation.

The blade to drive coupling integrity of each control rod was also verified by attempting to withdraw the rod past position 48 for 15 seconds and simultaneously observing no overtravel alarm.

In addition, local critical checks were conducted on Units 2 and 3. Two local critical checks were performed on Unit 2 to monitor reactivity changes and to provide a base point for further comparisons. These local critical checks are illustrated in Figure 2.

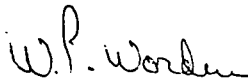
Initially, four symmetric local critical checks, one in each quadrant, were conducted on Unit 3 to provide a base point for comparison at a later date and to attempt to determine whether any of the Unit 3 control rods indicated anomalous behavior. These criticals revealed a 38 notch difference between the NE quadrant, which contains 10 of the 22 control rods manufactured in Wilmington, and the other three quadrants. Calculations by G.E. and evaluation by CECO have indicated that this 38 notch difference is worth only  $0.3\% \Delta K$ . These local criticals were conducted with natural circulation. They are illustrated in Figure 3.

Several other local criticals were performed on Unit 3 prior to startup, but only two of them provided significant results. These were conducted with "B" recirculation pump in operation and involved symmetric local criticals in the NE and SW quadrants with control rod configurations identical to those mentioned above. In this case, only a 6 notch differential was detected. This indicates that the large notch difference detected in previous criticals with natural circulation could have been due to quadrant temperature differences caused by poor mixing with natural circulation. These criticals are illustrated in Figure 4.

At this point in time, a positive explanation for this variation is not available. General Electric and Commonwealth Edison will continue analysis of the tests performed to date and evaluate the necessity of further tests to ascertain possible reasons for this variation in reactivity. Any conclusions significantly different from those outlined above will be reported to the AEC as they are developed.

None of the above tests or analyses have revealed any violation of the Technical Specifications, or anything detrimental to the safe operation of Units 2 and 3.

Sincerely,



W. P. Worden  
Superintendent  
Dresden Nuclear Power Station

cc: File/AEC Corr.

FIGURE 1

UNIT 3 CONTROL RODS PULLED TO POSITION 48  
TO VERIFY 1% SHUTDOWN MARGIN WITH A  
DIAGONALLY ADJACENT CONTROL ROD AT POSITION 48

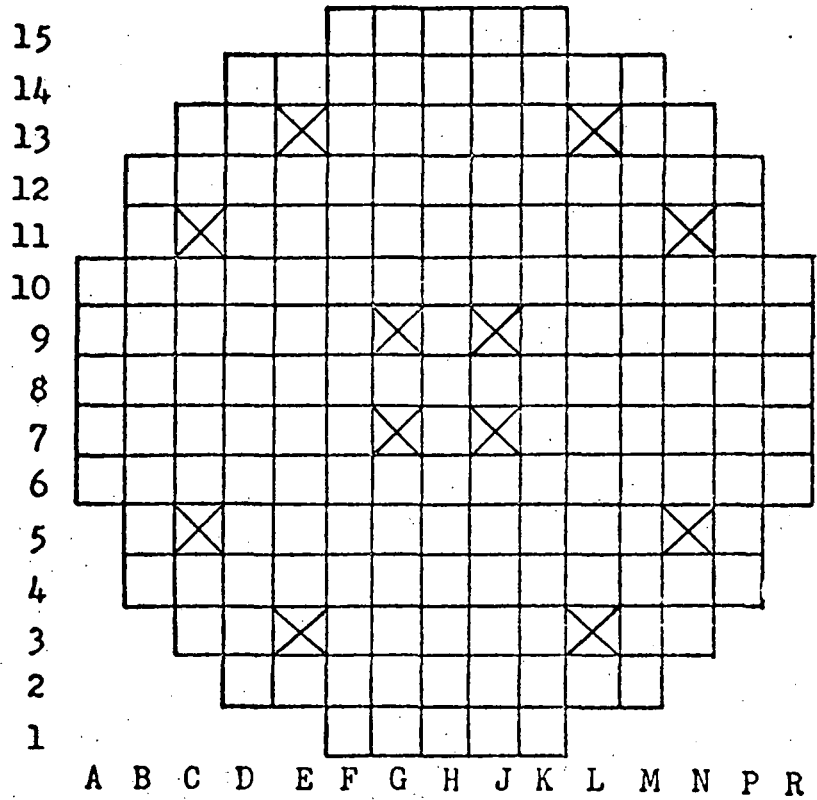
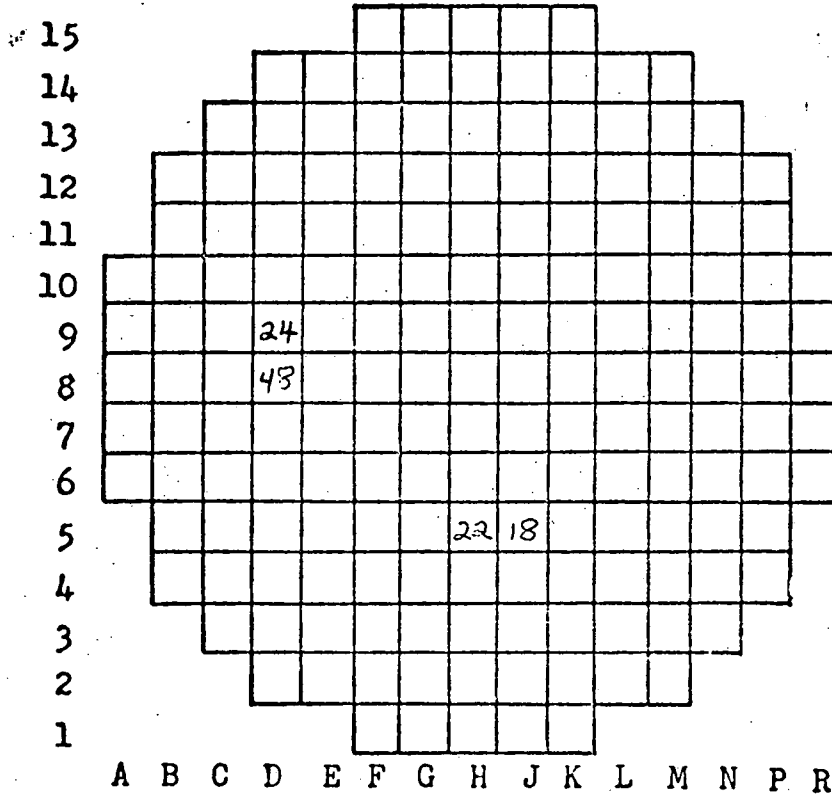


FIGURE 2

UNIT 2 LOCAL CRITICALS



H5-J5

Period 27 sec.

Recirc. Temp. 158°F

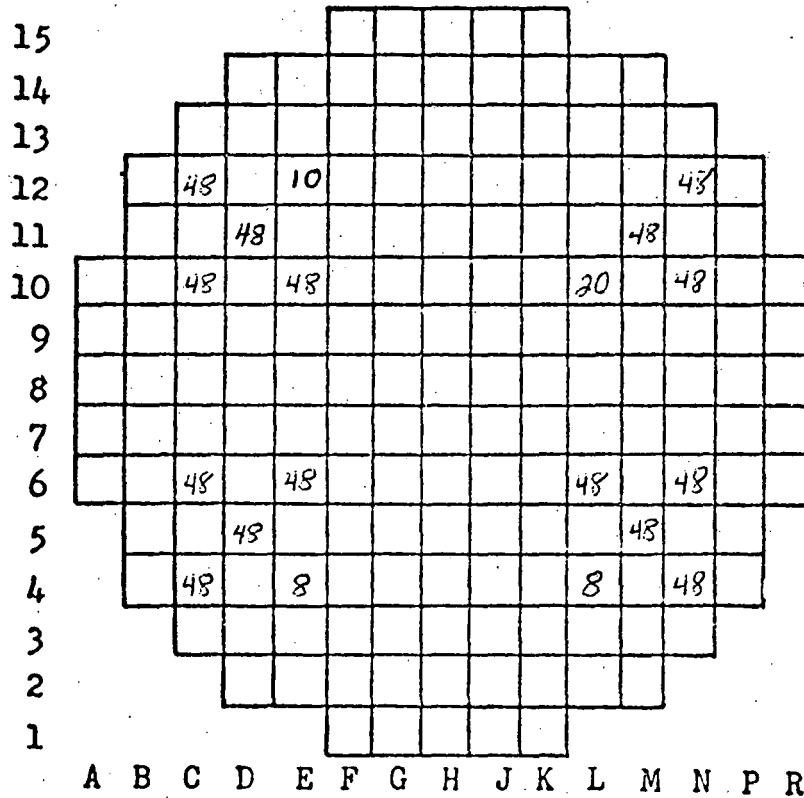
D8-D9

Period 169 sec.

Recirc. Temp. 158°F

FIGURE 3

UNIT 3 LOCAL CRITICALS 8/4/73



NW Quadrant

Period 31 sec.

Recirc. Temp. 166°F

NE Quadrant

Period 70 sec.

Recirc. Temp. 165°F

SW Quadrant

Period 14 sec.

Recirc. Temp. 168°F

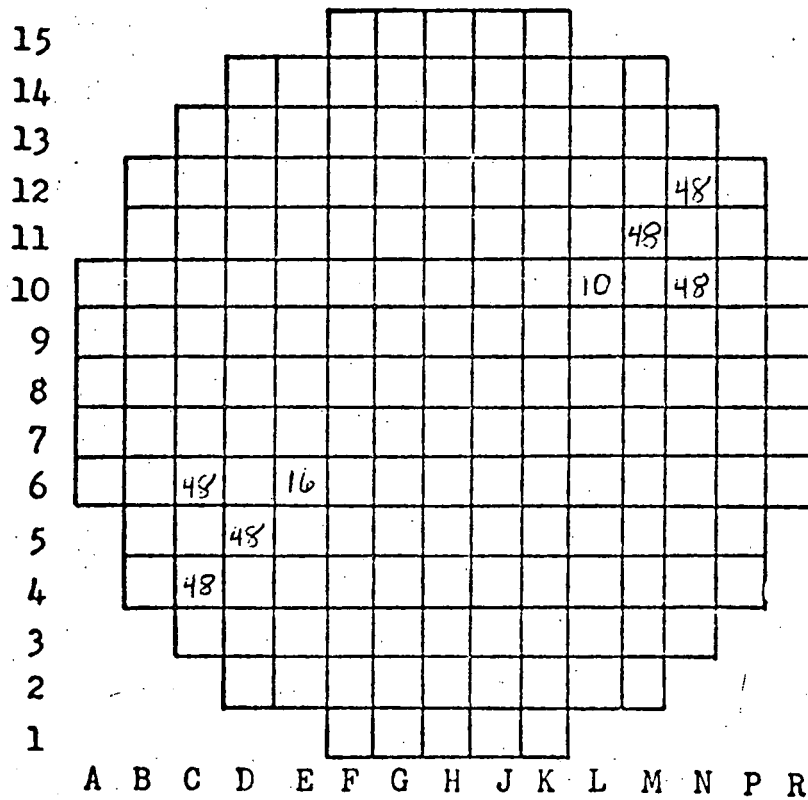
SE Quadrant

Period 38 sec.

Recirc. Temp. 167°F

FIGURE 4

UNIT 3 LOCAL CRITICALS 8/10/73



SW Quadrant

Period 38 sec.

Recirc. Temp. 159°F

NE Quadrant

Period 44 sec.

Recirc. Temp. 159°F