

LICENSEE EVENT REPORT

CONTROL BLOCK: 1

(PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

01 M I I D I C I C 1 2 0 0 0 - 0 0 0 0 0 0 - 0 0 3 4 1 1 1 1 1 4 5

CON'T
01 L 6 0 5 0 0 0 3 1 5 7 0 5 2 5 8 3 5 0 6 2 2 8 3 9

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES 10

012 | DURING ROUTINE STARTUP, FOLLOWING A RAPID POWER REDUCTION TO APPROXIMATELY 2% FOR STEAM;
013 | GENERATOR STOP VALVE SURVEILLANCE TESTING, THE AXIAL FLUX DIFFERENCE TARGET BAND LIMIT
014 | WAS EXCEEDED. THIS EVENT WAS NON-CONSERVATIVE WITH RESPECT TO TECHNICAL SPECIFICATION
015 | 3.2.1. THE ACTION REQUIREMENT WAS MET. PUBLIC HEALTH AND SAFETY WERE NOT AFFECTED.
016 | THIS WAS THE FIRST OCCURRENCE OF THIS TYPE. (SEE ATTACHED SUPPLEMENT)

017 |
018 |

019 R B 11 X 12 Z 13 Z Z Z Z Z Z Z 14 Z 15 Z 16
17 8 3 0 5 2 0 3 L 0
X 13 Z 19 Z 20 Z 21 0 10 10 10 Y 23 N 24 Z 25 Z 9 9 9

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS 27

110 | WITH THE UNIT BEING AT END OF CORE LIFE, A LARGE POSITIVE AXIAL FLUX DIFFERENCE SWING
111 | AFTER A RAPID POWER REDUCTION (AS EXPERIENCED ON 5-25-83) IS EXPECTED. THIS IS CAUSED
112 | BY THE AXIAL BURNUP DISTRIBUTION, LARGE NEGATIVE MODERATOR TEMPERATURE COEFFICIENT
113 | AND THE CONSIDERABLE ROD WITHDRAWAL REQUIRED TO OVERCOME THE XENON BUILDUP. (SEE
114 | ATTACHED SUPPLEMENT)

115 C 28 0 1 5 29 NA B 31 OPERATOR OBSERVATION 32
116 Z 33 Z 34 NA NA 36
117 0 0 0 37 Z 38 NA 39
118 0 0 0 40 NA 41
119 Z 42 NA 43
120 N 44 NA 45

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NRC USE ONLY

ATTACHMENT TO LER# 83-052/03L-0

SUPPLEMENT TO EVENT DESCRIPTION

On May 25, 1983, Unit 1 power level was reduced from 100% RTP to approximately 2% RTP to perform Steam Generator Stop Valve surveillance tests. The power reduction was accomplished through rod insertion and RCS boration from 100% RTP to 40% RTP then by rod insertion and RCS dilution from 40% RTP to 2% RTP. During the power reduction, the Axial Flux Difference, AFD, did not exceed the AFD $\pm 5\%$ Target Band Limit, see attached Figure 1. While at the reduced power level, maximum dilution and considerable rod withdrawal were required to compensate for the negative reactivity, due to xenon buildup, to maintain the RCS temperature and reactor power level.

After the completion of the Steam Generator Stop Valve testing, reactor power escalation commenced. By 1745 hours, the power level had increased to 15% RTP. The AFD at this time was approximately +9%, greater than 4% outside of the target band positive limit of +4.7%. As the AFD was outside the target band, the AFD penalty deviation began to accumulate time. This event was logged by Operations personnel at 1745 hours on May 25, 1983. The power ascension was subsequently continued until a reactor power level of approximately 48% was achieved.

During the time the AFD was out of the target band (until 0800 hours on May 26, 1983) and for a twenty-two (22) hour period after the AFD was returned to the target band (0610 hours on May 27, 1983) the reactor power level was maintained below 50% RTP per Technical Specification Action Item 3.2.1c.

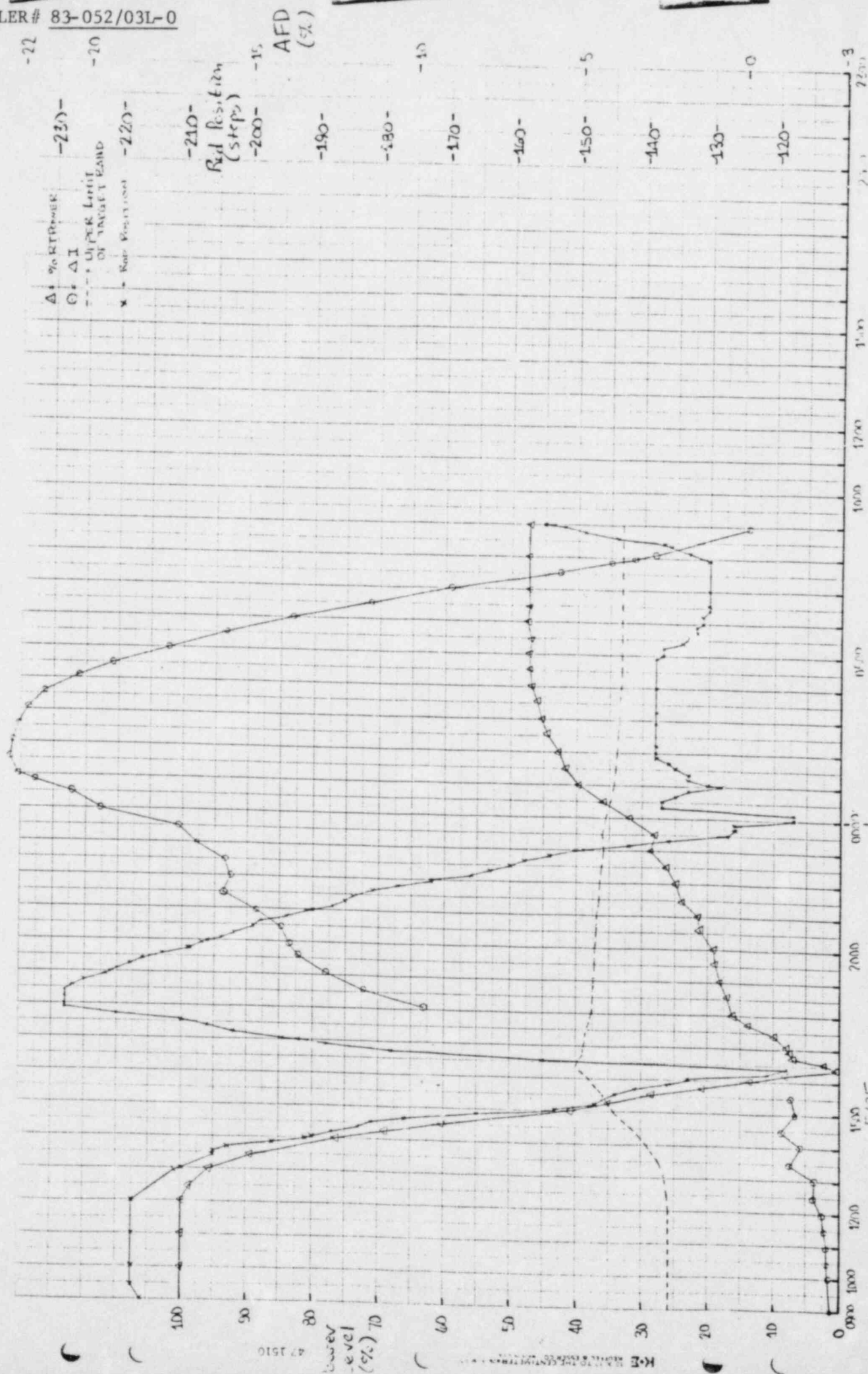
SUPPLEMENT TO CAUSE DESCRIPTION

The three important contributing factors inducing the large positive AFD are summarized below:

- I. The Moderator Temperature Coefficient temperature feedback, which causes the flux level at the top of core to be relatively higher than that produced at the bottom of core, when compared to HFP condition, during a power reduction.
- II. The axial burnup distribution, see attached Figure 2.
 1. Due to burnup the axial offset is large at low power levels at the end of cycle.
 2. Due to the axial core power sharing prior to the unit's power reduction, an axial Xenon oscillation develops.
- III. The rod withdrawal required to keep the unit critical and begin power escalation. This rod withdrawal develops an axial Xenon oscillation.

A large positive AFD swing after a rapid power reduction (as experienced on May 25, 1983) or unit trip, is expected at the end of core life. Experience has shown that rod movement is not sufficiently effective, because of the above items, to completely dampen the positive AFD swing.

Figure 1. Red Position, Thermal Power, AFD and Upper Target Band Limit vs Time



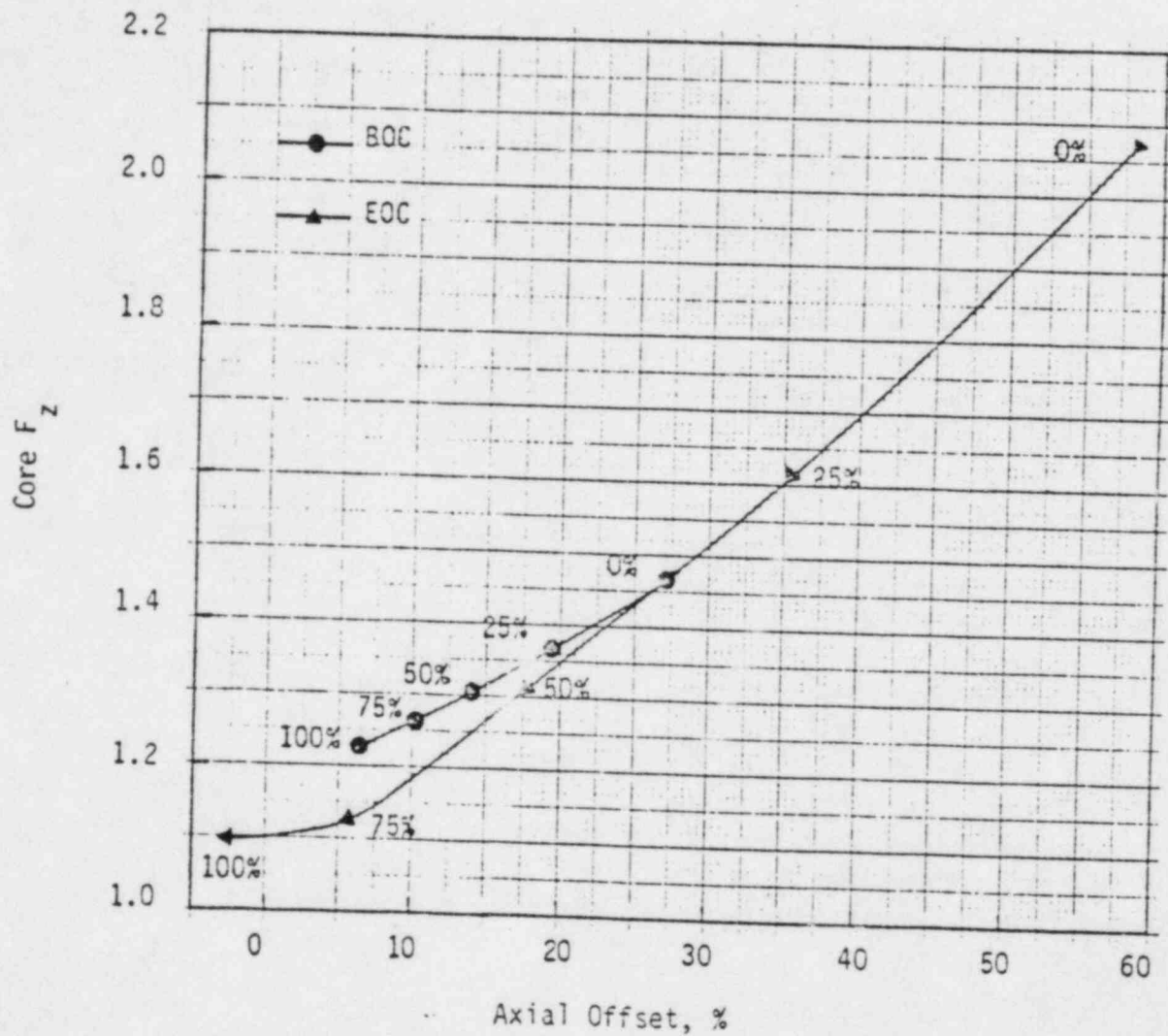


Figure 2 D. C. Cook Unit 1, Cycle 7, BOC and EOC Core Average Peak F_z vs. Axial Offset at Various Power Levels