

DRESDEN UNIT 2

Startup Test No. 4

Initial Criticality Comparison

PURPOSE

The purpose of this procedure is to perform a critical eigenvalue comparison. This is done by comparing the predicted critical control rod pattern to the actual critical control rod pattern and accounting for period and temperature coefficient corrections.

CRITERIA

The actual cold critical rod pattern should be within $1\Delta K$ of the predicted control rod pattern. If the difference is greater than $\pm 1\Delta K$, General Electric and Commonwealth Edison Company core management engineers will be promptly contacted to investigate the anomaly.

RESULTS

The Unit 2 initial critical occurred on May 1, 1979 at 7:15 p.m. on the B sequence. The moderator temperature was $148^{\circ}F$ and the period was 68 seconds. The General Electric predictions and rod worths were performed using the PANACEA code, which assumed a $68^{\circ}F$ moderator.

When corrected for temperature and period, the actual critical was within $1\Delta K$ of the predicted critical. Table 4-1 summarizes the results.

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TIP SYMMETRY - GROSS CHECK

Table 3.1

TIP Pair	% Deviation on 5-15-79	% Deviation on 6-21-79
1	2.23	19.39
2	12.14	12.3
3	19.69	19.99
4	3.47	1.67
5	15.47	12.15
6	2.80	1.71
7	2.63	6.05
8	4.09	4.33
9	3.57	4.89
10	5.19	10.30
11	7.10	9.66
12	1.87	3.60
13	3.43	1.64
14	9.12	10.81
15	1.61	4.47
16	5.76	2.58
17	6.34	8.26
18	15.14	15.43
Average:	6.76	8.29

SYMMETRIC TIP LOCATIONS

TIP PAIR	LPRM
1	08-17 16-09
2	08-25 24-09
3	08-33 32-09
4	08-41 40-09
5	08-49 48-09
6	16-25 24-17
7	16-33 32-17
8	16-41 40-17
9	16-49 48-17

TIP PAIR	LPRM
10	24-33 32-25
11	24-41 40-25
12	24-49 48-25
13	24-57 56-25
14	32-41 40-33
15	32-49 48-33
16	32-57 56-33
17	40-49 48-41
18	40-57 56-41

TABLE 4-1

CRITICAL EIGENVALUE CALCULATIONS

	<u>K</u>	<u>Data Source</u>
Keff with all rods in	.9475	#1
ρ inserted by Group 1 rods	.0364 Δ Keff	#1
ρ inserted by Group 2 rods withdrawn at criticality	.0198 Δ Keff	#1
Panacea Keff at Critical Rod Pattern at 68	<u>1.0037</u>	
Temperature Correction between 68° F and 153°	- .00264 Δ K	
MTC of $\frac{-3.3 \times 10^{-5} \Delta K}{F K}$		#2
Panacea Keff at critical Rod Pattern corrected for Temperature	<u>1.00106</u>	
Keff at time of Critical with ∞ period	1.000	
Period correction for 68 sec period	+ .00076 Δ K	#3
Actual Keff with 68 sec period	<u>1.00076</u>	
Difference (Panacea Keff - Actual Keff)	.0003 Δ K .03% Δ K	

Data Sources Used in Calculations

- #1. GE letter, A. F. Devita to T. J. Rausch dated May 21, 1979.
 #2. Actual Moderator Temp. Coeff. determined BOC 6 on site.
 #3. ρ vs. τ tables.

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