

DRESDEN UNIT 2
CYCLE 8

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% ΔK of the predicted control rod pattern. If the difference is greater than $\pm 1\%$ ΔK , General Electric and Commonwealth Edison Company core management engineers will be promptly contacted to investigate the anomaly.

RESULTS AND DISCUSSION

The Unit 2 initial critical occurred on May 10, 1981 at 12:14 a.m. on the A sequence. The moderator temperature was 161.8° F and the period was 83.8 seconds. The General Electric predictions and rod worths were performed using the PANACEA code, which assumed a 68° F moderator.

When corrected for temperature and period, the actual critical was within 1% ΔK of the predicted critical. Table 4-1 summarizes the results.

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TABLE 4-1

CRITICAL EIGENVALUE CALCULATIONS

	<u>K</u>	<u>Data Source</u>
Keff with all rods in	.9328	#2
ρ inserted by Group 1 rods	.0397 Δ Keff	#1
ρ inserted by Group 2 rods	.0170 Δ Keff	#1
ρ inserted by Group 3 rods	.0166 Δ Keff	#3
withdrawn at critical		
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Panacea Keff at Critical Rod Pattern at 68°	1.0061	#3
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Temperature Correction between 68° F and 161.8° F	-.0036 Δ Keff	
MTC of $\frac{-3.85 \times 10^{-5} \Delta K}{^{\circ}F}$		#4
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Panacea Keff at critical Rod Pattern corrected for Temperature	1.0025	
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Keff. at time of Critical with ∞ period	1.000	
Period correction for 83.8 sec. period	+.00065 Δ Keff	#5
Actual Keff with 83.8 sec. period	1.00065	
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Difference (Panacea Keff - Actual Keff)	.00185 Δ Keff .185% Δ Keff	

Data Sources Used in Calculations

- #1. G.E. letter, A. F. DeVita to G. R. Grable, dated April 29, 1981.
- #2. G.E. letter, A. F. DeVita to G. R. Grable, dated May 26, 1981.
- #3. G.E. letter, A. F. DeVita to G. R. Grable, dated May 13, 1981.
- #4. Actual Moderator Temp. Coeff. determined BOC-8 onsite.
- #5. ρ vs. τ tables.