



Commonwealth Edison Company

72 WEST ADAMS STREET ★ CHICAGO, ILLINOIS

Address Reply to:

POST OFFICE BOX 767 ★ CHICAGO, ILLINOIS 60690

Dresden Nuclear Power Station
R. R. #1
Morris, Illinois 60450
December 14, 1972



Mr. A. Giambusso
Deputy Director for Reactor Projects
Directorate of Licensing
U. S. Atomic Energy Commission
Washington, D.C. 20545

Subject: License DPR-19, Dresden Nuclear Power Station,
Section 6.6.C.2 of the Technical Specification

Dear Mr. Giambusso:

Upon re-evaluation of an event which occurred on August 17, 1972; i.e., a Dresden Unit #2 scram occurred during startup from a IRM HiHi flux trip, we wish to inform you of the event that occurred on that date.

PROBLEM AND INVESTIGATION

On August 17, 1972, Unit #2 was in the process of being brought critical following a reactor scram at 1845 the same day. The reactor had a moderator temperature of approximately 430°F and had a Xenon inventory in excess of the full power equilibrium condition. At 2330, a check of the Startup Range Monitors indicated only subcritical multiplication and the Intermediate Range Monitors were downscale. At this time the operator began withdrawing continuously from notch 2 to notch 10, the second control rod (B-07) in group #8 of sequence B-2, Rev. 1 (6/19/72), the neutron flux increased rapidly. The Intermediate Range Monitors responded and exceeded 120%, thus initiating a reactor scram on "IRM HiHi flux".

A review of the startup and intermediate range recorders indicated that a short period had resulted from the withdrawal of control rod B-07.

Prior to a subsequent startup, investigation of the control rod pattern at the time of critical indicated that control rod B-07 was one of the strongest control rods in the reactor. The conditions of the reactor, high temperature and maximum Xenon, made it necessary to withdraw more control rods than usual for criticality. This results in withdrawing control rods that are no longer in a checker board pattern, a situation not planned for in the sequence.

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CORRECTIVE ACTION

For the subsequent startup it was decided to "bank" withdraw group #8 in a notchwise fashion in order to minimize the amount of reactivity inserted in any one withdrawal. The reactor was brought critical at nearly the same state conditions in an orderly manner.

Analysis of the worth of control rod B-07 at the time of the scram, and analysis of the sequence itself was requested from Production Nuclear Reactor Analysis Department (Commonwealth Edison) and General Electric Company. A temporary revision to the sequence was provided by G.E. which consisted of taking the same action that was employed by the station when pulling the second critical. General Electric also recommended bypassing one group in the sequence until higher power has been reached.

Computer analysis of the situation indicated that control rod B-07 had a worth of approximately 1.50 to 1.70% $\Delta k/k$ and notches 0 to 10 accounted for 70% of the total worth. No reactivity anomaly existed and there were no safety related problems during this incident or subsequent startups. The worth of the rod is less than 2.5% Δk as specified in the Technical Specifications.

A permanent revised sequence has been issued for Unit 2 and Unit 3 to provide a broader range of geometrically low worth rods so that elevated temperatures and maximum Xenon conditions will not force the critical to be attained at a point where rod worths are enhanced by the lack of voids and distortion of the rod worth due to axial Xenon transients. As additional protection against high notch worths during maximum Xenon conditions and elevated temperatures (scram recovery), an operating order has been issued that requires bank withdrawal, in a notch wise fashion, of rod Group #5 and subsequent Groups till criticality is achieved.

Fred S. Menzies
for W. P. Worden
Superintendent

WPW:sdb