February 16, 1995

Mr. D. L. Farrar
Manager, Nuclear Regulatory Services
Commonwealth Edison Company
Executive Towers West III
1400 Opus Place, Suite 500
Downers Grove, IL 60515

SUBJECT: QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2, AND DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3 - TECHNICAL SPECIFICATION BASES CHANGE FOR SHUTDOWN MARGIN (TAC NOS. M90748, M90749, M90750 AND M90751)

Dear Mr. Farrar:

By letter dated October 13, 1994, the Commonwealth Edison Company (ComEd) submitted a change to the Technical Specification (TS) Bases Section 3.3 for Quad Cities and Dresden stations. This change substitutes a discussion of reactivity Shutdown Margin (SDM) demonstration for the existing local SDM test for an alternate method of SDM demonstration used by many operating boiling water reactors and considered acceptable by the NRC staff which is the in-sequence critical method. This change also makes some typographical and pagination changes to make the pages consistent between Quad Cities, Units 1 and 2, and Dresden, Units 2 and 3.

We have reviewed your request and we agree that it would be acceptable for Quad Cities and Dresden to use this in-sequence method. We have accordingly revised the Bases pages of the Quad Cities and Dresden Technical Specifications. A copy of these revised pages are enclosed.

Sincerely,

Original signed by:

Robert M. Pulsifer, Project Manager
Project Directorate III-2
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Docket Nos. 50-254, 50-265, 50-237, 50-249

Enclosure: Revised TS Bases Pages

cc w/encls: see next page

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3.3 LIMITING CONDITIONS FOR OPERATION BASES

A. Reactivity Limitations

1. Reactivity margin - core loading

The core reactivity limitation is a restriction to be applied principally to the design of new fuel which may be loaded in the core or into a particular refueling pattern. Satisfaction of the limitation can only be demonstrated at the time of loading and must be such that it will apply to the entire subsequent fuel cycle. The generalized form is that the reactivity of the core loading will be limited so the core can be made subcritical by at least R + 0.25% Δk in the most reactive condition during the operating cycle, with the strongest control rod fully withdrawn and all others fully inserted. The value of R in % Δk is the amount by which the core reactivity, at any time in the operating cycle, is calculated to be greater than at the time of the check; i.e., the initial loading. R must be a positive quantity or zero. A core which contains temporary control or other burnable neutron absorbers may have a reactivity characteristic which increases with core lifetime, goes through a maximum, and decreases thereafter.

The value of R is the difference between the calculated core reactivity at the beginning of the operating cycle and the calculated value of the core reactivity any time later in the cycle where it would be greater than at the beginning. The value of R shall include the potential shutdown margin loss assuming full B_4C settling in all inverted poison tubes present in the core. A new value of R must be determined for each new fuel cycle.

The 0.25% Δk in the expression R + 0.25% Δk is provided as a finite, demonstrable, subcriticality margin. This margin is verified using an insequence control rod withdrawal at the beginning-of-life fuel cycle conditions. This assures subcriticality with not only the strongest rod fully withdrawn but a margin of at least R + 0.25% Δk beyond this.

2. Reactivity margin - stuck control rods

Specification 3.3.A.2 requires that a rod be taken out of service if it cannot be moved with drive pressure. If the rod is fully inserted and then disarmed electrically (Note: To disarm the drive electrically, four amphenol type plug connectors are removed from the drive insert and withdrawal solenoids, rendering the drive immovable. This procedure is equivalent to valving out the drive

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and is preferred, as drive water cools and minimizes crud accumulation in the drive), it is in a safe position of maximum contribution to shutdown reactivity. If it is disarmed electrically in a nonfully inserted position, that position shall be consistent with the shutdown reactivity limitation stated in Specification 3.3.A.1. This assures that the core can be shut down at all times with the remaining control rods, assuming the strongest operable control rod does not insert. An allowable pattern for control rods valved out of service, which shall meet the specification, will be available to the operator. The number of rods permitted to be inoperable could be many more than the eight allowed by the specification, particularly late in the operation cycle: however, the occurrence of more than eight could be indicative of a generic control rod drive problem and the reactor will be shut down.

Also if damage within the control rod drive mechanism and in particular, cracks in drive internal housings, cannot be ruled out, then a generic problem affecting a number of drives cannot be ruled out. Circumferential cracks resulting from stress assisted intergranular corrosion have occurred in the collet housing of drives at several BWR's. This type of cracking could occur in a number of drives and if the cracks propagated until severance of the collet housing occurred, scram could be prevented in the affected rods. Limiting the period of operation with a potentially severed collet housing and requiring increased surveillance after detecting one stuck rod will assure that the reactor will not be operated with a large number of rods with failed collet housings.

3. Rod Position Indication System (RPIS)

Normal control rod position is displayed by two-digit indication to the operator from position 00 to 48. Each even number is a latching position, whereas each odd number provides information while the rod is in motion and input for rod drift annunciation. The LCO provides for the condition where no positive information is displayed for a large portion or all of the rod's travel. In this case the rod is given a full insert signal, individually scrammed and treated as an inoperable rod. Usually only one digit of one or two of a rod's positions is unavailable with a faulty RPIS, and the control rod may be located in a known position.

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The value of R is the difference between the calculated core reactivity at the beginning of the operating cycle and the calculated value of the core reactivity any time later in the cycle where it would be greater than at the beginning. For the first fuel cycle, R was calculated to be not greater than 0.10% delta k. A new value of R must be determined for each new fuel cycle.

The 0.25% delta k in the expression R + 0.25% delta k is provided as a finite, demonstrable, sub-criticality margin. This margin is verified using an insequence control rod withdrawal at the beginning-of-life fuel cycle conditions. This assures sub-criticality with not only the strongest rod fully withdrawn but at least an R + 0.25% delta k margin beyond this.

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NOTE: This change issued by letter dated August 27, 1975, which noted that 0.02% delta k should be included in the value.