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January 10, 1977

Mr. Benard C. Rusche, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Dresden Station Units 2 and 3
Proposed Amendment to Appendix A Technical Specifications for Facility Operating Licenses DPR-19 and DPR-25 to Change the Operability Limits of the Rod Worth Minimizer (RWM)
NRC Docket Nos. 50-237 and 50-249

Reference (a): Generic Reload Application for 8x8 Fuel, NEDO-20360, Revision 1, Supplement 4.

Dear Mr. Rusche:

Pursuant to 10 CFR 50.59, Commonwealth Edison Company proposes to amend Appendix A to facility operating licenses DPR-19 and DPR-25 to change the operability limits of the Rod Worth Minimizer (RWM) from 10% to 20% power.

This change is necessary in order to preserve the assumptions of the rod drop accident analysis found in Reference (a). The analysis found that a peak fuel enthalpy of 280 cal/gram could occur at 10% power. Thus, it is necessary to maintain control rod sequences to minimize rod worth up to 20% power in order to ensure adequate margin to the 280 cal/gram limit for the rod drop accident.

Dresden Nuclear Power Station administratively imposed the more restrictive limitation after having been informed of the inconsistency between Reference (a) and the present Technical Specifications.

The option to provide an independent verifier in lieu of the RWM becomes more significant with this additional requirement to ensure in sequence withdrawals up to 20% power. This is true because the present 99 rod group capacity of the RWM computer may be inadequate to hold the number of control rod groups necessary to achieve 20% under core conditions of high exposure and/or peak xenon conditions.

For your scheduling purposes, incorporation of these changes into Technical Specifications at the next licensing action will be satisfactory inasmuch as the Station is observing the more restrictive requirements.

The proposed changes have received on-site and off-site review and approval.

Three (3) signed originals and 37 copies are provided for your use.

Very truly yours,

R. L. Bolger
Assistant Vice President

SUBSCRIBED and SWORN to
before me this 11th day
of January, 1977.

Nancy M. Hollingsworth
Notary Public

Enclosure: Forty copies of amended pages 57, 62a, and 62b for DPR-19. (Pages and changes are identical for DPR-25.)

3.3 LIMITING CONDITION FOR OPERATION

3. (a) Control rod withdrawal sequences shall be established so that maximum reactivity that could be added by dropout of any increment of any one control blade would not make the core more than 0.013 delta K supercritical.

(b) Whenever the reactor is in the startup or run mode below 20% rated thermal power, the Rod Worth Minimizer shall be operable. A second operator or qualified technical person may be used as a substitute for an inoperable Rod Worth Minimizer which fails after withdrawal of at least 12 control rods to the fully withdrawn position. The Rod Worth Minimizer may also be bypassed for low power physics testing to demonstrate the shutdown margin requirements of specifications 3.3.A.1 if a nuclear engineer is present and verifies the step-by-step rod movements of the test procedure.

4.3 SURVEILLANCE REQUIREMENTS

3. (a) To consider the rod worth minimizer operable, the following steps must be performed:

(i) The control rod withdrawal sequence for the rod worth minimizer computer shall be verified as correct.

(ii) The rod worth minimizer computer on-line diagnositc test shall be successfully completed.

(iii) Proper annunciation of the select error of at least one out-of-sequence control rod in each fully inserted group shall be verified.

(iv) The rod block function of the rod worth minimizer shall be verified by attempting to withdraw an out-of-sequence control rod beyond the block point.

(b) If the rod worth minimizer is inoperable while the reactor is in the startup or run mode below 20% rated thermal power and a second independent operator or engineer is being used, he shall verify that all rod positions are correct prior to commencing withdrawal of each rod group.

Bases (cont'd)

These techniques are described in a topical report (1) and its supplements.

By using the analytical models described in those reports coupled with conservative or worst-case input parameters, it has been determined that for power levels less than 20% of rated power, the specified limit on insequence control rod or control rod segment worths will limit the peak fuel enthalpy to less than 280 cal/gm. Above 20% power even single operator errors cannot result in out-of-sequence control rod worths which are sufficient to reach a peak fuel enthalpy of 280 cal/gm should a postulated control rod drop accident occur.

(1) "General Electric Boiling Water Reactor Generic Reload Application for 8x8 Fuel", NEDO-20360, Revision 1, Supplement 4, April 1, 1976.

The following conservative or worst-case bounding assumptions have been made in the analysis used to determine the specified 0.013 K limit on insequence control rod or control rod segment worths. Details of this analysis are contained in Reference (1). Each core reload will be analyzed to show conformance to the limiting parameters.

a. A maximum inter-assembly local power peaking factor of 1.30 or less.

b. An end-of-cycle delayed neutron fraction of 0.005.

c. A beginning-of-life Doppler reactivity feedback.

d. The technical specification rod scram insertion rate.

e. The maximum possible rod drop velocity (3.11 ft./sec.)

f. The design accident and scram reactivity shape function.

g. The minimum moderator temperature to reach criticality.

Bases (con'd)

It is recognized that these bounds are conservative with respect to expected operating conditions. If any one of the above conditions is not satisfied, a more detailed calculation will be done to show compliance with the 280 cal/gm design limit.

In most cases the worth in insequence rods or rod segments will be substantially less than 0.013ΔK. Further, the addition of 0.013ΔK worth of reactivity as a result of a rod drop and in a conjunction with the actual values of the other important accident analysis parameters described above would most likely result in a peak fuel enthalpy substantially less than the 280 cal/gm design limit. However, the 0.013ΔK limit is applied in order to allow room for future reload changes and ease of verification without repetitive Technical Specification changes.

Should a control drop accident result in a peak fuel energy content of 280 cal/gm less than 660 (7 x 7) fuel rods are conservatively estimated to perforate. This would result in an offsite dose well below the guideline value of 10CFR 100. For 8 x 8 fuel, less than 850 rods are conservatively estimated to perforate with nearly the same consequences as for the 7 x 7 fuel case because of the rod power differences.

The Rod Worth Minimizer provides automatic supervision to assure that out of sequence control rods will not be withdrawn or inserted; i.e., it limits operator deviations from planned withdrawal sequences. Ref. Section 7.9 SAR. It serves as a backup to procedural control of control rod worth. In the event that the Rod Worth Minimizer is out of service, when required, a licensed operator or other qualified technical employee can manually fulfill the control rod pattern conformance functions of the Rod Worth Minimizer. In this case, procedural control is exercised by verifying all control rod positions after the withdrawal of each group, prior to proceeding to the next group. Allowing substitution of a second independent operator or engineer in case of RWM inoperability recognizes the capability to adequately monitor proper rod sequencing in an alternate manner without unduly restricting plant operations. Above 20% power, there is no requirement that the RWM be operable since the control rod drop accident with out-of-sequence rods will result in a peak fuel energy content of less than 280 cal/gm. To assure high RWM availability, the RWM is requried to be operating during a startup for the withdrawal of a significant number control rods for any startup after June 1, 1974.

4. The Source Range Monitor (SRM) system performs no automatic safety system function; i.e., it has no scram function. It does provide the