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DENTON, H. R. Office of Nuclear Reactor Regulation, Director (post 851125

SUBJECT: Forwrds WCAP-11081, "American Electric Power DC Cook Unit 2 RDF RTD Installation Safety Evaluation," as addl info re Cycle 6 reload analyses & proposed Tech Specs.
See REPTS.

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INDIANA & MICHIGAN ELECTRIC COMPANY

P.O. BOX 16631
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March 27, 1986
AEP:NRC:0916P

Donald C. Cook Nuclear Plant Unit No. 2
Docket No. 50-316
License No. DPR-74
ADDITIONAL INFORMATION REQUIRED FOR
CYCLE 6 RELOAD

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Denton:

The purpose of this letter is to provide you with additional information related to our D. C. Cook Unit 2 Cycle 6 reload analyses and proposed Technical Specifications (T/Ss). The additional information and appropriate references are as described below.

1. Additional Information Requested by the Reactor Systems Branch

On January 8, 1986, your staff transmitted to AEPSC a request for additional information related to the Unit 2 Cycle 6 reload analyses. Specifically, eleven questions were received related to the analyses performed by the Exxon Nuclear Company (ENC), the fuel supplier for the Cycle 6 reload.

The responses to questions numbered 1, 2, 3, 4, 7, and 11 were transmitted to you by ENC on March 5, 1986 in their letter RAC:017:86. Subsequently, ENC transmitted responses to questions 6, 8, and 10 in their letter RAC:022:86 on March 14, 1986.

Question 9 in your January 8, 1986 transmittal refers to the boron dilution accident analyzed in the Standard Review Plan. Our response to this question is contained in Attachment 1 to this letter. This response references Supplement 1 to ENC Cycle 6 Plant Transient Analysis, XN-NF-85-64(P) Rev. 1. This supplement was supplied directly to you by ENC in their letter RAC:025:86, dated March 21, 1986.

Question 5 concerns natural circulation flow from conditions of 20% power. As discussed with members of your staff on March 13, 1986, this issue is currently under investigation both at AEPSC and at ENC. We will transmit a response to this question as soon as our investigation is complete.

A001 1/1 Add: NRR/DSRO/RSIB Ltr Encl ! !
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2. Cycle 6 T/Ss

The majority of the proposed T/S changes necessary to support the Cycle 6 reload were transmitted to you in our letter AEP:NRC:0916I, dated March 14, 1986. In that submittal, we indicated that we would be transmitting supplementary changes to T/Ss 3/4.1.1.2 (Shutdown Margin - $T_{avg} \leq 200^{o}F$) and to 3/4.1.2.7 (Borated Water Sources - Shutdown). These changes, as well as additional ones described below, are included as Attachment 2 to this letter.

The changes to required shutdown margin (T/S 3/4.1.1.2) in Mode 5 are based on ENC's analysis of the Boron Dilution Transient. This analysis was supplied to you by ENC in their letter RAC:025:86, dated March 21, 1986, and represented a supplement to their Unit 2 Cycle 6 plant transient document, XN-NF-85-64(P), Rev. 1. The 10 CFR 50.92 analyses for these changes were included in Attachment 1 of our AEP:NRC:0916I submittal, and therefore will not be repeated here.

In addition to changes to required shutdown margin, the boron dilution analysis performed by ENC also requires changes to minimum contained borated water volumes for the refueling water storage tank (RWST) and the boric acid storage system for T/Ss 3.1.2.7 and 3.1.2.8. (Borated Water sources - Shutdown and Operating respectively.) For T/S 3.1.2.7, it is necessary to increase the required volumes from 835 to 8,750 gallons for the boric acid storage system, and from 9690 to 190,000 gallons for the RWST. For T/S 3.1.2.8, the minimum boric acid storage system volume required must be increased from 5470 to 9,250 gallons. These changes are necessary to ensure the capability to provide shutdown margin after xenon decay and cooldown. The required volumes are increased to reflect the increased shutdown margin requirements at beginning of life for RHR operation in Modes 4 and 5.

The revised volumes are based on analyses performed by ENC. They are bounding in nature. The method for obtaining these volumes is described in Attachment 3.

The supplemental changes to T/Ss 3.1.2.7 and 3.1.2.8 represent additional restrictions placed on D. C. Cook Unit 2 operations as a result of the safety analyses performed for the Cycle 6 reload. As such, they are covered by the 10 CFR 50.92 analysis provided in the third category of changes discussed in Attachment 1 to our original submittal AEP:NRC:0916I. Therefore, the 10 CFR 50.92 analyses will not be repeated here. Additionally, because these changes supplement the original submittal, we believe that no additional fees are required per 10 CFR 170.12.

Attachment 2 is a complete substitute package of Technical Specification changes required for Cycle 6 operation. It replaces Attachment 2 of our submittal AEP:NRC:0916I. In addition to the changes described above, it includes corrections of typographical errors in the previous submittal. In order to submit the Cycle 6 T/Ss on a timely basis, our proofreading concentrated on the changes to the present T/Ss. Through additional proofreading done after the submittal, we located several typographical errors not related to the changes on pages which had been retyped to improve legibility. The correction of these errors is intended to restore the unchanged portions of the T/Ss to their original form, and thus does not constitute a change request.

3. Non-Proprietary Version of Westinghouse RdF RTD Safety Evaluation

Attachment 3 to our letter AEP:NRC:0916I contained a proprietary version of the safety evaluation performed by the Westinghouse Electric Corporation for the installation of RdF RTDs in Unit 2 (WCAP-11080). As committed to in that letter, we are transmitting as Attachment 4 a non-proprietary version of this report, numbered WCAP-11081.

4. Clarification of PORV Specification

Section 6 of Attachment 1 to our letter AEP:NRC:0916I consisted of 10 CFR 50.92 justifications for our proposed changes to the power-operated relief valve (PORV) T/S, 3/4.4.11. In that section, we stated:

> Specifically , we are proposing to change T/S 3/4.4.11 to require at least 2 PORVs be available in Modes 1, 2, and 3. For purposes of this specification, "available" means that the PORV is operable with its solenoid deenergized and that the block valve is operable and energized.

Through additional internal review of this document, it was determined that the above statements could be confusing and thus should be clarified.

At the Cook Plant, the PORV solenoids are normally deenergized, but with power available; the solenoid must be energized to open the PORV. As for the block valves, their motor operators are energized only when they are in the process of opening or closing the valve. "Available" for these devices then means that the equipment and controlling circuitry is in its normal configuration with power available to perform the required safety function.

This document has been prepared following Corporate procedures which incorporate a reasonable set of controls to insure its accuracy and completeness prior to signature by the undersigned.

Very truly yours,

M. P. Alexich
Vice President

Attachments

cc: John E. Dolan
W. G. Smith, Jr. - Bridgman
G. Bruchmann
R. C. Callen
G. Charnoff
NRC Resident Inspector - Bridgman

bc: J. G. Feinstein/M. S. Ackerman (w/o attachments)
S. H. Horowitz/T. O. Argenta/R. C. Carruth (w/o attachments)
J. J. Markowsky/S. H. Steinhart/J. A. Kobyra (w/o attachments)
R. F. Kroeger (w/o attachments)
M. L. Horvath - Bridgman
J. F. Stietzel
J. B. Shinnock (w/o attachments)
D. L. Wigginton, NRC - Washington, D.C.
J. M. Cleveland/V. Vanderburg/D. H. Malin
AEP:NRC:0916P
DC-N-6500.1
DC-N-6015.1
0916P/NRCA

Attachment 1 to AEP:NRC:0916P

Response to Question 9 on

Reactor Systems Branch

Transmittal of January 8, 1986

Question 9

The times required for loss of shutdown margin from boron dilution are provided on Page 188 of XN-NF-85-64. These times are significant for providing operating reaction times only following the initiation of an alarm. For each reactor condition given in Table 15.4.6.1, provide the time following initiation of the boron dilution event to the time when the alarm would function. Discuss diversity and redundancy of available alarms.

Response 9

A) The time from initiation of dilution to the time of alarm has not been specifically calculated for the analysis presented in XN-NF-85-64, Rev. 1, Supp. 1. Instead, the analysis in XN-NF-85-64 (P), Rev. 1, Supp. 1, was performed in a similar manner to the analysis presented in Section 14.1.5 of the Unit 2 Donald C. Cook Nuclear Plant Updated FSAR.

Additional detail on the FSAR analysis which bounds operation in Modes 4, 5 and 6 is provided in a letter (AEP:NRC:0860I) from M. P. Alexich to Harold R. Denton dated May 17, 1984. The analysis is also described in a letter (NS-TMA-2273) from T. M. Anderson of Westinghouse Electric Corporation to Victor Stello dated July 8, 1980. The results have been in use on Unit 1 since the beginning of Cycle 6 and on Unit 2 since the beginning of Cycle 3.

Both the FSAR analysis and the XN-NF-85-64(P), Rev. 1, Supp. 1 analysis for Modes 4, 5 and 6 ensure that 15 minutes are available from the initiation of dilution to the loss of shutdown margin. Volumes used in these analyses are limited to those assumed to have active flow.

As indicated in the updated FSAR and XN-NF-85-64(P), Rev. 1, Supp. 1, substantially longer times are available for operator response for the cases of dilution during startup and dilution during full power operation. The FSAR Mode 3 analysis is performed for startup from a reactor coolant system boron concentration of 2000 ppm.

B) Indications available to the operator include:

1) Status indication of the Chemical and Volume Control System and Reactor Makeup Water System with,

a. Indication of boric acid and clean makeup flow rates including alarms on deviation from setpoint for both of these flows. These alarms would be expected to occur at the initiation of any inadvertent dilution involving the blender.

b. CVCS valve position status lights, and

c. Reactor Makeup Water Pump "running" status light.

Response 9 (Cont'd)

2) Source Range Neutron Flux with,

a. High Flux at Shutdown Alarm set at half a decade above background. This alarm is expected to occur after the dilution transient has been in progress for a period of time.

b. Use of the audible count rate indication to distinguish significant changes in flux, i.e., a doubling of the count rate.

c. Periodic, i.e., frequent surveillance of the Source Range meters and continuous strip chart recorder performed by the operator.

During startup operations, the high flux at shutdown alarm is not available. Additional indications available during startup operations include pressurizer and volume control tank levels. During power operations, the high flux at shutdown alarm and audible source range indications are not available. Source range meters and continuous strip chart indication are replaced by power range and intermediate range meters and a continuous strip chart which selectively displays these indications. When the rods are in automatic, rod insertion low and low-low alarms are available. When rods are in manual, Overtemperature Delta Temperature trip, alarm, and turbine runback are available.