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December 13, 1983

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

SUBJECT: Dresden Station Units 2 and 3
RODEX-2 Confirmatory Calculations
Supporting the Exxon Fuel Reload
NRC Docket Nos. 50-237 and 50-249

REFERENCES (a): Letter, B. Rybak to H. R. Denton "Dresden Station Unit 3 Response to NRC Requirement for Confirmatory Calculations Supporting the Exxon Fuel Reload NRC Docket No. 50-249," April 25, 1983.

(b): Letter, D. M. Crutchfield to D. L. Farrar "Extension of Deadline for Confirmatory Calculations Required by the Cycle 8 Reload SER," July 7, 1983.

(c): Safety Evaluation by the Office of Nuclear Reactor Requlation Supporting Amendment No. 75 to Provisional Operating License No. DPR-19 Dresden Unit 2 Docket No. 50-237, April, 1983.

(d): Letter, C. O. Thomas to J. C. Chandler, "Acceptance for Referencing of Licensing Topical Report XN-NF-81-58P RODEX-2 Fuel Rod Thermal Mechanical Response Evaluaton Model Revision 2," November 16, 1983.

Dear Mr. Denton:

References 2 and 3 formally transmitted the NRC's requirement that CECo confirm the adequacy of the present calculations of design strain, external corrosion, rod pressure, fuel centerline temperature, transient stress for PCI and MAPLHGR following the approval of ENC's RODEX-2 code. The safety evaluation, Reference 4, covering the RODEX-2 code was issued on November 16, 1983. Subsequently, Exxon Nuclear performed these confirmatory calculations using the NRC approved version of RODEX-2. The results, provided in Attachment 1, are applicable to both Dresden Units 2 and 3 due to nearly identical plant design, plant fuel management and fuel design.

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To the best of my knowledge and belief the statements contained herein are true and correct. In some respects these statements are not based on my personal knowledge but upon information furnished by other Commonwealth Edison employees and consultants. Such information has been reviewed in accordance with Company practice and I believe it to be reliable.

Your expeditious response to these requests will be appreciated. One (1) signed original and forty (40) copies of this transmittal are provided for your use.

Very truly yours,

Bob Rybak
Nuclear Licensing Administrator

BR/JWB/lm

cc: Region III Inspector - Dresden

Attachment (1): Dresden 2/3 8X8 Fuel Analysis with the Approved Version of RODEX 2.

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ATTACHMENT 1

DRESDEN 2/3 8x8 FUEL ANALYSIS WITH

THE APPROVED VERSION OF RODEX2

The maximum fuel centerline temperature has been calculated as a function of burnup for Dresden-3 using the approved version of RODEX2. The RODEX2 calculations at 20% overpower (20% above MAPLHGR limits) at specific intervals show a maximum fuel centerline temperature of 4276°F at BOL, decreasing gradually to 3166°F at EOL. This compares to a fuel melt temperature of 5081°F at BOL decreasing to 4879°F at EOL. Thus the minimum margin to melt is always greater than 800°F. The previous fuel centerline temperature calculation was based on a mechanical design LHGR limit instead of the MAPLHGR limit and used a very conservative power history and an older version of RODEX2.

An end-of-life pressure calculation was made using the approved version of RODEX2, which shows a maximum fill gas pressure of 914 psia. This is less than the core fluid pressure (>1000 psia).

Steady state strain calculations for the Dresden 3 X-1 fuel design were performed using a preliminary version of RODEX2. The approved RODEX2 version has been run using the same input as for this earlier Design Report analysis. Results of the calculation using the approved version of RODEX2 indicate the mechanical design criteria (EOL strain, transient stress and external corrosion) was conservatively predicted by the previous calculation presented in the Design Report. Thus the results of the earlier analysis remain conservatively applicable.

The ENC MAPLHGR analyses for Dresden 3 Cycle 8 used a preliminary version of RODEX2 for stored energy initialization. The revised MAPLHGR analysis[1] used the approved version of RODEX2 for initialization. Though the approved version of RODEX2 calculates higher initial stored energy than the preliminary versions, the MAPLHGR's are the same in these two reports because the Mechanical design LHGR limit is initially used to determine proposed MAPLHGR limits. ECCS analyses are then performed to confirm that these MAPLHGR values meet 10 CFR 50.46 acceptance criteria, i.e., PCT<2200°F). The reanalysis for Dresden 3 Cycle 9[1] using the approved RODEX2 for stored energy initialization resulted in different PCT's than the previous analysis, but still demonstrated margin to 2200°F. Therefore the previous MAPLHGR values remain applicable. In addition to using the approved RODEX2, the MAPLHGR reanalysis also used a more realistic (yet still bounding) power history as discussed with the NRC Staff during the RODEX2 review.

All of the above analysis results are applicable to both Dresden 2 and 3 because of the similarity in plant design, plant fuel management and fuel design.

(1) XN-NF-81-75 Supplement 1, "Dresden Unit 3 Revised MAPLHGR Analysis Using the ENC EXEM Evaluation Model", July 1983.