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April 25, 1983

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

Subject: Dresden Station Unit 3
Response to NRC Requirement for
Confirmatory Calculations
Supporting the Exxon Fuel Reload
NRC Docket No. 50-249

References (a): Safety Evaluation by the Office of Nuclear Reactor Regulation Supporting Amendment No. 63 to Facility Operating License No. DPR-25 Commonwealth Edison Company Dresden Nuclear Power Station Unit 3 Docket No. 50-249.

(b): Letter, D. B. Vassallo (NRC) to L. O. DelGeorge (CECo), NRC Requirement for Confirmatory Calculations for D3C8, August 27, 1982.

(c): Teleconference, B. Rybak/J. Wojnarowski/ Boyar to R. Gilbert/Shih-Liang Wu, April 11, 1983.

Dear Mr. Denton:

The NRC's Safety Evaluation Report (SER) for Dresden 3, Cycle 8 Reload XN-1 (Reference 1) identified that ENC's RODEX 2 code for modeling fuel rod behavior was not yet approved and required that confirmatory calculations of MAPLHGR, fuel rod internal pressure and fuel centerline temperature be provided prior to ENC bundle exposures exceeding 10,000 MWD/MT. In addition, a related footnote was added by the Staff to the MAPLHGR Technical Specification (Figure 3.5-1). Exxon Nuclear has performed these confirmatory calculations using the NRC approved GAPEXX code out to an assembly average burnup of 15,000 MWD/MT. The results, provided in the attached table, show that the peak clad temperature and metal-water reaction limits specified in 10CFR50.46 are met with the current MAPLHGR limit of 13 kw/ft. The internal pin pressure and fuel centerline temperature up to 15,000 MWD/MT are substantially less than the system pressure and melting temperature, respectively, and are therefore acceptable.

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At the present time, the maximum assembly burnup of the Exxon reload fuel in Dresden 3 is approximately 8,400 MWD/MT; we are projecting reaching 10,000 MWD/MT in late June of this year; and the end of cycle exposure is predicted to be around 12,800 MWD/MT in late October. During the Reference 3 telephone conference, we were informed that the NRC plans to approve a modified version of RODEX-2 (i.e. Revision 2) by July 15 of this year. Since it appears that NRC approval of Revision 2 of RODEX-2 will be almost coincident with Dresden 3 reaching 10,000 MWD/MT on the Exxon reload fuel, we request an extension of your deadline for performing confirmatory calculations of design strain, external corrosion and transient stain. We propose, instead, to supply these confirmatory calculations prior to reaching 15,000 MWD/MT or prior to Dresden 3, Cycle 9 startup, whichever occurs first. This will allow us to perform the required calculations with the NRC approved version of RODEX-2. This approach was discussed and tentatively agreed to by members of your staff during the Reference 3 telephone conference.

The RODEX-2 calculated EOL strain reported in XN-NF-81-21(P) Rev. 1, is 0.18%, which is in general agreement with irradiated fuel data for ENC fuel. This calculated EOL strain value corresponds to an average assembly exposure of 33,000 MWD/MTU. For a burnup range of 10,000 to 15,000 MWD/MTU, the calculated steady state strain would be less than 0.18%, which is small in comparison to the strain limit of 1.0%.

Corrosion and hydrogen absorption calculations are based on MATPRO-11 correlations. The calculated EOL corrosion layer is 0.00077 inches. For a burnup range of 10,000 to 15,000 MWD/MTU, the corrosion layer increase is calculated to be 0.000126 inches, which is considered insignificant.

Stress levels experienced during a power transient will not increase significantly over a burnup range of 5,000 MWD/MTU. Since at 10,000 MWD/MTU, clad creep is sufficient to cause a steady state contact between the pellet and cladding, transient stress levels produced at burnups of 10,000 or 15,000 MWD/MTU would be nearly equal.

Based on the preceeding discussion, Commonwealth Edison feels that an extension of the NRC's deadline for confirmatory calculations to 15,000 MWD/MT assembly average exposure is acceptable and will not compromise the safe operation of Dresden Unit 3 employing Exxon Nuclear Company reload fuel.

In addition to supplying confirmatory calculations for design strain, external corrosion, and transient strain, Commonwealth Edison will also submit a reanalysis of MAPLHGR, internal rod pressure, and fuel rod centerline temperature using the approved version of RODEX-2 prior to Dresden 3, Cycle 9 startup.

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,

B. Rybak

Bob Rybak
Nuclear Licensing Administrator

BR:JWB:klm/lm

cc: Region III Inspector - Dresden (w/o Att.)

Attachments (1): Table: GAPEXX Confirmatory Calculations of MAPLHGR, Rod Internal Pressure, and Fuel Rod Centerline Temperature

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Attachment 1

GAPEXX Confirmatory Calculations of
MAPLHGR, Rod Internal Pressure, and
Fuel Centerline Temperature

Parameter	Exposure 10,000 MWD/MT	Exposure 15,000 MWD/MT
MAPLHGR (kw/ft)	13	13
PCT (^{o}F)	1886	1861
Maximum Cladding Oxidation	0.79%	0.70%
Maximum Centerline Temperature (^{o}F)	2935.	2874.
Maximum Internal Pressure (psia)	413.	549.

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