Commonwealth Edison
1400 Opus Place
Downers Grove, Illinois 60515

December 31, 1991

Dr. Thomas E. Murley, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

ATTN: Document Control Desk

Subject: Dresden Station Units 2 and 3
Quad Cities Station Units 1 and 2
LaSalle County Station Units 1 and 2
Topical Report for Neutronics Methods for
BWR Reload Design Using CASMO/MICROBURN
NRC Docket Nos. 50-237/249, 50-254/265 and 50-373/374

Reference: M. Richter (CECo) letter to T. Murley (NRC), dated December 12, 1990, submitting CECo Topical Report for Neutronics Methods for BWR Reload Design (NFSR-0085).

Dr. Murley:

Commonwealth Edison Company (CECo) hereby submits for NRC Staff review and approval the licensing topical report titled "Commonwealth Edison Company Topical Report - Benchmark of CASMO/MICROBURN BWR Nuclear Design Methods", NFSR-0091, Revision 0. This topical report summarizes the nuclear analysis methods employed by CECo, based on Siemens Nuclear Power Corporation's (formerly Advanced Nuclear Fuels) approved methodology, and is being submitted in support of reload nuclear design analyses for Dresden, Quad Cities, and LaSalle County Stations. A supplement to this topical report is scheduled to be issued in March 1992 which will describe the means by which the neutronic methods will be used for the analysis of abnormal neutronic events. Comparisons to vendor results for these neutronic licensing events will be included in the supplement.

CECo has two fuel vendors for its three BWR stations: Siemens (SNP) is the fuel supplier for Dresden Station; and General Electric (GE) is the fuel supplier for Quad Cities and LaSalle County Stations. Due to the differences between the SNP and GE methodologies with respect to the Critical Power correlation and the associated uncertainties, CECo is currently not planning on using the SNP methods described in the attached topical report for neutronic licensing calculations for Quad Cities and LaSalle County Stations (which has GE-supplied fuel). However, CECo may utilize the SNP steady-state neutronic methods for Quad Cities and LaSalle County fuel management and operational support analyses as outlined in Table 1.3-1 of the attached topical report. A similar topical report for Quad Cities and LaSalle County Stations, which is based on GE's most recently approved neutronics methodology, was submitted in December 1990 (Reference) and is currently under review by your staff.

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It should be noted that very recently, after completion of the attached topical report, CECo discovered a minor error in the MICROBURN code obtained from SNP. The impact of this error, which involves the manipulation of the samarium number density array to reflect fuel shuffling, occurs near beginning of cycle (BOC) only. It has been assessed by SNP and has been shown to affect hot and cold eigenvalues by approximately 0.0005 Δk or less. A summary letter from SNP is enclosed. No correction for this error has been incorporated in the attached topical report. The corrected version of MICROBURN will, however, be implemented by CECo after receipt from SNP and appropriate testing.

CECo does not plan to repeat the entire benhmark because: 1) there is no impact on CECo comparisons to SNP results in the topical report (since they are equally affected); and 2) the impact on comparisons to BOC plant data are very slight and well within the uncertainty of the calculations for both hot and cold conditions. Sample cases, however, will be reperformed and included in the supplement discussed above to demonstrate the small impact consistent with SNP's assessment.

CECo believes that licensing our capability to perform Reload Nuclear Design and Safety Analyses is critical in efforts to develop and maintain excellence in the area of engineering and technical support for our Nuclear Stations. The NRC has encouraged utilities to perform such analyses and expects CECo to perform as an industry leader in this area. This BWR submittal is the latest element of CECo's overall program to perform reload licensing analyses in-house. At this time, CECo has completed more than twenty nuclear designs for our PWR reloads using NRC-approved methods, and has submitted topical reports in support of the PWR safety analysis methods, which will be applied to reload safety analyses of record upon approval by your staff.

CECo plans to begin using the BWR methods described in the attached topical report as the neutronic analyses of record for Dresden Unit 3 Cycle 14 which is currently scheduled for start up in June 1993. To support this effort, CECo is requesting approval of the topical report, and its planned supplement, by December 1992, as indicated in previous discussions with your staff.

Please contact this office should further information by required.

Respectfully,

Peter L. Piet
Nuclear Licensing Administrator

Attachments: 1. Commonwealth Edison Company Topical Report - Benchmark of CASMO/MICROBURN BWR Nuclear Design Methods
2. Letter from U. Fresk (SNP) to R. J. Chin (CECo) dated December 26, 1991 concerning MICROBURN-B computer program error

cc: A. B. Davis - Regional Administrator, Region III
B. L. Siegel - Dresden/LaSalle Project Manager, NRR
L. N. Olshan - Quad Cities Project Manager, NRR
R. C. Jones - Reactor Systems Branch Chief, NRR (w/2 copies of Att.)
W. G. Rogers - Senior Resident Inspector, Dresden
T. Taylor - Senior Resident Inspector, Quad Cities
D. E. Hills - Senior Resident Inspector, LaSalle County

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ATTACHMENT 1

COMMONWEALTH EDISON COMPANY TOPICAL REPORT

BENCHMARK OF CASMO/MICROBURN BWR NUCLEAR DESIGN METHODS

(NFSR-0091, REVISION 0)

ATTACHMENT 2

SIEMENS NUCLEAR POWER CORPORATION

LETTER TO

COMMONWEALTH EDISON COMPANY

(DATED DECEMBER 26, 1991)

SIEMENS

December 26, 1991
YUF:374:91

Dr. R. J. Chin
Nuclear Fuel Services
Commonwealth Edison Company
Room 900 Edison Building
P. O. Box 767
Chicago, IL 60690

Dear Dr. Chin:

Subject: SHUFL Routine Programming Error

Per your discussion with Mr. O. C. Brown, the following nonproprietary information is given regarding the error discovered in the SHUFL routine of MICROBURN-B.

Specifically, the number density array for samarium is not shuffled properly during a fuel shuffle from Cycle N-1 to Cycle N. This discrepancy, which impacts BOC only, is deemed to have no significant impact on any calculated results as the difference in calculated core k-eff is well within the uncertainty of the calculation for both hot and cold eigenvalues; there is also no significant impact on the associated hot power distributions. There is no impact on MCPR margin, and LHGR/APLHGR margin at BOC differs by less than 0.5 percent. The results show the impact of the SHUFL routine error to be negligible. SNP plans to include a correction to MICROBURN-B as part of the next update of the code.

Very truly yours,

Udell Fresk

(Mrs.) Udell Fresk
Contract Administrator

rc

c: J. Stanton (fax)
D. R. Zahakaylo

Siemens Nuclear Power Corporation

Corporate Offices

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