



1901 Gratiot Street, St. Louis

**Donald F. Schnell**  
Vice President

October 2, 1987

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555

Gentlemen:

ULNRC- 1642

CALLAWAY PLANT  
DOCKET NO. 50-483  
CALLAWAY PLANT UPDATING SUBMITTAL

- References: 1) ULNRC-1471, dated March 31, 1987  
2) ULNRC-1494, dated April 21, 1987  
3) ULNRC-1565, dated July 31, 1987

References 1 and 2 transmitted the Union Electric application to uprate the Callaway Plant to 3565 MWt core power level. This letter provides the requested fluence calculation information which supports the subject submittal as discussed in a telecon between Union Electric and the NRC on September 25, 1987.

The Callaway Plant Upgrading Submittal fluence calculation is based on the Westinghouse version of the discrete ordinate code DOT-3.5 which used the SAILOR cross section data set. See Reference 3, Attachment 1 for a more complete discussion of the SAILOR cross section data set. An R-theta calculation was performed with 18 groups above 1 MeV and  $S_8$  angular quadrature. Scattering is treated with a  $P_3$  approximation. The fission energy spectrum accounts for anticipated changes due to burnup including increases in plutonium.

The Callaway Plant Upgrading Submittal uses, in lieu of additional conservatisms, plant specific core power distributions based upon measurements of Cycle 1 parameters. Previous predictions of fluence during Cycle 1 were based on 3411 MWt and an out-in loading pattern which has inherently high leakage.

The Cycle 2 fluence calculation was based upon best estimate calculations assuming 3411 MWt and a low leakage loading pattern (checkerboard pattern). The low leakage loading pattern will be employed at Callaway for Cycle 2 onward.

Cycles 3 and 4 are transition cores to Vantage 5 fuel and design values at 3565 MWt are used in the Upgrading Submittal fluence calculations. Cycle 5 is a full Vantage 5 core and is

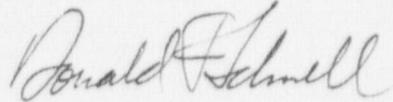
8710090061 871002  
PDR ADDOCK 05000483  
P PDR

Ass  
11

based upon design values at 3565 MWt. Cycle 5 average fluxes were modified and used to reflect actual cycle burnup for fluences beyond Cycle 5.

Since we anticipate core design changes which will only reduce leakage, no additional margin has been added to account for future design changes. It should also be noted that this methodology was employed to generate fluence for the pressure/temperature curves as submitted in Reference 3. If additional information is requested, please contact us.

Very truly yours,



Donald F. Schnell

WEK/mat

STATE OF MISSOURI )  
                          )     S S  
CITY OF ST. LOUIS )

Donald F. Schnell, of lawful age, being first duly sworn upon oath says that he is Vice President-Nuclear and an officer of Union Electric Company; that he has read the foregoing document and knows the content thereof; that he has executed the same for and on behalf of said company with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By Donald F. Schnell  
Donald F. Schnell  
Vice President  
Nuclear

SUBSCRIBED and sworn to before me this *2nd* day of *October*, 1987

Barbara J. Pfaff  
BARBARA J. PFAFF  
NOTARY PUBLIC, STATE OF MISSOURI  
MY COMMISSION EXPIRES APRIL 22, 1989  
ST. LOUIS COUNTY

cc: Gerald Charuoff, Esq.  
Shaw, Pittman, Potts & Trowbridge  
2300 N. Street, N.W.  
Washington, D.C. 20037

Dr. J. O. Cermak  
CFA, Inc.  
4 Professional Drive (Suite 110)  
Gaithersburg, MD 20879

W. L. Forney  
Chief, Reactor Project Branch 1  
U.S. Nuclear Regulatory Commission  
Region III  
799 Roosevelt Road  
Glen Ellyn, Illinois 60137

Bruce Little  
Callaway Resident Office  
U.S. Nuclear Regulatory Commission  
RR#1  
Steedman, Missouri 65077

Tom Alexion (2)  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Mail Stop 316  
7920 Norfolk Avenue  
Bethesda, MD 20014

Ron Kucera, Deputy Director  
Department of Natural Resources  
P.O. Box 176  
Jefferson City, MO 65102

Manager, Electric Department  
Missouri Public Service Commission  
P.O. Box 360  
Jefferson City, MO 65102

bcc: D. Shafer/A160.761  
/QA Record (CA-758)  
E210.01  
Nuclear Date  
DFS/Chrono  
D. F. Schnell  
J. E. Birk  
J. F. McLaughlin  
A. P. Neuhalfen  
R. J. Schukai  
M. A. Stiller  
G. L. Randolph  
R. J. Irwin  
H. Wuertenbaecher  
W. R. Campbell  
A. C. Passwater  
R. P. Wendling  
D. E. Shafer  
D. J. Walker  
O. Maynard (WCNOC)  
R. C. Slovic (Bechtel)  
G56.37 (CA-460)  
Compliance (J. E. Davis)  
NSRB (Sandra Auston)