Commonwealth Edison Company
1400 Opus Place
Downers Grove, IL 60515-5701

May 23, 1997

ComEd

United States Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: NRC Document Control Desk

Subject: Information Pertaining to the Braidwood Steam Generator Leakage Assessment

Braidwood Nuclear Power Station Unit 1
Byron Nuclear Power Station Unit 1
NRC Docket Numbers: 50-454 and 50-456

Reference: Teleconference dated May 19, 1997, between the Commonwealth Edison Company and the Nuclear Regulatory Commission

During the Referenced Teleconference, the Commonwealth Edison Company (ComEd) and the Nuclear Regulatory Commission (NRC) discussed the preliminary condition monitoring leak rate calculations for Braidwood Unit 1 Cycle 6, where it was observed that the end of cycle as found leak rate value exceeded the predicted leak rate. ComEd stated that a root cause investigation would be performed to assess why the leak rate was underpredicted. The Staff requested that ComEd provide a description of the areas that would be assessed along with a schedule. This information is contained in Attachment A. Additionally, the Staff requested that ComEd provide the Braidwood Cycle 6 growth rates for tube support plate indications, which is provided in Attachment B.

If you have any questions regarding this correspondence, please contact Denise Saccomando, Senior Licensing Administrator at 630-663-7283.

Sincerely,

John B Hosmer

John B. Hosmer
Engineering Vice President

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Attachments

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cc: D. Lynch, Senior Project Manager-NRR
G. Dick, Byron/Braidwood Project Manager-NRR
S. Burgess, Senior Resident Inspector-Byron
C. Phillips, Senior Resident Inspector-Braidwood
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ATTACHMENT A

During preliminary condition monitoring Main Steam Line Break (MSLB) leak rate calculations for Braidwood Unit 1 end of cycle six, EOC-6, it was observed that the end of cycle as-found leak rate value exceeded the predicted leak rate based upon the beginning of cycle six (BOC-6), voltage distribution and a Cycle 5A hybrid growth distribution. The predicted leak rate for EOC-6 for the limiting steam generator was 6.99 gpm. The actual leak rate, based upon EOC-6 as-found voltage distribution, is 11.5 gpm. The higher leak rate resulted from an as-found distribution of indications which had a higher number of indications in the tail of the distribution than predicted. This is evident in that over 80% of the leak rate is attributable to the ten largest indications. In order to accurately perform the end of cycle calculations for Braidwood 1 Cycle 7, and to assess the impact on the current Byron 1 Cycle 8 calculations, a root cause analysis of the leak rate discrepancy has been initiated. Once the root cause of the discrepancy has been determined, the Braidwood end of Cycle 7 calculations will be performed incorporating corrective measures from the root cause. An assessment of the impact on the current Byron 1 Cycle 8 calculations will be performed.

In order to fully assess the root cause for the discrepancy between the predicted and actual end of cycle leak rates, the inputs which could possibly affect the end of cycle distribution and leak rate calculations are being evaluated. The root cause is being performed independently by two organizations, Westinghouse and EPRI, using two separate Monte Carlo systems. The workscope will involve approximately fifteen different Monte Carlo runs. This work will be performed simultaneously. A brief description of the areas which are being assessed is presented below.

Growth Rates

In order to test the current calculation methodology, the actual Cycle 6 growth rates will be applied to the BOC-6 voltage distribution. The results will then be compared to the actual as found EOC-6 voltage distribution.

Other growth evaluations include: use the largest growth rates from all four steam generators in one distribution, developing a voltage dependent growth rate (assessing if large indications grow faster), use of growth rates with varying distributions, and comparing short cycle growth rates to full cycle growth rates.

Number of Indications

As the number of indications, the size of indications, and growth points increase, a higher density of indications and growth points in the probability density function toward the higher end of the distribution may develop. The impact of this may lead to an increase in the number of large indications in the tail of the distribution. This issue will be investigated by increasing the number of indications in the growth distribution and BOC

voltage distribution, and assessing how the voltage distribution and leak rate increase with the number of indications.

POD

The end of cycle calculations will be performed using different constant Probability of Detections (POD) and a voltage dependent POD.

Distribution Probability

Because the end of cycle leak rate is strongly dependent on the tail of the distribution, the leak rate may be more accurately predicted by using a higher probability to define the tail of the distribution. Leak rates will be calculated at the 95%, 99% and other probabilities to assess the predicted vs. as-found leak rates. Although this method may more accurately predict the leak rate, it will not change the predicted end of cycle distribution.

Growth Distribution

Other growth distributions will be assessed to determine if there is a distribution which provides a better fit of the data.

NDE Uncertainty

Non-Destructive Examination (NDE) uncertainty is applied to the as-found voltage distribution results before determining an end of cycle voltage distribution and leak rate. The calculations will be performed without the NDE uncertainty to evaluate its impact on the end of cycle voltage distribution and leak rate.

The sensitivity analyses discussed above will be performed for Braidwood 1 Cycle 6 voltage distributions and benchmarked using other Braidwood 1 and Byron 1 distributions.

Schedule

Braidwood 1 IPC Leak Rate Root Cause Analysis Complete: June 15, 1997

Root Cause Analysis Results Factored into Braidwood EOC-7 Predictions: July 15,1997

Assessment of Byron EOC-8 Calculations based upon Braidwood root cause and if necessary Re-perform Calculations: July 15, 1997

Submittal of Braidwood 1 90 Day Report: August 1, 1997

ATTACHMENT B

Braidwood Unit 1
Signal Growth Statistics on an EFPY Basis

Delta Volts	CYCLE 6	
	No. of Obs	*CPDF
-0.4	5	0.0007
-0.3	23	0.0041
-0.2	54	0.0121
-0.1	205	0.0424
0.0	709	0.1471
0.1	1614	0.3855
0.2	1497	0.6066
0.3	862	0.7339
0.4	534	0.8127
0.5	380	0.8689
0.6	196	0.8978
0.7	145	0.9192
0.8	95	0.9332
0.9	80	0.9451
1.0	49	0.9523
1.1	62	0.9615
1.2	36	0.9668
1.3	29	0.9711
1.4	27	0.9750
1.5	22	0.9783
1.6	25	0.9820
1.7	12	0.9838
1.8	16	0.9861
1.9	8	0.9873
2.0	6	0.9882
2.1	6	0.9891
2.2	4	0.9897
2.3	5	0.9904
2.4	3	0.9908
2.5	3	0.9913
2.6	1	0.9914
2.7	3	0.9919
2.8	5	0.9926
2.9	2	0.9929

Delta Volts	CYCLE 6	
	No. of Obs	*CPDF
3.0	2	0.9932
3.1	1	0.9934
3.2	1	0.9935
3.3	2	0.9938
3.4	2	0.9941
3.5	1	0.9942
3.6	5	0.9950
3.7	3	0.9954
3.8	1	0.9956
3.9	3	0.9960
4.0	2	0.9963
4.1	1	0.9965
4.2	7	0.9975
4.5	2	0.9978
4.6	1	0.9979
4.7	2	0.9982
5.0	1	0.9984
5.3	2	0.9987
5.8	1	0.9988
6.0	3	0.9993
6.3	1	0.9994
7.1	1	0.9996
7.3	1	0.9997
8.1	2	1.0000
TOTAL	6771	

* Cumulative Probability Distibrution Function