Iowa Electric Light and Power Company

January 3, 1980
LDR-80-9

LARRY D. ROOT
ASSISTANT VICE PRESIDENT
NUCLEAR GENERATION

Mr. James G. Keppler, Director   *50-331*
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

         Subject: Boron Loss From BWR Control Blades
         Reference: IE Bulletin No. 79-26
            File: A-101a

Dear Mr. Keppler:

        Please find attached our responses to Items 1 and 2 of
IE Bulletin 79-26. Responses to Items 3 and 4 will be submitted
within the intervals listed in Item 5 of the bulletin.

                              Very truly yours,

                              Larry D. Root
                              Assistant Vice President
                              Nuclear Generation

LDR/JVS/n
Attachment

cc: U.S. Nuclear Regulatory Commission
     Office of Inspection and Enforcement
     Division of Reactor Operations Inspection
     Washington, D.C. 20555

     D. Arnold
     S. Tuthill
     L. Liu
     D. Mineck
     K. Meyer
     D. Wilson
     B. York

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Item No. 1

The operating history of the reactor is to be reviewed to establish a record of the current B^{10} depletion averaged over the upper one-fourth of the blade for every control blade; the record is to be maintained on a continuing basis. This action is required on all reactors whether shutdown for refueling or operating.

Response

1. The operating history of the DAEC reactor has been reviewed and a record of the current B^{10} depletion averaged over the upper one-fourth of each control blade has been made. The method for calculating the maximum number of SNVTs (NVT x 10E21) is as follows:

$$K_{B-10} = \frac{5.9223 \times 10^{-4}}{(C2)\ (NBUN)} \qquad C2 = .97 \times 10^{-7} \qquad NBUN = 368$$

$$K_{B-10} = \frac{5.9223 \times 10^{-4}}{(.97 \times 10^{-7})\ (368)} = 16.591$$

$$\text{Maximum SNVTs} = \frac{\%B^{10}}{K_{B-10}} = \frac{34}{16.591} = 2.048\ \text{SNVTs}$$

$$\%B^{10} = 34$$

C2 is a plant dependent constant furnished by GE.
NBUN is the number of fuel bundles.
$\%B^{10}$ is the percent of allowable Boron depletion

The records on control blade exposures are being maintained on a continuous basis.

Following is a list of the upper one-fourth control blade exposures as of November 30, 1979. These exposures remain essentially unchanged due to the present control rod configuration.

Control Rod No.	SNVTs	Control Rod No.	SNVTs
1	0.07577	46	1.05403
2	0.13292	47	0.96892
3	0.07575	48	1.35679
4	0.06612	49	0.66616
5	0.21654	50	0.08998
6	0.12314	51	0.07021
7	0.60654	52	0.35794
8	0.12318	53	0.45619
9	0.21683	54	1.09636
10	0.06629	55	0.93590
11	0.07754	56	1.25799
12	0.21896	57	0.93923
13	0.52774	58	1.09362
14	1.19210	59	1.31322
15	1.11327	60	0.35798
16	1.19415	61	0.07207
17	0.52795	62	0.23178
18	0.21884	63	1.00018
19	0.07752	64	1.02800
20	0.23207	65	1.33851
21	0.99931	66	1.08309
22	1.02710	67	1.33730
23	1.33515	68	1.02741
24	1.08302	69	0.99963
25	1.33910	70	0.23207
26	1.02682	71	0.07752
27	0.99963	72	0.21884
28	0.23178	73	0.52795
29	0.07207	74	1.19392
30	0.35792	75	1.11112
31	1.31343	76	1.19290
32	1.09626	77	0.52769
33	0.93875	78	0.21896
34	1.26354	79	0.07754
35	0.93666	80	0.06629
36	1.09776	81	0.21683
37	0.45568	82	0.02318
38	0.35794	83	0.60656
39	0.07019	84	0.12314
40	0.08998	85	0.21639
41	0.66168	86	0.06614
42	1.35649	87	0.07575
43	0.97086	88	0.13291
44	1.05213	89	0.07577
45	1.04190		

Item No. 2

Identify any control blades predicted to have greater than 34 percent B^{10} depletion averaged over the upper one-fourth of the blade by the next refueling outage.

   a.   Describe your plans for replacement of identified control blades.

   b.   Describe measure which you plan to take justifying continued operations until the next refueling specifically addressing (1) any blade with greater than 42 percent depletion averaged over the upper one-fourth of the blade; and (2) the condition where you find greater than 26 percent of the control blades calculated to have greater than 34 percent depletion averaged over the upper one-fourth of the blade.

Response

DAEC will not have any control blades with greater than 34 percent B^{10} depletion averaged over the upper one-fourth of the blade by the next refueling outage. (End of cycle 4B) It is predicted that the following control blades will reach 34 percent B^{10} depletion during cycle 6; 18-15; 26-15; 10-23; 34-23; 18-31; 26-31. We plan to replace these blades at the end-of-the-cycle 5.