Commonwealth Edison
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Address Reply to: Post Office Box 767
Chicago, Illinois 60690

November 1, 1982

Mr. Darrell G. Eisenhut, Director
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Quad Cities Station Unit 2
Barrier Fuel Ramp Test
Information
NRC Docket Nos. 50-265

References (a): L. DelGeorge letter to D. G. Eisenhut
dated December 3, 1981.

(b): T. J. Rausch letter to D. G. Eisenhut
dated August 31, 1982.

Dear Mr. Eisenhut:

In Reference (a), Commonwealth Edison agreed to provide additional information concerning the barrier fuel demonstration test which will be conducted in the latter part of the current Quad Cities Unit 2, Cycle 6. The information (items 1 and 4 of Reference (a)) was originally shceduled for submittal to the NRC in June, 1982 and rescheduled for October, 1982 in Reference (b).

Item 1 refers to providing expected peak local power changes for fuel in the ramp cells and the adjacent buffer zones. This data is provided in Tables 1 and 2 as Linear Heat Generation Rates (LHGR) at nodal locations for individual fuel rods.

In response to Item 2, the estimated failure probability for the barrier fuel in the ramp cells is established to be essentially zero ($<1 \times 10^{-6}$). However, it must be borne in mind that the data base, containing only one failure point (in a population of 47) at much higher burnup and LHGR than in the demonstration, permits only a rough estimate. This number represents the expected number of fuel rods to fail in the ramp cell population of 992 rods. By comparison, an analysis of the power ramp data for reference (non-barrier) fuel (71 ramp tests) indicates that only 0.036 rods would be expected to fail even if the ramp cells were postulated to have fuel with conventional cladding. In both situations it was assumed that the ramp was done with 100% core power capability (i.e., no coastdown prior to the ramp). The reason for such low failure is that the fuel has been protected by a control blade throughout its irradiation; thus the burnup is still very low.

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Please address any questions you may have concerning this matter to this office.

One (1) signed original and thirty-nine (39) copies of this transmittal are provided for your use.

Very truly yours,

Thomas J. Rausch

Thomas J. Rausch
Nuclear Licensing Administrator

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Attachment

cc: Region III Inspector - Quad Cities

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TABLE I: Ramp Cell Maximum LHGR's for

100% Core Power During Ramp

Bundle Location	Maximum LHGR During Ramp (kW/ft)	Maximum Δ LHGR	Rod Segment Nodal Exp. (MWd/ST)
(7,7)	12.39	10.37	2164
(7,8)	12.86	10.54	2528
(8,7)	12.87	10.63	2544
(8,8)	13.02	10.69	2679

* Δ LHGRs above are from before/after the blade pull resulting in peak LHGR during ramping.

TABLE II: Buffer Zone Maximum LHGRs for

100% Core Power During Ramp

Bundle Location	Maximum LHGR During Ramp (kW/ft)	Maximum Δ LHGR	Rod Segment Nodal Exp. (MWd/ST)
(6,6)	5.72	1.18	13,995
(6,7)	5.39	0.96	20,989
(6,8)	7.19	1.59	20,258
(6,9)	5.95	0.57	28,269
(7,9)	6.47	0.87	27,905
(8,9)	6.60	0.86	28,592
(9,9)	8.78	1.10	9,151

* (9,9) has barrier cladding.