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November 4, 1981

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

Subject: Quad Cities Unit 2 Cycle 6
Barrier Fuel Demonstration Program
NRC Docket No. 50-265

References (a): NEDO-24259-A, "Generic Information for Barrier Fuel Demonstration Bundle Licensing" (Submitted May 1980; Reissued February 1981 as Amended and Approved).

(b): R. L. Tedesco letter to R. E. Engle (G.E.), dated November 12, 1980.

(c): J. S. Abel letter to D. G. Eisenhut, dated January 23, 1981.

(d): T. J. Rausch letter to H. R. Denton dated August 21, 1981.

(e): E. D. Swartz letter to H. R. Denton dated July 27, 1981.

Dear Mr. Eisenhut:

The acceptability of the Reference (a) Generic Licensing Topical Report on Barrier Fuel was documented by the NRC Staff in Reference (b) and the associated Topical Report Evaluation. The review concluded that Reference (a) as supplemented in response to Staff questions provides an acceptable generic licensing basis and that the large scale demonstration planned for Quad Cities 2 is licensable. Approval was contingent, however, on receipt of additional information in the following areas:

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a) The detailed operating plan for the demonstration;

b) Plans for on-line failure detection monitoring and post-irradiation examinations; and

c) Other information traditionally submitted in fuel reload applications (physics and thermal-hydraulic analytical results).

In January of this year, Commonwealth Edison Company's intentions with respect to providing these items were described in Reference (c), where we indicated that the requested information could be provided as it became available. More recently, however, during an unrelated meeting in Bethesda, it became obvious that the Staff now desires additional information prior to the Quad Cities 2 Cycle 6 startup.

Each of these areas is addressed in the three attachments to this letter. As stated therein, we believe that further details on the EOC-6 ramp test procedures and the post-irradiation examination (PIE) plans must await final definition until mid-cycle when the actual EOC conditions and outage critical path are better known. Furthermore, the acceptability of the reloaded core for initial startup and normal operation does not appear to be in any way dependent on the EOC test and PIE details.

As described in Attachment C, Commonwealth Edison provided the Reload Licensing Submittal for Quad Cities 2 Cycle 6 in Reference (d). In discussions with the NRC Project Manager, we were informed that the review of the Reload Submittal would require the appropriate fee per 10 CFR 170. We believe that a fee is not appropriate in this case, because the required fee for the Technical Specification changes associated with the forthcoming cycle was submitted in Reference (e). In the past, separate fees for both the proposed Technical Specification changes and the Reload Licensing Submittal were <u>not</u> required. Nevertheless, to avoid any possible delay in the receipt of your approval, we have enclosed a Class III fee remittance in the amount of $4,000.

Since separate fees are being provided for the Technical Specification changes and the Reload Licensing Submittal, we request that you document your reviews by preparing separate SERs for these two issues. This has the advantage of separating any concerns your staff may have with our proposed barrier demonstration tests from the Technical Specifications changes needed to support Cycle 6 operation.

Please direct 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
Boiling Water Reactors

Attachments (3)

cc: Region III Inspector - Quad Cities

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ATTACHMENT A

Additional Information Concerning the Detailed Operating Plan for the Barrier Fuel Demonstration

The cycle management plan for the barrier demonstration will be very similar to a standard control cell core operating strategy with the exception that the target control rod patterns have been developed such that the four control rods in the cells to be ramp tested at EOC will not be withdrawn more than ~ 4.5 feet prior to the test.

The general plans with respect to the EOC test itself have been described (e.g. staggered withdrawals of ~1.5 ft. increments etc.) in the program's semi-annual (Reports (GEAP-25163-1 through 4) for Phase 2 which have been previously distributed to the Reactor Fuels Section of the Core Performance Branch, as well as in the Reference (a) LTR.

Specific plant operating procedures for the EOC special test are currently being developed. It is expected that the final form of the procedures will have been internally reviewed and approved by both GE and CECo by June, 1982. At that time (approximately 8 months prior to the test) the procedures would be available for NRC review, presumably by IE Region III personnel who normally perform procedural level reviews at the station. Minor changes may be necessary, however, as the actual core conditions expected for the test become better defined.

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ATTACHMENT B

Additional Information Concerning On-Line Failure Detection and Post Irradiation Examinations.

1. On-Line Failure Detection

There are three means of detecting significant fuel failures at Quad Cities:

a) On-line monitoring of the off-gas activity at the steam jet air ejectors using a gamma detector. Strip chart recorders and alarms are provided in the control room.

b) Off-gas sampling and isotopic analysis at regular intervals. Samples are taken at the recombiner inlet of the augmented off-gas system and are analyzed based on the sum of seven isotopes.

c) Coolant sampling and isotopic analysis based on samples from the recirculation system or clean-up inlet.

Data acquisition and evaluation from all three methods will be performed at normal intervals during the operating months preceding the EOC ramp test.

One to two weeks prior to the first control rod withdrawal step of the ramp test, the sampling will be performed on a daily basis to adequately characterize the pre-test concentrations and distribution of fission products in the off-gas and coolant.

As the ramp test is performed, the SJAE control room monitor will be carefully observed and checked for any unusual behavior several times per shift between rod withdrawal steps. If any significant activity increase is noted, the frequency of the isotopic analysis of both off-gas and coolant samples will be increased from daily to once per shift.

2. Post-Irradiation Examinations

If the failure detection methods described in Section 1 indicate that fuel failures have occurred during the ramp test or if indicated fission product activity has significantly increased during the cycle any suspect assemblies which are scheduled for reinsertion for Cycle 7 will be sipped during the EOC6 refueling outage. Suspect assemblies which are scheduled for discharge will be sipped off critical path or following the outage.

If no failure indications occur during the ramp test or earlier in the cycle, the extent of sipping will be determined based, in part, on the time available during the refueling outage. The highest priority

assemblies would be the 16 special barrier demonstration assemblies from the 4 ramp test cells and the buffer region assemblies which are scheduled for reinsertion. Since it is not possible to define the critical path activities and schedule this far in advance of the EOC6 outage (Spring, 1983), no further definition of sipping plans seems prudent at this time.

Since barrier demonstration fuel is not expected to be finally discharged for at least three operating cycles, additional post-irradiation examinations have not been defined at this time. The extent of the examinations will be influenced by fuel performance as indicated by:

a. offgas activity history during the demonstration cycles at Quad Cities 2,

b. examination results on the four Lead Test Assemblies in Quad Cities 1, and

c. laboratory studies of barrier fuel ramped in test reactors.

Funding of such tests is also dependent on the future definition and approval of the Phase 3 Work Scope which is subject to future DOE budget uncertainties.

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ATTACHMENT C

Additional Information Concerning the Reload Licensing Analyses

Although CECo's intent was to implement preparatory Technical Specification changes to allow application of 10CFR50.59, the submittal of reload licensing analyses results was planned for the Staff's information in order to fulfill the request of Reference (b) item c "other information traditionally submitted in fuel reload applications".

The preparatory Tech. Spec. changes were docketed via letter of E. D. Schwartz to H. R. Denton, dated July 27, 1981. Subsequently, the Supplemental Reload Licensing Submittal for Quad Cities Nuclear Power Station Unit 2 Reload 5 (Cycle 6) was formally docketed at the request of the Quad Cities project reviewer by letter of T. J. Rausch to H. R. Denton dated August 21, 1981. Although these two submittals should provide all the information requested, CECo and GE are prepared to respond to any further needs in the area of reload analyses.

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