

Consumers
Power
Company

General Offices: 212 West Michigan Avenue, Jackson, Michigan 49201 • Area Code 517 788-0550

April 25, 1975

Mr. Dennis L. Ziemann
Division of Reactor Licensing
US Nuclear Regulatory Commission
Washington, DC 20555

Re: Docket 50-155
License DPR-6
Big Rock Point Plant

Dear Mr. Ziemann:

Your letter of April 2, 1975 requested additional information with respect to the Big Rock Point Reload G-1 submittal. The requested information is submitted in the attachment to this letter.

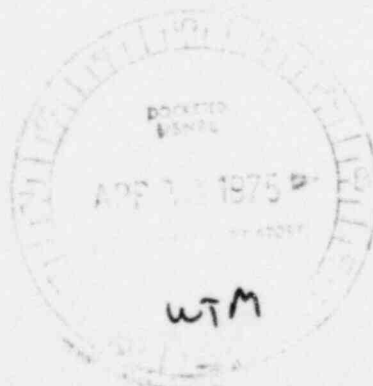
You asked that this information be submitted by April 14, 1975. As discussed with a member of your staff, we have delayed our response to this information request. The wording of the request and that of the Commission's March 19, 1975 order suspending the ASLB proceeding concerning the use of mixed-oxide fuel at the Big Rock Point Plant appeared to be inconsistent with the staff's prior positions in the proceeding. As a result, clarification of the status of Amendment 4 to the Big Rock Point operating license, and our ability to utilize it this fall, is needed. For this purpose, we are concurrently filing with the Commission a petition for Declaratory Order.

Yours very truly,

Ralph B. Sewell
Nuclear Licensing Administrator

RBS/ds

CC: JGKieppler,
USNRC



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RESPONSE TO REQUEST FOR ADDITIONAL
INFORMATION DATED APRIL 2, 1975

Question 1

"Identify the number of mixed-oxide (MOX) fuel bundles, as well as the total number of fuel bundles, in the proposed reload. If the number of MOX fuel bundles is large, the total inventory of MOX in BRP would be large, core physics would be altered and a detailed review would be necessary. Our review procedure for large reloads, as discussed with all US fuel vendors and the ACRS last Winter, would begin with the review of a generic report prepared by the fuel vendor in accordance with the scope established in WASH-1303 and later is GESMO."

Answer

It has been Consumers Power Company's intention to insert approximately 28 new MOX fuel assemblies in the Big Rock Point reactor during the next refueling outage. At the present time, there are 26 mixed-oxide fuel bundles in the Big Rock Point reactor. Assuming the fuel performance of the mixed-oxide fuel is as we expect, then the core constitution following the next refueling outage would be approximately 54 MOX fuel assemblies with the remaining 30 fuel assemblies being all uranium. If the June 20, 1974 submittal for Type Reload G-1 fuel is not approved in a timely manner sufficient to allow fabrication of this type of fuel for use during the next refueling outage, the MOX fuel type will be predominantly Type Reload G (48 Type Reload G plus four NFS DA assemblies and two Exxon Type J2 assemblies). If the Type Reload G-1 fuel assemblies are authorized in a timely manner, we plan to insert approximately eight Reload G type assemblies and 20 Reload G-1 type assemblies during the next refueling outage. (Eight Reload G type assemblies are already fabricated, one on site in storage and seven at the fabricator's shop.) At succeeding refueling outages, we plan to insert approximately 21 MOX fuel assemblies, removing the oldest (or prematurely failed) fuel assemblies from the reactor at that time. At present, the oldest fuel assemblies in the reactor are the all-uranium fuel assemblies and will be until the all-uranium fuel bundles are discharged.

A detailed review of the core physics parameters was performed and submitted in the application for an Amendment to Operating License DPR-6 and request for change to the Technical Specifications dated June 16, 1972. This application covered the transition from the then present UO₂ reload fuel to the mixed-oxide Reload G fuel. This application was subsequently approved on December 6, 1972. Our June 20, 1974 application for Reload G-1 fuel stated that this fuel was similar to the already licensed Reload G fuel presently in use at the Big Rock Point Plant with the exception that it will contain four solid zirconium rods instead of one as contained in the Reload G fuel. The purpose of this modification was to enhance fuel clad temperature performance under assumed Loss of Coolant Accident conditions. As this modification did not result in significant changes in core physics parameters, we have concluded that the Reload G analysis is appropriate for the Reload G-1 type fuel assemblies and ask that, if additional review is required, you review that analysis.

Our license and licensing of reloads for Consumers Power Company's plants are Consumers Power Company's responsibilities, not "all US fuel vendors." We have no idea of what the review procedure is that you reviewed with "all US fuel vendors last winter." In addition, we have contacted our fuel vendor for this fuel and he states that your review procedure was not discussed with him.

Question 2

If Reload G-1 includes no more than seven MOX fuel bundles, provide the information described below.

Answer

Reload G-1 will include more than seven MOX fuel assemblies when use is authorized. (See answer to Question 1.)

Question (a)

Peak cladding temperatures for the LOCA must be calculated using current models as required in 10 CFR 50, Appendix J.

Answer

As reported in our letter of March 27, 1975, we intend to calculate and submit peak cladding temperatures for the Reload G-1 type fuel as well as the Reload G type fuel by July 26, 1975. However, it must be recognized that as the Reload G type fuel is presently in use at Big Rock Point, it will have a higher priority if the time requirements are not sufficient to allow completion of both calculations. If this is the case, the calculations for the Reload G-1 type fuel will be submitted as soon as possible thereafter.

Question (b)

The Exxon UO_2 fuel densification model must be shown to apply to Reload G-1 MOX fuels. This can be accomplished by demonstrating that the G-1 MOX fuels like the G MOX fuel (eg, microstructure thermal stability, process history and referencing all our acceptance of XN-75-11 for Reload G).

Answer

The fuel rods, including pellets, will be manufactured using the same processes for Type G-1 fuel as they were for Type G fuel. Therefore, the microstructure, thermal stability, and process history will be the same for Type Reload G-1 fuel as for Type Reload G fuel. Thus, we have concluded that the Exxon UO_2 fuel densification model applies to Reload G-1 MOX fuel as well as the Reload G fuel for which it has already been accepted.

Question (c)

An appropriate reduction in thermal conductivity for MOX fuel must be included in the stored energy calculation.

Answer

As for the Reload G fuel, Reload G-1 type fuel analyses will appropriately consider thermal conductivity in the stored energy calculation.

Question (d)

Describe the location of reload and residual assemblies and provide the power distribution to be used in LOCA analysis indicating peak power rods in the reload. The use of a fuel densification model should change the burnup at which peak cladding temperatures are expected.

Answer

Licensing analysis of fuel assemblies for Big Rock Point including Reload G-1 type fuel assemblies have been performed on the basis of envelope calculations. These envelopes included the worst cases of conditions and the envelopes are adhered to when designing the precise core loading following identification of fuel which is available to be reloaded in the reactor (after fuel sipping has identified fuel assemblies classified as unsuitable for reuse in the reactor). The assembly power distribution that results in the worst case analysis will be used in the LOCA analysis which will be performed as indicated in (a) above and will be provided with the submittal described in (a) above. As previously stated in (a) above, we will use current models as required in 10 CFR 50, Appendix K, which includes the use of a fuel densification model.

Question (e)

Provide an estimate of the time to collapse using an approved cladding collapse model.

Answer

This was not previously provided because we had concluded that there was no question regarding the ability of this fuel to withstand collapse under the conditions of use in the Big Rock Point reactor. Calculations will be performed and submitted with the information described in (a) above.

Question (f)

Summarize the current performance of Reload G which is the reference cycle for G-1.

Answer

Please refer to Special Reports No 18 and No 19 submitted August 2, 1974 and October 24, 1974, respectively. These reports describe the Cycle 11 and Cycle 12 fuel performances including that of mixed-oxide fuel. The only additional indications available of fuel performance to date are the outstanding

off-gas performance of the plant since the July 1974 refueling. Following start-up and during continuous operation for a period of approximately six months, the off-gas remained steady at a level of approximately 1500 microcuries per second, indicating good performance of all fuel in the reactor at that time (which includes 26 MOX fuel assemblies).

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CLASS	UNCLASS XX	PROP INFO	INPUT	NO CYS REC'D 40		DOCKET NO: 50-155		

DESCRIPTION: Ltr re our letter of 4-2-75
trans the following:

ENCLOSURES: Response to request for additional
info. dated 4-2-75 with respect to the Big
Rock Point Reload G-1 submittal...

PLANT NAME: Big Rock Point Plant

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