Consumers
Power
Company

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

February 9, 1977

Director of Nuclear Reactor Regulation
US Nuclear Regulatory Commission
Washington, DC 20555

DOCKET 50-155 - LICENSE DPR-6 -
BIG ROCK POINT PLANT - MAPLHGR
LIMITS FOR RELOAD G AND G-1U FUEL

The purpose of this letter is to provide responses to questions concerning the more restrictive MAPLHGR limits imposed by Consumers Power Company on the reload G and reload G-1U fuels installed at the Big Rock Point Plant. These questions are a result of a phone conversation with your staff on February 3, 1977. The questions involved explaining the basis for the self-imposed restrictive limits, the development of the restrictive limits, and the monitoring of the restrictive limits to ensure compliance.

On September 28, 1976, Consumers Power Company was informed by Exxon, that for the Exxon G-3 fuel, it had been discovered that the limiting break for unexposed fuel was approximately .25 ft^2. This was inconsistent with the earlier findings that the limiting break for the G and G-1U fuels was the Design Basis Accident (DBA). Because the intermediate break was limiting for G-3, it was selected for the MAPLHGR versus exposure curves. Since smaller breaks are not as sensitive to initial stored energy, this curve did not show the gradual increase with exposure that is seen with the DBA. It was concluded that the G and G-1U curves would probably exhibit the same tendency if evaluated at the intermediate break point. The decision was made to reevaluate the MAPLHGR limits for reload G and reload G-1U fuels based upon the intermediate break size. The results of that analysis have been submitted as a proposed change to the Technical Specifications for the Big Rock Point Plant, Docket 50-155, License DPR-6, dated December 17, 1976. However, in the interim, it was determined by Consumers Power Company that some more restrictive set of MAPLHGR curves be developed for the G and G-1U fuels. These more restrictive MAPLHGR curves were generated utilizing the G-3 curves after correcting for the proper number of rods for both G and G-1U. The actual MAPLHGR curves used in the interim basis consisted of the value for either the current Technical Specifications MAPLHGR or the corrected G-3 value, whichever was more conservative. Enclosures 1 and 2 list the current Technical Specifications MAPLHGR limits, the proposed MAPLHGR limits, and the interim MAPLHGR limits currently in effect for both G-1 and G-1U fuels.

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On October 28, 1976 a Licensee Event Report was issued explaining the situation and indicating that Consumers Power Company had imposed the more restrictive limits. It should be noted that since that date G and G-1U fuels have been maintained within the self-imposed restrictive MAPLHGR limits, and it is the intent of Consumers Power Company to continue operation bound by these limits until the Technical Specifications changes are approved.

The primary method utilized for ensuring core parameters are maintained within their Technical Specifications limits (MAPLHGR, MCHFR and Heat Flux) is GROK, a one-group diffusion theory code based on FLARE. Power distribution calculations are performed based on actual core operating conditions (rod patterns, power level, core flow, etc). These calculations are then adjusted to correlate with power distribution measurements made by the insertion of flux wires into the core. The thermal hydraulic results of these calculations are then compared to Technical Specifications limits and a maximum allowable power level is established. Out-of-core instrumentation (gamma compensated ion chambers) is calibrated to read 100% power at the established maximum allowable power level, and an administrative limit is established to which the results of the heat balance are compared. The primary function of the in-core instrumentation is to determine the necessity for new flux wire calculations by observing trends or changes in power distribution.

David A. Bixel

David A Bixel
Nuclear Licensing Administrator

CC: JGKeppler, USNRC

MAPLHGR LIMITS FOR RELOAD G FUEL

Exposure (MW/ST)	Current Tech Spec MAPLHGR	Proposed Tech Spec MAPLHGR	Interim MAPLHGR
0	6.38	6.453	6.38
214	-	6.750	-
437	-	6.887	-
885	-	6.978	-
1,758	-	6.929	-
1,814	-	-	6.746
2,041	6.79	-	-
3,494	-	6.885	-
4,536	6.76	-	-
5,443	-	-	6.660
6,939	-	6.838	-
9,072	-	-	6.643
9,979	6.86	-	-
10,422	-	6.847	-
13,608	6.97	-	-
13,938	-	6.867	-
14,515	-	-	6.629
18,144	-	-	6.621
19,051	6.95	-	-
21,022	-	6.905	-
25,401	7.05	-	-
27,216	-	-	6.580
27,778	-	6.843	-
34,013	-	6.703	-

MAPLHGR LIMITS FOR RELOAD G-1U FUEL

Exposure (MW/ST)	Current Tech Spec MAPLHGR	Proposed Tech Spec MAPLHGR	Interim MAPLHGR
0	6.40	6.491	6.40
214	-	6.758	-
437	-	6.888	-
884	-	6.960	-
907	6.86	-	6.86
1,769	-	6.970	-
1,814	6.87	-	6.87
3,374	-	-	6.887
3,545	-	6.983	-
4,536	6.90	-	-
5,443	-	-	6.837
7,085	-	6.987	-
9,072	7.05	-	6.819
10,690	-	7.019	-
14,355	-	7.069	-
14,515	7.25	-	6.805
18,144	7.25	-	6.796
21,843	-	7.171	-
27,216	7.28	-	6.755
29,084	-	7.161	-
35,322	-	6.958	-

NRC FORM 195 (2-76)

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50-155
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TO: NRC

FROM: Consumers Pwr Co
Jackson, Michigan
D A Bixel

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Response to NRC questions re MAPLHGR limits imposed by Consumers pwr for reload G & GlU fuel.....

(40 cys encl rec'd)

2p

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Big Rock Pt

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