



**Consumers
Power
Company**

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

December 17, 1976

REGULATORY DOCKET FILE COPY

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



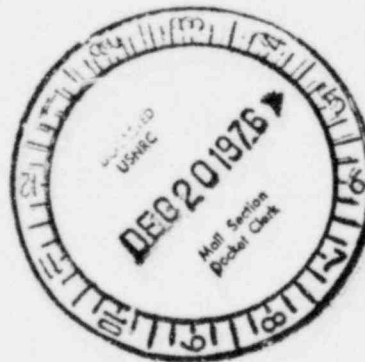
DOCKET 50-155, LICENSE DPR 6 -
BIG ROCK POINT PLANT

Transmitted herewith are three (3) originals and thirty-seven (37) conformed copies of a proposed change to the Technical Specifications for the Big Rock Point Plant, Docket 50-155, License DPR-6.

The purpose of this change is to keep the MAPLHGR limits for Exxon Reload G and Reload G-1U fuel consistent with updated analyses which resulted in lower MAPLHGR limits at high exposure. Events leading to this proposed change to the Technical Specifications were reported in a Licensee Event Report to the Commission dated October 28, 1976.

Ralph B Sewell

Ralph B Sewell
Nuclear Licensing Administrator



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CONSUMERS POWER COMPANY

Docket No 50-155

Request for Change to the Technical Specifications
License No DPR-6

For the reasons hereinafter set forth, the following change to the Technical Specifications of License No DPR-6 issued to Consumers Power Company on May 1, 1964 for the Big Rock Point Plant is requested:

I. Change Table 2 of Section 5.2.1(b) to read as follows:

TABLE 2

MAPLHGR (kW/Ft)

<u>Planar Average Exposure (Mwd/STU)</u>	<u>Modified F</u>	<u>F, E-G, J-1, J-2</u>	<u>Reload G and NFSDA</u>	<u>Reload G-1U</u>
0	-	-	6.453	6.491
200	9.5	9.4	-	-
214	-	-	6.750	6.758
437	-	-	6.887	6.888
884	-	-	-	6.960
885	-	-	6.978	-
1,758	-	-	6.929	-
1,769	-	-	-	6.970
3,494	-	-	6.885	-
3,545	-	-	-	6.983
5,000	9.9	9.7	-	-
6,939	-	-	6.838	-
7,085	-	-	-	6.978
10,000	9.9	9.7	-	-
10,422	-	-	6.847	-
10,690	-	-	-	7.019
13,938	-	-	6.867	-
14,355	-	-	-	7.069
15,000	9.8	9.6	-	-
20,000	8.7	8.6	-	-
21,022	-	-	6.905	-
21,843	-	-	-	7.171
25,000	8.4	8.3	-	-
27,778	-	-	6.843	-
29,084	-	-	-	7.161
34,013	-	-	6.703	-
35,322	-	-	-	6.958

II. Change Table 8.2 in Section 8 to read as follows:

TABLE 8.2

	EEI UO ₂ - PuO ₂	Centermelt		NFS-DA
		Inter- mediate	Advanced	
Minimum Core Burnout Ratio at Overpower	1.5*	1.5*	1.5*	1.5
Transient Minimum Burnout Ratio in Event of Loss of Recirculation From Rated Power	1.5	1.5	1.5	1.5
Maximum Heat Flux at Overpower, Btu/h-Ft ²	500,000	-	-	402,000
Maximum Steady State Heat Flux, Btu/h-Ft ²	410,000	500,000	500,000	329,000
Maximum Average Planar Linear Heat Generation Rate, Steady State, kW/Ft	**	**	**	(See Table 2 Section 5.2.1)
Stability Criterion: Maximum Measured Zero-to-Peak Flux Amplitude, Percent of Average Operating Flux	20	-	-	20
Maximum Steady State Power Level, MW _t	240	-	-	240
Nominal Reactor Pressure During Steady State Power Operation, Psig	1,335	-	-	1,335
Minimum Recirculation Flow Rate, Lb/h (Except During Pump Trip Tests or Natural Circulation Tests as Outlined in Sec 8)	6 x 10 ⁶	-	-	6 x 10 ⁶
Maximum MWd/T of Contained Uranium for an Individual Bundle	23,500	-	-	23,500
Number of Bundles:				
Pellet UO ₂	-	1	3	-
Powder UO ₂	-	1	2	-

Rate-of-Change-of-Reactor Power During Power Operation:

Control rod withdrawal during power operation shall be such that the average rate-of-change-of-reactor power is less than 50 MW_t per minute when power is less than 120 MW_t, less than 20 MW_t per minute when power is between 120 and 200 MW_t, and 10 MW_t per minute when power is between 200 and 240 MW_t.

*Based upon critical heat flux correlation, APED 5286.

**No longer used in reactor.

III. Discussion

Break spectrum sensitivity studies for the heatup of Exxon Reload G-3 fuel have indicated that the limiting break size is 0.25 ft^2 instead of the 3.926 ft^2 used in previous ECC analyses of Exxon Reload G and Reload G-1U fuel. Subsequent reanalyses of the heatup of these last two fuel types with this change in limiting break size and updates in various portions of the Exxon Nuclear Co's Non-Jet-Pump Boiling Water Reactor Fuel-Heatup-Model (NJP-BWR-FHM) have provided new MAPLHGR Limits versus exposure. The new MAPLHGR limits are slightly higher at low exposure and are slightly lower at exposures beyond $9,072 \text{ MWd/STU}$ than those currently in Table 2 of Section 5.2.1(b) of the Big Rock Point Technical Specifications. The revised MAPLHGR values in this proposed change to the Technical Specifications will conform with these new limits.

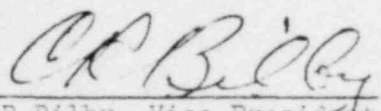
Updates to the NJP-BWR-FHM analysis are listed below:
(Items No 1 to 17 on Pages 3 and 4 of XN-76-55.)

1. Reduction of axial peaking in GAPEX from 1.5 to 1.4 to add conservatism and consistency with analyses for other plants.
2. A reduction of convective heat transfer coefficient in GAPEX to establish consistency with HUXY.
3. Minor changes in mixed-oxide weight fractions for better consistency with the fuel design report⁽²⁾.
4. A doubling of points in the gap coefficient and hot gap versus LHGR look-up table in HUXY for improved solution convergence.
5. A reduction of HUXY time step size in the adiabatic heatup and spray cooling periods to ensure solution convergence.
6. A switch after 40 seconds from the JSSS normalized power curve to the ANS curve as described in Reference 5.
7. A replacement of the fuel pellet power depression versus radius table in HUXY for Reload G mixed-oxide fuel by one which may be conservatively applied to both mixed-oxide and all UO_2 fuel pins in the fuel type.
8. Application of thermal conductivity penalty to mixed-oxide fuel pins alone and not to all fuel pins in a mixed-oxide bundle.
9. A change in the Yamanouchi canister quench algorithm in HUXY so that all parameters are evaluated relative to the input plane of interest. This was done for SER compliance. Previously some parameters were evaluated at locations other than the plane of interest.
10. A correction of canister inside width from 6.453 to 6.543 inches.
11. A reduction of initial zirc-oxide thickness in HUXY from 0.0000324 inch to 0.000021 inch to be consistent with most recent shop data.


12. A change in the modeling of inert pins from solid zirc bars to zirc-clad zirc bars with radial gap.
13. Increased radial nodding of inert pins to ensure convergence.
14. A change in the quench plane of interest from 75% below the top of the core to mid-core to be self-consistent within the analysis.
15. An expansion of the Ellion film boiling look-up table in HUXY to adequately cover all conditions in the Big Rock Point LOCA break spectrum.
16. A correction of end-of-life local peaking factors used in previous analyses.
17. An exact evaluation of the burn-up condition associated with each MAPLHGR point.

CONSUMERS POWER COMPANY

By


C R Bilty, Vice President
Production & Transmission

Sworn and subscribed to before me this 17th day of December 1976.


Linda R Thayer, Notary Public
Jackson County, Michigan

My commission expires July 9, 1979.

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DESCRIPTION

Ltr. w/attached....notorized 12/17/76....
Amdt. to ol/change to tech spec. to keep
the MAPLHGR limits for Exxon Reload G and
Reload G-1U fuel consistant with updated
analyses which resulted in lower MAPLHGR
limits at high exposure.

(5-P)

PLANT NAME:
Big Rock Point

ENCLOSURE

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ACKNOWLEDGED

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