



NORTHERN STATES POWER COMPANY

MINNEAPOLIS, MINNESOTA 55401

September 19, 1980

Director of Nuclear Reactor Regulation
U S Nuclear Regulatory Commission
Washington, DC 20555

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
Docket No. 50-282 License No. DPR-42
50-306 DPR-60

Supplement to License Amendment Dated
May 6, 1980 SI Actuation and Power Distribution Limits

The staff has requested additional information concerning this license amendment. The staff questions and the NSP responses associated with the Westinghouse fuel are as follows:

Question 1

The effects of rod bow on DNBR margin have been at least partially accounted for in previous licensing reviews by the application of generic thermal margin credits such as (1) the DNBR correlation statistics, (2) the rod pitch reduction factor and (3) the thermal diffusion coefficient value. Please provide the appropriate values for the DNBR margins represented by these parameters for the Prairie Island plant.

Response 1

The appropriate DNBR margins represented by the specified parameters for the Prairie Island plant are:

Table with 4 columns: Parameter, Required for Safety Analysis, Used in Design, % DNBR Margin. Rows include Limit DNBR, Pitch Reduction, Thermal Diffusion Coefficient, and a TOTAL row.

Question 2

The axial heat flux densification spike effect on DNB is plant specific. Please provide the existing DNBR margin represented by inclusion of this factor in the Prairie Island safety analysis. Include a brief discussion of how the densification spike factor is utilized in the safety analyses with respect to the DNBR thermal margin represented by its inclusion in these analyses.

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Response 2

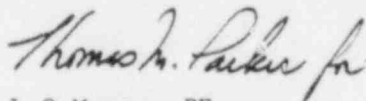
When the P*⁽¹⁾ Densification FSAR was done in 1973, the DNB analysis included a densification power spike immediately upstream of the location of minimum DNBR, resulting in a calculated DNBR 7% less than that calculated without the densification spike.

Since that time, Westinghouse conducted DNB tests with power spikes similar to those predicted to result from densification⁽²⁾. The results indicated that the effect of that spike on DNB heat flux was negligible.

Therefore, the inclusion of the above spike penalty (7% in DNBR) in the PI analysis represents a 7% margin which can be utilized to offset current rod bow penalties.

Please contact us if you have any questions.

Very truly yours,



L O Mayer, PE
Manager of Nuclear Support Services

LOM/TMP/jh

cc: J G Keppler
G Charnoff
NRC Resident Inspector

REFERENCES

- (1) R Salvatori, "Fuel Densification Prairie Island Unit 1," WCAP-8091, March, 1973.
- (2) WCAP-8174, re: spike penalty elimination, DNB tests; Staff review Stello to DeYoung (TAR-794).
- (3) Letter Eicheldinger to Stello, August 13, 1976, NS-CE-1161; re: NRC acceptability of procedure of offsetting bow penalty with thermal margins, and application to plants.
- (4) WCAP-2298, re: TDC; reviewed by staff, Stello to DeYoung, September 18, 1974 (TAR-903).
- (5) Letter Eicheldinger to Vassallo, May 1, 1975, NS-CE-598, re: Staff review of pitch reduction allowance.
- (6) Letter Salvatori to Vassallo, November 5, 1974, NS-RS-423, re: pitch reduction.