



Northern States Power Company

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April 2, 1985

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

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

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
Docket Nos. 50-282^{cc} License Nos. DPR-42
50-306^{cc} DPR-60

Request for Exemption from the Requirements
of 10 CFR Part 50, Section 50.46-
Acceptance Criteria for Emergency Core Cooling Systems
for Light Water Nuclear Power Reactors

- References:
1. Letter dated June 23, 1983, D M Musolf, NSP, to the Director of NRR, "License Amendment Request, LOCA Analysis." (Containing XN-NF-83-38)
 2. Letter dated October 3, 1983, D DiIanni to D M Musolf, NSP, NRC Safety Evaluation of XN-NF-83-38
 3. Letter dated January 21, 1985, D M Musolf, NSP, to Director of NRR, "Supplemental Information Related to License Amendment Request dated July 11, 1984."
 4. Letter dated March 26, 1985, D M Musolf, NSP, to Director of NRR, "K(z) Curve."
 5. Letter dated March 29, 1985, C W Giesler, Wisconsin Public Service, to the Director of NRR, "Request for Exemption from 10 CFR 50.46."

The purpose of this letter is to request, in accordance with the provisions of 10 CFR Part 50 Section 50.12, a temporary exemption from the requirements of 10 CFR Part 50, Section 50.46(a)(1) and 10 CFR 50, Appendix K Section I.A. This exemption is required to allow Northern States Power time to verify that the Prairie Island Technical Specification K(z) curve, Figure TS.3.10-5, does conform to the requirements of Section 50.46 and Appendix K.

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Appendix K, as referenced by Section 50.46, requires a peak clad temperature of less than 2200 degrees F to be calculated for "a range of power distribution shapes and peaking factors representing power distributions that may occur over the core lifetime" This requirement is normally satisfied by Westinghouse by periodically verifying an axially dependent peaking factor limit, commonly referred to as the "K(z) curve."

It has been recently found by the NRC Staff that Exxon Nuclear Company cannot independently verify with their currently approved models the current K(z) curve for a number of Westinghouse reactors. We believe that Exxon Nuclear would also not be able to support the current Technical Specification K(z) curve for the Prairie Island reactor. Our current LOCA analysis was performed by Exxon Nuclear using a chopped cosine axial power shape centered at the six-foot elevation (References 1, 2 and 3). Other power distribution shapes were not analyzed, since it was assumed that Westinghouse justification of the K(z) curve would be applicable to similar Exxon fuel. When the NRC Staff requested Exxon Nuclear to verify that the current K(z) curve for Westinghouse reactors, they were unable to support the existing curves with their current methodology. Exxon Nuclear has indicated that their current methodology is overly conservative in the upper regions of the core and that this conservatism is the reason they cannot verify the existing K(z) curves (Reference 4). Exxon is recorrelating the FLECHT reflood test data to remove some of this conservatism. However, this recorrelation is not expected to be completed until mid-summer.

Beginning next year, Westinghouse Optimized Fuel will be used for Prairie Island reloads. Westinghouse has performed an Appendix K LOCA analysis for Prairie Island with Westinghouse Optimized Fuel assuming a chopped cosine axial power shape centered at the six-foot elevation (Reference 4, Attachment 2). Because Westinghouse methodology initially developed the K(z) curve and since they have recently performed an Appendix K LOCA analysis for Prairie Island, we have requested them to perform the hot rod analysis portion of the LOCA analysis for Exxon Nuclear TOPROD fuel at various power shapes to verify that the existing K(z) curve meets the requirements of Section 50.46 and Appendix K. This work is expected to be completed in the next two weeks, however there is some uncertainty in this schedule. Please be assured that we are attempting to resolve this matter in the most expeditious manner possible.

We believe that operation of Prairie Island Nuclear Generating Plant, until compliance with 10 CFR Section 50.46 and Appendix K can be confirmed, will in no way endanger life or property or the common defense and security and is in the public interest. Recent research has shown that many of the models and assumptions required by 10 CFR 50 Appendix K are extremely conservative, which causes Appendix K Evaluation Models to predict artificially high peak cladding temperatures for the large break LOCA. This has been well documented by Wisconsin Public Service in their March

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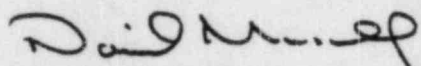
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29, 1985 exemption request related to the same issue (Reference 5). There is a great deal of margin in the peak clad temperatures calculated by current methodology. Therefore, because of this large margin, the granting of this exemption request will not affect the health and safety of the public in any way.

This exemption request is in the public interest. If Exxon Nuclear were to calculate a K(z) curve for Prairie Island using their current conservative methodology, it would be expected to be significantly lower than our existing curve. Operation with this revised K(z) curve would cause approximately a 25% derate for both Prairie Island units. This derate would continue until Exxon has recorrelated the FLECHT data, revised their model and performed a reanalysis for the Prairie Island plant. This would require approximately one year. The cost of replacement power required for a one-year 25% derate of both units would be approximately twenty-five million dollars. This cost to the people in our service area would be unwarranted since there is no safety concern with operation of the Prairie Island Nuclear Generating Plant while this issue is being resolved.

For the reasons mentioned above, we request that Northern States Power Company be granted a temporary exemption from the power distribution shape sensitivity requirements of Appendix K as required by 10 CFR 50 Section 50.46 until an analysis can be performed to confirm the K(z) curve currently in our Technical Specifications. A check in the amount of \$150.00 is enclosed in accordance with 10 CFR Part 170 as the required application fee.

Please contact us if you have any questions related to our request.



David Musolf
Manager - Nuclear Support Services

DMM/TMP/tp

c: Secretary of the Commission (original and 2 copies)
Regional Administrator-III, NRC
NRR Project Manager, NRC
Resident Inspector, NRC
G Charnoff

Attachment: Oath and Affirmation Statement
Check (Director NRR Copies)

UNITED STATES NUCLEAR REGULATORY COMMISSION

NORTHERN STATES POWER COMPANY

PRAIRIE ISLAND NUCLEAR GENERATING PLANT

Docket No. 50-282
50-306

LETTER DATED APRIL 2, 1985
INFORMATION RELATED TO REQUEST FOR EXEMPTION FROM
THE REQUIREMENTS OF 10 CFR PART 50, SECTION 50.46 -
ACCEPTANCE CRITERIA FOR EMERGENCY CORE COOLING SYSTEMS
FOR LIGHT WATER NUCLEAR POWER REACTORS

Northern States Power Company, a Minnesota corporation, by this letter dated April 2, 1985 hereby submits information related to 10 CFR Part 50, Section 50.46.

This letter contains no restricted or other defense information.

NORTHERN STATES POWER COMPANY

By David Musolf
David Musolf
Manager - Nuclear Support Services

On this 2nd day of April, 1985 before me a notary public in and for said County, personally appeared David Musolf, Manager - Nuclear Support Services, and being first duly sworn acknowledged that he is authorized to execute this document on behalf of Northern States Power Company, that he knows the contents thereof and that to the best of his knowledge, information and belief, the statements made in it are true and that it is not interposed for delay.

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