



Northern States Power Company

Prairie Island Nuclear Generating Plant

1717 Wakonade Dr. East
Welch, Minnesota 55089

January 3, 2000

U S Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

PRAIRIE ISLAND NUCLEAR GENERATING PLANT

Docket Nos. 50-282 License Nos. DPR-42
50-306 DPR-60

**NSPNAD-8101, Revision 2:
Prairie Island Nuclear Power Plant
Qualification of Reactor Physics Methods for Application to Prairie Island**

In February 1983, the Nuclear Regulatory Commission granted approval of Revision 1 to NSPNAD-8101, "Prairie Island Nuclear Power Plant, Qualification of Reactor Physics Methods for Application to Prairie Island." Since then, NSP has evaluated a different model, based on the Studsvik CMS system of codes. The evaluation is contained in Revision 2 of NSPNAD-8101, attached.

We are seeking NRC approval of this revision allowing us to implement the methods specified in the following Topical reports:

- NSPNAD-8101, Revision 2, December 1999, "Qualification of Reactor Physics Methods for Application to PI Units". This report contains the methodology discussion and benchmark results for the new CASMO-4/SIMULATE-3 model. This topical is basically a complete rewrite of Revision 1 of the same report, thus nothing is side-barred. However, some of the report, particularly the methodology, remains the same as Rev. 1. Where this occurs is clearly stated in Rev. 2 of the report.
- NSPNAD-8102-PA, Revision 7, July 1999, "Prairie Island Nuclear Power Plant Reload Safety Evaluation Methods for Application to PI Units". This is the currently approved revision for the PI Reload Safety Evaluation (RSE) topical report. We are requesting approval to continue using this topical report with physics input data

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generated by the new CASMO-4/SIMULATE-3 model as per the new physics topical NSPNAD-8101, Rev. 2. The events analyzed as part of the RSE topical will continue to be evaluated according to the processes defined in the RSE topical to determine if they meet the acceptance criteria defined in the RSE topical. The only change will be that the physics input data for the transient analyses will be generated with the new model.

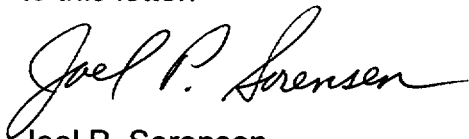
- NSPNAD-93003-A, Revision 0, April 1993, "Prairie Island Units 1 and 2 Transient Power Distribution Methodology ". This is the currently approved revision for the PI V(z) methodology topical. We are requesting approval to continue using this topical report with V(z) data generated by the new CASMO-4/SIMULATE-3 model as per the new physics topical NSPNAD-8101, Rev. 2. The validity of using the methodology defined in NSPNAD-93003-A, Revision 0 with the new model is discussed in section 4.4 of NSPNAD-8101, Rev. 2.
- NSPNAD-8408-A, Rev. 2, May 1991, "Prairie Island Units 1 and 2 Rod Swap Methodology ". This is the currently approved revision for the PI Rod Swap methodology topical. We are requesting approval to continue using this topical report with rod swap predictions generated by the new CASMO-4/SIMULATE-3 model as per the new physics topical NSPNAD-8101, Rev. 2. The validity of using the methodology defined in NSPNAD-8408-A, Rev. 2 with the new model is discussed in section 4.3 of NSPNAD-8101, Rev. 2.

The practice at Prairie Island has always been to introduce new fuel types in terms of U235 enrichment and burnable poison using a controlled approach and then continuously benchmarking the fuel to ensure that the methodology continues to perform as expected. Through this process we have loaded and benchmarked fuel up to 4.95 w/o U235, 8 w/o Gd, including Vantage+, OFA and other product lines, mixed and non-mixed cores and have obtained burnups near licensed exposure limits (e.g. up to ~61,000 MWd/MTU under a 62,000 MWd/MTU peak pin limit for Westinghouse Vantage+ fuel). In view of this we believe that the following range of applicability of the new CASMO-4/SIMULATE-3 model benchmarked in NSPNAD-8101, Rev. 2 is reasonable:

- Fuel enriched anywhere from 0-5 w/o U235
- Fuel with Gadolinium poison anywhere from 0-10 w/o Gd
- Any current Westinghouse fuel product line including OFA, Vantage+, or Standard, poisoned either with Gd as described above, integral fuel burnable absorber, or discrete burnable poison rods.
- Any fuel vendor current or new product line as long as the fuel is mechanically and thermal hydraulically compatible with currently loaded fuel and falls within the enrichment and burnable poisons described above.

- Any fuel burnup within limits approved by the NRC at the time of fuel loading for the specific fuel being loaded.
- Any mixed fuel core as long as each fuel type falls within the criteria listed above.

We respectfully request completion of NRC review by the end of December 2000. In this letter we have made no new Nuclear Regulatory Commission commitments. Please contact Jack Leveille (651-388-1121, X-4142) if you have any questions related to this letter.



Joel P. Sorensen
Site General Manager
Prairie Island Nuclear Generating Plant

c: Regional Administrator - Region III, NRC
Senior Resident Inspector, NRC
NRR Project Manager, NRC
J E Silberg

Attachment: NSPNAD-8101, Revision 2, Prairie Island Nuclear Power Plant,
Qualification of Reactor Physics Methods for Application to Prairie Island

TRANSMITTAL MANIFEST
 NORTHERN STATES POWER COMPANY
PRAIRIE ISLAND NUCLEAR GENERATING PLANT

NSPNAD-8101, Revision 2
Prairie Island Nuclear Power Plant
Qualification of Reactor Physics Methods for
Application to Prairie Island

Correspondence Date: January 3, 2000

USNRC:		Westinghouse	
DCD (original)	1*	W J Orga	1
NRR, Tae Kim	1*	S P Swigart	1
Regional Admin III	1*		
Resident Inspector	1*	Pat Culbert	RS-9 1
		George Miserendino	GO-2 1

State of Minnesota		K J Albrecht	1
Steve Minn	1	T E Amundson	1
		J O Hill	1
J E Silberg	1*	Betty Underwood (SAC)	1
Safety Audit Committee		NL Administrative: <small>(copies - 2/4/00)</small>	
Dave Cook	1	Gene Eckholt	1
Al Cutter	1	Jeff Kivi	1
Gerard Goering	1	Jack Leveille	1
Jim Hill	1	Dale Vincent	1
Joel Sorensen	1	NL File (original)	1*
Ken Weinbauer	1	PI Records Mgmt	1*
		Design Change	No
Extra Distribution:		USAR	No
Dave Horneck	1	Commitment	No
Cliff Bonneau	1	Fire Protection Related	No
Oley Nelson	1		

Comments: Attachment with astericked persons only

Manifest Date: January 4, 2000

RMS - Doc Type: _____

NSPNAD-8101.DOC