



**Nuclear Management Company, LLC**  
Prairie Island Nuclear Generating Plant  
1717 Wakonade Dr. East • Welch MN 55089

January 15, 2001

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

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

**PRAIRIE ISLAND UNIT 1, PROPOSED IRRADIATION OF  
FUEL RODS BEYOND CURRENT LEAD ROD BURNUP LIMIT**

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Prairie Island Nuclear Generating Plant (PINGP) plans to irradiate a Westinghouse VANTAGE+ fuel assembly that will attain end of life rod average burnups ranging from about 52,000 to 75,000 MWD/MTU. Irradiation of these rods is intended to provide data on fuel and material performance that will support industry goals of extending the current fuel burnup limits, and will provide data to address Nuclear Regulatory Commission (NRC) questions related to fuel performance behavior at higher burnups. This fuel assembly has already been irradiated for two cycles in Prairie Island Unit 2 and currently has cumulative rod average burnups ranging from approximately 37,000 to 56,000 MWD/MTU. The assembly will be irradiated for one additional cycle in Prairie Island Unit 1 Cycle 21. NRC approval was requested to implement this program in a letter dated December 21, 2000.

A conference call was held with the NRC on January 3, 2001 to discuss the irradiation program. This letter provides supplemental information that was requested during our meeting.

In this letter we have made no new Nuclear Regulatory Commission commitments. Please contact Jack Leveille (651-388-1121, Ext. 4142) if you have any questions related to this letter.

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

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USNRC  
January 15, 2001  
Page 2

**NUCLEAR MANAGEMENT COMPANY, LLC**

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

Attachment

# ATTACHMENT

Page 1 of 1

## Introduction

On January 3, 2001 a conference call was held with the NRC concerning Prairie Island Nuclear Generating Plant (PINGP) plans to irradiate an assembly, T81, to high burnup. Additional information on the pre-cycle 21 measurements and updates as to the status of the safety analysis were requested.

## Results of pre cycle 21 fuel inspections

Six peripheral rods with exposures of approximately 52 GWD/MTU were examined. Notes were taken as to the appearance of the cladding between the grid spans. The bottom of the fuel rods were clean with some mottled oxide. The central region was clean. A very light crud film was present on the top third. The appearance of the fuel was normal for twice-burned fuel. An eddy current probe was used to measure the oxide thickness. The peak oxide thickness measured on the six rods was less than 30 microns.

Control rod drag testing was performed on T81. The results for T81 were typical of ZIRLO assemblies and were well away from the Westinghouse susceptibility threshold for incomplete rod insertion (IRI). Predictions for T81 indicate that it should not be susceptible to IRI even at discharge from cycle 21.

The assembly growth was measured and it was found that the assembly had grown only 0.06% which is in the typical range of ZIRLO assembly growth data.

## Analysis update

The use of this fuel assembly has been fully evaluated as part of our normal reload design process and all design criteria were satisfied. The analyses of the Condition III and IV transients show that the predicted temperatures remain below the fuel melting temperature. It was confirmed that for the locked rotor and the rod ejection accident, where fuel is allowed to fail, that the less than 20% fuel failure criteria was met even assuming that all the pins in T81 fail.

Westinghouse has performed the mechanical design / fuel performance assessment of Fuel Assembly T81. The history of the assembly and planned operating conditions in Prairie Island 1 Cycle 21 were considered. All current licensed fuel design criteria were satisfied.

## Summary

The measured data taken prior to the cycle 21 irradiation of T81 shows that T81 exhibits typical ZIRLO performance. The data supports the conclusion that T81 is capable of being irradiated in cycle 21 without exceeding any design limits. The safety analysis for the cycle 21 reload has been completed and shows that all design criteria have been satisfied.