



STATE OF MINNESOTA
Minnesota Department of Commerce



June 3, 2008

Brian R. Zelenak
Manager, Regulatory Administration
Xcel Energy
414 Nicollet Mall
7th Floor
Minneapolis, MN 55401

RE: Xcel Energy's Monticello Nuclear Generating Plant Uprate Project
PUC Docket No. E002/GS-07-1567
Request for Additional Information

Dear Mr. Zelenak:

As you are aware, Extended Power Uprates (EPU) at boiling water reactor (BWR) nuclear facilities around the country have not been without controversy and/or operational issues.

The controversy in other states has mainly centered on concerns of safety, including vibration of various components (i.e., robustness of the steam dryer, etc.) and the affect on the emergency core cooling system (i.e., performance of the ECC and the containment heat removal pumps).

Please provide the Department with a short narrative summarizing the issues encountered from previous EPU at BWR in the United States, and the physical plant improvements and operational strategies that will be implementation at the MNGP to avoid or monitor these conditions.

Thank you.

Sincerely,

William Cole Storm
State Planning Director
Office of Energy Security
Energy Facility Permitting



414 Nicollet Mall
Minneapolis, Minnesota 55401-1993

June 13, 2008

William Cole Storm
State Planning Director
Office of Energy Security
Energy Facility Permitting
85 7th Place East - Suite 500
St. Paul, MN 55101-2109

—VIA E-MAIL—

RE: MONTICELLO NUCLEAR GENERATING PLANT
EXTENDED POWER UPRATE PROJECT
DOCKET No. E002/GS-07-1567
DOC-OES INFORMATION REQUEST NO. 1

Dear Mr. Storm:

Attached please find our response to the Department of Commerce, Office of Energy Security's above-referenced information request.

If you have any questions regarding this response, please call me at (612) 330-6737.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mary A. Martinka', written over a large, stylized circular flourish.

MARY A. MARTINKA
REGULATORY CASE SPECIALIST

Attachment

- Non Public Document – Contains Trade Secret Data**
 Public Document – Trade Secret Data Excised
 Public Document

Xcel Energy

Docket No.: E002/GS-07-1567

Response To: Department of Commerce Information Request No. 1
Office of Energy Security

Requestor: William C. Storm

Date Received: June 3, 2008

Question:

Extended Power Upgrades (EPU) at boiling water reactor (BWR) nuclear facilities around the country have not been without controversy and/or operational issues.

The controversy in other states has mainly centered on concerns of safety, including vibration of various components (i.e., robustness of the steam dryer, etc.) and the effect on the emergency core cooling system (i.e., performance of the ECC and the containment heat removal pumps).

Please provide the Department with a short narrative summarizing the issues encountered from previous EPU at BWR in the United States, and the physical plant improvements and operational strategies that will be implemented at the MNGP [Monticello Nuclear Generating Plant] to avoid or monitor these decisions.

Response:

As nuclear plants across the country go through the power uprate process, valuable information is gathered and disseminated to other plant owners and operators. The information is available through the NRC and the Boiling Water Reactor User's Group, and other venues. The EPU issues that have arisen are identified and documented in the "*Extended Power Uprate (EPU) Lessons Learned and Recommendations*" report prepared by the Boiling Water Reactor Owner's Group EPU Committee. The Table of Contents of the report is included as Attachment A to this response. Following is a description of the process the plant follows in response to the issues raised.

The Monticello plant and its personnel are uniquely positioned to address issues identified from other Extended Power Uprate (EPU) projects. The plant went through a power uprate in 1998, so site awareness of historical and developing EPU industry issues is well established among the plant staff. As EPU issues at other

plants become known, the Monticello Operating Experience Program at the plant identifies the issues, and the impacts are analyzed in light of the plant specific applicability to Monticello.

All core EPU project team members have comprehensive experience in EPU industry issues through their previous EPU work at boiling water reactors. Monticello plant staff are responsible to prepare EPU task reports and plant specific impacts on EPU issues identified at BWR's, such as with steam dryers and emergency core cooling systems, are formally analyzed by the project team and documented in topic task reports.

The plant has also adopted programmatic controls for implementing the EPU based upon EPU lessons learned at other U.S. boiling water reactors. Some of the controls include:

- Benchmarking trips to other BWRs that have implemented EPUs (e.g. Vermont Yankee, Brunswick),
- Attendance at NRC reviews of pending EPU applications,
- Participation in the BWR Owners Group committee on Extend Power Upgrades,
- Requiring previous EPU experience from key project contractors,
- Incorporation of insights from NEDO-33159, Extended Power Uprate (EPU) Lessons Learned and Recommendations (January 2007) into the Project Work Plans,
- Formal requirements for EPU task owners to address Lessons Learned from previous EPUs as part of their work plans,
- Independent project audits from industry experts with previous EPU experience.

The equipment effects and lessons learned from industry EPU experience have been carefully reviewed and documented at each stage of the EPU project at Monticello: including the feasibility study, the evaluation phase, and the ongoing design and modification phase.

If a condition identified from a previous EPU is determined to materially reduce Monticello's equipment operating and/or design margins, a formal process is initiated to address any consequent safety concerns. A team of subject matter experts with EPU and Monticello plant experience, which typically includes independent technical consultants with EPU experience, perform a detailed evaluation of the condition's effect on plant operation and safety. If a design, operational, or safety impact is identified, the team (or its representative) makes a recommendation to senior

management committee regarding a decision to modify, replace, or monitor the equipment.

Some examples of the process being successfully employed for the present Monticello EPU include: Industry experience has definitively shown that EPU operating conditions require more duty from and reduce the operating margins for feedwater pumps and their associated drive motors. This effect had been previously identified and extensively studied during the first Monticello power uprate. Given this awareness level and relevant plant experience, Xcel Energy assigned experienced site personnel and engaged national experts on pump design to analyze the operation of these pumps early in the feasibility and evaluation phases of the project. Xcel Energy then decided to replace feedwater pumps and motors for the current Monticello EPU in lieu of further reducing operating margins.

Another example is the known effect of vibrations on steam dryers due to operation at higher power levels. To understand the potential impact of these vibrations on the Monticello steam dryer, the plant conducted detailed planning and analysis to proactively address this issue. Sensitive vibration instrumentation was installed to gather data. The effects of steam dryer vibration at current power levels has been extrapolated from current power levels to EPU conditions and analyzed by independent experts with state-of-the-art knowledge of dryer design and operating margins. The report prepared by the independent experts was reviewed by the plant staff and audited by third-party experts. Additional data at the increased power levels needed to achieve the 15 MWe power increase will be gathered following the 2009 refueling outage to further validate the extrapolated data prior to making a decision on whether or not to replace or modify the existing Monticello steam dryer.

Notwithstanding the processes described above, the safety consequences of all EPU equipment operating conditions are subject to the review and approval of the Nuclear Regulatory Commission. This includes an evaluation of Monticello's treatment of equipment operating conditions identified by previous extended power uprates implemented at other boiling water reactors.

Response By: Allen Williams
Title: Monticello EPU/LCM Project Manager
Department: Nuclear Projects
Telephone: 763-295-1641
Date: June 13, 2008

**BWR Owners' Group
EPU Committee**

**Extended Power Uprate (EPU)
Lessons Learned
and
Recommendations**

Revision 1

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