



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 17, 2010

Mr. Mark A. Schimmel
Site Vice President
Prairie Island Nuclear Generating Plant
Northern States Power – Minnesota
1717 Wakonade Drive East
Welch, MN 55089

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2 –
REQUESTS FOR ADDITIONAL INFORMATION (RAI) ASSOCIATED WITH
LICENSE AMENDMENT REQUEST RE: MEASUREMENT UNCERTAINTY
RECAPTURE POWER UPRATE (TAC NOS. ME3015 AND ME3016)

Dear Mr. Schimmel:

By letter dated December 28, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML093650045) to the U.S. Nuclear Regulatory Commission, Northern States Power Company, a Minnesota corporation (NSPM) submitted a license amendment request for the Prairie Island Nuclear Generating Plant, Units 1 and 2. The proposed amendment would increase the licensed rated thermal power (RTP) as a result of a measurement uncertainty recapture power uprate. The proposed change would increase the RTP by 1.64 percent from 1650 megawatts thermal (MWt) to 1677 MWt. NSPM's request is based on reduced uncertainty in the RTP measurement achieved by installation of a Caldon® Leading Edge Flow Meter Checkplus™ System used to measure feedwater flow and temperature.

The NRC staff provided draft RAIs to NSPM from March 3 through March 11, 2010 (ADAMS Accession Nos. ML100620270, ML100620905, ML100630504, ML100640008, ML100640482, ML100680403, ML100690307, and ML100700372). On March 16, 2010, the draft RAIs were discussed with Mr. Sam Chesnutt to ensure a clear understanding of the requested information.

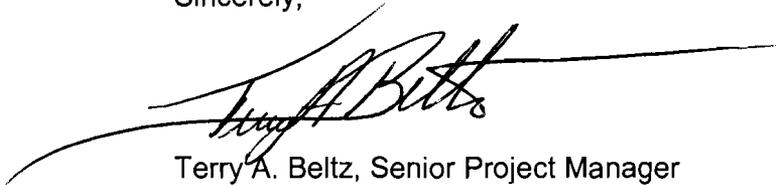
The finalized RAIs are being issued as an enclosure to this letter. As agreed upon with Mr. Chesnutt, a response is requested to the RAIs no later than April 19, 2010.

M. Schimmel

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If you have any questions, please contact me at (301) 415-3049.

Sincerely,

A handwritten signature in black ink, appearing to read "Terry A. Beltz", is written over a long horizontal line that extends across the page.

Terry A. Beltz, Senior Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-282 and 50-306

Enclosure:
As stated

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REQUESTS FOR ADDITIONAL INFORMATION (RAI)
LICENSE AMENDMENT REQUEST (LAR) REGARDING
MEASUREMENT UNCERTAINTY RECAPTURE POWER UPRATE (MUR-PU)
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2
DOCKET NOS. 50-282 AND 50-306
TAC NOS. ME3015 AND ME3016

FIRE PROTECTION BRANCH (AFPB)

AFPB RAI 1

The staff notes that Enclosure 2 to the LAR, Section II.2.26, "10.3.1 – Plant Fire Protection Program (Appendix R)," states that "...Evaluations conclude that the current safe shutdown analyses use an analytical core power of 1683 MWt (or higher) and, as such, the MUR Power Uprate has no effect on the plant equipment and systems credited with achieving safe shutdown. Likewise, evaluations also conclude that MUR PU has no impact on Appendix R manual action constraints..."

The staff requests the licensee to verify that the (1) measurement uncertainty recapture power uprate will not require any new operator actions, and (2) any effects from additional heat in the plant environment from the increased power will not interfere with existing operator manual actions being performed at their designated time and place.

AFPB RAI 2

Some plants credit aspects of their fire protection system for other than fire protection activities, e.g., utilizing the fire water pumps and water supply as backup cooling or inventory for non-primary reactor systems.

If the Prairie Island Nuclear Generating Plant (PINGP), Units 1 and 2, credits its fire protection system for other than fire protection activities, the MUR-PU LAR should identify the specific situations and discuss to what extent, if any, the MUR-PU affects these "non-fire-protection" aspects of the plant fire protection system.

If the PINGP, Units 1 and 2, do not take such credit, the staff requests that the licensee verify this as well.

STEAM GENERATOR TUBE INTEGRITY AND CHEMICAL ENGINEERING BRANCH (CSGB)

Protective coating systems provide a means for protecting the surfaces of facilities and equipment from corrosion and radionuclide contamination. Additionally, coatings used inside containment should be suitable and stable under design-basis loss-of-coolant accident conditions. It is unclear to the staff whether the protective coatings used inside containment were evaluated under power uprate conditions.

CSGB RAI 1

Please discuss whether the protective coating systems used in the containment remain qualified under MUR-PU conditions. Specifically, please discuss whether the temperature, pressure, and irradiation of the coatings during the qualification testing bounds the anticipated MUR-PU conditions.

VESSELS & INTERNALS INTEGRITY BRANCH (CVIB)

Staff has reviewed the proposed request in accordance with Regulatory Information Summary (RIS) 2002-03, "Guidance on the Content of Measurement Uncertainty Recapture Power Uprate Applications" with respect to the integrity of the reactor pressure vessel (RPV), and reactor internal and core support structures.

The staff has reviewed the information submitted by the licensee, and based on this review, determined the following information is required to complete the evaluation.

CVIB RAI 1

It was noted that the licensee's RPV surveillance capsules withdraw schedule is based on American Society for Testing and Materials (ASTM) E-185-82.

Please provide the actual schedule as to when the licensee plans to withdraw any capsules in the future for PINGP, Units 1 and 2.

CVIB RAI 2

Has the licensee pulled any surveillance capsules for either PINGP Units 1 or 2 since capsules S and P were pulled and evaluated? If so, what were the capsules and the analysis report results?

CVIB RAI 3

For RPV internals of PWR-designed light-water reactors may be susceptible to the following aging effects. Discuss how each is affected by the MUR:

1. Cracking induced by stress corrosion cracking (SCC), or irradiation assisted stress corrosion cracking (IASCC);
2. Loss of fracture toughness properties induced by radiation exposure for all stainless steel grades, or the synergistic effects of radiation exposure and thermal aging for cast austenitic stainless steel grades;

3. Stress relaxation in bolted, fastened, keyed or pinned RPV internal components induced by irradiation exposure and/or exposure to elevated temperatures; and
4. Void swelling (induced by radiation exposure).

ELECTRICAL ENGINEERING BRANCH (EEEB)

EEEB RAI 1

Provide detailed discussion about the affects (if any) of the MUR-PU on the plant direct current systems.

EEEB RAI 2

Provide more detailed discussion of the uprated loadings for each of the main generators with respect to their nameplate ratings. Also, provide the nameplate ratings and the uprated loadings of the generator step up transformers, plant service transformers and the main generator isolated phase bus.

INSTRUMENTATION AND CONTROLS BRANCH (EICB)

EICB RAI 1

On Pages 5 and 6 (Item I.C) in Enclosure 2 of the LAR, the licensee proposes to operate at uprated power in both "Alert" mode and "Fail" mode before the next scheduled daily Power Range Nuclear Instrumentation calibration.

Please list all conditions (e.g., one main steam pressure input fails) in these two modes separately, and provide additional explanation if necessary.

EICB RAI 2

On Pages 17 and 18 (Item I.G) in Enclosure 2 of the LAR, the licensee proposes to operate at uprated power in "Alert" mode with indefinite allowed outage time (AOT), and "Failed" mode with a 7-day AOT.

Please provide the data of known transmitter drift and nozzle fouling during the AOT to justify these proposed AOTs.

MECHANICAL AND CIVIL ENGINEERING BRANCH (EMCB)

EMCB RAI 1

Section IV.1.B.ii in Enclosure 2 of Reference 1 indicates that the cumulative usage factors for the PINGP systems, structures, and components (SSCs) within the scope of the LAR are bounded by the current licensing basis under the proposed MUR-PU conditions.

Based on the fact that the PINGP operating license is currently being considered for renewal by the NRC staff, please indicate whether consideration has been given to the impact of the proposed MUR-PU conditions on the fatigue evaluations for the SSCs which are within the scope of this LAR.

Please provide justification that demonstrates that the 60 year plant life, for which review has been requested, has been accounted for in the fatigue evaluations of the SSCs included within the scope of the MUR-PU LAR.

EMCB RAI 2

As a result of higher-than-design moisture carryover (MCO) percentages for the Unit 2 steam generators, which would be realized at MUR uprate conditions, Section IV.B.i in Enclosure 2 of Reference 1 (for balance of plant piping and components) indicates that "...a revision of the MS [main steam] stress analysis to ensure MSSV [main steam safety valve] thrust force is acceptable at the higher-than-design MCO condition..." was initiated in support of the proposed MUR-PU.

Please provide justification which demonstrates that the Unit 2 MS piping, MS piping supports, and MS system components remain acceptable by comparison to the design-basis code allowable values (or other design-basis qualification standard) when considering the MSSV thrust forces at the higher-than-design MCO conditions.

EMCB RAI 3

Section IV.1.A.ii in Enclosure 2 of Reference 1 states that operation at the proposed MUR-PU conditions will not adversely affect the structural integrity of the reactor vessel internals and core support structures.

Please verify whether the current analysis of record (AOR) remains bounding for the reactor vessel internals and core support structures at the proposed MUR uprate conditions. If the AOR is not bounding, wholly or in-part, please provide the updated analyses results for the core support structures and/or reactor vessel internals which are not bounded under the proposed MUR uprate conditions.

Reference

- 1) Letter from M. A. Schimmel, Northern States Power Company - Minnesota, to NRC Document Control Desk, "Prairie Island Nuclear Generating Plant Units 1 and 2, Dockets Nos. 50-282 and 50-306, License Nos. DPR-42 and DPR-60, License Amendment Request for Measurement Uncertainty Recapture - Power Uprate," dated December 28, 2009. (ADAMS Accession No. ML093650045)

CONTAINMENT AND VENTILATION BRANCH (SCVB)

SCVB RAI 1

Please provide the current (operating at 1650 MWt power) and the MUR-PU (operating at 1677 MWt power) reactor vessel cold leg inlet fluid and hot leg outlet fluid temperatures. For the short term loss-of-coolant accident containment response analysis, please explain why the

mass and energy release for the cold leg and hot leg breaks in the current analysis bounds the same for the analysis under MUR-PU conditions.

REACTOR SYSTEMS BRANCH (SRXB)

SRXB RAI 1

Describe and provide drawings of the location where the unified fracture mechanics are installed. The information should be sufficient for the NRC staff to perform an in-depth comparison of the Alden Labs test configuration with the in-plant configuration.

M. Schimmel

- 2 -

If you have any questions, please contact me at (301) 415-3049.

Sincerely,

/RA/

Terry A. Beltz, Senior Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-282 and 50-306

Enclosure:
As stated

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ADAMS Accession No.: ML100740039

* concurrence via memo

** concurrence via e-mail

OFFICE	LPL3-1/PM	LPL3-1/LA	AFPB/BC *	CGSB/BC *	CVIB/BC **
NAME	TBeltz	BTully	AKlein	RTaylor	MMitchell
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OFFICE	EEEEB/BC *	EICB/BC *	EMCB/BC *	SCVB/BC **	SRXB/BC *
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DATE	03/05/10	02/24/10	02/26/10	03/03/10	03/02/10
OFFICE	LPL3-1/BC	LPL3-1/PM			
NAME	RPascarelli	TBeltz			
DATE	03/17/10	03/17/10			

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