

January 21, 1998

Mr. Roger O. Anderson, Director  
Nuclear Energy Engineering  
Northern States Power Company  
414 Nicollet Mall  
Minneapolis, Minnesota 55401

SUBJECT: MONTICELLO NUCLEAR GENERATING PLANT - DRAFT ENVIRONMENTAL ASSESSMENT RELATED TO ISSUANCE OF LICENSE AMENDMENT RE: POWER RERATE PROGRAM (TAC NO. M96238)

Enclosed is a copy of the draft Environmental Assessment related to your application dated July 26, 1996, as revised December 4, 1997, for an amendment to License No. DPR-22 for the Monticello Nuclear Generating Plant (MNGP) that would increase the maximum power level to 1775 megawatts-thermal (MWt) as part of the MNGP's power rerate program. This change is approximately 6.3 percent above the current maximum power level of 1670 MWt.

As stated in the staff's position paper on Boiling-Water Reactor Extended Power Uprate Program dated February 8, 1996, the staff has the option of preparing an environmental impact statement if it believes a significant impact results from the power uprate. The staff did not identify a significant impact; therefore, the staff documented its environmental review in an environmental assessment (EA). In accordance with the February 8, 1996, staff position paper, the draft EA and finding of no significant impact will be published in the *Federal Register* for a 30-day public comment period.

Sincerely,  
Original signed by  
Tae Kim, Senior Project Manager  
Project Directorate III-1  
Division of Reactor Projects -III/IV  
Office of Nuclear Reactor Regulation

Docket No. 50-263  
Enclosure: Draft Environmental Assessment  
cc w/encl: See next page

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See memo to D. Meyer from C. Carpenter dated January 21, 1998, for PGEB and OGC concurrence.

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

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Northern States Power Company  
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Minneapolis, Minnesota 55401

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Sincerely,

A handwritten signature in cursive script, appearing to read "Tae Kim".

Tae Kim, Senior Project Manager  
Project Directorate III-1  
Division of Reactor Projects -III/IV  
Office of Nuclear Reactor Regulation

Docket No. 50-263

Enclosure: Draft Environmental Assessment

cc w/encl: See next page

Mr. Roger O. Anderson, Director  
Northern States Power Company

Monticello Nuclear Generating Plant

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## UNITED STATES NUCLEAR REGULATORY COMMISSION

## DRAFT ENVIRONMENTAL ASSESSMENT

RELATING TO A PROPOSED LICENSE AMENDMENT TO INCREASE THE  
MAXIMUM RATED THERMAL POWER LEVEL  
AT THE MONTICELLO NUCLEAR GENERATING PLANT  
DOCKET NO. 50-263

AGENCY: Nuclear Regulatory Commission

ACTION: Notice of opportunity for public comment

SUMMARY: The Nuclear Regulatory Commission has prepared a draft environmental assessment related to the Northern States Power Company's (NSP's) request for a license amendment to increase the maximum rated thermal power level from 1670 megawatts-thermal (Mwt) to 1775 Mwt. As stated in the NRC staff's position paper on the Boiling-Water Reactor Extended Power Uprate Program dated February 8, 1996, the staff has the option of preparing an environmental impact statement if it believes a significant impact results from the power uprate. The staff did not identify a significant impact related to the NSP's request and, therefore, the NRC staff documented its environmental review in an environmental assessment (EA). In accordance with the February 8, 1996, staff position paper, the draft EA and finding of no significant impact is being published in the FEDERAL REGISTER for a 30-day comment period.

DATES: Comment period expires February 26, 1998. Comments received after this date will be considered if it is practical to do so, but the Commission is able to assure consideration only for comments received on or before this date.

ADDRESSEES: Submit written comments to Chief, Rules Review and Directives Branch, U.S. Nuclear Regulatory Commission, Mail Stop T-6D-69, Washington, DC 20555-0001. Written comments may also be delivered to 11545 Rockville Pike, Rockville, Maryland, from 7:30 am to 4:15 pm, Federal Workdays. Copies of written comments received may be examined at the NRC Public Document Room, 2120 L Street, N.W. (Lower Level), Washington, DC.

FOR FURTHER INFORMATION CONTACT: Tae Kim, Office of Nuclear Reactor Regulation, Mail Stop O-13D18, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, telephone (301) 415-1392.

SUPPLEMENTARY INFORMATION:

The U.S. Nuclear Regulatory Commission (the Commission) is considering issuance of an amendment to Facility Operating License No. DPR-22, issued to Northern States Power Company, for operation of the Monticello Nuclear Generating Plant located in Wright County, Minnesota. The Commission's draft environmental assessment and finding of no significant impact related to the subject license amendment is provided below:

## ENVIRONMENTAL ASSESSMENT

### 1.0 INTRODUCTION

#### 1.1 Description of Proposed Action

By letter dated July 26, 1996, as revised December 4, 1997, Northern States Power Company (NSP) requested an amendment to License No. DPR-22 for the Monticello Nuclear Generating Plant (MNGP) that would increase the maximum power level from 1670 megawatts-thermal (Mwt) to 1775 Mwt. This change is approximately 6.3 percent above the current maximum license power level and is considered an extended power uprate.

#### 1.2 Need for the Proposed Action

NSP has projected the need for additional generation resources through a comparison of needs to available resources. NSP has projected a shortfall of generating capacity in the future. The proposed action would provide increased reactor power, thus adding an additional 26 MW of reliable electrical energy generating capacity without major hardware modifications to the plant. Hardware changes are not needed because of improvements in technology, performance, and design. These improvements have resulted in a significant increase in the difference between the calculated safety analysis results and licensing limits established by the original license.

## 2.0 ENVIRONMENTAL IMPACTS

The issuance of the operating license for MNGP stated that any activity authorized by the license is encompassed by the overall action evaluated in the Final Environmental Statement (FES), which was issued in November 1972. The license for MNGP allowed a maximum reactor power level of 1670 Mwt. NSP submitted an environmental evaluation supporting the proposed power uprate action and provided a summary of its conclusions concerning both the radiological and nonradiological environmental impacts of the proposed action. The evaluations performed by the licensee concluded that the environmental impacts of power uprate are well bounded or encompassed by previously evaluated environmental impacts and criteria established by the staff in the FES. A summary of the nonradiological and radiological effects on the environment that may result from the proposed amendment is provided below.

### 2.1 Nonradiological Impacts

#### 2.1.1 Land Use

Power uprate does not modify land use at the site. No new facilities, access roads, parking facilities, laydown areas, or onsite transmission and distribution equipment, including power line right of way, are needed to support the uprate or operation after uprate. No change to above or below ground storage tanks would occur as a result of power uprate and the uprate does not affect land with historical or archeological sites.

Based on the operating history at the MNGP, the effects of drift, icing, and fog have been negligible. The frequency of fog and drift were provided by the licensee at the time of original licensing and the impacts of that frequency of drift and fog are bounded by the evaluation contained in the FES. The FES assumed cooling tower operation of 7 months, with the total fogging time estimated at 45 hours per year. If the cooling tower fogging rate is assumed to increase proportional to the proposed power increase, the amount of fogging due to power uprate could increase by approximately 6.3 percent above the normal summer operating period of 4 months. Additionally, the licensee determined that power uprate may involve an extra week of cooling tower operation. Taking into account the additional fogging rate and the additional cooling tower operation, the conditions at power uprate are still bounded by the FES.

The increase in power level would cause a current and magnetic field increase on the onsite transmission line between the main generator and the plant substation. The line is located entirely within the fenced, licensee-controlled boundary of the plant, and it is not expected that members of the public or wildlife would be affected. Exposure from magnetic fields from the offsite transmission system is not expected to increase significantly.

#### 2.1.2 Water Use

Power uprate does not involve a significant increase in water use at MNGP. Both ground and surface water appropriation limits are established by

the Minnesota Department of Natural Resources. Operating history shows that over the last 5 years MNGP has used less than 13 million gallons of ground water per year. The annual limit established in the permit for groundwater use is 15 million gallons. Power uprate is not expected to change the groundwater usage and, therefore, operation within the allowable limit would continue. Under the surface water appropriation limit, MNGP may withdraw a maximum of 645 cubic feet per second (cfs) from the Mississippi River. There are special restrictions when the river flow is particularly high or low; however, power uprate is not expected to change the surface water requirements of the plant and, therefore, current appropriation limits would be maintained.

Power uprate would result in an increase in the evaporation rate of the cooling towers resulting in an increase in evaporative losses from the river. Assuming the evaporation rate of the cooling towers increases linearly in proportion to the power increase, the evaporation rate would increase to 4400 acre-ft/yr [acre-foot per year]. The value assumed in the FES was 5000 acre-ft/yr evaporative losses; therefore, the FES is still bounding.

Discharges to the water are governed by the National Pollutant Discharge Elimination System (NPDES) permit, issued by the State of Minnesota. Temperature and effluent limits at certain points are established in the permits. As a result of power uprate, a slight increase in circulating water discharge temperature is projected to occur. This is due to an increase in heat rejected by the condenser due to the increased power levels and increased

steam flow. A conservative estimate by the licensee predicts a maximum 1.7 °F [degrees Fahrenheit] increase in the temperature of the water entering the discharge canal. This increase would not result in exceeding the limits delineated in the FES or the limits established by the State in the permit. Additionally, temperature monitoring is continuous and this maximum temperature increase would occur only at certain times of the year with certain river flows. In the past, when MNGP has approached the limit designated in the NPDES permit, NSP has reduced power at the plant to maintain compliance; this will continue in the future. The slight increase in temperature does not require any changes to permit requirements and would not result in any significant impacts to the environment that are different from those previously identified or change the previous Clean Water Act Section 316(a) demonstration concerning thermal plume in the Mississippi River.

Power uprate would not introduce any new contaminants or pollutants and would not significantly increase the amount of potential contaminants previously allowed by the State. NSP will continue to adhere to effluent limitation and monitoring requirements as part of compliance with the NPDES permit. As a result of the additional week of cooling tower operation, a slight increase in normal bromine and sodium hypochlorite injection may be required; however, the effluent concentrations would continue to be well below

the NPDES permit limits. Continuous flowrate monitoring at designated points will continue.

Over the years of operation, a number of modifications to the intake structure have been implemented to reduce cold shock, impingement, and entrainment of organisms and fish. Because the discharge canal inlet temperature is expected to increase 1.7 °F at power uprate, the overall discharge canal temperature is not significantly increased; therefore, the temperature decrease during cold shock is not significantly changed.

Additionally, impingement and entrainment mortality of drift organisms is not increased above what was previously evaluated by the staff.

### 2.1.3 Other Impacts

No significant increases or changes to the noise generated by MNGP are expected as a result of power uprate; therefore, the FES remains bounding. A small number of endangered and threatened species exist within the licensee-controlled area at MNGP. Using information from the Minnesota Department of Natural Resources, the licensee performed a biological assessment of the impact of power uprate on these species. The assessment did not identify any impacts. Power uprate would not result in any significant changes to land use or water use, or result in any significant changes to the quantity or quality of effluents; therefore, no effects on the endangered or threatened species or on their habitat are expected as a result of power uprate.

The proposed power uprate would not change the method of generating electricity nor the method of handling any influent from the environment or nonradiological effluents to the environment. Therefore, no changes or different types of nonradiological environmental impacts are expected.

## 2.2 Radiological Impacts

MNGP has a number of radioactive waste systems designed to collect, process, and dispose of solid, liquid, and gaseous radioactive waste. No changes to these systems are required for power uprate conditions. The licensee considered the effect of the higher power level on solid radioactive wastes, liquid radioactive wastes, gaseous radioactive wastes, and radiation levels.

As a result of power uprate, a slight increase in solid waste from the reactor water cleanup (RWCU) system demineralizers and condensate demineralizers would occur. This is due to more frequent filter backwashes. Additional RWCU filter backwashes would result in less than 1 cubic meter of additional resin waste per year; condensate demineralizer filter backwashes are estimated to result in an additional 4 cubic meters of resin waste per year. Therefore, the projected increase in spent resin volume is less than 6 cubic meters per year, which would bring the total generation rate to approximately 55 cubic meters per year.

In addition to the solid process waste, there are solid reactor system wastes generated from the plant. These include irradiated fuel assemblies and

control blades. Due to extended burnup and the higher enrichments, the number of irradiated fuel assemblies is not expected to significantly increase the volume of waste; however, the activity of the waste generated from spent control blades and incore ion changers may increase slightly. This is due to the higher flux conditions expected under power uprate. Improvements in technology and longer fuel cycles are expected to offset this slight increase. The increase in waste would be insufficient to impact the amount of waste generated at the site. Further, the licensee believes ongoing efforts at MNGP to reduce radioactive wastes will balance the slight increase in waste that would be generated as a result of power uprate.

The FES and Technical Specifications allow MNGP to discharge a limited amount of liquid radioactive waste. The FES concluded that, based on the allowed amounts, no adverse environmental impact would result from release of the allowable radioactive waste. However, since 1972, an administrative limit of zero radioactive liquid release has been imposed by NSP. MNGP expects to keep the zero release administrative limit and remain well within the bounds of the FES.

A slight increase in input to the liquid radioactive waste system is expected due to the increase in backwash frequency of the RWCU and condensate demineralizer system. However, the liquid radioactive waste input will be recycled instead of discharged and will not result in a significant increase in volume of liquid radioactive waste. Other sources of liquid radioactive

waste such as valve packings, pump seal flows, drain waste, etc., are not expected to change or increase as a result of power uprate. Based on the above, it does not appear that power uprate will cause an increase in liquid radioactive waste above the presently allowed limits and will not affect compliance with the limits of 10 CFR Part 20 or Appendix I of 10 CFR Part 50.

Gaseous radioactive waste effluents consist of two pathways: reactor building ventilation system and offgas system pathway. Operational experience at MNGP shows a 4-year average release of 688 Ci/yr [curie per year] noble gas and 0.22 Ci/yr iodine and particulate release. The FES assumed release rates of 110,376 Ci/yr for noble gases and 0.75 Ci/yr for iodine and particulate releases. Assuming power uprate increases the offgas release rate linearly in proportion to the core thermal power increase, the increase in offgas stack release would be well below that assumed in the FES. Assuming the radioactivity of the reactor coolant system increases in a linear fashion proportional to the power increase, the reactor building release rate is well below that assumed in the FES. Based on the above, power uprate has an insignificant effect on the present production and activity of gaseous effluents released through the reactor building ventilation system and the offgas system pathways and the dose from effluent releases is well within the bounds of Appendix I to 10 CFR Part 50 and 10 CFR Part 20. The changes in core flux profile would result in increased consequences of a fuel defect for

a bundle in a non-leak location; however, this continues to be bounded by the consequences for the peak bundle and those limits are not changed.

Power uprate does not introduce any new or different radiological release pathways and does not increase the probability of an operator error or equipment malfunction that would result in a radiological release.

Tables S-3 and S-4 of 10 CFR 51.51 and 10 CFR 51.52, respectively, outline the environmental effects of uranium fuel cycle activities and fuel and radioactive waste transportation. The environmental evaluation supporting Table S-3 assumed a reference reactor with a specific capacity factor that results in an adjusted daily electricity production during a reference year. An average burnup and enrichment are also assumed. MNGP will not exceed the assumption of the reference reactor year, but will exceed the average burnup and fuel enrichment criteria as a result of power uprate. The environmental impacts of the higher burnup and enrichment values were documented in NUREG/CR-5009, "Assessment of the Use of Extended Burnup Fuels in Light Water Power Reactors," and discussed in the Environmental Assessment and Finding of No Significant Impact, which was published in the FEDERAL REGISTER on February 29, 1988 (53 FR 6040). The staff concluded that no significant adverse effects will be generated by increasing the burnup levels as long as the maximum rod average burnup level of any fuel rod is no greater than 60 Gwd/MtU [gigawatt-days per metric ton of uranium]. The staff also stated that the environmental impacts summarized in Tables S-3 and S-4 for a burnup

level of 33 Gwd/MtU are conservative and bound the corresponding impacts for burnup levels up to 60 Gwd/MtU and uranium-235 enrichments up to 5 weight percent. Based on the above, there are no adverse radiological or non-radiological impacts associated with the use of extended fuel burnup and/or increased enrichment and, therefore, power uprate will not significantly affect the quality of the human environment.

### 3.0 ALTERNATIVES

As an alternative to the proposed action, the staff considered denial of the proposed action. Denial of the proposed action would result in no change in current environmental impacts of plant operation but would restrict operation to the currently licensed power level. The environmental impact of the proposed action and the alternative action are similar.

### 4.0 ALTERNATIVE USE OF RESOURCES

This action does not involve the use of any resources not previously considered in the Final Environmental Statement for the MNGP.

### 5.0 BASIS AND CONCLUSIONS FOR NOT PREPARING AN ENVIRONMENTAL IMPACT STATEMENT

The staff has reviewed the proposed power uprate for the MNGP relative to the requirements set forth in 10 CFR Part 51. Based upon the environmental assessment, the staff has concluded that there are no significant radiological or nonradiological impacts associated with the proposed action and that the proposed license amendment will not have a significant effect on the quality

of the human environment. Therefore, the Commission has determined pursuant to 10 CFR 51.31 not to prepare an environmental impact statement for the proposed amendment but to prepare this draft finding of no significant impact.

For further details with respect to the proposed action, see the licensee's letter dated July 26, 1996, as revised by letter dated December 4, 1997, which are available for public inspection at the Commission's Public Document Room, The Gelman Building, 2120 L Street, NW., Washington, DC, and at the local public document room located at the Minneapolis Public Library, Technology and Science Department, 300 Nicollet Mall, Minneapolis, Minnesota 55401.

Dated at Rockville, Maryland, this 21st day of January, 1998.



Cynthia A. Carpenter, Acting Director  
Project Directorate III-1  
Division of Reactor Projects - III/IV  
Office of Nuclear Reactor Regulation