

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

David C. Boyd	Chair
J. Dennis O'Brien	Commissioner
Thomas Pugh	Commissioner
Phyllis A. Reha	Commissioner
Betsy Wergin	Commissioner

In the Matter of the Application of Northern States Power Company, a Minnesota Corporation, for a Site Permit for the Monticello Nuclear Generating Plant for Extended Power Uprate

ISSUE DATE: December 23, 2008

DOCKET NO. E-002/GS-07-1567

FINDINGS OF FACT, CONCLUSIONS,
AND ORDER ISSUING A SITE PERMIT
TO XCEL ENERGY FOR THE MNPG
EXTENDED POWER UPRATE PROJECT

The above-captioned matter came before the Minnesota Public Utilities Commission (Commission) on December 18, 2008, pursuant to an application by Northern States Power Company, a Minnesota corporation (Xcel Energy) for a Large Electric Power Generating Plant (LEPGP) Site Permit to increase the electrical generating capacity of its Monticello Nuclear Generating Plant (Monticello Plant) by 71 megawatts (MW).

Administrative Law Judge Steve M. Mihalchick conducted a public hearing on this matter on August 21, 2008, in Monticello, Minnesota.

STATEMENT OF ISSUE

Should Xcel Energy be granted a site permit under Minnesota Statutes Chapter 216E to increase the electrical generating capacity of the Monticello Plant by 71 MW?

Based upon the record in this proceeding, the Commission makes the following:

FINDINGS OF FACT

I. Background And Procedural History

1. Xcel Energy is a public utility that generates electrical power and transmits, distributes, and sells the power to its residential and business customers within service territories assigned by state regulators in parts of Minnesota, Wisconsin, Michigan, South Dakota, and North Dakota.
2. The Monticello Plant is a 600-megawatt, nuclear-powered boiling water reactor electric generating plant located near Monticello in Wright County, Minnesota. The Monticello Plant is owned by Xcel Energy and had been operated by Nuclear Management Company, LLC (NMC), under contract with Xcel Energy. During the

pendency of this proceeding, the reintegration of the functions of NMC into Xcel Energy was completed. In addition to the Monticello Plant, Xcel Energy now operates the Prairie Island Nuclear Generating Plant.

3. On February 14, 2008, Xcel Energy submitted an Application for a Certificate of Need (CON) for an extended power uprate to increase the generating capacity of the Monticello Plant by 71 MW (Exhibit 2, CON Application). Under the proposal, Xcel Energy will implement design uprates to take advantage of the additional capability of the nuclear reactor at the Monticello Plant. The Commission docket for the CON application is E-002/CN-08-185.
4. The Monticello Plant cannot operate at the increased thermal power level until the Nuclear Regulatory Commission (NRC) approves an amendment to the plant's operating license. Xcel Energy provided testimony in the CON proceeding discussing the NRC amendment process (Exhibit 35, CON Application). An application for an operating license amendment was submitted to the NRC on March 31, 2008 and later withdrawn after consultation with the NRC. The application was re-filed on November 5, 2008, and Xcel Energy expects to receive the NRC license amendment in early 2010.
5. Since the proposed uprate is less than 80 MW, the project is eligible for the alternative site permit review process available under Minnesota Statutes section 216E.04. On December 7, 2007, Xcel Energy filed notice pursuant to Minn. R. 7849.5500, subp. 2, that it intended to file its Site Permit Application pursuant to the alternative review process available under Minn. R. 7849.5500 (Exhibit 1, CON Application).
6. On May 2, 2008, Xcel Energy filed its Site Permit Application for the extended power uprate to increase the generating capacity of the Monticello Plant by 71 MW (Exhibit 3, CON Application).
7. The Commission met on May 8, 2008 to consider the Site Permit Application. On May 12, 2008, the Commission issued an Order accepting the Site Permit Application as complete and approving coordination of the public hearing for the Site Permit with the public hearing for the CON (Exhibit 9, CON Application).
8. The Office of Energy Security (OES) at the Department of Commerce (Department) issued a Notice of Public Information Meeting on May 13, 2008 to provide information to the public regarding both the CON Application and the Site Permit Application, to afford the public an opportunity to ask questions and present comments, and to solicit input on the scope of the Environmental Assessment (EA) (Exhibit 7, CON Application). The Notice described the proposed project, provided directions for obtaining a copy of the application, identified the public advisor, provided a deadline for submission of comments on the EA, and provided notice of the initial public meeting. The Department provided the Notice to all individuals on the project contact list, and published notice of the public meeting in the *Monticello Times* on May 15, 2008, the *Minneapolis Star Tribune* on May 19, 2008, and the *St.*

Cloud Times on May 19, 2008, pursuant to Minn. R. 7849.5570 and 7849.5260, subp. 2 (Exhibits 8 and 17, CON Application). The Notice was also published in the *EQB Monitor* on May 19, 2008 (Vol. 32, No. 10) (<http://www.eqb.state.mn.us/documents/EQBMonitor5-19-08.pdf>).

9. Xcel Energy published notice of the public meeting in the *Monticello Times* on May 15, 2008, the *Minneapolis Star Tribune* on May 16, 2008, and the *St. Cloud Times* on May 16, 2008, pursuant to Minn. R. 7849.5240 (Exhibit 17, CON Application).
10. The public meeting was held as provided for in the Notice on May 29, 2008, at River City Extreme, 3875 School Boulevard, Monticello, Minnesota at 7:00 p.m.
11. Minn. R. 7849.7030 requires the OES to prepare an Environmental Report on a proposed large electric power generating plant at the need stage. Minn. R. 7849.7100, however, provides that in the event an applicant for a certificate of need applies to the Commission for a site permit prior to completion of the Environmental Report, the OES may elect to prepare an Environmental Assessment in lieu of the required Environmental Report. The OES elected to prepare an EA addressing the proposed uprate to the Monticello Plant in lieu of an Environmental Report.
12. The OES released its EA scoping decision on June 10, 2008 (Exhibit 10, CON Application). Notice of the scoping decision was sent to those persons on the project contact list pursuant to Minn. R. 7849.5700, subp. 3.
13. The OES released the EA on July 31, 2008 (Exhibit 14, CON Application). A Notice of Public Hearings and Environmental Assessment Availability was sent to those persons on the project contact list and published in the *EQB Monitor* on August 11, 2008 (Vol. 32, No. 16) pursuant to Minn. R. 7849.5700, subp. 6 (Exhibits 12, 13 and 15, CON Application). The purpose of the public hearing was to compile the record for the Commission to consider in making a final decision on the CON and the Site Permit Applications.
14. The OES published Notice of the public hearing in the *Monticello Times* on August 7, 2008, the *St. Cloud Times* on August 8, 2008, and the *Minneapolis StarTribune* on August 8, 2008 (Exhibit 18, CON Application).
15. The coordinated public hearing relating to the CON and the Site Permit Applications was held on August 21, 2008, in the North Mississippi Room at the Monticello Community Center, 505 Walnut Street, Monticello, Minnesota at 7:00 p.m. Approximately 20 people attended the meeting, most of whom were company and agency representatives. Two members of the public made comments or asked questions at the public hearing. The public had until September 2, 2008, to submit written comments to the Administrative Law Judge.
16. The Minnesota Department of Natural Resources and Xcel Energy submitted comments on the EA (Exhibits 21, 22 and 24, CON Application).

17. The Administrative Law Judge submitted a Summary of Public Comments to the Commission on September 25, 2008 (<https://www.edockets.state.mn.us/EFiling/ShowFile.do?DocNumber=5521496>).
18. An evidentiary hearing relating to the CON Application was held on October 6, 2008 in St. Paul, Minnesota (To view Transcripts, call 651-296-6913).

II. The Proposed Project

A. Plant Characteristics And Performance

19. The Monticello Plant was initially granted its operating license by the NRC in September 1970. The facility employs a single-unit boiling water reactor powered by nuclear fuel. In such a configuration, a nuclear reaction in the reactor core generates heat, which boils water to produce steam inside the reactor vessel, which in turn is directed to turbine generators to produce electrical power. The water is cooled in a condenser and returned to the reactor vessel to be boiled again. The cooling water is force-circulated by electrically powered feedwater pumps. Emergency cooling water is supplied by other pumps, which can be powered by onsite diesel generators.
20. From 2002 through 2006, the plant has maintained an average capacity factor of 94.2 percent. In 2006, the Monticello Plant generated a record 5,070,000 megawatt-hours of electricity. The plant supplies about 10 percent of Xcel Energy's Upper Midwest customers' electric energy requirements.
21. The Monticello Plant has received the General Electric Outstanding Plant Performance Award for boiling water reactors 17 times. The Monticello Plant also has received the Minnesota Safety Council Award for the past five years for outstanding efforts in reducing workplace injuries and illnesses. The plant has "green" indicators from the NRC's Reactor Oversight Process, the highest performance indicator given by the NRC.

B. Nuclear Fuel Characteristics

22. Nuclear fuel used at the Monticello Plant consists of high-density ceramic uranium dioxide pellets, which are fabricated into fuel assemblies and transported to the Monticello Plant by truck.
23. A fuel assembly consists of standard fuel rods, part length fuel rods, tie rods, and water rods. Standard rods contain the nuclear fuel, the part length rods extend to an intermediate point in the assembly, tie rods are included to provide support to the assembly, and water rods are hollow Zircaloy tubes with several holes located at each end to facilitate water flow through the assembly. Each fuel assembly is 5.28 by 5.28 inches wide and up to 172 inches long. A fuel rod consists of high-density ceramic uranium dioxide fuel pellets, each about the size of a thimble, stacked in a Zircaloy tube. When filled with fuel, the air in a fuel rod is evacuated, helium is backfilled, and the rod sealed by welding plugs in each end.

24. The plant's reactor core consists of 484 fuel assemblies, arranged in 121 cells. Each cell contains 4 fuel bundles of assemblies and a control blade.
25. Approximately every two years, the Monticello Plant is shut down to refuel the reactor. During the shutdown, approximately one-third of the fuel assemblies, or about 150 fuel assemblies, are replaced with new assemblies. Thus, each nuclear fuel assembly provides heat constantly over about a six-year period before its output declines to the point it is replaced to maintain the desired plant output level. These spent fuel assemblies are then removed from the reactor and stored in the spent fuel pool to cool and are ultimately placed in dry storage casks and moved to the Independent Spent Fuel Storage Installation ("ISFSI").

C. Power Uprate History

26. Several decades of reactor safety technology improvements, plant performance feedback, and improved fuel and core designs have shown that Monticello and many similar reactors throughout the country can operate at higher thermal output than allowed under the original NRC license and still remain well within NRC calculated safe operational levels. Many nuclear power plants throughout the United States have requested power increases above the original NRC approved thermal power level.
27. As of December 2007, the NRC had completed 123 power uprate project reviews. GE is the lead vendor for the power uprate projects for boiling water reactors and has been the primary engineering firm for each power uprate.
28. Under NRC terminology, a power uprate of more than seven percent (up to a maximum of 20 percent) over the Original Licensed Thermal Power ("OLTP") that requires significant balance-of-plant upgrades is called an "Extended Power Uprate" or "EPU". As of May 2008, the NRC has approved extended power uprates for 14 boiling water reactor plants.
29. Monticello was the lead plant for GE's Power Uprate Program. In 1998, the thermal power rating for the Monticello Plant was increased from the original design rating of 1670 MWt to 1775 MWt, or 106.3 percent of OLTP. The first power uprate was completed by making use of available excess equipment, system and component capabilities at the site. The plant was able to increase generation by 35 MWe to a nominal net electrical output to the grid of 585 MWe with very few changes to installed plant equipment.

D. Proposed Increase In Generating Capacity

30. Xcel Energy proposes to expand the generating capacity of the Monticello Plant by 71 MW by (1) increasing the amount of the steam produced in the reactor, and (2) improving the balance-of-plant equipment that converts the steam into electricity.
31. Higher steam flow from the reactor is obtained by operating the reactor at a higher thermal power level. The additional heat is achieved primarily by increasing the number of new fuel assemblies replaced in the reactor core at each refueling. The

goal of the power uprate project is to increase the thermal power to 120 percent of OLTP, which would increase reactor power from the current licensed thermal power level of 1775 MWt to 2004 MWt. The corresponding increase in net generator output is estimated at 71 MWe for a nominal net electrical output delivered to the grid of 656 MWe. Xcel Energy projects that plant operation at power uprate conditions will require on average approximately 173 of the 484 fuel assemblies to be replaced during each refueling instead of 150.

32. The project will take place over two refueling outages and will require very few modifications to the reactor and the reactor support systems that produce steam.
33. To take advantage of the increased steam output, Xcel Energy proposes a number of balance-of-plant improvements to the systems that convert the steam produced in the reactor to generate additional electricity. The implementation of the power uprate is scheduled to take place during each of the next two routine refueling outages in 2009 and 2011. The modifications completed during the 2009 refueling outage will increase output by approximately 15 MWe upon the NRC's approval of the license amendment to operate at the increased thermal power level, and the modifications completed during the 2011 refueling outage will increase output by approximately 56 MWe.
34. Modifications to be completed during the 2009 refueling outage include replacement of the rotating element and diaphragm assemblies of the high pressure turbine, modification of several of the low pressure turbine stages, and upgrades to the isophase bus duct cooling system.
35. Modifications to be completed during the 2011 refueling outage include replacement of the condensate demineralizer vessels, replacement of the condensate pumps and motors, a new 13.8 KV bus and 1R and 2R transformers and distribution systems, replacement or modification of the steam dryer, rewind of the main generator stator, replacement of feed water pumps and motors, and an increase of the drain capacity of the two feedwater heaters.
36. In general, operation of the plant will not change after implementation of the power uprate. The primary impact will be more frequent operation of the cooling towers to supplement the cooling provided by the Mississippi River over the course of a year.
37. The power uprate will result in a total of approximately 230 additional fuel assemblies being produced over the remaining operating license period. Three new dry storage canisters may be necessary to support operations until 2030 due to the power uprate. The three additional storage canisters would not become necessary until approximately 2025. Xcel Energy is not requesting additional storage canisters at this time because it anticipates that the federal government could begin to remove spent fuel from Monticello in time to preclude the need for more than the 30 canisters already approved.

E. Site Characteristics and Qualities

38. The Monticello Plant is located within the city limits of Monticello, Minnesota, in Wright County, on property abutting the Mississippi River, in Section 32, T-122N, R-25W, at 45° 20' N latitude and 93° 50' W longitude, approximately 50 miles northwest of Minneapolis-St. Paul.
39. The plant site consists of 2,150 acres owned by Xcel Energy and configured on the eastern bank of the Mississippi River in Sherburne County and the western bank in Wright County. The physical plant is on the western bank in Wright County. A perimeter fence and other barriers restrict access to the plant.
40. The Upper Mississippi River near the Monticello Plant supports a variety of plant and animal species that are typical of free-flowing rivers in the upper Midwest. The major primary producers, or plant groups, present are periphyton (attached algae), phytoplankton (floating algae), and macrophytes, which are larger flowering plants, either rooted or floating. Near the site, periphytons are the most important primary producer. Neither phytoplankton nor macrophytes are prominent in the area because they are not well adapted to the relatively turbulent currents in the area.
41. The Benthic invertebrate community, comprising a great variety of insects, crustaceans, mollusks, and others, constitute a prominent faunal feature of the Mississippi River near Monticello. The Mississippi River also supports a diverse array of fish species.

III. Requirements of Statute and Rule

42. Minnesota Statutes Chapter 216E and Minn. R. 7849, parts 7849.5010 through 7849.7010 set forth the criteria that must be met by an applicant to obtain a Site Permit.
43. Minn. Stat. § 216E.03 prohibits construction of a large electric generating plant without first obtaining a Site Permit from the Commission. The Monticello Plant is an existing large electric power generating plant as defined in Minn. Stat. § 216E.02, subd. 5, and Minn. R. 7849.5010, subp. 11. The project will increase the generating capacity of the Monticello Plant, and therefore a site permit from the Commission is required under Minn. R. 7849.5040, subp. 3.
44. Xcel Energy submitted its Site Permit Application under the alternative review process contained in Minn. R. 7849.5500 to 7849.5720. Under the alternative review process, the applicant is not required to propose alternative sites to the project.
45. Under Minn. Stat. § 216E.03, subd. 7(a), when making its site permit decision, the Commission must be guided by the state's goals to conserve resources, minimize environmental impacts, minimize human settlement and other land use conflicts, and ensure the state's electric energy security through efficient, cost-effective power supply and electric transmission infrastructure.

46. Minn. Stat. § 216E.03, subd. 7(b) states that to facilitate the study, research, evaluation and designation of sites and routes, the Commission shall be guided by the following considerations:

- (1) evaluation of research and investigations relating to the effects on land, water and air resources of large electric power generating plants and high-voltage transmission lines and the effects of water and air discharges and electric and magnetic fields resulting from such facilities on public health and welfare, vegetation, animals, materials and aesthetic values, including baseline studies, predictive modeling, and evaluation of new or improved methods for minimizing adverse impacts of water and air discharges and other matters pertaining to the effects of power plants on the water and air environment;
- (2) environmental evaluation of sites and routes proposed for future development and expansion and their relationship to the land, water, air and human resources of the state;
- (3) evaluation of the effects of new electric power generation and transmission technologies and systems related to power plants designed to minimize adverse environmental effects;
- (4) evaluation of the potential for beneficial uses of waste energy from proposed large electric power generating plants;
- (5) analysis of the direct and indirect economic impact of proposed sites and routes including, but not limited to, productive agricultural land lost or impaired;
- (6) evaluation of adverse direct and indirect environmental effects that cannot be avoided should the proposed site and route be accepted;
- (7) evaluation of alternatives to the applicant's proposed site or route;
- (8) evaluation of potential routes that would use or parallel existing railroad and highway rights-of-way;
- (9) evaluation of governmental survey lines and other natural division lines of agricultural land so as to minimize interference with agricultural operations;
- (10) evaluation of the future needs for additional high-voltage transmission lines in the same general area as any proposed route, and the advisability of ordering the construction of structures capable of expansion in transmission capacity through multiple circuiting or design modifications;
- (11) evaluation of irreversible and irretrievable commitments of resources should the proposed site or route be approved; and

- (12) when appropriate, consideration of problems raised by other state and federal agencies and local entities.
47. Minn. R. 7849.5910 implements the above statutory requirements and requires that the Commission be guided by the following siting considerations:
- A. effects on human settlement, including, but not limited to, displacement, noise, aesthetics, cultural values, recreation, and public services;
 - B. effects on public health and safety;
 - C. effects on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining;
 - D. effects on archaeological and historic resources;
 - E. effects on the natural environment, including effects on air and water quality resources and flora and fauna;
 - F. effects on rare and unique natural resources;
 - G. application of design options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission or generating capacity;
 - H. use or paralleling of existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries;
 - I. use of existing large electric power generating plant sites;
 - J. use of existing transportation, pipeline, and electrical transmission systems or rights-of-way;
 - K. electrical system reliability;
 - L. costs of constructing, operating, and maintaining the facility which are dependent on design and route;
 - M. adverse human and natural environmental effects which cannot be avoided; and
 - N. irreversible and irretrievable commitments of resources.

A. Effects on Human Settlement

48. The project's effects on human settlement will be very limited due to the use of a pre-existing site. The project will not displace any other existing or planned land uses.

49. The power uprate will not change the visual appearance of plant features from outside the facility boundaries. All equipment will be installed within the existing plant buildings with the exception of the new transformers. All equipment will be installed within the existing plant footprint. There is no anticipated impact to aesthetics from the power uprate.
50. The power uprate will not result in any significant changes to the character, sources, or energy of noise generated at the Monticello Plant. No new significant noise-generating equipment is planned as part of the uprate, and no significant increases in ambient noise levels are expected within the plant.
51. The power uprate is not anticipated to result in additional traffic generated beyond normal levels currently experienced during periods of power generation and refueling outages. Plant modifications to accomplish the power uprate will be completed primarily during refueling outages, and equipment deliveries for the power uprate will not involve deliveries that are materially different from those required during past refueling outages. There will be no long-term change to the routes, number of trips, types of vehicles, or speed of traffic compared to current conditions.
52. The power uprate is not likely to create significant additional jobs for the immediate area. The size of the workforce during the two refueling outages when the power uprate is implemented is not expected to increase significantly from the size of the workforce during a normal refueling outage.
53. No impacts to public activities, including recreation, are anticipated because the power uprate activities will be confined to the plant boundaries and primarily the existing plant buildings. Although minor changes in thermal discharge are anticipated, these changes are unlikely to have any noticeable effect on recreation (e.g., sport fishing).
54. No additional demands will be placed on public services, because significant changes to the site, workforce, and infrastructure are not anticipated as part of the project.

B. Health and Safety

55. The power uprate will involve slight increases in in-plant radiation levels. The impact of the increase in radiation dose to workers is minimized by monitoring radiation levels, controlling access to radiation areas, and by implementation of the As-Low-As-Reasonably-Achievable (ALARA) principles. These practices are already in place at the Monticello Plant and will continue after the power uprate.
56. The power uprate does not create any new or different sources of off-site radiation dose from operation and does not involve significant increases in present radiation levels. The uprate will result in an increase in the production and activity of radioactive gaseous effluents of approximately 13 percent, but gaseous effluents will remain within regulatory limits after the increase. Likewise, while the project will result in a slight increase in radiation dose rates for the surrounding public, that dose rate will still be far below federal dose limits.

57. The uprate will not result in any changes in the operation or design of equipment of the solid and liquid waste systems, and the safety and reliability of those systems is unaffected. The uprate will result in a small increase in reactor wastes and radioactive solid waste. The uprate will not result in radiological levels above the safe thresholds established by the NRC and in the Technical Specifications for the plant.
58. The project will also remain within the plant's permitted limits for non-radiological emissions. Though the primary power generation process does not emit criteria pollutants, the plant does operate diesel engines and a boiler. Emissions from these sources will not change enough to require a change in the Title V air pollution control operation permit issued by the Minnesota Pollution Control Agency.

C. Land-Based Economies, Including Agriculture, Forestry, Tourism and Mining

59. No effects on land-based economies are expected, because the project will be located within the footprint of an existing plant.

D. Effects on Archaeological and Historical Resources

60. No archaeological or historical resources will be affected by the project.

E. Effects on the Natural Environment

61. The project will result in a small increase in the site's discharge canal temperature, but that increase will not require any changes to the NPDES-permitted discharge temperature limits. Extensive field studies have been performed to confirm that the limits imposed by the NPDES permit are conservative and assure no significant adverse impact on the environment. Studies have confirmed that cooling tower operation during the summer months has adequately prevented detrimental environmental effects, and water temperatures downstream are not high enough to harm aquatic species or impede fish migration.
62. The project would not increase the likelihood of cold shock, since the probability of an unplanned shutdown will not increase as a result of the uprate. Furthermore, the cold shock concerns for river fish species have been reduced by the construction of a weir at the end of the discharge canal, and by backwashing of the traveling screens above 50 degrees Fahrenheit. The weir limits the number of fish in the canal and reduces the effects of cold shock on aquatic species in the river.
63. The power uprate will not result in a significant increase in the impingement and entrainment of organisms in the site's condenser cooling system. Furthermore, studies of fish populations in the vicinity of the plant have shown the plant's cooling system has resulted in no substantial detriment to the fisheries population.
64. The projected increase in discharge canal inlet temperature will not involve any significant increase in harmful thermophilic organisms in the discharge canal.

65. The power uprate may cause some increase in effluent levels for a few chemical constituents monitored under the site's NPDES permit, but those levels would remain well below the permit's daily discharge limits.
66. The change in water consumption due to the power uprate is not expected to be significant, so no change in the Monticello Plant's Groundwater Appropriations Permit will be necessary.
67. The estimated increase in surface water consumption resulting from the uprate is within the values previously evaluated by the NRC for licensing purposes, and is not considered to be significant. It will not involve any changes to the Surface Water Appropriations Permit issued by the Minnesota Department of Natural Resources (DNR).
68. The Environmental Assessment concluded that the power uprate will not negatively affect the trumpeter swans' use of the area downstream of the plant in the winter.
69. The DNR submitted several comments on the Environmental Assessment. The DNR comment letter expressed concern about the increase in the site's discharge canal temperature and suggested that an auxiliary dry cooling tower could address the increase and eliminate any concerns of impairment to aquatic biota as well as address the increased potential for cold shock. The DNR also expressed concern that the additional heat loads would increase the temperature and size of the open water downstream of the plant and attract an excessive number of trumpeter swans. Finally, the DNR suggested that Xcel Energy use the uprate as an opportunity to improve management of plant lands.
70. Xcel Energy has effectively addressed the DNR's criticisms through its comments submitted in reply to the DNR's letter and the testimony of Allen L. Williams offered at the evidentiary hearing in the CON proceeding. Xcel Energy noted that the current cooling capabilities of the plant are sufficient to continue operation of the plant post power uprate within the terms of the existing NPDES permit. Additionally, Xcel Energy stated that cold shock events are related to the scheduled and unscheduled shutdown of the plant and are independent of and technically unrelated to the proposed power uprate. Xcel Energy also noted that research indicates that even during worst-case years, the thermal plume is largely restricted to one side of the river, disperses rapidly, and is not a barrier to fish movement. Xcel Energy also outlined the potential impacts of the ongoing CWA Section 316(b) rulemaking proceeding. The final rules associated with Section 316(b) could significantly impact the cooling tower solution, and any change involving cooling towers is premature and could be in conflict with the final Section 316(b) rules. Xcel Energy also noted that since the power uprate project will take place entirely within the existing plant boundaries and facilities, the project will not have any impact on the surrounding habitat about which the DNR expressed concern.
71. Mr. Williams also testified regarding two provisions in the existing NPDES permit that could authorize additional review by the MPCA following completion of the

extended power uprate. First, any discharge that would result in increasing the pollutant loading to the Mississippi River would be subject to the MPCA's Non-Degradation Review. Second, the NPDES permit states that the permit may be reopened to insert a more restrictive thermal limit or the requirement to complete a 316(a) study, if it is has been shown that the thermal components of the service water discharges affect the safety and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the Mississippi River. This provision gives the MPCA the authority to either change the thermal discharge limit to protect aquatic wildlife and/or require a new study to evaluate the thermal discharge impacts to the river if the agency believes that the thermal discharges may negatively impact the river.

F. Effect on Rare and Unique Natural Resources

- 72. No changes to land use are anticipated as a result of the power uprate, and there are no anticipated impacts to rare and unique natural resources or species.
- 73. Whereas the DNR suggests that the warmed water has increased the number of trumpeter swans downstream of the plant and made feeding them necessary because of scarce food supply, Xcel Energy suggests that it is the local citizens and the DNR providing food for the trumpeter swans that encourages them to remain in the area during the winter. Although this situation may require some further analysis and discussion to resolve, it does not override the appropriateness of the site.

G. Design Options that Maximize Energy Efficiency, Mitigate Environmental Effects, and Could Accommodate Expansion

- 74. The project is an expansion of an existing facility, taking full advantage of existing infrastructure and minimizing land use impacts. Nuclear power is among the most appropriate generation technologies for the base load service need the project is intended to address. And by operating the facility at a higher capacity, Xcel Energy will obtain energy at a lower unit cost than it does currently, an improvement that works in the favor of ratepayers with more efficient production.

H. Use or paralleling of existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries

- 75. The project will use existing transmission lines. It is possible that some upgrades to existing transmission facilities will be necessary as a result of the project, but no evidence has been presented that such upgrades would involve creation of new transmission corridors.

I. Use of Existing Large Electric Power Generating Plant Sites

- 76. The project will use the existing Monticello Plant site.

J. Use of Existing Transportation, Pipeline, and Electrical Transmission Systems or Rights-of-Way

77. The project will use existing transmission lines. It is possible that some upgrades to existing transmission facilities will be necessary as a result of the project, but no evidence has been presented that such upgrades would involve creation of new transmission corridors.

K. Electrical System Reliability

78. The proposed power uprate will help to ensure continued reliability of the state electricity system by supplying dependable, low-cost, carbon-free, base load power that could only be reliably replaced by more expensive sources. In addition, it will increase the ability of Xcel Energy to satisfy the demands of its Minnesota customers as the state works to add wind resources and remove carbon-emitting generation units from the system and will have a positive impact on the State's energy need.

L. Costs of Constructing, Operating and Maintaining the Facility Which Are Dependent on Design and Route

79. The project costs are estimated at between \$104 million and \$133 million.

M. Adverse Human, Natural and Environmental Effects Which Cannot be Avoided as a Result of Construction and Operation of the Plant

80. No significant adverse human, natural, or environmental effects have been identified as a result of the project.

N. Irreversible and Irretrievable Commitments of Resources

81. No irreversible or irretrievable commitments of resources have been identified as a result of the project.

O. Compliance with Other Siting Rules

82. Minn. R. 7849.5940, subp. 1, identifies areas that are prohibited from plant siting or excluded from that siting unless there is no feasible and prudent alternative. The Monticello site is not located in any of the prohibited areas.
83. Pursuant to Minn. R. 7849.5720, subp. 2, at the time the Commission makes a final decision on the site permit application, the Commission shall determine whether the Environmental Assessment and the record created at the public hearing address the issues identified in the scoping decision.
84. The OES released the EA on July 31, 2008. The DNR and Xcel Energy submitted comments on the EA. The EA and the record created at the public hearing address the issues identified in the scoping decision, and the EA is adequate for the Commission to make its decision in this matter.

Based on the foregoing Findings of Fact, the Commission makes the following:

CONCLUSIONS

1. Any of the foregoing Findings of Fact more properly designated as Conclusions are hereby adopted as such.
2. The Minnesota Public Utilities Commission has jurisdiction over this matter pursuant to Minn. Stat. 216B.08 and 216E.02, subd. 2.
3. All relevant procedural requirements of law and rules have been fulfilled prerequisite to the issuance of a Site Permit to Xcel Energy.
4. The record does not demonstrate that the design, construction, or operation of the Monticello Plant following the uprate will fail to comply with relevant policies, rules, and regulations of other state and federal agencies and local governments.
5. Xcel Energy has demonstrated that the proposed power uprate satisfies the criteria for a Site Permit in Minn. Stat. § 216E.03, subd. 7, and Minn. R. 7849.5910.
6. The Environmental Assessment addressed the issues identified in the scoping decision and is adequate.
7. The Site Permit requested by Xcel Energy should be issued.

Based upon the Findings of Fact and Conclusions contained herein and the entire record of this proceeding, the Commission hereby makes the following:

ORDER

A LEPGP Site Permit is hereby issued to Xcel Energy to increase the generating capacity of the Monticello Plant by 71 (seventy-one) megawatts.

The Site Permit shall be issued in the form attached hereto, with a map showing the approved site.

BY ORDER OF THE COMMISSION



Burl W. Haar
Executive Secretary

I. SITE PERMIT

The Minnesota Public Utilities Commission (“Commission”) hereby issues this Site Permit to Xcel Energy, pursuant to Minnesota Statute Chapter 216E and Minnesota Rules Chapter 7849, to construct the Extended Power Uprate (EPU), capable of producing an additional 71 megawatts (MW), at the Monticello Nuclear Generating Plant (MNGP) in Wright County, Minnesota.

II. PROJECT DESCRIPTION

The MNGP utilizes a boiling water reactor (BWR). In a boiling water reactor, a nuclear reaction in the reactor core generates heat, which boils water to produce steam inside the reactor vessel, which in turn is directed to turbine generators to produce electrical power. The steam is cooled in a condenser and returned to the reactor vessel to be boiled again. The cooling water is force-circulated by electrically-powered feedwater pumps. Emergency cooling water is supplied by other pumps, which can be powered by onsite diesel generators.

The plant is located on the western bank of the Mississippi River in Wright County, approximately 50 miles northwest of Minneapolis. The MNGP is owned and operated by Northern States Power Company, a Minnesota corporation (“Xcel Energy” or “Company”). The MNGP had been operated by Nuclear Management Company, LLC (“NMC”), under contract with Xcel Energy, but the functions of NMC have been reintegrated into Xcel Energy.

Xcel Energy proposes to uprate the electrical generating capacity of MNGP from 585 megawatts electric to 656 megawatts electric (MWe). The 71 MWe EPU will be achieved by increasing the steam output of the nuclear reactor and capturing this additional output with improved electrical generation equipment and systems. Steam output will be increased through an increase in the number of new fuel assemblies replaced in the reactor core at each refueling. Equipment and systems modifications include:

- Replacement of the high pressure turbine;
- Modification of the low pressure turbine;
- Replacement of condensate pumps, motors, and demineralizers;
- Upgrades of electrical power supplies and power cooling systems.

The modifications to the plant necessary for the EPU will occur in two phases during routine refueling outages at the plant in 2009 and 2011. All modifications, except for limited power supply upgrades, will occur within the current physical footprint of MNGP. No new structures are proposed. Operation at the increased power level following the 2009 refueling outage will occur following receipt of the operating license amendment approving reactor operations at the increased power level from the Nuclear Regulatory Commission (“NRC”). Approval from the NRC is expected in early 2010.

III. DESIGNATED SITE

The MNGP site itself consists of approximately 2,150 acres with roughly two miles of frontage on the north and south banks of the Mississippi River in Wright and Sherburne Counties. Most of the site is located on the southern side of the Mississippi River, with approximately 450 acres on the northern side. Approximately 50 acres are occupied by the plant and its supporting

facilities. The remaining acres are undeveloped, with approximately 174 acres leased by local farmers for growing row crops and 144 acres under lease for recreational use.

The project location and site layout are shown in **Attachment 1**. The site is more specifically described in the Site Permit Application and in the Environmental Assessment.

IV. PERMIT CONDITIONS

The following conditions shall apply to the construction of the facility.

- A. Contact Information.** At least fourteen (14) days prior to the start of each of the 2009 and 2011 refueling outages, the Permittee shall advise the Commission in writing of the person or persons designated as the contact representative for the Permittee. This person's address, phone number, and emergency phone number shall be provided to the Commission, who may make the information available to local residents, public officials and other interested persons. The Permittee may change its field representative at any time upon written notice to the Commission.
- B. Increased Power Level.** Within 30 days of achieving operations at the increased EPU power levels (an increase is anticipated in late 2009 or early 2010 following NRC approval of the Monticello EPU, and another increase is anticipated following completion of the refueling outage in 2011), the Permittee shall notify the Commission in writing of the increased power level achieved and address any issues affecting the ability of the plant to achieve its anticipated power output as a result of the uprate.
- C. Work Completion.** Within 120 days of the plant's return to service following the 2009 and 2011 refueling outages, the Permittee shall notify the Commission in writing of the completion of the EPU work performed during the outage. The communication shall address the main modifications as outlined below and whether any significant issues were encountered with the implementation of each.
- Modification of the low pressure turbine sections (2009)
 - Replacement of the high pressure turbine section (2009)
 - Condensate demineralizer replacement (2011)
 - Upgrades to isophase bus duct cooling system (2009)
 - Replacement of condensate pumps and motors (2011)
 - Upgrade of offsite power supplies to power larger plant loads (2011)
 - Replacement, or modification, of the steam dryer (2011)
 - Rewind of the main generator stator (2011)
 - Replacement of feedwater pumps and motors (2011)
 - Feedwater heater drain cooler capacity (2011)

D. Other Requirements. The Permittee shall comply with all applicable state rules and statutes. The Permittee shall obtain all required permits, or permit amendments required for the project and comply with the conditions of these permits.

E. Delay in Construction. If the Permittee has not commenced construction or improvement of the project within four (4) years from the date of issuance of this Permit, the Commission shall consider suspension of the Permit in accordance with Minn. Rule 7849.5970.

V. PERMIT AMENDMENT

This permit may be amended by the Commission. Any person may request an amendment of this permit pursuant to Minn. Rule 7849.5990 by submitting a request to the Commission in writing describing the amendment sought and the reasons for the amendment. The Commission will mail notice of receipt of the request to the Permittee. The Commission may amend the permit after affording the Permittee and interested persons such process as is required.

VI. TRANSFER OF PERMIT

The Permittee may request that the Commission transfer this permit to another person or entity pursuant to Minn. Rule 7849.6000. The Permittee shall provide the name and description of the person or entity to whom the permit is requested to be transferred, the reasons for the transfer, a description of the facilities affected, and the proposed effective date of the transfer. The person to whom the permit is to be transferred shall provide the Commission with such information as the Commission shall require in determining whether the new permittee can comply with the conditions of the permit. The Commission may authorize transfer of the permit after affording the Permittee, the new permittee, and interested persons such process as is required.

VII. REVOCATION OR SUSPENSION OF THE PERMIT

The Commission may initiate action to suspend or revoke this permit at any time. Grounds for suspension or revocation include:

- 1) A false statement was knowingly made in the application or in accompanying statements or studies required of the applicant, and a true statement would have warranted a change in the Commission's findings;
- 2) There has been a failure to comply with material conditions of this permit, or there has been a failure to maintain health and safety standards; or
- 3) There has been a material violation of a provision of an applicable statute or rule or an order of the Commission.

In the event the Commission shall determine that it is appropriate to consider suspension or revocation of this permit, it shall act in accordance with all applicable statutes and rules, including Minnesota Statutes Section 216E.14. The Commission may require the Permittee to undertake corrective measures in lieu of suspending or revoking this permit pursuant to Minn. Rule 7849.6010.

VIII. PERMIT COMPLIANCE

Failure to timely and properly make compliance filings required by this permit is a failure to comply with the conditions of this permit. Compliance filings must be eFiled through the Department of Commerce eDocket system in accordance with the Commission procedure for compliance filings attached to this permit (**Attachment 2**).

For ease of use, a compilation of compliance filings required under this permit is attached (**Attachment 3**).

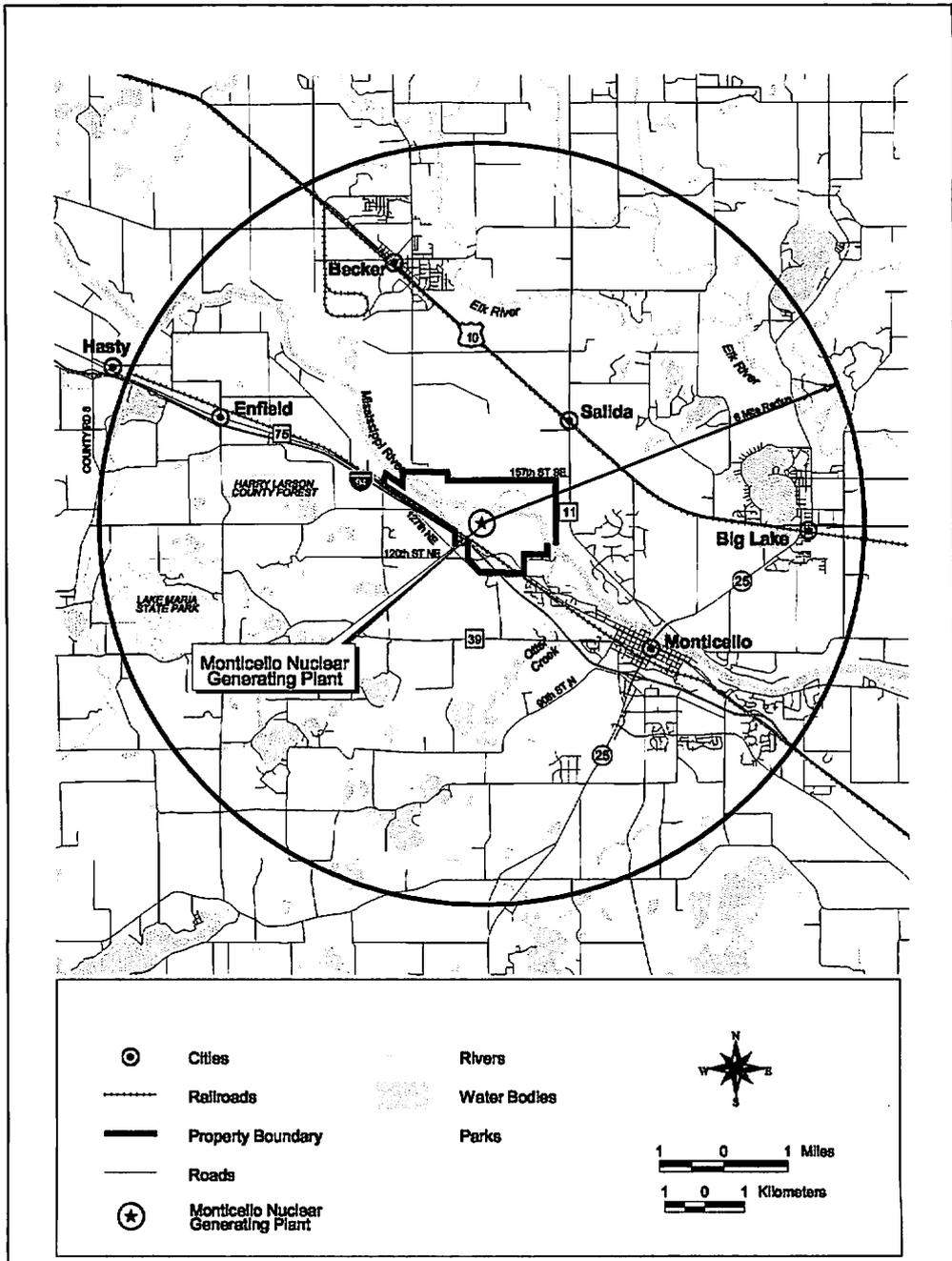
IX. RIGHT OF ENTRY

The Permittee shall allow Commission designated representatives to perform the following, upon reasonable notice, upon presentation of credentials and at all times in compliance with the Permittee's site safety and security standards:

- 1) To enter upon the facilities easement of the property for the purpose of obtaining information, examining records, and conducting surveys or investigations;
- 2) To bring such equipment upon the facilities easement of the property as is necessary to conduct such surveys and investigations;
- 3) To sample and monitor upon the facilities easement of the property; and
- 4) To examine and copy any documents pertaining to compliance with the conditions of this Permit.

X. COMPLAINT PROCEDURE

- 1) Within thirty (30) days of receiving this Site Permit, the Permittee shall submit to the Commission the Permittee's procedures to be used to receive and respond to substantial complaints received regarding the implementation of this project. The procedures shall be in accordance with the requirements set forth in the Commission complaint report procedure also attached to this permit.
- 2) The Permittee shall advise the Commission in writing (eFile) of any substantial complaints received by the Permittee during the course of construction that are not resolved within thirty (30) days of the complaint.
- 3) Upon request, the Permittee shall assist the Commission with the disposition of unresolved or longstanding complaints. This assistance shall include, but is not limited to, the submittal of complaint correspondence and complaint resolution efforts.



**MINNESOTA PUBLIC UTILITIES COMMISSION
COMPLIANCE FILING PROCEDURE
FOR PERMITTED ENERGY FACILITIES**

1. **Purpose**

To establish a uniform and timely method of submitting information required by Minnesota Public Utilities Commission (PUC) energy facility permits.

2. **Scope and Applicability**

This procedure encompasses all compliance filings required by permit.

3. **Definitions**

Compliance Filing – A sending (filing) of information to the PUC, where the information is required by a PUC site or route permit.

4. **Responsibilities**

A) The permittee shall eFile all compliance filings with Dr. Burl Haar, Executive Secretary, PUC, through the Department of Commerce (DOC) eDocket system. The system is located on the DOC website:

<https://www.edockets.state.mn.us/EFiling/home.jsp>

General instructions are provided on the website. Permittees must register on the website to eFile documents.

B) All filings must have a cover sheet that includes:

- 1) Date
- 2) Name of submitter / permittee
- 3) Type of Permit (Site or Route)
- 4) Project Location
- 5) Project Docket Number
- 6) Permit Section Under Which the Filing is Made
- 7) Short Description of the Filing

C) Filings that are graphic intensive (e.g., maps, plan and profile) must, in addition to being eFiled, be submitted as paper copies and on CD. Copies and CDs should be sent to: 1) Dr. Burl W. Haar, Executive Secretary, Minnesota Public Utilities Commission, 121 7th Place East, Suite 350, St. Paul, MN, 55101-2147, and 2) Department of Commerce, Energy Facility Permitting, 85 7th Place East, Suite 500, St. Paul, MN, 55101-2198. Additionally, the PUC may request a paper copy of any eFiled document.

Site Permit
 Xcel Energy Extended Power Uprate
 Monticello Nuclear Generating Plant
 PUC Docket No. E-002/GS-07-1567

ATTACHMENT 3 COMPILATION OF PERMIT COMPLIANCE FILINGS

PERMITTEE: Xcel Energy
PERMIT TYPE: LEPGP Site Permit
PROJECT LOCATION: Wright County
PUC DOCKET NUMBER: E-002/GS-07-1567

Filing Number	Permit Section	Description	Due Date
1	Section IV.A.	Contact Information	At least fourteen (14) days prior to the start of each of the refueling outages in 2009 and 2011.
2	Section IV.B.	Increased Power Level Notification	Within 30 days of achieving increased EPU power levels.
3	Section IV.C.	Work Completion	Within 120 days of the plant's return to service following completion of each of the 2009 and 2011 refueling outages.
6	Section X	Complaint Procedure	Within 30 days of receiving this Site Permit.



Oblique aerial photograph of
Monticello Nuclear Generating Plant, view looking toward the west.
Cooling towers in the foreground right; reactor building to the right.

STATE OF MINNESOTA)
)SS
COUNTY OF RAMSEY)

AFFIDAVIT OF SERVICE

I, Robin Benson, being first duly sworn, deposes and says:

That on the 23rd day of December, 2008 she served the attached
ORDER.

MNPUC Docket Number: E-002/GS-07-1567

- XX By depositing in the United States Mail at the City of St. Paul, a true and correct copy thereof, properly enveloped with postage prepaid
- XX By personal service
- XX By inter-office mail

to all persons at the addresses indicated below or on the attached list:

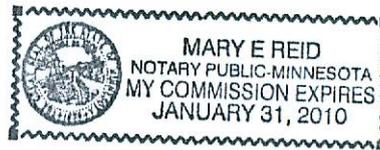
David Jacobson
Sharon Ferguson - DOC
Julia Anderson - OAG
John Lindell- OAG

Robin Benson

Subscribed and sworn to before me,

a notary public, this 23 day of
December, 2008

Mary E. Reid
Notary Public



10:
MN PUC

Burl W. Haar
MN Public Utilities Commission
Suite 350
121 7th Place East
St. Paul MN 55101-2147

20:
Dept. of Commerce

Sharon Ferguson
MN Department Of Commerce
Suite 500
85 7th Place East
St. Paul MN 55101-2198

30:
Inter-Office Mail

Julia Anderson
MN Office Of The Attorney General
1400 BRM Tower
445 Minnesota Street
St. Paul MN 55101-2131

John Lindell
OAG-RUD
900 BRM Tower
445 Minnesota Street
St. Paul MN 55101-2130

40:
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Gerald Larson
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Mail Stop 620
St Paul MN 55155

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Shafter MN 55074

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St. Cloud Times
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Robert & Lori Orlikowski
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Carol Overland
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Darrell Gerber
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Minneapolis MN 55414

James Willis
James G Willis Associates
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Plymouth MN 55447