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August 6, 2008

Burl W. Haar
Executive Secretary
Minnesota Public Utilities Commission
127 7th Place East, Suite 350
St. Paul, MN 55101-2147

RE: Comments and Recommendations of the Minnesota Department of Commerce
Prairie Island Nuclear Generating Plant (PINGP) Extended Power Uprate Project
Docket No. E002/GS-08-690

Dear Dr. Haar:

Attached are the comments and recommendations of the Minnesota Department of Commerce (DOC) Energy Facility Permitting (EFP) Staff in the above stated matter.

Xcel Energy proposes to uprate the electrical generating capacity of PINGP from 1150 megawatts electric to 1314 megawatts electric (MWe). The uprate would occur in two phases – the first on Unit 1 completed by 2013, the second on Unit 2 by 2014. The 164 MWe uprate would be achieved by operating the reactors at a higher thermal power level. Increasing the thermal output of the reactors would require more uranium in the reactor core to maintain the same fuel cycle length (e.g. eighteen to twenty months). This would be accomplished by using a fuel assembly that has slightly larger diameter fuel pellets. These larger fuel rods would also have more surface area for heat transfer offsetting some of the higher operating temperatures. To transfer the additional heat energy out of the fuel, the fuel assemblies themselves would operate at slightly higher temperatures. The NRC must approve the new fuel design prior to its use in the PINGP.

All modifications, except for limited power supply upgrades, will occur within the current physical footprint of PINGP.

The Department is providing you with:

- A. Comments and Recommendations;
- B. General route location map.

The Department EFP staff recommends acceptance of the LEPGP Site permit application with the understanding that any additional information necessary for processing the application will be provided promptly. Staff is available to answer any questions the Commission may have.

Sincerely,

William Cole Storm, DOC EFP Staff

Enclosures



BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

**COMMENTS AND RECOMMENDATIONS OF THE
MINNESOTA OFFICE OF ENERGY SECURITY
ENERGY FACILITY PERMITTING STAFF**

DOCKET No. E002/GS-08-690

Meeting Date: August 14, 2008.....Agenda Item #

Company: Xcel Energy

Docket No. PUC Docket Number: E002/GS-08-690
In the Matter of the Application for a LEPPG Site Permit for the Prairie Island Nuclear Generating Plant (PINGP) Extended Power Uprate Project.

Issue(s): Should the Commission accept or reject the application as substantially complete? If accepted, should the Commission authorize the Department to appoint a public advisor and/or an advisory task force?

DOC Staff: William Cole Storm.....651-296-9535

Relevant Documents (in Commission Packet).

1. Xcel Energy’s LEPPG Site Permit Application, Dated August 1, 2008.
2. PUC Order for 08-509 and 08-510, Application Acceptance, Dated July 22, 2008
3. PUC Order for 08-509 and 08-510, Notice & Order for Hearing, Dated July 22, 2008

The enclosed materials are work papers of the Department of Commerce Office of Energy Security Energy Facility Permitting Staff. They are intended for use by the Public Utilities Commission and are based on information already in the record unless otherwise noted.

This document can be made available in alternative formats; i.e. large print or audio tape by calling (651) 201-2202 (Voice) or 1-800-627-3529 (TTY relay service).

Documents Attached.

1. General site location map.

(Note: Relevant documents and additional information can be found on eDockets (E002/GS-08-690) or the PUC Facilities Permitting website <http://energyfacilities.puc.state.mn.us/>)

Statement of the Issue

Should the Commission accept or reject the application as substantially complete under the Full Review Process of the Power Plant Siting Act (Minnesota Statutes 216E.001 to 216E.18)? If accepted, should the Commission authorize the Department to appoint a public advisor and an advisory task force?

If the application is accepted, the Commission needs to notify the applicant in writing of the acceptance. If the application is rejected, the Commission must advise the applicant of the deficiencies in the application.

Introduction and Background

On August 1, 2008, Xcel Energy submitted a large electric power generating plant (LEPGP) Site Permit application to the Minnesota Public Utilities Commission (Commission) for the proposed Prairie Island Nuclear Generating Plant (PINGP) Extended Power Uprate (EPU) project.

The PINGP utilizes a pressurized-water reactor (PWR). In a pressurized-water reactor, a nuclear reaction in the reactor core generates heat, which heats water in the primary loop. This heat is transferred to the secondary loop in the steam generators, and the steam produced inside the steam generators is directed to turbine generators to produce electrical power. The exhaust steam is cooled by a tertiary loop in a condenser and returned to the steam generators to be boiled again. The water in all three loops is force-circulated by electrically powered pumps. Emergency cooling water is supplied by other pumps, which can be powered by onsite diesel generators.

The PINGP consists of two 575 MWe gross (550 MWe net), two-loop, pressurized-water nuclear reactors. The reactors are referred to as Unit 1 and Unit 2. The 560-acre plant site and the associated transmission and other facilities are in Red Wing, Minnesota, on the western bank of the Mississippi River in Goodhue County. The site is approximately 30 miles southeast of St. Paul (See Figure).

Unit 1 began commercial operation in December 1973, and Unit 2 began operations in December 1974. The initial NRC license for each unit was for a period of 40 years. The initial license will expire in 2013 and 2014 for Unit 1 and Unit 2, respectively. Xcel Energy submitted an application to the NRC for an additional 20-year license extension for both units on April 15, 2008.

The proposed EPU of 164 MWe consists of an 82 MWe net capacity uprate at Unit 1 and an 82 MWe net uprate at Unit 2. Xcel Energy proposes to complete the uprate on Unit 1 during the 2012 refueling outage and on Unit 2 during the 2015 refueling outage.

Project Description

Power uprates in a pressurized water reactor (PWR) do not require significant modifications to the reactor, nuclear steam supply system, or emergency core cooling systems. The 164 MWe total capacity uprate at the PINGP would be achieved by:

1. Increasing the heat produced in the reactor and steam produced in the steam generators and;
2. Improving the balance-of-plant equipment that converts the steam into electricity.

Higher steam flow from the reactors is obtained by operating the reactors at a higher thermal power level. Increasing the thermal output of the reactors would require more uranium in the reactor core to maintain the same fuel cycle length (e.g. 18 to 20 months). This would be accomplished by using a fuel assembly that has slightly larger diameter fuel pellets. These larger fuel rods would also have more surface area for heat transfer offsetting some of the higher operating temperatures. To transfer the additional heat energy out of the fuel, the fuel assemblies themselves would operate at slightly higher temperatures. The NRC must approve the new fuel design prior to its use in the PINGP.

In addition to the increased heat output, the EPU would require steam turbine replacements and a variety of other balance-of-plant improvements to take advantage of the increased steam production.

The major modifications that would be completed during the two outages are:

- Upgrade high-pressure turbines;
- Replace or rewind main generators;
- Replace generator step-up transformers;
- Replace moisture separator reheaters; and
- Upgrade isophase bus duct cooling.

Although few modifications are required for the reactor and its support systems, the reactor and support systems have been reanalyzed to demonstrate that their functions are unaffected by operation at power uprate conditions, with adequate margin remaining.

Nuclear Regulatory Commission

When the NRC issues a license for a commercial nuclear power plant, the agency sets limits on the maximum heat output, or power level, for the reactor core. This power level plays an important role in many of the analyses that demonstrate plant safety, so the NRC's permission is required before a plant can change its maximum power level. A power uprate only occurs after the NRC approves a commercial nuclear power plant's request to increase its power. The process for requesting and approving a change to a plant's power level is governed by 10 CFR 50.90-92.

As of January 2008, the NRC has approved 116 uprates, resulting in a gain of approximately 15,600 MWt (megawatts thermal) or 5,200 MWe (megawatts electric) at existing plants.

Collectively, these uprates have added generating capacity at existing plants that is equivalent to more than five new reactors.

The design of every U.S. commercial reactor has excess capacity needed to potentially allow for an uprate, which can fall into one of three categories:

- **Measurement uncertainty recapture power uprates** are power increases of less than 2 percent of the licensed power level, and are achieved by implementing enhanced techniques for calculating reactor power. This involves the use of state-of-the-art devices to more precisely measure feedwater flow which is used to calculate reactor power. More precise measurements reduce the degree of uncertainty in the power level which is used by analysts to predict the ability of the reactor to be safely shut down under possible accident conditions.
- **Stretch power uprates** are typically between 2 percent and 7 percent, with the actual increase in power depending on a plant design's specific operating margin. Stretch power uprates usually involve changes to instrumentation settings but do not involve major plant modifications.
- **Extended power uprates** are greater than stretch power uprates and have been approved for increases as high as 20 percent. Extended power uprates (EPU) usually require significant modifications to major pieces of non-nuclear equipment such as high-pressure turbines, condensate pumps and motors, main generators, and/or transformers.

The Xcel Energy's proposed power uprate to the PINGP is an extended power uprate. Xcel Energy intends to apply to the NRC for an amendment to the Prairie Island Operating License for the proposed EPU in 2010.

State Regulatory Process and Procedures

Determination of Need

The proposed EPU project is also required to obtain a Certificate of Need (CON) from the Commission pursuant to Minnesota Statutes, 216C.05 to 216C.30. Xcel Energy filed an application for a CON with the Commission for the project on May 16, 2008, in accordance with Minnesota Rules Chapter 7829 and 7849.

On July 15, 2008, the Commission accepted the CON application as complete (July 22, 2008 order); the docket number for the certificate of need for the EPU is E002/CN-08-509.

The Department of Commerce Office of Energy Security (OES) prepares an Environmental Report (ER) on proposed large electric power generating plants that come before the PUC for a determination of need (Minn. Rules 7849.7100); the proposed Extended Uprate falls within this definition. The ER must contain information on the human and environmental impacts of the proposed project associated with the size, type, and timing of the project, system configurations,

and voltage. The environmental report must also contain information on alternatives to the proposed project and address mitigating measures for anticipated adverse impacts.

Minnesota Rule 7849.7100, Subpart 2, provides that in the event an applicant for a certificate of need for a LEPGP or a HVTL applies to the Commission for a site permit or route permit prior to the time the OES completes the environmental report, the OES may elect to prepare an environmental impact statement (EIS) in lieu of the required environmental report. If combining the processes would delay completion of the environmental review, the applicant and the Commission must agree to the combination. If the documents are combined, OES includes in the EIS the analysis of alternatives required by part 7849.7060, but is not required to prepare an environmental report under part 7849.7030.

Minnesota Statutes 216B.243, Subd. 4, require a public hearing be held for the CON to obtain public comments on the necessity of the project. This subdivision provides that unless the commission determines that a joint hearing on siting and need under this subdivision and section 216E.03, subdivision 6, is not feasible or more efficient, or otherwise not in the public interest, a joint hearing under those subdivisions shall be held.

Additional Dry Cask Storage Docket

Along with its May 16, 2008, filing, Xcel Energy also filed a CON for additional dry cask storage at the existing Independent Spent Fuel Storage Installation (ISFSI) at the PINGP. This filing was pursuant to Minn. Stat. 116C.83, Minn. Stat. 216B.243, and Minn. Rule 7855.

The PINGP currently has State authorization for enough dry casks (e.g., 29) to store the spent fuel generated until the end of the current operating licenses in 2013 and 2014; there are currently 24 dry casks at the PINGP ISFSI. In order for the reactors to continue operation through a license renewal period to 2033 and 2034, up to an additional 35 dry casks would be needed to be added to the existing ISFSI.

Authorization of any additional dry cask storage or expansion or establishment of an independent spent-fuel storage facility at a nuclear generation facility in Minnesota is subject to approval of a certificate of need by the Commission pursuant to Minn. Stat. 216B.243. In any proceeding under this subdivision, the commission may make a decision that could result in a shutdown of a nuclear generating facility.

On July 15, 2008, the Commission accepted the CON application as complete (July 22, 2008 order); the docket number for the certificate of need for the Additional Dry Cask Storage is E002/CN-08-510.

An environmental impact statement (EIS) is required for the construction and operation of a new or expanded independent spent-fuel storage installation (Minn. Stat. 116C.83). The commissioner of the Department of Commerce is the responsible governmental unit for the environmental impact statement. Prior to finding the statement adequate, the commissioner must find that the applicant has demonstrated that the facility is designed to provide a reasonable expectation that the operation of the facility will not result in groundwater contamination in excess of the standards established in section 116C.76, subdivision 1, clauses (1) to (3).

Site Permit

The proposed EPU of the electrical generating capacity of the PINGP by 164 MW electric falls within the definition of a Large Electric Power Generating Plant (LEPGP) in the Power Plant Siting Act and, thus, requires a Site Permit from the Commission prior to construction. The Chapter 7849 rules provide for three different procedures for obtaining a site permit: full review, alternative review, and local review.

The proposed PINGP EPU project does not qualify for the alternative permitting process (Minn. Rule 7849.5500) and Xcel Energy has applied for a site permit following the full review process.

LEPGP Site Permit Applications under the full review process must provide specific information about the proposed project, applicant, an alternative site, environmental impacts, and mitigation measures (Minnesota Rule 7849.5220). The Commission may accept an application as complete, reject an application and require additional information to be submitted, or accept an application as complete upon filing of supplemental information (Minnesota Rule 7849.5230).

The review process begins with the determination by the Commission that the application is complete. The Commission has one year to reach a decision from the time the application is accepted.

Environmental Review

The OES EFP staff prepares a document called an Environmental Impact Statement (EIS). An EIS is a written document that describes the human and environmental impacts of a proposed large electric power generating plant (and selected alternative sites) and methods to mitigate such impacts. The public has the opportunity to comment on the scope of the EIS and the draft EIS through public comment periods and at OES sponsored information meetings.

As mentioned previously, the OES may elect to combine the ER required under the CON process with the EIS, in an effort to gain efficiencies and minimize redundancies.

Hearing Process

Upon completion of the draft EIS, a public hearing must be held pursuant to Minnesota Statute 216E.03, subd. 6 and Minnesota Rule 7849.5330. All hearings for designating a site or route shall be conducted by an administrative law judge from the Office of Administrative Hearings pursuant to the contested case procedures of Minnesota Statutes and Minnesota Rules Chapter 1405. Members of the public have an opportunity to speak at the hearings, present evidence, ask questions, and submit comments.

Public Advisor

Upon acceptance of an application for a site or route permit, the Commission must designate a staff person to act as the public advisor on the project (Minnesota Rule 7849.5250). The public advisor is someone who is available to answer questions from the public about the permitting process. In this role, the public advisor may not act as an advocate on behalf of any person.

The Commission can authorize the OES to name a staff member from the EFP staff as the public advisor or assign a PUC staff member.

Advisory Task Force

The Commission may appoint an advisory task force (Minnesota Statute 216E.08). An advisory task force must, at a minimum, include representatives of local governmental units in the affected area. The charge of a task force shall include with identifying additional sites or specific impacts to be evaluated in the EIS and terminates when the Department of Commerce (Department) Commissioner issues an EIS scoping decision. The Commission may establish additional charges. The Commission is not required to assign an advisory task force for every project.

If the Commission does not name a task force, the rules allow a citizen to request appointment of a task force (Minnesota Rule 7849.5580). The Commission would then need to determine at its next meeting if a task force should be appointed or not.

The decision whether to appoint an advisory task force does not need to be made at the time of accepting the application; however, it should be made as soon as practicable to ensure its charge can be completed prior to the EIS scoping decision by the Department Commissioner.

OES EFP Staff Analysis and Comments

Completeness

OES EFP staff conducted a completeness review of the Xcel Energy LEPGP Site permit application and concludes that the Application meets the content requirements of Minnesota Rule 7849.5530 and is complete. Application acceptance allows staff to initiate and conduct the public participation and environmental review process.

Advisory Task Force

In analyzing the merits of establishing an Advisory Task Force for the project, EFP staff considered four project characteristics: size, complexity, known or anticipated controversy and sensitive resources.

Project Size. PINGP consists of two 575 MWe, two-looped, pressurized-water nuclear reactors. The 560-acre plant site and associated transmission and other facilities are located in Red Wing, Minnesota, on the western bank of the Mississippi River in Goodhue County. The 164 MWe uprate would increase output by approximately 10 percent. PINGP is owned by Xcel Energy and operated by Nuclear Management Company, LLC (NMC) under contract with Xcel Energy. NMC is a wholly owned subsidiary of Xcel Energy.

The proposed uprate project would not require new structures or buildings, and so would not change the “footprint” of the existing site.

Complexity. The project is relatively uncomplicated; the increased thermal power is achieved primarily by increasing the size of the fuel pellet/rod assemblies replaced in the reactor core at each refueling.

No changes in operating pressure or core flow are necessary to support the uprate.

Although few modifications are required for the reactor and its support systems, the uprate will require steam turbine replacements and a variety of other balance-of-plant improvements to take advantage of the increased steam production.

After reviewing the Air Quality, Water Appropriations and Wastewater Discharge permits, it is not anticipated that any of these existing permits will require amendments.

According to the application, the proposed uprate would not significantly change the maximum projected annual off-site dose or cumulative radiation dose. On-site and off-site radiological doses would remain well below federal regulatory limits.

Known/Anticipated Controversy. Nationally, uprates at nuclear power plants have not been without controversy and/or operational issues; however, here in Minnesota, the public has been largely silent through the public comment period on the completeness of the CON application.

The controversy in other states has mainly centered on concerns of safety (vibration of components and emergency cooling system issues), additional waste generation and a lack of public confidence in the NRC's Reactor Oversight Process (ROP).

Since uprates affect a reactor's licensed power level, utilities must apply for NRC permission to amend their operating license in order to implement a power uprate. The process for requesting and approving a change to a plant's power level is governed by 10 CFR 50.90-92. The applications and reviews are complex and involve many areas of expertise in the NRC's Offices of Nuclear Reactor Regulation and General Counsel.

Some reviews may also involve the Office of Nuclear Regulatory Research and the Advisory Committee on Reactor Safeguards (ACRS). In evaluating a power uprate request, NRC reviews data and accident analyses submitted by a licensee to confirm that the plant can operate safely at the higher power level.

The NRC uses a review standard for extended power uprates (RS-001, December 2003), that has been endorsed by the ACRS. The standard provides a comprehensive process and technical guidance for reviews by the NRC staff, and provides useful information to licensees considering applying for an extended uprate.

After a licensee submits an uprate application, the NRC places a notice in the *Federal Register* to notify the public that the agency is considering the application. The public has 30 days to comment on the licensee's request and 60 days to request a hearing where the application could be contested. The NRC thoroughly reviews the application and any public comments, while the Atomic Safety and Licensing Board (ASLB) considers any requests for hearings. NRC technical staff complete their review while considering and addressing any public comments, issuing a safety evaluation and another *Federal Register* notice to inform the public. If the ASLB determines a hearing is required, a separate legal process takes place, and NRC staff provides technical information, if

needed. The safety evaluation and any hearing rulings form the basis for the NRC's final decision on the uprate request.

Sensitive Resource. The primary impact of the EPU is a small temperature increase in the circulating water leaving the main condenser due to the increase in thermal power output. Cooling water discharge temperature will be maintained through increased use of the cooling towers or other methods; therefore, the thermal discharge will remain within the limits of the recently reissued NPDES permit. No changes are planned for the PINGP plant intake system or intake flow rates, therefore no change in permitted water appropriation is needed.

Except for transportation of equipment during construction and the routine disposal of waste, the EPU maintenance activities are confined to the inner-plant security fenced area. The uprate does not affect the storage requirements for above ground or below ground tanks. Other lands located outside the inner security fence will not be modified or changed to support uprate activities. The uprate does not involve changes to any aesthetic resources and does not involve any impacts to lands with historical or archaeological significance.

Based on the analysis above, OES EFP staff concludes that an advisory task force is not warranted in this case. Additionally, Minn. Stat. 216B.243, Subdivision 3b, prohibits the issuing of a CON for the construction of a new nuclear-powered electric generating plant, thus eliminating the primary charge, that of identifying alternative sites, to an advisory task.

Environmental Review

There are currently three dockets relative to PINGP before the PUC; each of these dockets requires an environmental review document.

Item	Docket No.	Review Document
CON for the EPU	E002/CN-08-509	Environmental Report
CON for Additional Dry Casks	E002/CN-08-510	Environmental Impact Statement
LEPGP Site Permit for the EPU	E002/GS-08-690	Environmental Impact Statement

The OES EFP staff has concluded that combining the ER requirement of the EPU CON process and the EIS requirement of the LEPPG Siting process into a single environmental review document is warranted.

The site permit application was filed prior to the completion of the ER required for the CON and prior to initiation of the scoping process for the ER. Thus, preparing an EIS in lieu of the ER will achieve process efficiencies. It will enable staff to solicit comments pertinent to the scoping of both the Environmental Report (CON process) and the Environmental Impact Statement (LEPPG Siting process) at a single public informational meeting. OES will then develop one scoping document and one environmental document for both applications.

Additionally, the OES in consultation with PUC staff has determined that further process efficiencies can be obtained by incorporating the EIS requirements for the Additional Dry Cask

Storage CON process with those addressed above for the EPU CON and Site Permit approval processes. This determination is supported by Minn. Stat. 216A.07, Subdivision 6, which encourages the coordination of the Department's activities.

OES will prepare one document to fulfill:

- The Uprate CON and site permit environmental review requirements of 7849.7030 and 7849.5300, respectively, combined pursuant to 7849.7100.
- The Independent Spent Fuel Storage Installation EIS required pursuant to 116C.83, developed in accordance with 116D and Chapter 4410.

As discuss above, OES will hold a single Public Informational/Scoping meeting. OES will then develop one scoping document for all three projects.

The single EIS will contain different sections for each project. Each section will be found adequate by its respective reviewing body (7849 EIS is found adequate by the PUC; the 4410 EIS is found adequate by the DOC Commissioner).

Combining the processes will not delay completion of the environmental review; it is anticipated that the draft EIS will be completed by the end of March, 2009.

Public Hearing

In its July 22, 2008, Order, the Commission referred the Certificate of Need dockets (PUC Dockets E002/CN-08-509 and E002/CN-08-510) to the Office of Administrative Hearings for conduct of the Minnesota Rules Chapter 1400 contested case proceeding. Thus, the hearing for the two certificates of need dockets will be contested case hearings presided over by an ALJ.

The ALJ will issue a report containing findings, conclusions, and a recommendation on whether the Commission should issue a certificate of need for the proposed projects.

The public hearing required in the LEPGP siting docket (Docket E002/GS-08-690) is governed by Minn. Rule 7849.5330, which specifies a contested case hearing.

Efficiencies could be gained by coordinating the contested case hearings for the two CON proceedings with that required for the LEPGP siting process.

Commission Decision Options

A. Application Acceptance

1. Accept the LEPGP Site permit application submitted by Xcel Energy for the PINGP EPU project as complete authorizing OES EFP Staff to initiate the full review process under Minnesota Rules Chapter 7849 and refer the docket to the Office of Administrative Hearings to hold a contested case processing pursuant to Minn. Rule Chapter 1405.
2. Reject the LEPGP Site permit application as incomplete and issue an order indicating the specific deficiencies to be remedied before the Application can be accepted.
3. Find the Application complete upon the submission of supplementary information.

4. Make another decision deemed more appropriate.

B. Public Advisor

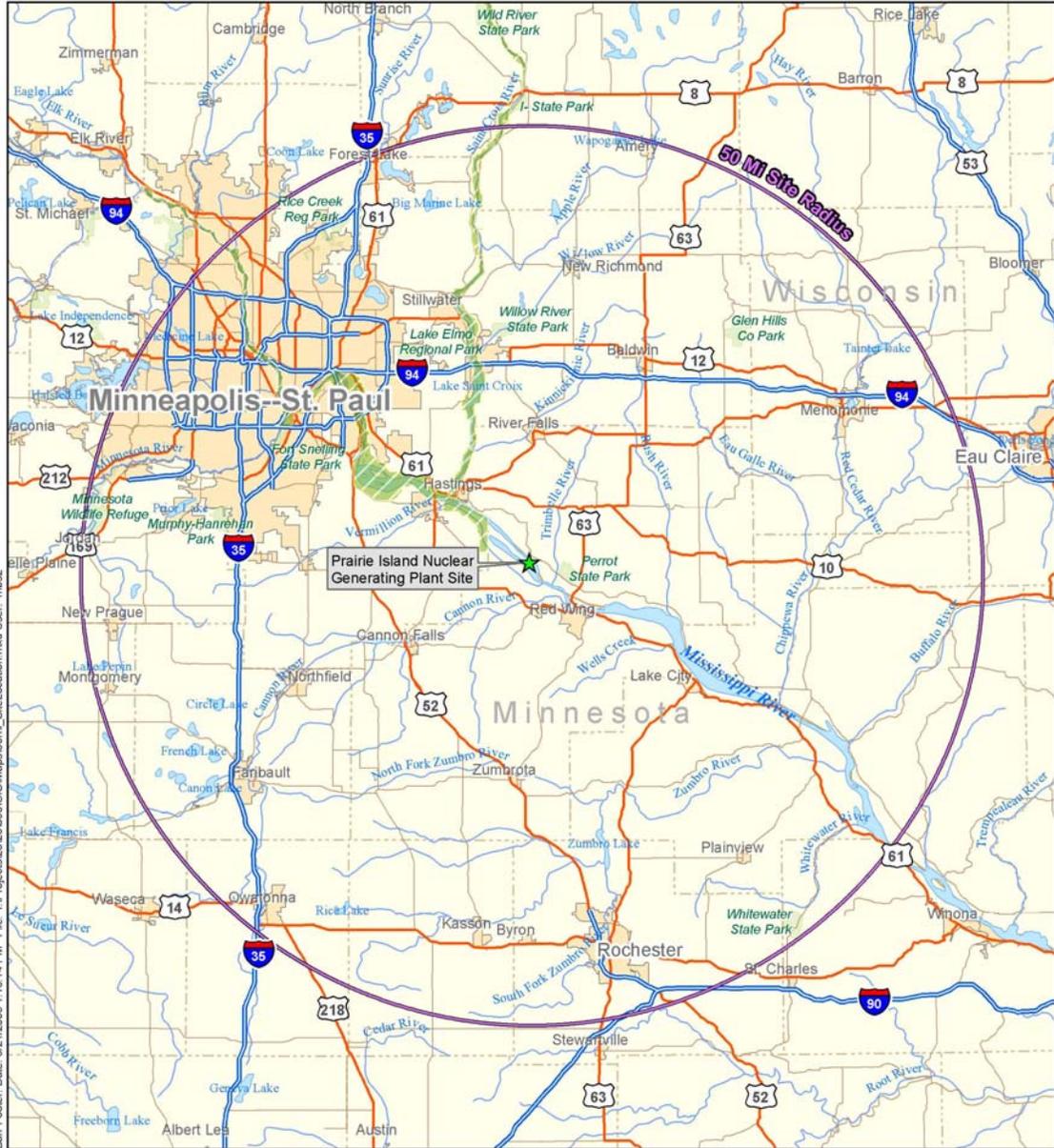
1. Authorize the OES EFP staff to name a public advisor in this case.
2. Appoint a Commission staff person as public advisor.
3. Make another decision deemed more appropriate.

C. Advisory Task Force

1. Authorize OES EFP staff to establish an advisory task force, and develop a proposed structure and charge for the task force.
2. Take no action on an advisory task force at this time.
3. Determine that an advisory task force is not necessary.
4. Make another decision deemed more appropriate.

EFP Staff Recommendation

Staff recommends Options A-1, B-1, and C-3.



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-  River/Stream
-  Larger Water Body/River
-  Mississippi and St. Croix National River Areas
-  Park Land
-  Urban Area
-  County Boundary

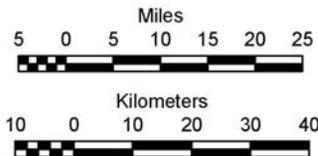


Figure 1-1

SITE LOCATION MAP
50 MILE RADIUS
Prairie Island Uprate
Site Permit
Red Wing, MN