OAH Docket No. 12-2500-16407-2
PUC Docket No. E-002/CN-05-123

STATE OF MINNESOTA
OFFICE OF ADMINISTRATIVE HEARINGS

FOR THE PUBLIC UTILITIES COMMISSION

In the Matter of the Application of Northern States Power (d/b/a/ Xcel Energy) for a Certificate of Need to Establish an Independent Spent Fuel Storage Installation at its Monticello Generating Plant

FINDINGS OF FACT, CONCLUSIONS OF LAW AND RECOMMENDATION

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APPEARANCES

An evidentiary hearing was held before Administrative Law Judge Steve M. Mihalchick, on February 21-23, 2006, in St. Paul, Minnesota. The following appearances were made:

B. Andrew Brown, Attorney at Law, Dorsey and Whitney LLP, 50 S. Sixth Street, Minneapolis, Minnesota, 55402, appeared for and on behalf of Northern States Power, d/b/a Xcel Energy (Xcel or Xcel Energy).

Linda Jensen and Valerie Smith, Assistant Attorneys General, 1400 Bremer Tower, 445 Minnesota Street, St. Paul, Minnesota 55101-2131, appeared for and on behalf of the Department of Commerce (Department or DOC).

Thomas P. Harlan and Katherine Becker, Madigan, Dahl & Harlan, P.A., 701 Fourth Avenue South, Suite 1700, Minneapolis, Minnesota 55415, appeared for and on behalf of the Minnesota Center for Environmental Advocacy (MCEA) and Minnesotans for an Energy-Efficient Economy (ME3) as intervenors.

Elizabeth Goodpaster, Attorney at Law, 26 East Exchange Street, Suite 206, St. Paul, Minnesota 55101, also appeared for and on behalf of MCEA

George Crocker, NAWO Executive Director, P.O. Box 174, Lake Elmo, Minnesota 55042, appeared on behalf of North American Water Office as an intervenor.

David L. Jacobson, 121 Seventh Place East, Suite 350, St. Paul, Minnesota 55101-2147, participated as representative of the staff of the Public Utilities Commission (Commission or PUC).

NOTICE

Under the PUC's Rules of Practice and Procedures, Minn. R. 7829.0100 to 7829.3200, exceptions to this Report, if any, by any party adversely affected must be filed within 15 days of the mailing date hereof with the Executive Secretary of the PUC, 350 Metro Square Bldg., 121 Seventh Place East, St. Paul, Minnesota 55101-2147. Exceptions must be specific, relevant to the matters at issue in this proceeding, and stated and numbered separately. Proposed Findings of Fact, Conclusions, and Order should be included, and copies thereof shall be served upon all parties.

The PUC shall make its determination on the matter of the Certificate of Need after expiration of the period to file Exceptions as set forth above, or after

oral argument, if such is requested and had in the matter. Notice is hereby given that the PUC may accept, modify, condition, or reject this Report of the Administrative Law Judge and that this Report has no legal effect unless expressly adopted by the PUC.

Notice is further given that the PUC's decision shall be stayed until June 1 following the next regular annual session of the Legislature that begins after the date of the PUC decision to allow for legislative review. Minn. Stat. § 116C.83, subd. 3. If the Legislature does not modify or reject the PUC's decision by law enacted during that regulation legislative session, the decision shall become effective on the expiration of the stay.

STATEMENT OF ISSUES

The overarching issues are whether the proposed Independent Spent Fuel Storage Installation (ISFSI or proposed storage facility) satisfies the criteria for a Certificate of Need (CON) in Minn. Stat. §§ 116C.83 and 216B.243, subd. 3, and Minn. Rules Ch. 7855, or whether a more reasonable and prudent alternative to the proposal exists.

The Administrative Law Judge concludes that Xcel demonstrated that its proposed storage facility meets the legal criteria and that no other party demonstrated that a more reasonable and prudent alternative exists at this time.

Based upon the proceedings herein, the Administrative Law Judge makes the following:

FINDINGS

I. Procedural History

1. The Applicant, Northern States Power d/b/a/ 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 Minnesota, South Dakota and North Dakota. Ex. 22 (Bomberger Direct) at 2.

2. The Monticello Nuclear Generating Plant (Monticello Plant or MNGP) is a 600-megawatt, nuclear-powered boiling water reactor electric generating plant located near Monticello, in Wright County, Minnesota. It is owned by Xcel Energy and is operated by Nuclear Management Company, LLC (NMC), under contract with Xcel Energy. NMC, a nuclear power plant operating company, is a joint venture, owned by Xcel Energy, CMS Energy, and We Energies. NMC operates six reactors at four sites, including the two reactors at Prairie Island Generating Unit. Ex. 1 (CON Application) at 1-1; Ex. 22 (Bomberger Direct) at 2; Hg. Transcript, vol. 2 at 66, 70 (Bomberger test.).

3. The Monticello Plant is licensed by the Nuclear Regulatory Commission (NRC) to operate through 2010. On March 24, 2005, Xcel Energy filed an application to renew the operating license for an additional 20 years with the NRC. Ex. 1 (CON Application) at 1-2.

4. On January 18, 2005, Xcel Energy submitted its Application for a CON to construct and operate a spent nuclear fuel storage facility on 3.5 acres owned by Xcel Energy and adjacent to the reactor and generating building at the Monticello Plant. The storage facility is known as an Independent Spent Fuel Storage Installation (ISFSI or proposed storage facility) by the NRC. Under the proposal, up to 30 spent fuel storage canisters would be placed in horizontally configured concrete storage vaults and arranged in rows on a concrete pad within the storage facility. The storage facility and 30 containers would enable the Monticello Plant to operate through 2030. Ex. 22 (Bomberger Direct) at 2-3; Ex. 1 (CON Application) at 1-3.

5. Ultimately, a dry spent fuel storage facility will be necessary regardless of how long the Monticello Plant operates in order to provide a storage system for plant decommissioning and full core discharge capacity. Xcel plans to build another concrete pad with capacity to hold 35 to 40 additional spent fuel casks at the time of decommissioning. Ex. 1 (CON Application) at 3-16; Final EIS at 1, 8.

6. On January 20, 2005, the PUC issued a notice requesting comments on the substantial completeness of Xcel Energy's CON Application. The comment and reply periods ran, respectively, through February 8, 2005, and February 22, 2005.

7. On February 1, 2005, the PUC issued an Order extending the completeness review period for Xcel Energy's Application and stating that the PUC would determine the substantial completeness as soon as practicable.

8. The PUC met on March 24, 2005, to consider the CON Application. The PUC found the CON Application would be substantially complete as of the date of Xcel Energy's supplementary filing. In the same Order, the PUC found it had jurisdiction over the matter and referred the Application for a contested case proceeding and public hearing. Ex. 3.

9. Xcel Energy made a supplementary filing on June 15, 2005, triggering a one-year deadline for a decision under Minn. Stat. § 216B.243, subd. 5. (Ex. 5). Xcel Energy has agreed to a short extension of that deadline.

10. Public hearings were held February 2, 2006, in Monticello and February 16, 2006, in St. Paul. Notice of the public hearings was published in the Monticello Times on January 6, 2006, (Ex. 9). Evidentiary hearings were held on February 21-23, 2006, in St. Paul, Minnesota.

11. Briefs were submitted. The record was closed upon receipt of the final reply brief on June 15, 2006.

II. Related Proceedings

12. Related proceedings that affect this proceeding are occurring before the Commission and other regulatory bodies. These are the Commission's review of Xcel Energy's Resource Plan, the Department's preparation and determination of adequacy of an Environmental Impact Statement (EIS), and the NRC's licensing approval of the proposed storage facility system's design, construction, and operation.

13. Xcel Energy is required to submit a Resource Plan to the PUC that examines the need for electricity over a 15-year planning period, evaluates a broad spectrum of alternatives to meet the anticipated demand for power, and presents a plan for meeting the need. Minn. Stat. § 216B.2422. The PUC then accepts, modifies, or rejects the Resource Plan. Xcel Energy filed a Resource Plan on November 1, 2004, that, among other things, addresses the Monticello plant's role in meeting the demand for electricity and alternatives to operations at Monticello. Information from that Resource Plan was used by some witnesses in this matter.

14. Xcel Energy submitted a draft Environmental Assessment Worksheet (EAW) on November 11, 2004, to the Environmental Quality Board (EQB), which at that time had responsibility for preparing the environmental review for the proposed project under Minn. Stat. § 116C.83, subd. 6(b), and Minn. Stat. Ch. 116D, the Minnesota Environmental Policy Act (MEPA). The Legislature then transferred the authority to prepare the EIS from the EQB to the Department effective July 1, 2005.

15. The Department released a Draft EIS (DEIS) on November 18, 2005, for public comment. The deadline for comments on the DEIS was March 3, 2006. The Final EIS was released on March 20, 2006, with comments due April 10, 2006. On July 26, 2006, the Commissioner of Commerce determined, under Minn. R. 4410.1288, subp. 4, that the EIS is adequate. The EIS is discussed below.

16. The federal government regulates many aspects of nuclear power plant operation and waste management and preempts state law on those issues. Federal regulations govern such issues as renewal of operating licenses, environmental protection regulations, emergency response requirements, and waste and spent fuel storage and transportation. 10 C.F.R. Parts 2, 19, 20, 21, 26, 30, 50, 50, 51, 54, 55, 70-73, 100.

17. As part of the federal relicensing process, the NRC prepared a Generic Environmental Impact Statement (GEIS), which applies to all facilities.

Individual supplements are then prepared for each facility; one was done for the proposed storage facility here (SEIS).

18. The GEIS concludes that air quality impacts from nuclear power plant emissions are "minimal." The principal impact on water quality occurs through the intake and discharge of large volumes of cooling water, which is of higher temperature than ambient conditions and controlled by the use of cooling towers. GEIS at §§ 2.3.2 - 2.2.5.

19. The GEIS examined risk from potential accident scenarios. Accident analysis focuses on the identification of "design basis accidents" and "severe accidents." Design basis accidents are those accidents that are expected to occur through the routine operation of a facility, and for which safety measures are built into operating systems. The GEIS concluded that the probability weighted risk posed by design basis accidents of all types was small. GEIS at §§ 5.3.2, 5.5.1.

20. Severe Accidents, including those from earthquakes, floods, or sabotage, are separately evaluated as scenarios which could cause significant damage to the reactor core. The GEIS concluded that the probability weighted risk posed by severe accidents of all types was also small. GEIS at §§ 5.3, 5.4, 5.5.2.

21. The SEIS for Monticello further examined accidents specifically applicable for the Monticello Generating Plant and concluded that the probability weighted risks of accidents of all types at Monticello is small. SEIS at § 5.1.

22. The SEIS for Monticello examined in detail potential impacts to water quality based on the intake and discharge of cooling water and found that the use of cooling towers, coupled with intake limits adjusted for river flow and discharge temperature limits adjusted by season, effectively mitigated water quality impacts. The overall impact on water quality from operation of Monticello was determined to be SMALL. SEIS at §§ 4.1.2-4.1.4.

III. Proposed Spent Fuel Storage Facility

A. Plant Characteristics and Performance

23. The Monticello Plant was initially granted its operating license by the NRC in September 1970. It 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. Ex. 22 (Bomberger Direct) at 3; Ex. 1 (CON Application) at 3-2.

24. The plant site consists of 2,150 acres owned by Xcel Energy on the eastern bank of the Mississippi River in Sherburne County and the western bank

in Wright County. 'Ex. 22 (Bomberger Direct) at 2. A perimeter fence and other barriers restrict access to the plant site. Ex. 1 (CON Application) at 3-2.

25. *The Monticello Plant operates 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 is then routed to turbine generators and produces 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 diesel fuel. Ex. 1 (CON Application) at 3-9.

26. The Monticello Plant has an average capacity factor of 88.3 percent. A plant's capacity factor is a measure of its performance and is based upon the ratio of the energy that a power-generating system produces to the energy that would be produced if it were operated at full capacity throughout a given period. In 2002, the Monticello plant generated a record five million megawatt-hours of electricity. Last year, the Monticello plant produced 4.6 million megawatt-hours, or about 10 percent of Xcel Energy customers' electric energy requirements. Ex.1 (CON Application) at 3-9.

27. Xcel Energy also owns the Prairie Island Nuclear Generating Plant located in Red Wing, Minnesota. The Monticello and Prairie Island plants together produce nearly 30 percent of the electric energy Xcel Energy's customers use. Ex. 1 (CON Application) at 1-1.

28. The Monticello plant has an excellent operating record. It received the General Electric Outstanding Plant Performance Award for boiling water reactors annually for the past 10 years and 17 of the last 22 years. The Monticello plant also has received the Minnesota Safety Council Award for the past 15 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. Ex. 1 (CON Application) at 3-9.

B. Nuclear Fuel Characteristics

29. The 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. Ex.1 (CON Application) at 3-2.

30. A fuel assembly consists of fuel rods, tie rods that do not contain fuel and are included to provide support to the assembly, and water rods, which are hollow tubes with holes located at each end to facilitate water flow through the assembly. Each fuel assembly is 5.28 inches wide and up to 172 inches long. A fuel rod consists of fuel pellets, each about the size of a thimble, stacked in a tube made of a steel alloy called Zircaloy. 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. Ex.1 (CON Application) at 3-10; Ex. 28 (McKeown Direct) at 2.

31. 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. Ex. 1 (CON Application) at 3-11.

32. 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 152 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 no longer useful. These "spent" nuclear fuel assemblies are then removed from the reactor and stored in the Monticello plant's spent fuel pool. Ex. 1 (CON Application) at 3-11; Ex. 28 (McKeown Direct) at 3.

33. The spent fuel pool is located on the refueling floor in the reactor building of the plant and is filled with storage racks that hold the spent fuel assemblies and other irradiated reactor components. The water in the pool is 37 feet, 9 inches deep. The pool is equipped with redundant cooling systems to remove heat that continues to be generated by the assemblies. The water above the spent fuel also provides radiation shielding. The spent fuel pool provides an area for cask loading operations. The pool area is configured so that a container can be lowered into the pool and assemblies transferred to it for removal to dry storage or transport. Ex. 1 (CON Application) at 3-12; Ex. 28 (McKeown Direct) at 3.

34. The spent fuel pool is now outfitted with 13 high-density racks, which are configured to hold 169 spent fuel assemblies, and one remaining low-density rack. Xcel Energy replaced all but one of the low-density racks in the spent fuel pool at the Monticello plant in 1978. Ex. 1 (CON Application) at 3-12.

35. The Monticello plant's NRC license allows for storage of up to 2,237 spent fuel assemblies in the current spent fuel storage rack configuration. Eight of the licensed spaces are not available because they do not meet the required dimensional specifications, leaving 2,229 spaces available in the spent fuel pool. Since 20 of the available spaces hold control rod blades, there are 2,209 spaces available for spent nuclear fuel storage in the spent fuel pool. Ex. 1 (CON Application) at 3-12.

36. Existing spent fuel storage capacity will be exhausted by 2010. Ex. 1 (CON Application) at 1-1.

C. Spent Fuel Inventory and Production

37. As of December 15, 2004, 2,536 spent fuel assemblies had been discharged from the Monticello plant's reactor and 1,478 spent fuel assemblies resided in the spent fuel pool. There were 731 spaces available in the pool. In

the mid-1980s, 1,058 spent fuel assemblies were shipped to a General Electric storage pool in Morris, Ill., pursuant to a contract with General Electric. Ex.1 (CON Application) at 3-11, 3-12.

38. The Monticello Plant maintains "full core offload capacity," which means the ability to remove all of the fuel from the reactor. Maintaining full core offload capacity is not necessary for safe plant operation, but is a feature of the plant's Updated Safety Analysis Report and provides flexibility in operations. The existing spent fuel pool has the storage capacity to allow full core offload capacity until 2007. Ex. 1 (CON Application) at 3-12, 3-14; Ex. 28 (McKeown Direct) at 3.

39. NMC plans to obtain NRC approval to use a temporary rack in the cask loading area of the pool to allow continued plant operation and maintain full core offload capacity through 2009. If approval of Monticello's proposed storage facility is delayed such that the first loading cannot be completed in 2008, the remaining low-density spent fuel rack in the existing pool may be replaced with a high-density spent fuel rack. The new high-density rack and the temporary rack in the cask loading area would provide full core offload capacity until 2011. NRC approval would be required for the high-density rack. Ex.1 (CON Application) at 3-14; Ex. 28 (McKeown Direct) at 4.

40. Spent fuel assemblies customarily reside in the spent fuel pool for at least five years to cool. They can then be placed in containers for dry storage or transport. Beginning in 2008, assemblies currently in the pool that have adequately cooled will have to be transferred to dry storage to make room for additional spent fuel assemblies in the pool and maintain full core offload space. Ex. 1 (CON Application) at 3-16.

41. Xcel Energy estimates that 1,520 spent fuel assemblies would be discharged from Monticello's reactor during operations between 2010 and 2030. Xcel Energy proposes to use storage containers that each hold 61 spent fuel assemblies. In order for the plant to operate from 2010 through 2030, up to 30 storage containers will be necessary. Ex.1 (CON Application) at 3-16.

D. Proposed Spent Fuel Storage Facility

42. The storage technology proposed by Xcel Energy will be provided by Transnuclear, Inc. (Transnuclear). According to its Website www.transnuclear.com, Transnuclear provides services for the "nuclear fuel cycle," including transportation, storage, and handling of spent nuclear fuel, radioactive waste, and other radioactive materials. The system it has proposed for the Monticello plant, the Transnuclear NUHOMS 61 BT spent nuclear fuel container, storage vault, and transport system, was licensed by the NRC in 2001.

43. The proposed dry spent fuel storage facility would consist of a lighted area, approximately 400 feet long by 200 feet wide, roughly 3.5 acres in size, located adjacent to the reactor and generating building on the 2150 acre

Xcel Energy Property. Ex. 42 (DEIS) § 3.1; Ex. 1 (CON Application) at Figure 3-10. The tallest structures would be the light poles, which are approximately 40 feet tall. Two fences would surround the facility, with a monitored, clear zone between them. Within the storage area, spent fuel will be encased in a canister, placed in a transfer cask for removal to modular concrete vaults, then removed from the transfer cask and stored in the vault, which will be placed on a reinforced concrete support pad, 18 to 24 inches thick. Ex. 1 (CON Application) at 3-16 to 3-17; Ex. 42 (DEIS) at 4.

44. Concrete approach pads would surround the support pad to accommodate storage vault placement and spent fuel container transfer traffic. A small concrete building approximately 20 feet by 22 feet would be located within the installation to house electrical equipment. The site and storage vaults would be monitored with cameras, other security devices, and temperature sensors. An access road would connect the storage facility to the rest of the plant. Ex. 1 (CON Application) at 3-16 to 3-17; Ex. 42 (DEIS) at 14.

45. Transnuclear's NUHOMS 61 BT storage system is designed to both store and transport spent fuel. It consists of seven main components: (1) a dry shielded canister, which is a stainless steel container used to store up to 61 boiling water reactor assemblies; (2) certain ancillary devices, which are used to dry, weld, backfill, and seal the dry shielded canisters for storage; (3) a transfer cask, which is a stainless steel cask used to handle and move the canister from the spent fuel pool to the storage facility; (4) a lifting yoke, a steel-lifting device that hooks up to a crane to lift the transfer cask; (5) a trailer, which is used to support and move the transfer cask from the reactor building to the horizontal storage module; (6) a horizontal storage module, which is a concrete vault that houses the canister; and (7) a transportation cask, which is a stainless steel overpack cask used to ship the canister to a permanent storage site. Ex.1 (CON Application) at 3-26 to 3-31; Ex. 28 (McKeown Direct) at 5-8.

46. The dry shielded canister is a half-inch thick steel cylinder with a lid secured to the shell with a double weld closure to ensure no leakage. The lid incorporates a 7-inch thick carbon steel plug to provide radiological shielding for workers during closure operations. The transfer casks are constructed from two concentric cylindrical steel shells with a bolted top cover plate and a welded bottom end assembly. The space between these two shells is filled with cast lead to provide gamma radiation shielding. The transfer cask also includes an outer stainless steel jacket, which is filled with water for neutron radiation shielding. The top and bottom assemblies incorporate a solid neutron shield material. The storage vaults are made of reinforced concrete and are designed to provide radiological shielding, protection from environmental conditions, structural integrity, and heat removal. Pursuant to federal regulations, the storage facility will include temperature monitoring in each storage vault. Ex. 1 (CON Application) at 3-26 to 3-32, 3-36 to 3-37; Ex. 28 (McKeown Direct) at 5-8.

47. Canister loading and storage is a multiple-step procedure that generally consists of placing a canister into a transfer cask, placing the canister and cask into the spent fuel pool, loading the spent fuel assemblies into the canister, plugging the canister while it remains under water, lifting and draining the canister and cask, decontaminating them, welding the cover plates on the canister, bolting the transfer cask lid on, and transferring the cask to the loading bay for removal to the storage vaults. Ex. 1 (CON Application) at 3-32 to 3-34.

48. The proposed facility is designed for relatively long-term interim storage, based upon the legal obligation of the federal Department of Energy to develop a permanent repository under Yucca Mountain, Nevada, or provide other permanent repositories. The date when Yucca Mountain will open is uncertain. Xcel Energy estimates that the earliest date Yucca Mountain would accept spent fuel from commercial generating plants is 2015. Ex. 1 (CON Application) at 3-17; Ex. 45 (Rakow Direct) at 70.

49. When the spent fuel is eventually moved offsite, a transportation cask will be backed up to the storage vault and the spent fuel container transferred from the storage vault into the transportation cask. The transportation cask will be covered and sealed, then transferred onto a transportation trailer for shipment. The concrete storage vaults can then be dismantled and handled as non-radioactive construction waste. Ex. 1 (CON Application) at 3-35 to 3-36.

50. Xcel Energy proposes to begin construction of the proposed storage facility in July 2007. The first spent fuel would be moved to it beginning in July 2008. Ex. 1 (CON Application) at 3-38 to 3-39; Ex. 42 (DEIS) at 15.

E. *Site Characteristics and Qualities*

51. Minn. Stat. § 116C.83, subd. 4b, requires that spent nuclear fuel storage be limited to the plant site at which the fuel was used. Xcel Energy identified five possible locations on the plant site suitable for dry spent nuclear fuel storage. From the identified five locations, it selected a Preferred Site and an alternative site. Ex. 1 (CON Application) at 3-17; Ex. 28 (McKeown Direct) at 9.

52. The Monticello plant is located at approximately 935 feet in elevation, 30 to 35 feet above the river. The Preferred Site for the storage facility is at approximately the same location. The slope of the Preferred Site runs 0 to 3 percent over most of the site. Both the Preferred Site and the alternate site are located above the 100-year or 500-year floodplain elevations. Those levels were not provided, but they appear to be well down the bluff from the plateau on which the plant and preferred and alternate sites are located. Ex.1 (CON Application) at 6-3 and 6-6.

53. Soils at the plant are primarily Hubbards, which is a loamy sand that is excessively permeable. The bedrock lies at a depth of 75 to 122 feet below the ground surface. Ground water was found in borings at approximately 20 to 22 feet below ground surface. At the Preferred Site, ground water is 30 to 35 feet below ground level. Ex.1 (CON Application) at 6-8 to 6-9.

54. The Preferred Site was used as a staging area during plant construction. It has regrown primarily with quaking aspen, and the ground cover is grass. Common species include bigtooth aspen, black cherry, gray birch, poison ivy, Virginia creeper, and wild grape. Approximately 80 percent of the site is covered by vegetation. Ex.1 (CON Application) at 6-11 to 6-12.

55. Approximately three acres of lower quality wooded land and scrub will be cleared to construct the ISFSI. Ex. 42 (DEIS) at 19.

56. The Minnesota National Heritage and Non-game Research Program has identified two rare species within approximately one mile west of the proposed site: dry oak savannah and the Peregrine Falcon.

57. The dry oak savannah is located in an area adjacent to the proposed site, identified by the Minnesota County Biological Survey as a "Site of High Biodiversity Significance," which means it may contain high quality native plant communities, rare plants, animals or animal aggregations. Ex. 42 (DEIS) at 20-21. Ex. 1 (CON Application) at 6-12. The EIS concluded that the proposed ISFSI would not detrimentally impact the dry oak savannah. Ex. 42 (DEIS) at 20.

58. In 1995, a nesting box for the Peregrine Falcon was established on the stack at the Monticello Plant. The Peregrine Falcon is a state-listed threatened species in Minnesota, but it was recently removed from the U.S. Endangered Species List. Ex.42 (DEIS) at 19-20. Ex. 1 (CON Application) at 6-13. Falcons have successfully used the nesting box, in conjunction with their successful adaptation to urbanized environments. The proposed facility will not impact falcon survival. Ex. 42 (DEIS) at 20 to 21.

59. Six National Register historic sites are located within five miles of the plant. There are no Minnesota Historical Society sites located within 5 miles of the Preferred Site. The closest site is the Oliver Kelley Farm located in Elk River, more than 10 miles to the northeast. Ex.1 (CON Application) at 6-27 to 6-28.

60. The selected dry spent fuel storage system will not generate waste or pollutants. Because the canister and cask assembly is sealed, welded, and decontaminated before leaving the reactor building, no residual radioactive contamination is released to the environment. Ex.1 (CON Application) at 6-41.

61. Direct radiation from the storage system will be released, but it will be limited to low levels by the heavy gamma and neutron shielding in the

overpack and vault design. Radiation doses to the population around the site will be significantly below federal requirements. Ex.1 (CON Application) at 6-41.

IV. Requirements of Statute and Rule

62. Minn. Stat. § 116C.83, subds. 2 and 4, provide:

Subd. 2. ***Commission process for future additional authorization.*** Authorization of any additional dry cask storage other than that provided for in subdivision 1, or expansion or establishment of an independent spent-fuel storage facility at a nuclear generation facility in this state, is subject to approval of a certificate of need by the Public Utilities Commission pursuant to section 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. In considering an application for a certificate of need pursuant to this subdivision, the commission may consider whether the public utility that owns the nuclear generation facility in the state is in compliance with section 216B.1691 and the utility's past performance under that section.

Subd. 4. **Other conditions.** (a) The storage of spent nuclear fuel in the pool and in dry casks at a nuclear generating plant must be managed to facilitate the shipment of waste out of state to a permanent or interim storage facility as soon as feasible in a manner that allows the continued operation of the plant consistent with sections 116C.71 to 116C.83 and 216B.1645, subdivision 4.

(b) The authorization for storage capacity pursuant to this section is limited to the storage of spent nuclear fuel generated by a Minnesota nuclear generation facility and stored on the site of that facility.

63. Minn. Stat. § 216B.243, subds. 3 and 3a, provide:

Subd. 3. **Showing required for construction.** No proposed large energy facility shall be certified for construction unless the applicant can show that demand for electricity cannot be met more cost effectively through energy conservation and load-management measures and unless the applicant has otherwise justified its need. In assessing need, the commission shall evaluate:

(1) the accuracy of the long-range energy demand forecasts on which the necessity for the facility is based;

(2) the effect of existing or possible energy conservation programs under sections 216C.05 to 216C.30 and this section or other federal or state legislation on long-term energy demand;

(3) the relationship of the proposed facility to overall state energy needs, as described in the most recent state energy policy and conservation report prepared under section 216C.18, or, in the case of a high-voltage transmission line, the relationship of the proposed line to regional energy needs, as presented in the transmission plan submitted under section 216B.2425;

(4) promotional activities that may have given rise to the demand for this facility;

(5) benefits of this facility, including its uses to protect or enhance environmental quality, and to increase reliability of energy supply in Minnesota and the region;

(6) possible alternatives for satisfying the energy demand or transmission needs including but not limited to potential for increased efficiency and upgrading of existing energy generation and transmission facilities, load-management programs, and distributed generation;

(7) the policies, rules, and regulations of other state and federal agencies and local governments;

(8) any feasible combination of energy conservation improvements, required under section 216B.241, that can (i) replace part or all of the energy to be provided by the proposed facility, and (ii) compete with it economically;

(9) with respect to a high-voltage transmission line, the benefits of enhanced regional reliability, access, or deliverability to the extent these factors improve the robustness of the transmission system or lower costs for electric consumers in Minnesota;

(10) whether the applicant or applicants are in compliance with applicable provisions of sections 216B.1691 and 216B.2425, subdivision 7, and have filed or will file by a date certain an application for certificate of need under this section or for certification as a priority electric transmission project under section 216B.2425 for any transmission facilities or upgrades identified under section 216B.2425, subdivision 7;

(11) whether the applicant has made the demonstrations required under subdivision 3a; and

(12) if the applicant is proposing a nonrenewable generating plant, the applicant's assessment of the risk of environmental costs and regulation on that proposed facility over the expected useful life of

> the plant, including a proposed means of allocating costs associated with that risk.
>
> Subd. 3a. **Use of renewable resource.** The commission may not issue a certificate of need under this section for a large energy facility that generates electric power by means of a nonrenewable energy source, or that transmits electric power generated by means of a nonrenewable energy source, unless the applicant for the certificate has demonstrated to the commission's satisfaction that it has explored the possibility of generating power by means of renewable energy sources and has demonstrated that the alternative selected is less expensive (including environmental costs) than power generated by a renewable energy source. For purposes of this subdivision, "renewable energy source" includes hydro, wind, solar, and geothermal energy and the use of trees or other vegetation as fuel.

64. Similarly, Minn. Stat. § 216B.2422, subd. 6, requires an analysis of alternative renewable energy facilities when a utility proposes a new or refurbished nonrenewable energy facility and a determination that a renewable energy facility is not in the public interest. Xcel has not proposed a new generation facility or a refurbished nonrenewable plant in this matter, so this requirement does not apply. Nonetheless, a public interest analysis was done by the Department.

65. Minn R. 7855.0120 sets forth criteria to implement the foregoing statutes. It provides:

> A certificate of need shall be granted to the applicant if it is determined that:
>
> A. the probable direct or indirect result of denial would be an adverse effect upon the future adequacy, reliability, safety, or efficiency of energy supply to the applicant, to the applicant's customers, or to the people of Minnesota and neighboring states, considering:
>
> (1) the accuracy of the applicant's forecast of demand for the energy or service that would be supplied by the proposed facility;
>
> (2) the effects of existing or expected conservation programs of the applicant, the state government, or the federal government;
>
> (3) the effects of promotional practices in creating a need for the proposed facility, particularly promotional practices that have occurred since 1974;

(4) the ability of current facilities and planned facilities not requiring certificates of need to meet the future demand; and

(5) the effect of the proposed facility, or a suitable modification thereof, in making efficient use of resources;

B. a more reasonable and prudent alternative to the proposed facility has not been demonstrated by a preponderance of the evidence on the record by parties or persons other than the applicant, considering:

(1) the appropriateness of the size, the type, and the timing of the proposed facility compared to those of reasonable alternatives;

(2) the cost of the proposed facility and the cost of energy to be supplied by the proposed facility compared to the costs of reasonable alternatives and the cost of energy that would be supplied by reasonable alternatives;

(3) the effects of the proposed facility upon the natural and socioeconomic environments compared to the effects of reasonable alternatives; and

(4) the expected reliability of the proposed facility compared to the expected reliability of reasonable alternatives;

C. it has been demonstrated by a preponderance of the evidence on the record that the consequences of granting the certificate of need for the proposed facility, or a suitable modification thereof, are more favorable to society than the consequences of denying the certificate, considering:

(1) the relationship of the proposed facility, or a suitable modification thereof, to overall state energy needs;

(2) the effects of the proposed facility, or a suitable modification thereof, upon the natural and socioeconomic environments compared to the effects of not building the facility;

(3) the effects of the proposed facility, or a suitable modification thereof, in inducing future development; and

(4) the socially beneficial uses of the output of the proposed facility, or a suitable modification thereof, including its uses to protect or enhance environmental quality; and

D. that it has not been demonstrated on the record that the design, construction, operation, or retirement of the proposed facility will fail

to comply with those relevant policies, rules, and regulations of other state and federal agencies and local governments.

V. Compliance with Minn. R. 7855.0120

A. Would Denial of the CON Likely Result in an Adverse Effect upon the Future Adequacy, Reliability, or Efficiency of the Energy Supply?

66. Xcel Energy will continue to need the capacity and amount of energy provided by the Monticello facility through and beyond approximately 2010, when the plant would have to cease operations due to lack of spent fuel storage if the CON is denied. Ex. 22 (Bomberger Direct) at 20-22; Ex. 1 (CON Application) at 7-6.

67. Xcel Energy will experience a capacity deficit by 2010 if Monticello is shut down. Replacing the Monticello facility would require approximately 600 MW of baseload capacity (578 MW in the summer and 604 MW in the winter), and associated energy, nearly continuously (90 percent capacity factor) beginning October of 2010. Ex. 45 (Rakow Direct) at 25.

68. Xcel Energy has extensive conservation programs that include a variety of load management, incentives, rebates, discounts, and efficiency standards. Xcel Energy's conservation program forecasts show that demand for electricity in Xcel Energy's service territories in the Upper Midwest is growing at about the rate of 1.65 percent per year. Conservation programs can slow the growth in demand for electricity, but cannot reduce demand in a way that would replace Monticello. Ex. 1 (CON Application) at 5-1 and Appendix C; Ex. 41 (Ham Direct) at 5.

69. Xcel Energy has not engaged in any promotional practices that created the need for spent fuel storage. Ex. 1 (CON Application) at 7-5; Ex. 41 (Ham Direct) at 6.

70. Xcel Energy's nuclear plants are efficient. The economic benefits to Xcel's ratepayers of relicensing both Monticello and Prairie Island are consistently in the range of $1.8 to $1.9 billion dollars in Present Value of Revenue Requirements (PVRR). Many of the efficiencies of continued operation arise from the fact that the fixed costs associated with the Monticello Plant have already been incurred. On the other hand, new installations would require both new capital investments as well as variable operating costs. Ex. 45 (Rakow Direct) at 10; Ex. 1 (CON Application) at 1-11.

71. The Monticello Generating Plant cannot operate during the period 2010-2030 without the requested ISFSI, because there are no presently forecasted alternative locations to store spent fuel generated during that period. Ex. 22 (Bomberger Direct) at 20-22; Ex. 1 (CON Application) at 7-6.

72. Xcel Energy cannot meet its future need with other current facilities. Ex. 41 (Ham Direct) at 6.

73. Denial of the certificate of need would cause an adverse effect upon the future adequacy, reliability, safety, or efficiency of energy supply to Xcel, Xcel's customers, and the people of Minnesota and neighboring states.

B. Has a More Reasonable and Prudent Alternative to the Storage Facility Been Demonstrated?

1. Generation Alternatives

74. Both Xcel Energy and the Department examined several alternatives that might provide a replacement for the electricity generated by the Monticello Generating Plant. One group of alternatives examined was Distributed Generation (DG). DG generally refers to generation sources that are connected to a utility's distribution system rather than its transmission system.

75. Pursuant to the Commission's April 7, 2005 Order, Xcel identified six scenarios consisting of various DG alternatives. The Department's EIS included a process that identified additional DG alternatives. Xcel also identified six community based options involving demand-side management, wind and other DG sources that would use small generation sources. Ex. 45 (Rakow Direct) at 20, 26, 33.

76. In addition to DG, the Department also evaluated three "central station alternatives" as alternative forms of generation: renewables on a stand-alone basis, a combination of renewables and non-renewable sources, and non-renewable alternatives, including a so-called Innovative Energy Project. Ex. 45 (Rakow Direct) at 22-23.

77. For the EIS, the Department invited 20 experts to participate in a collaborative process to identify possible DG combinations and scenarios that might serve as alternatives to extension of the Monticello Generating Plant operating license. The EIS team examined an array of renewable DG alternatives, including wind, biomass, biodiesel, ethanol, hydro-power, digesters, and Demand Side Management (DSM). From these, the EIS proposed a best possible renewable DG alternative using a combination of sources. The cost of the renewable DG alternative was calculated to exceed the cost of extension of the Monticello operating license by $2.708 billion. Ex. 42 (DEIS) at 62-65; Ex. 45 (Rakow Direct) at 64-67.

78. Each of the DG sources, except DSM, creates environmental effects, including consumption of land (wind, digesters), fuel (biomass, biodiesel, ethanol), and impact on natural ecosystems (hydro-power). Biomass and biodiesel require significant crop acreage and produce substantial air emissions. Ethanol supply is limited and its principal use is as vehicle fuel. Digesters and

hydro-power have significant supply limitations. Wind power is limited by available sites and technological efficiency.

79. DSM programs and increased conservation programs proposed by Xcel Energy cannot meet the need for the 600MW provided by Monticello. DSM can contribute only approximately 100 MW of power under reasonable assumptions. Ex. 42 (DEIS) at 64-66; Ex. 45 (Rakow Direct) at 16-19; Ex. 30 (Stern Rebuttal) at 5-8, 13-18.

80. NAWO's expert Michael Michaud critiqued the analysis of renewable options. He testified that the modeling underestimated the benefits of distributed ownership of generation assets, underestimated the benefits of avoided transmission costs, improperly limited the analysis of externalities to PUC-approved externalities, improperly excluded generation units smaller than 10kW, underestimated savings from reduced transmission losses, and underestimated wind capacity factors. Michaud proposed an alternative mix of renewable sources to replace the power generated by the Monticello Plant if it is decommissioned in 2010, but did not attempt to cost this or any other mix of alternatives. Ex. 32 (Michaud Direct) at 10-14; Ex. 33 (Michaud Surrebuttal).

81. Department witness Steven Rakow and Xcel Energy witnesses Franklin Stern and Elizabeth Engelking effectively rebutted Michaud's criticisms. See, Ex. 47 (Rakow Rebuttal); Ex. 30 (Stern Rebuttal); Ex. 26 (Engelking Rebuttal). For example in response to the claim of avoided transmission costs, Rakow re-ran cost estimates using the most favorable set of assumptions for Michaud's argument. Under these assumptions, the cost of the renewable/DG alternative declined by $265 million. Ex.47 (Rakow Rebuttal) at 12-13.

82. Regarding externalities, both Rakow and Engelking observed that expansion of the list of environmental externalities would make renewables less advantageous compared to nuclear power, because many renewables generate air emissions or other environmental harms that nuclear power does not. Ex. 26 (Engelking Rebuttal) at 8-9; Ex. 47 (Rakow Rebuttal) at 13-14.

83. Both Xcel Energy and the Department employed revised cost estimates to reflect the higher wind capacities asserted by Michaud. Xcel Energy concluded that such an adjustment would have no material effect on costs. Ex.26 (Engelking Rebuttal) at 10. The Department estimated potential cost savings of $360 million. Ex. 47 (Rakow Rebuttal) at 18.

84. The collective savings of all quantifiable adjustments advocated by Michaud would result in net savings of at most $625 million from the original $2.708 billion cost differential estimate. Thus, renewables are not cost competitive with continued operation of the Monticello Plant. Ex.47 (Rakow Rebuttal) at 18.

85. The Department also screened alternatives for central station generation, including a coal fired facility, a natural gas-fired combined cycle (CC) facility, a combustion turbine (CT) facility, new transmission facilities to some other generation source, DSM reducing demand, and purchased power. Several of these were screened out on the basis of cost or inability to be constructed by 2010. It is unlikely that the existing DSM program can be improved adequately to meet the need. Ultimately, the Department included a coal-fired facility with an interim or "bridge" source, a wind/gas combination, an IGCC plant, and DG options in its alternatives analysis. Ex. 45 (Rakow Direct) at 24-32.

86. Xcel Energy uses a computer program called Strategist to model the variables that go into electricity production, demand, and supply to determine the PVRR for various scenarios. The Department also relied upon the model by having Xcel Energy run certain scenarios for it.

87. Strategist modeling by Xcel Energy indicated that the PVRR necessary to meet customer demand for electricity would be at least $395 million more expensive if Monticello is shut down in 2010 compared to continuing operation through 2030. Strategist scenarios run for the Department predict that the costs of gas plants or a gas/wind alternative would be even higher. Ex. 25 (Engelking Direct) at 3-5, 12; Ex. 3 (CON App. Supp.) at S.65 (Table 5-1); Ex. 45 (Rakow Direct) at 56; Ex. 22 (Bomberger Direct) at 18, 23.

88. The Department performed "uncertainty analyses" to assess the potential impact of three factors that could not be predicted with adequate certainty. They were: future natural gas prices, continued ownership of Monticello by Xcel, and the length of the storage of nuclear waste at Monticello.

89. As to future natural gas prices, it is likely that, if anything, the price has been under-estimated. If so, the cost of the natural gas combined cycle plant will have been understated. Thus, uncertainty as to natural gas prices would not affect the Department's conclusion that such a plant was too expensive to be a suitable alternative. Ex. 45 (Rakow Direct) at 77-82; Griffing Direct at 6-7.

90. Uncertainty concerning a possible change in ownership or control of Monticello was raised by the Department, but resolved to its satisfaction by Xcel's committing to provide adequate notice to the Department and Commission in advance of a possible sale or transfer of the facilities. Ex. 48 (Rakow Surrebuttal) at 2 (quoting Xcel witness Mr. Bomberger). The Department recommends that the Commission include in its Order such a notice requirement and require Xcel Energy to file specific compliance language. Ex. 48 (Rakow Surrebuttal) at 2.

91. Uncertainty regarding possible increased costs of storage due to a longer period of storage at Monticello than expected was evaluated by the Department. The Department calculated the cost of storing an additional 30

casks, and then extending the duration of storage for 50, 100, 150 and 200 years, and beyond. The present value of such added costs of such long term storage is $114 million for 100 years and $117 million for 200 years. If these long term storage adjustments are made, the resulting changes would be too small to alter the ranking of alternatives. Ex. 45 (Rakow Direct) at 80; Ex. 47 (Rakow Rebuttal) at 2-4.

92. The Commission has established externality values, or environmental cost factors, to be applied to the emission of certain air pollutants and used in resource planning analysis. In economic terms, the effects of the proposed facility and reasonable alternatives upon the natural and socioeconomic environments are captured by the Commission-approved environmental externality values. Ex. 25 (Engelking Direct) at 5; Ex. 45 (Rakow Direct) at 41.

93. However, there are no Commission-approved externality values for the operation of nuclear facilities, so the Department estimated externality values for use in this proceeding. The Department based its externality values in part on NMC's accident-related cost estimates provided to the NRC as part of the Monticello relicensing process. The Department analyzed NMC's estimates and adopted the high-end accident-related externality cost value of $21.6 million PVRR. Ex. 45 (Rakow Direct) at 43-45.

94. In addition to accident-related externality costs, the Department analyzed potential externality costs due to ongoing operations (including the proposed ISFSI) and concluded that no additional externality cost results from routine operations. Its analysis included off-site exposure costs, off-site economic costs, on-site exposure costs, on-site cleanup costs, and replacement power. Xcel Energy and the Department's analyses demonstrate that the externality cost of off-site exposure impacts and/or economics attributable to radioactive emissions from routine operations is zero, due to below detectable off-site radiation levels. The externality cost associated with on-site exposure impacts is also approximately zero because such injury would be covered by health insurance. Similarly, Xcel Energy's on-site cleanup costs due to routine operations result in no externality costs because these costs are already included in the costs established for decommissioning processes. Ex. 45 (Rakow Direct) at 46-50.

95. Thus, incremental nuclear externality costs do not significantly change the financial impact of relicensing. Ex. 45 (Rakow Direct) at 51.

96. Xcel Energy's simulations also show that carbon dioxide emissions, carbon monoxide emissions, and nitrogen oxide emissions would significantly increase if the nuclear power supply is replaced with coal plants or gas-fueled plants. Ex. 45 (Rakow Direct) at 51.

97. No alternative was shown to be more reasonable and prudent than Xcel's proposed storage facility. It is approximately $1 billion less expensive for ratepayers than any alternative analyzed in the record. A central station natural gas combined cycle unit would cost between $715 million to $823 million more PVRR than the proposed storage facility. A partially renewable distributed generation option would cost about $1.2 billion to $1.3 billion more, and a fully renewable DG replacement would cost about $2.6 to $2.7 billion more than Xcel's proposal. Similarly, non-economic factors including reliability, environmental impact, and health and safety weigh heavily in favor of the proposed ISFSI. Ex. 45 (Rakow Direct) at 40 to 51, 61, 65.

98. Both Xcel Energy and the Department emphasize that every alternative will include nuclear waste storage for some period of time at the Monticello site. Spent nuclear fuel currently is stored on-site in the pool and will be stored outside the plant in casks at the time of decommissioning for some period of time. As Dr. Rakow observed, the only practical difference regarding nuclear waste storage due to Commission approval or rejection of Xcel's certificate of need proposal, "is the number of casks required to hold the waste generated." Ex. 45 (Rakow Direct) at 11-12. Final EIS at 10-15.

99. Intervenors submitted extensive testimony questioning the likelihood that Yucca Mountain would ever open, whether it will be safe, and whether it will have the capacity for the spent fuel generated by the Monticello Plant from 2010 to 2030. ME3 and MCEA's witness Dr. Gordon Thompson testified that there are no other viable federal disposal options – all other options, including above-ground storage at a federal facility and reprocessing of spent fuel, have enough political adherents to drain resources from Yucca Mountain, but not enough to be constructed themselves. Thompson further concluded that the most likely scenario is that the federal government would "take title" to on-site spent fuel, and leave it on-site indefinitely. Ex. No. 34 (Thompson Direct); Ex. 35 (Thompson Rebuttal); Ex. 36 (Thompson Surrebuttal).

100. Nevertheless, the US Department of Energy found in its Final EIS for Yucca Mountain that Yucca Mountain is safe. Xcel Energy believes there is a high likelihood that Yucca Mountain will open during the operating lifespan of the ISFSI and that Yucca Mountain or alternative facilities will have capacity for Monticello's spent fuel. Ex. 17; Ex. 23 (Bomberger Rebuttal) at 5-9.

101. The federal government has acknowledged delays and difficulties in permitting Yucca Mountain, but its most recent pronouncements affirm its commitment to open the facility. Ex. 49 (USDOE); Ex. 50 (2/15/06 Statement of Samuel Bodman, United States Secretary of Energy).

102. Evaluation of the capacity and engineering of Yucca Mountain are within the exclusive jurisdiction of the Nuclear Regulatory Commission and beyond the scope of this proceeding.

103. Dr. Thompson also testified that the Department's accident-related externality analysis underestimates nuclear externality values because it allegedly does not account for risks of ISFSI or spent-fuel pool accidents or events arising from an act of malice or insanity. Dr. Thompson's theory is that a sophisticated attack on the Monticello plant by a terrorist-like group would breach the spent fuel pool, causing all the coolant water to be lost. Then the spent fuel rods would heat up and create a fire with sufficient heat to cause a release of the Cesium-137 in the spent fuel rods, which would be a radiation release comparable to the accident in Chernobyl. He calculates that the economic consequences of a spent fuel fire would be $355 billion and that the average annual expected costs of a spent fuel fire are $69-138 million over the period 2010-2030. He estimates that the externality costs of such an accident could reach a present value of as much as $1.0 to $2.1 billion. Ex. 35 (Thompson Rebuttal) at 18-22.

104. Dr. Thompson's has presented his estimate of the externality costs of a spent fuel pool fire at other plants to the NRC, which has rejected the argument. Tr. v. 5 at 60-61, 63-64.

105. Dr. Thompson's scenario is largely speculative and contrary to known data about the risks and consequences of an attack upon the Monticello plant and of a spent fuel pool fire. He used unsupported economic assertions to make his cost calculations. His estimates of vulnerability were at odds with the information given by Xcel Energy witness Douglas True. Dr. Thompson provided no basis to substantiate his proposed multiplier. His analysis does not provide a reliable basis on which to quantify externalities associated with the operation of the Monticello Plant. Ex. 47 (Rakow Rebuttal) at 16-19; Ex. 23 (Bomberger Rebuttal); Ex. 24 (Bomberger Surrebuttal); Ex. 31 (True Surrebuttal).

106. Xcel Energy possesses over $13 billion in direct and indirect insurance to cover risks, including damage from accidents or events arising from an act of malice or insanity. The cost of that insurance is reflected in the price charged to ratepayers. Therefore, the cost of this risk is not an externality that should be costed again. Ex. 27 (Engelking Surrebuttal) at 3; Ex. 24 (Bomberger Surrebuttal) at 2; Ex. 45 (Rakow Direct) at 49.

107. The Department did not adjust its nuclear externality value to reflect a potential terrorist attack. In Dr. Rakow's opinion, because every option available includes storage of nuclear waste at Monticello for a period of time, the hypothetical cost of such an attack would not affect the ranking of alternatives. Ex. 47 (Rakow Rebuttal) at 16-20.

2. ISFSI Alternatives

108. Xcel Energy examined alternatives to the proposed dry storage facility to accommodate operation of the Monticello plant through 2030 and determined that none were viable alternatives to on-site interim storage. These

alternatives included reprocessing of spent fuel, use of existing off-site storage facilities, the proposed Private Fuel Storage Initiative (PFS) in Skull Valley, Utah, and Yucca Mountain. The Department concluded that none of the off-site alternatives met its screening criteria. Ex. 22 (Bomberger Direct) at 20-22; Ex. 23 (Bomberger Rebuttal) at 4; Ex. 45 (Rakow Direct) at 67-72.

109. While the Monticello plant and other facilities were previously able to store some spent nuclear fuel at General Electric's Morris facility in Morris, Illinois, no further storage space is available at that facility. There are no other off-site storage locations presently accepting spent fuel. Ex. 1 (CON Application) at 4.2.2.

110. The federal government has committed to construct a repository for spent nuclear fuel from commercial reactors at Yucca Mountain, Nevada. The current schedule proposed by the Department of Energy, however, does not ensure that the facility would be available early enough to prevent the need for on-site storage expansion at the Monticello plant. The DOE is preparing an application to construct the repository and will file it with the NRC. The agency recently notified commercial operators, however, that due to fiscal and other issues, it could not resume the Delivery Commitment Schedule process, through which commercial operators were given a place "in line" for receipt of their spent fuel. Ex.1 (CON Application) at 4.2.4; Ex. 2 (Bomberger Direct) at 20-21; Ex. 23 (Bomberger Rebuttal) at 7-10.

111. Xcel Energy is pursuing private, interim storage at a facility in Utah, 70 miles southwest of Salt Lake City on the reservation of the Skull Valley Band of Goshute Indians. An application has been filed with the NRC, an EIS has been conducted, regulatory reviews have been completed, and a license has been issued. Since the project is opposed by the state of Utah, however, challenges and delays have occurred and may continue to occur. Once the facility has secured an adequate customer base, it could begin operations within 1 to 2 years after construction begins. Even assuming that the facility secures an adequate customer base to justify construction, it would not eliminate the need for some storage at the Monticello Plant, though it may reduce the number of containers on site and the length of time they are stored there. Ex. 1 (CON Application) at 4-4 to 4-6; Ex. 22 (Bomberger Direct) at 21-22.

112. On-site non-cask storage alternatives do not provide viable alternatives to the proposed Project. Rod consolidation can only nominally increase pool storage capacity and poses risks of occupational radiation exposure to through time-consuming and labor-intensive fuel-handling activities. Increasing storage pool capacity is not a viable option. Re-racking would only extend the operation of the plant to 2014. Construction of a new pool on-site would be more expensive than dry cask storage and would not be available soon enough. Ex. 45 (Rakow Direct) at 72-73; Ex. 28 (McKeown Direct) at 4.

113. Xcel Energy considered whether any further reracking in the spent fuel pool could be accomplished and concluded that only limited modifications could be made to storage space within the pool, which would extend the operating capabilities of the plant by two operating cycles, or four years. Ex. 1 (CON Application) at 4-11 to 4-12.

114. Construction of a new pool also was examined by Xcel Energy. Under this alternative, a new spent fuel storage pool and building would be designed and built and licensed and regulated by the NRC. The new pool would be designed for older, cooler fuel. It would require a transfer cask to transfer spent fuel assemblies from the existing pool to the new pool. Handling of spent fuel would triple because in addition to first placing it in a transportation canister, the fuel assemblies would have to be handled again to place them in the transfer cask to move to the new pool, again to remove the spent fuel from the transfer cask and place it in the new storage pool. Construction and licensing would take an estimated five years, running beyond license expiration in 2010. Pool storage also entails increased maintenance and operational demands as compared with an ISFSI, because cooling would rely on an active system of water circulation and filtration, crane and fuel assembly handling tools, and building ventilation. The estimated cost would be $50 million, based upon estimates for a new storage pool prepared for the Prairie Island CON proceedings in 1991, excluding maintenance costs and the costs of eventual preparation and transport to Yucca Mountain. Ex. 1 (CON Application) at 4-12 to 4-13; Ex. 42 (DEIS) at § 6.5.

115. Xcel Energy examined reprocessing of spent nuclear fuel. In reprocessing, unused uranium and plutonium from used nuclear fuel is recovered and recycled for use in new reactor fuel. Reprocessing does not eliminate all nuclear wastes and radioactivity, but the volume of high-level waste to be stored would be reduced. Commercial reprocessing facilities, however, do not presently exist in the United States. Ex. 1 (CON Application) at 4-3.

116. Xcel Energy looked at consolidation of fuel assemblies to reduce the volume by repacking the fuel rods into a container that allows closer packing. Fuel rod consolidation is not widely used in the industry. Northern States Power conducted a demonstration project at the Prairie Island nuclear generating plant in 1986 and found that the predicted compaction ratios for assembly hardware were not achievable and the occupational dose of radiation was significantly higher than predicted because workers were subject to increased exposure from the many time-consuming and labor-intensive fuel-handling activities. The Prairie Island study also found that consolidation would generate significant amounts of radioactive debris. Ex. 1 (CON Application) at 4-10 to 4-11.

117. The advantages of the horizontal canisterized storage system are that once welded, the canister never needs to be opened, avoiding additional exposure to spent fuel assemblies. The system eliminates the need to return casks to the fuel pool to re-handle or expose individual spent fuel assemblies for repackaging into a shipping cask. The concrete storage vaults are also

prefabricated and shipped to the site. The system also does not require canister transfer in the reactor building or a canister transfer building. The transfer cask diameter can be accommodated in the available spent fuel pool cask area. The system is licensed for both storage and transportation, facilitating shipping the spent fuel offsite in the future. Ex. 1 (CON Application) at 4-13; Ex. 5 (CON App. Supp. S-15 to S-19); Ex. 28 (McKeown Direct) at 9.

118. Xcel Energy's selection of horizontal cask storage was based on internal analysis of alternative dry cask technologies. Ex. 5 (CON App. Supp. S-15 to S-19); Ex. 28 (McKeown Direct) at 9. The NRC reviewed and licensed the storage technology Xcel Energy proposes to use at Monticello. Ex. 1 (CON Application) at 2-6, 2-10; Ex. 28 (McKeown Direct) at 7.

119. Xcel Energy also examined alternative sites to the location selected for the pad, which is adjacent to the reactor and generating building. The alternative site identified in the CON Application was not selected because it was situated farther from the reactor and generating building and would require backup diesel generators for power supply to security systems and other needed infrastructure. Ex. 5 (CON App. Supp. S-15 to S-19).

120. Transnuclear's dry cask storage system is completely passive and generates no dry, liquid, hazardous, or radioactive wastes. It has been reviewed and approved by the NRC Ex. 1 (CON Application) at 1-13, 2-10, 6-40; Ex. 28 (McKeown Direct) at 6-11; Ex. 1 (CON Application) at 4-37 to 4-47.

121. Dr. Thompson testified that spent fuel presently stored at GE Morris in Illinois may need to be returned to Monticello. He is incorrect, but if he were correct, it would not affect the Department's analysis of storage or generation alternatives for Monticello. Ex. 34 (Thompson Direct) at 36; Ex. 47 (Rakow Rebuttal) at 5.

122. Dr. Thompson also provided recommendations regarding the management of nuclear waste in, for instance, a storage pool in high density racks. He recommended that storage at Monticello be conditioned to exclude waste generated at other facilities as well as the Monticello-generated waste that was transported to, and currently stored at, the GE Morris facility in Illinois. He recommended that a long-term strategy be adopted for storage at Monticello that would include institutional, legal, financial, and physical attributes such as how to physically arrange the fuel storage facility within a "berm." His recommendations include repackaging the waste every 100 years to insure against degradation of the dry storage materials. He also recommended that the Commission re-visit issues of storage at Monticello in 2020 in order to keep abreast of then current technological options and the status of Yucca Mountain. Tr. v. 5 at 55-62.

123. Despite the suggestions, management of the nuclear waste currently at Monticello, as well as waste produced by extending nuclear operations, is not a matter within the Commission's authority.

124. The Department also considered an Innovative Energy Project as provided in Minn. Stat. § 216B.1694, subd. 2(7). No such project currently exists in Minnesota, although one has been proposed. *Petition of Excelsior Energy, Inc.*, MPUC Docket No. E-6472/M-05-1993. Nonetheless, the Department evaluated a hypothetical integrated gasification combined cycle (IGCC) unit (with and without a "bridge" for timing purposes), and found that it would not meet the availability or timing criteria. Nonetheless, the Department performed a cost assessment for a hypothetical central station IGCC unit and estimated that it would cost $1.11 - $1.29 billion more than Xcel's proposed storage facility. An Innovative Energy Project is not a reasonable alternative at this time. Ex. 45 (Rakow Direct) at 61-62.

125. The no-build alternative was also evaluated. If no ISFSI is approved and built, Xcel will have to buy replacement power when the Monticello plant shuts down in 2010. The no-build alternative is not viable because it would exacerbate the capacity deficit Xcel would have at the time. Ex. 45 (Rakow Direct) at 33; Ex. 41 (Ham Direct) at 6.

126. No alternative to Xcel's at-reactor cask storage has been shown to be more reasonable or prudent than Xcel's proposed storage facility.

C. Are the Consequences of Granting the Certificate of Need More Favorable to Society than the Consequences of Denying It?

1. Relationship of Continued Operation of the Monticello Plant to Overall Energy Needs.

127. Denial of a CON for the proposed storage facility would mean that the Monticello plant would shut down in 2010 and decommissioning would be commenced. That would result in a 4-5 million megawatt per year loss of electrical supply that would have to be replaced. As discussed above, that amount of power can only be replaced by base load plant or plants with 600 megawatts of capacity, ones that are powered by coal or natural gas.

128. The Monticello plant's continued operation would be a cost effective and efficient use of existing resources. Xcel Energy has invested an average of $10 million a year in capital projects to meet regulatory requirements, perform preventive maintenance, and address component wear and aging. Only limited major capital investments will be needed to keep the plant operating efficiently beyond 2010. Xcel Energy has identified approximately $135 million in investments above normal annual investments that may occur in the future. Ex. 22 (Bomberger Direct) at 11-16.

2. Effects Upon Natural and Socioeconomic Environments.

129. The proposed storage facility will have a minimal impact on environmental resources. The footprint of the facility is 3.5 acres and it is located entirely within the existing perimeter of the Monticello generating plant. It is well

above the Mississippi River floodplain. No sensitive plant species or critical animal habitat will be impacted. Ground water will not be affected. Ex. 42 (DEIS) at 18-27.

130. The spent nuclear fuel will be contained in canisters that are sealed by welding. Convection and naturally circulating external air movement dissipate heat. No waste streams – dry, liquid, hazardous, or radioactive – will be generated during time the facility is in use.

131. Spent nuclear fuel generates ionizing radiation. Federal regulations at 10 C.F.R. 72.104 require radiation exposure to the public from normal operation of an ISFSI to be less than 25 millirem per year. The canisters and storage vaults are designed to shield employees and the public from harmful radiation exposure. Xcel Energy estimates that its ISFSI with 30 containers will contribute no more than 0.16 millirem per year in exposure potential at the nearest residence. By way of comparison, background radiation from natural and man-made sources in Minnesota is about 52-60 millirem per year and existing variations in ambient background radiation are greater than the additional estimated exposure from the proposed storage facility. Ex. 5 (Supplement to CON Application); Ex. 28 (McKeown Direct) at 10; Ex. 42 (DEIS) at 37.

3. Effects Upon Future Development.

132. The Monticello generating plant currently employs 414 permanent employees and 105 long term contractors. During refueling events (once each 22-24 months) up to 600 temporary workers are employed for 30-40 days. Taxes paid by the facility comprise significant percentages of the annual revenues for the City of Monticello (ranging from 29.8% to 24.6% for the years 1998-2002), Wright County (6.9% to 3.4%), School District 882 (20.4% to 5.2%), and the Monticello/Buffalo Hospital District (1.4% to 0.5%). Ex. 5 (CON Supp. App.) at S. 29-30.

4. Socially Beneficial Uses, Including Uses to Protect or Enhance Environmental Quality.

133. The DEIS indicated that the 20 year extension of operations of the Monticello Generating Plant and proposed ISFSI would have no significant adverse effects on the environment over a period of ISFSI operation lasting as long as 200 years. Ex. 42 (Pile Direct) at 3; Ex. 42 (DEIS) § 4.

134. The proposed ISFSI would be located entirely within the property of the existing plant and would be approximately three and a half acres in size. Impacts on fish, wildlife or ecologically sensitive resources from the proposed ISFSI are not likely to be significant. The proposed ISFSI is not expected to impact water resources. No traffic improvements or mitigation measures are warranted due to the construction activities associated with the proposed ISFSI.

The major roads and highways that will be used by ISFSI construction traffic are in good condition and the increased traffic is unlikely to have any significant negative impact on the surrounding area. Noise impacts were tested and are not expected from the construction or operation of the proposed ISFSI. The closest historical site is located approximately three miles from the Monticello facility site and no impacts are anticipated. The proposed ISFSI will not be visible from the Mississippi River or adjacent properties, therefore there would be no visual impact. Final EIS at 22-29.

135. The cumulative impacts of the proposed facility and plant operation were assessed in the Final EIS. The analysis considered six possible causes of impacts: terrorism, accidents, degradation, controlled releases, earthquakes and floods including those due to dam failure. These causes were examined relative to their possible impact on four elements of the environment: air quality, water quality, human health and ecological resources. Four factors were used to gauge the level or degree of impact the specific cause might have: 1) frequency or likelihood of occurrence, 2) warning time 3) potential severity or extent and 4) population and resources at risk. Based on these considerations, impacts relative to terrorism, accidents and degradation were rated as low. The impacts relative to controlled releases, earthquake and flood/dam failure were rated as very low. Final EIS at 30-31.

136. The possibility of radiation exposure is a major public health concern associated with nuclear plant operations and spent fuel storage. It is subject to extensive monitoring and regulation. One way to distinguish the source of radioactivity is to identify the radionuclides specific to that source. Certain radioactive isotopes are known to be created only through human-initiated nuclear power activity. These radionuclides may be traced from any leakage in the containment area and distinguish Monticello Plant radioactivity effects, if any, from the effects of all the other natural and human-engineered sources of radioactivity in our environment. No radionuclides associated with nuclear power activity have been found near the Monticello plant. Air samples and thermo luminescent dosimeter results have been consistent with natural background radiation for the life of the plant. Risks to public health from the Monticello ISFSI as a result of exposure to radiation appear to be negligible under normal (non-accident) conditions. Public health risk from regulated uses of radioactive materials is widely regarded by medical experts as very small. Radiation risks associated with cancer were also negligible. Excess cancer deaths per 100,000 were less than 1. The actual population within a two-mile radius of the Monticello Plant is approximately 2,300. Also, the expected dose of 0.16 mrem per year for the ISFSI can be compared to radon exposure from cooking with natural gas. Final EIS at 33-35.

137. The Monticello Nuclear Generating Plant is not allowed to release radionuclides or radioactivity into ground or surface water. The proposed ISFSI is designed not to release radioactivity or radionuclides into surface water or ground water. Final EIS at 35-36.

138. No large scale releases of radiation have ever occurred at the Monticello Plant. In the event that a radiological or security incident were to occur, many different agencies would respond. These agencies would consist of federal, state, and local governments as well as Monticello. The lead federal agency for most radiological incidents at nuclear generating stations is the NRC. The NRC would coordinate any federal assets that the NRC or the State of Minnesota would require. The U.S. Department of Energy would be expected to provide assistance. Final EIS at 45-46.

139. Minnesota provides direction, coordination and control in accordance with the Minnesota Emergency Operations Plan. The Plan recommends evacuation for a two-mile radius around the station and five miles downwind for actual or projected severe core damage or loss of control to the Monticello Plant. If a radiological incident were to occur, the counties surrounding Monticello would also respond in accordance with their emergency operation plans. Final EIS at 46.

140. Monticello maintains an emergency operations plan that is used if a radiological incident occurs. The main focus is to find the cause of the radioactive release and to stop it as soon as possible while keeping the station safe from further damage. Since the NRC is the lead federal agency, Monticello would stay in close communication with that agency during any incident.

141. Based on extensive testing and examination, no adverse health effects are expected from the ISFSI. Final EIS at 35.

142. The possibility of accidents was assessed. The worst case would be an accidental reduction in the air inlet and outlet shielding. Transnuclear, the cask manufacturer, estimates that the dose from such an occurrence would be 44 mrem at 100 meters. This is below the NRC design-basis accident requirement of 5 rem. The predictable accident scenarios have been considered in the emergency plans of Xcel Energy and the federal, state, and affected local governments. Final EIS at 38, 47.

5. Views of the Public

State and Local Economic Benefits

143. A number of speakers at the public hearings stressed the benefits to the state and local economies arising from the operation of the Monticello Plant. John Hilton, Purchasing Manager for Gold'n Plump, indicated that his company has many plants and operations in Minnesota. Gold'n Plump's operations consume 1.5 million kWh from Xcel, which amounts to 4% of the company's manufacturing costs. Gold'n Plump asserted that its operations have an impact on the Minnesota economy of more than $100 million, including the company's Minnesota employment of 1,000 employees. Gold'n Plump described its biggest challenge as affording the rising cost of fuel and energy. Gold'n

Plump estimated that the thirty-year cost of electricity to Xcel's customers would increase by $1 billion if the Monticello Plant were to shut down. Public Ex. 1

144. Susan Struckness appeared on behalf of the Monticello Chamber of Commerce (Monticello Chamber), representing 256 members in the Monticello business community. The Monticello Chamber expressed confidence in Xcel's safety record and security measures. The group indicated that taxes paid by Xcel are important to the community and jobs at the Monticello Plant are important to the local economy. The Monticello Chamber also noted that the Plant's warm water discharge provides habitat for trumpeter swans. The swans are credited with generating about 10,000 winter visitors to Monticello. Public Ex. 2

145. Larry Newell, General Manager for Liberty Paper, supported the proposed storage of spent fuel. Liberty Paper operates a recycled paper mill in Becker, Minnesota. The company shares a fence line with Xcel's Sherco facility. Liberty Paper recycles over 200,000 tons of corrugated containers using 13 MW of electricity. Low cost electricity is important to Liberty Paper's continued operation. Public Ex. 3

146. Jed Falgren spoke on behalf of the Dotson Company, an iron foundry in Mankato, Minnesota. Several years ago, Dotson switched from using coal in its furnaces to using far less polluting electricity provided by Xcel. The company uses four megawatts of electricity constantly. Dotson expressed concern that increases in cost will result in Dotson being unable to meet global competition in its markets. Dotson considers the current state of alternative energy sources to be insufficiently reliable to meet the needs of the Company. Saint Paul Public Hearing (Afternoon), Tr. at 37-39.

147. Sandra Westerman spoke on behalf of the Saint Paul Area Chamber of Commerce (Saint Paul Chamber). The Saint Paul Chamber consists of 2,200 member businesses. The Saint Paul Chamber supports Xcel's application due to the lower cost, greater reliability, and superior availability of electricity produced by the Monticello Plant. The speaker noted that thirty percent of Minnesota's electrical grid is reliant on nuclear energy. The Saint Paul Chamber maintained that nuclear power is a clean reliable source of energy. Saint Paul Public Hearing (Afternoon), Tr. at 35-36.; Public Ex. 12.

148. James Greenwald, Vice President of Facilities and Airport Affairs for Northwest Airlines (NWA), noted that more than 12,000 NWA employees work in Minnesota. The low cost of power is important to the company being able to maintain hub status at the Minneapolis Saint Paul International Airport, which it believes has an economic impact of more than $10 billion per year. NWA expressed concern that any action taken by the Commission not increase the cost of electricity. Public Ex. 19.

149. Mike Sarafolean, U.S. Energy Manager for Gerdau Ameristeel, spoke in favor of Xcel's application. Gerdau Ameristeel operates nine mills in U.S., including one in St. Paul. The Company described itself as one of Xcel's largest customers and expressed concern about any change in rates for electricity. Gerdau Ameristeel also expressed concern that not relicensing the Monticello Plant would result in the need to replace a large amount of baseload electricity with no timely ability to bring additional generating capacity online. Sarafolean personally toured a number of nuclear power plants (including Xcel's Prairie Island facility) after September 11, 2001, and he expressed his opinion that these plants are very secure. Saint Paul Public Hearing (Afternoon), Tr. at 42-45; Public Ex. 13.

150. David Blatnik, Manager of State Government Affairs for Marathon Petroleum, Company, LLC (Marathon), spoke in favor of Xcel's application. Marathon is a large electricity customer in Minnesota, with $15 million in electricity costs (including an oil refinery in Saint Paul Park and 168 Super America stores). Blatnik described nuclear-generated electricity as having the lowest cost (except for hydro-generation), with no fossil fuel emissions. Marathon is interested in approval of Xcel's application to keep electricity rates low. Saint Paul Public Hearing (Afternoon), Tr. at 45-46; Public Ex. 14.

151. Todd Klinglel, President and CEO of the Minneapolis Regional Chamber of Commerce (Minneapolis Chamber), spoke on behalf of the organization's 1,100 businesses. The Minneapolis Chamber supports Xcel's application due to impacts on cost, reliability, and availability of energy. The Minneapolis Chamber maintained that with the Monticello Plant, there would be no greenhouse gas emissions. This situation was compared to generating an equivalent amount of electricity using coal, which would result in several thousand tons of pollutants being put in the atmosphere over next 30 years. The Minneapolis Chamber believes that the Nuclear Regulatory Commission will closely monitor the plant's operation to ensure safety. Saint Paul Public Hearing (Afternoon), Tr. at 19-20. Public Ex. 10.

152. Annette Henkel, President of Minnesota Utility Investors (MUI), commented on behalf of MUI's 27,000 investor-members. MUI described the typical utility shareholder as a retired person, over sixty years of age, holding relatively few shares of stock, and not seeking undue risk in investment choices. The typical shareholder was also noted to be a ratepayer, and therefore interested in the lowest cost of electricity possible, consistent with an appropriate return on investment. MUI asserted that the interests of its members were consistent with allowing Xcel to continue producing electricity at the Monticello Plant and approving spent fuel storage at the facility. Public Ex. 18

153. MUI maintained that nuclear powered generation of electricity was cost-effective, reliable, and "environmentally acceptable." MUI opined that the storage casks were safe and that there would be an adverse effect on both consumers and shareholders if Xcel's petition was not approved. MUI also

maintained that retaining the Monticello Plant addresses the electrical supply problem with lower air emissions than some other baseload generating options. Public Ex. 18

154. Christopher Childs, chair of the Conservation Committee of the Northstar Chapter of the Sierra Club (Sierra Club), noted that the wind power resource available in Minnesota has not been fully utilized. The Sierra Club compared Minnesota's share of electricity generated by wind power (2%) with that of Denmark's (25%), when the two have roughly the same population. Saint Paul Public Hearing (Evening), Tr. at 5-7.

155. Jeff Bendel submitted a breakdown of the local economic benefits arising from community-based economic development (C-BED) for harnessing wind power. These benefits included $12 million in plant expansion and hiring between 75 and 100 new employees. A number of local steel and concrete suppliers were identified for providing parts and footings. Others identified as benefiting were local landowners, trucking companies, surveyors, road contractors, engineering firms, crane companies and steel fabricators. Public Ex. 25.

156. Ken Valley of Midwest Wind Energy Finance noted that wind turbine development to replace the energy generated by the Monticello Plant would amount to $1 billion in economic activity. Valley suggested that economic benefits to the entire state, but particularly in the southwestern portion, would arise from committing to that technology. Saint Paul Public Hearing (Afternoon), Tr. at 21-22.

Availability and Cost of Electricity

157. David C. Olson, President of the Minnesota Chamber of Commerce expressed support for Xcel's Application. The Minnesota Chamber suggested that the potential exists for electric bill increases through the Minnesota Emissions Reduction Programs. The speaker pointed out that the MPCA estimated the cost of these recently proposed MERPs at $650 million. The Minnesota Chamber noted that keeping the Monticello Plant operating resulted in the ongoing benefit of keeping mercury emission low. The speaker suggested that an expansion of base load power would be required between 2011 and 2017. If the Monticello Plant is not kept operating, the Minnesota Chamber suggested that additional coal-fired baseload generation would likely be brought into service. The Minnesota Chamber objected to increasing the cost of electricity by removing the Monticello Plant from operation. Public Ex. 20.

158. Joseph Steffel, Utilities Director of the City of Buffalo, ascribed recent energy cost increases to the shortage of surplus generating capacity above the existing baseload capacity. This volatility resulted in a 30% increase in the price of electricity for Buffalo in 1998 (during the widespread electricity shortages that summer). Monticello Public Hearing (Afternoon), Tr. at 32-33.

Long-term Spent Fuel Storage Options

159. Sister Zoa Braunwarth, OSF, opposed adding additional storage at the Monticello. The extreme length of time that the spent fuel remains toxic, the absence of a long-term storage facility, and the dangers inherent in transporting spent fuel were cited as supporting her opposition to Xcel's request. Sister Braunwarth suggested that allowing additional onsite storage would delay implementation of alternative energy sources, such as wind, solar, and biomass. She urged the implementation of renewable energy technologies to exceed current levels, to exceed any mandated minimum requirements, and to practice responsible citizenship. Public Ex. 21.

160. State Senator Ellen Anderson described the history of Xcel's requests for storage approval, noting that the requests were described as temporary. Senator Anderson pointed out that no alternative permanent options have been put in place. Nuclear waste has been generated for more than 50 years with no realistic plan for permanent storage. Senator Anderson summarized the status of the proposed Yucca Mountain storage facility. Among the problems currently experienced in that project are uncertain estimates of cost and the lack of a timeline for completion. From this information, Senator Anderson concluded that Xcel has no long-term storage plan for the waste that will be generated over the remaining period that the Monticello Plant will be in operation. Senator Anderson concluded that addressing both long-term storage and potential health concerns was necessary to meet the responsibility to act in Minnesota's best interest. Saint Paul Public Hearing (Afternoon), Tr. at 26-34; Public Ex. 11.

161. Diane Rother noted that the Federal government has not managed to establish a long-term storage solution in over 60 years. She characterized the current proposed solution, Yucca Mountain, as problematic, including the possibility that there will be insufficient space to accept Monticello's spent fuel. Transportation of spent fuel to the long-term storage site was also described as presenting undue risk to the general public. Monticello Public Hearing (Afternoon), Tr. at 42-47.

162. Kristen Eide-Tollefson of Citizens United for Responsible Energy (CURE) maintained that the assumptions being built into the analytical framework amounted to "a fiction built upon fictions." Public Ex. 33a. The impact of weather on degradation of storage modules over the long term was cited as a concern. The time elapsed to collapse of the concrete roof for storing spent fuel casks was estimated to be 80.5 years, due to the effects of freeze and thaw on the concrete. Public Ex. 33b Table 2-1. There is some dispute on this point, since the heat dissipating from the spent fuel appears sufficient to prevent freezing of the concrete. Further, the increased temperature was observed to reduce the moisture content of the concrete, reducing the impact of freeze and thaw and rendering the concrete stronger. Public Ex. 32b, at A-6. Another assessment of the concrete vault lifespan (as being between 1,045 and 3,100 years) assumed a

subterranean configuration, with clay, gravel, topsoil, and surface vegetation atop the storage vaults. The proposed storage site for the Monticello Plant consists of above-ground concrete vaults. Public Ex. 32b, at B-3, 10.

163. CURE maintains that these concerns are more serious due to the storage limitations at Yucca Mountain (assuming any spent fuel will be stored there at all). Public Ex. 17. The potential for increasing the amount of spent fuel with no long-term storage planned was described as a "crazy situation." Saint Paul Public Hearing (Afternoon), Tr. at 83.

164. The Sierra Club pointed out that even basic necessities for long-term storage, such as language that will be sure to explain proper handling of spent fuel and conveying the danger posed by these materials to future generations, have not been addressed in any meaningful way. Saint Paul Public Hearing (Evening), Tr. at 4.

Monticello Area Residents

165. Donald Lemm is a near neighbor of the Monticello Plant. He appeared at several public sessions. He supports the proposed storage, while also wanting alternative energy sources. Monticello Public Hearing (Afternoon), Tr. at 23. He suggested that a twenty-year transition period be established to address reprocessing of spent fuel rods and moving to alternative energy sources. Mr. Lemm also suggested requiring that the storage materials, insofar as is possible, be locally produced. Saint Paul Public Hearing (Afternoon), Tr. at 22-25.

166. Roger Carlson, a Monticello resident for many years described the positive impact of Xcel on the community, as an employer and corporate citizen. Public Ex. 6

167. Kevin Krone and Jonay Krone expressed concern over the potential health impacts of dry cask storage, in addition to the potential impacts of living near the Monticello Plant. Monticello Public Hearing (Evening), Tr. at 19-20. The Krones related their experiences with Xcel in attempting to get their questions answered and exploring the possibility of selling their property to Xcel. Public Ex. 22.

168. Vicki Schmidt, a resident of Monticello, questioned whether there was any longer-term solution available for disposal of spent fuel. She proposed that additional needs be met through energy conservation. Ms. Schmidt characterized her position as "not completely against" the proposed storage, but that she had unanswered questions about the project. Public Ex. 23 and 27.

169. Jim Grubbs related his experiences living in the vicinity of the Monticello power plant for the twelve years. He supports Xcel's application. Monticello Public Hearing (Evening), Tr. at 21.

170. Sharon Pederson of Buffalo, Minnesota expressed concern over the storage facility being built away from the plant site and that other producers could ship spent fuel to Monticello. Monticello Public Hearing (Afternoon), Tr. at 24.

171. Genell Reese, Nuclear Director for Wright County, supports Xcel's proposed dry cask storage as meeting safety concerns. Public Ex. 4. Pat Sawatzke, a member of the Wright County Board, noted the Wright County Board's unanimous vote of support for Xcel's application. Wright County conducts a two-day drill annually to be assured of preparedness in the event of a problem at the Plant. Monticello Public Hearing (Afternoon), Tr. at 72-74.

172. Jim Johnson, Superintendent of Schools for Monticello, expressed his support for the approval of spent fuel storage to maintain low energy costs. Johnson expressed his concern that State government initiatives leave too little available for ongoing expenses, including energy, making inexpensive electricity even more important. He also described the disaster planning arranged with Xcel to provide for student safety. Johnson noted that he has not been asked about Plant safety as superintendent, and the principal of an elementary school located one mile from the Plant has never heard concerns about safety regarding the Plant. Monticello Public Hearing (Afternoon), Tr. at 65-68.

173. Jim Herbst, Mayor of Monticello, related his experience as Mayor and, before that as a member on the City Council of Monticello. In his 14 years as an elected official of the City, Mayor Herbst did not receive a complaint or concern about the Plant. Monticello Public Hearing (Afternoon), Tr. at 69.

174. Mary Lanegran spoke on behalf of the Monticello/Buffalo Hospital District. Ms. Lanegran described the ongoing education and drills performed in conjunction with Xcel. These drills were shared with a number of hospitals across the nation in the wake of the September 11, 2001 terrorist attack. Ms. Lanegran supported Xcel's application. Monticello Public Hearing (Afternoon), Tr. at 70-71.

175. State Representative Bruce Anderson, who resides in Buffalo Township, described the economic impact of the Monticello Plant's low cost of producing electricity. Representative Anderson also noted that plant security has been improved. He also praised the conscientiousness and professionalism of Xcel employees at the various facilities owned by the company. Monticello Public Hearing (Evening), Tr. at 25-28.

176. Ronald Baumer supports Xcel's Application due to the benefits of nuclear power, which he identified as a healthy tax-base, improved employment, and the absence of airborne pollutants compared to gas or coal. Public Ex. 9

Health Effects of Nuclear Power Generation

177. Diane Rother, a holistic health practitioner, recited risks from nuclear waste and public policy choices that undermine sound long-term energy generation from renewable sources. She related her experiences with clients who suffer from breast cancer, including clients who have no history of that disease in their family. Rother maintained that a 14 to 36% increase in breast cancer has been observed in counties in the vicinity of nuclear power plants. The work of Ernest Sternglass and Jay Gould was cited in support of this claim. Public Exs. 5 and 31a; Monticello Public Hearing (Afternoon), Tr. at 52-54.

178. Rother estimated the economic costs borne by persons diagnosed with breast cancer (based on the estimated costs of care, ongoing treatments and follow-up care). Using the assertion that a 14% increase in breast cancer is caused by the location of the Monticello Plant, Rother concluded that Wright County's citizens are incurring an indirect annual cost of $106,011 to $114,488 due to the impact of the Monticello Plant on breast cancer cases. Public Ex. 31a. The financial impact for the counties near nuclear power plants imposed by increased breast cancer deaths was estimated to be $3.6 million per year. Saint Paul Public Hearing (Afternoon), Tr. 55-58; Public Ex. 15.

179. Lea Foushee also addressed the costs of breast, prostate, and colorectal cancers, ranging from $11,000 to $24,200 per year, per patient (under the Medicaid program). She maintained that these cancers have been associated with radiation exposure and these costs should be included in the assessment of impact of the Monticello Plant. Saint Paul Public Hearing (Afternoon), Tr. 65.

180. Foushee cited a report by the Committee on Biological Effects of Ionizing Radiation of the National Academy of Sciences (BIER VII) as finding that there is no "safe" dose of radiation. An increase in infant mortality, from 6.8 to 7.0 (per 1,000 live births), was cited as demonstrating that nuclear power generation is a contributing factor. She also maintained that Down syndrome (among newborns) and prostate cancer (among adults) were both caused by exposure to tritium (a weakly radioactive form of hydrogen, usually found in water molecules where the tritium has replaced one regular hydrogen atom). No comparative information was introduced to show a correlation between any tritium released by any Minnesota nuclear generating plant and any increase in the occurrence of Down syndrome. Similarly, there was no comparative information to show a causal connection between radiation releases and any changes in the infant mortality rate. Saint Paul Public Hearing (Afternoon), Tr. 66-67; Public Ex. 16

181. Ronald Baumer expressed support for the spent fuel storage proposal for the economic benefits for the community both in tax base and local employment. He asserted that the Monticello Plant is better for the environment than fossil fuel sources of electricity due to the lack of harmful emissions. Responding to comments by others, Mr. Baumer disputed assertions regarding air emissions of radioactive contaminants. He maintained that coal-fired power

plants will emit more radioactive materials than a nuclear power plant. Public Ex. 28.

182. Foushee emphasized that there is no safe dose of ionizing radiation, established by the Biological Effects of Ionizing Radiation VII (BEIR VII). Any radiation coming from the Monticello Plant is therefore in addition to the background radiation that nearby residents are exposed to. Foushee also cited a lecture by Dr. Alice Stewart, who suggested that even minimal exposure to radiation increased health risks by some small degree. Dr. Stewart's hypothesis was cited in a survey of health effects completed by Drs. Nussbaum and Köhnlein, and Nussbaum suggested that "inconsistencies, open questions, and omissions" from existing research understate the impact of low level radiation on human health. Public Ex. 30.

183. Dr. Nussbaum studied populations that included Hiroshima atomic blast survivors, Marshall Islanders (who lived near the Bikini atoll above-ground nuclear weapons test), and persons in the vicinity of the 1986 Chernobyl explosion. Surveys also compared fetal exposure to medical ionizing radiation (x-rays) and noted increases in children born with Down syndrome or developing childhood cancers. The Nussbaum study did not reach a firm conclusion on any particular linkage between low-level radiation exposure and health effects. The study urged researchers to approach the issue of health effects from low dose radiation "with an open mind." Public Ex. 30, Nussbaum study.

184. Diane Rother submitted several studies as attachments to her written comments. In a June 1994 study, a Ernest Sternglass, Ph.D., released his analysis that suggested a significant increase in mortality from breast cancer in seven so-called "nuclear counties" near the Prairie Island nuclear generating plant. A smaller, but still significant increase was identified as occurring in the counties adjacent to the Monticello Plant. The increase in breast cancer mortality over this same time period was asserted by Dr. Sternglass to be only 1 percent statewide. Public Ex. 31b, at 5-1, 2.

185. Rother also submitted a Minnesota Department of Health study. That department operates the Minnesota Cancer Surveillance System (MCSS) which monitors the occurrence of cancer in Minnesota's population and conducts epidemiological studies of those occurrences seeking correlations that would suggest causation. In response to the Sternglass analysis, the MCSS conducted an evaluation of the data available seeking to determine whether there is evidence that breast cancer rates differ over the past 43 years between the state-wide cancer rates and those in counties adjacent to the Monticello and Prairie Island nuclear power plants. MCSS also expanded its study to look for trends in other cancers known to be associated with exposure to ionizing radiation. Public Ex. 31b, Minnesota Cancer Surveillance System Report to the Minnesota Legislature, March 1995, at 5-1. (MCSS 1995 Report).

186. MCSS used cancer mortality data from 1950 through 1992. No significant differences were found between the cancer rates surrounding the two nuclear plants compared to the state-wide average. This absence of significant differences was true for breast, bone and thyroid gland cancers, as well as for leukemia. For all of these diseases, exposure to ionizing radiation is an established risk factor. Public Ex. 31b, MCSS 1995 Report, at 5-1.

187. MCSS noted that the Sternglass study used only three time periods: 1950-54, 1980-84, and 1985-89. The mortality data examined in that study was only of the white population. The large increases in mortality were determined to arise from limiting the time studied, thereby failing to account for wide variability in the number of deaths through breast cancer. The two counties closest to the Monticello Plant (out of the seven identified as "nuclear counties" being affected by that facility) had no change or a decrease in mortality over one of the periods used in the Sternglass study. MCSS also noted that the average asserted in the Sternglass study for the Prairie Island "nuclear counties" was higher than any of those counties individually (which must be the result of a mathematical or methodological error). Public Ex. 31b, MCSS 1995 Report, at 5-6, 7.

188. The incidence of breast cancer mortality was used as the basis of the Sternglass study. MCSS went further, examining data on newly-diagnosed cases of breast cancer. Using the period of 1988 through 1992, MCSS determined that the per capita rate of newly-diagnosed breast cancer in the "nuclear counties" was "virtually identical" to the state-wide per capita average. Public Ex. 31b, MCSS 1995 Report, at 5-7, Table 5-1. Similar results were obtained for comparisons to newly-diagnosed cases of thyroid cancer, bone cancer, and leukemia. Public Ex. 31b, MCSS 1995 Report, at 5-7, 8, Tables 5-1. The observed mortality rates for those diseases in the "nuclear counties" is actually lower over the studied period than the statewide average. Id.

189. Thus, contrary to Rother's assertions, MCSS concluded that there were no discernible differences in the mortality rates of persons in counties in the vicinity of nuclear power plants from breast cancer (or other cancers associated with exposure to ionizing radiation) and the state-wide average for those diseases. Further, MCSS concluded that the rates of newly-diagnosed cancers in those counties did not differ from the state-wide average. Public Ex. 31b, MCSS 1995 Report, at 5-8. This was confirmed at the hearing by George Johns, Jr., Supervisor of the Radiation Control Program of the Department of Health. He testified that monitoring results indicated no increases in cancers adjacent to the Monticello plant. 6Tr. 38.

Potential Impact of a Catastrophic Nuclear Power Accident

190. Rother noted that the assumptions underlying the impact of the ISFSI excluded the impacts that could result from a catastrophic accident

resulting in the release of radiation from a nuclear generating plant. She described the current situation as "hedging a poor bet." Monticello Public Hearing (Afternoon), Tr. at 42 and 55-56. Rother estimated the financial impact of a Chernobyl-type accident. Assuming that a similar area to that evacuated in Ukraine would be affected, Rother estimated that the loss in residential property value alone would approach $800 million. Loss of incomes for the area would exceed $6 million annually. These numbers would be higher in the event of such an accident, due to the wider effect on areas adjacent to the evacuated zone. Saint Paul Public Hearing (Afternoon), Tr. at 48-49.

191. Rother indicated that security issues, such as the threat of terrorist attack, are legitimate concerns. The Sierra Club noted that nuclear plants have been trespassed upon before, for the purpose of highlighting the risks posed by that particular form of electricity generation. Saint Paul Public Hearing (Evening), Tr. at 7-8.

192. Foushee objected to the characterization of nuclear power as clean, safe, or secure. She cited the 1982 report entitled the Calculation of Reactor Accident Consequences (CRAC II), indicating that it showed the human and financial impact of a Three Mile Island level accident. (FN On March 28, 1979, the Three Mile Island Unit 2 (TMI-2) nuclear power plant near Middletown, Pennsylvania, experienced a partial core meltdown. While little radiation was released by the accident, there was a very real risk of containment breach and widespread contamination by radioactivity.)

193. CRAC II was prepared by the Sandia National Laboratory at the direction of the NRC to estimate the impact of a class-9 accident. (FN A class-9 accident is a core meltdown, such as that experienced at TMI-2. CRAC II estimated the impacts if a containment breach occurs in such an accident.) These impacts included the potential for 500 deaths in the immediate vicinity of the Monticello Plant, and 4,000 deaths arising from cancers in the exposed population. Saint Paul Public Hearing (Afternoon), Tr. 63-64; Public Ex. 16.

194. Foushee noted that the Monticello Plant has had two accidents and maintained that the design of the spent fuel storage pool (which is situated above ground) renders the plant unsafe, particularly from terrorist attack. Saint Paul Public Hearing (Afternoon), Tr. 73-74.

195. Foushee also submitted an excerpt from Jane's Weapons Systems which contains information about various anti-tank missiles. These missiles range from large, vehicle-borne weapons, to shoulder-fired weapons that project a 2.25 kg (about five pounds) grenade to a maximum range of 500 meters. Public Ex. 16a.

196. Baumer disputed the risks posed to nuclear power plants from potential terrorist attack. He asserted that the risk posed by missiles is very limited, due to the thickness of the materials storing the spent fuel, and the

absence of a direct line of sight between accessible areas and the storage locations. Public Ex. 28.

D. Will the Design, Construction, Operation, and Retirement of the Storage Facility Comply with Applicable State and Federal Laws and Policies?

197. The Monticello plant's storage facility is licensed by the NRC, which has examined its specifications, performance, and suitability. While no further licensing of the storage facility is required, Xcel Energy will submit and file documentation with the NRC to confirm that the storage facility is in compliance with the license held by the vendor, Transnuclear. The NRC will review the documentation and respond with any comments prior to implementation. Ex.1 (CON Application) at 2-5 to 2-6, 5-7 to 5-8.

198. The continued operation of the Monticello plant will be examined in the NRC licensing proceeding, and a separate EIS addressing radiological and other issues within the NRC's expertise will be conducted. As part of these proceedings, issues related to the Monticello plant's age and maintenance will be examined. The NRC will confirm that the Monticello plant has appropriate monitoring and inspection programs in place to assure that potential aging effects can be detected and addressed before they affect operations. Ex. 28 (McKeown Direct) at 9-11.

199. Xcel Energy has demonstrated that the proposed storage facility will comply with applicable state and federal laws and policies. Ex. 45 (Rakow Direct) at 84-87.

VI. Compliance with Other Statutes

200. Minn. Stat. § 116C.83, subd. 4, requires stored spent nuclear fuel to be managed to facilitate the shipment of waste out of state to a permanent or interim storage facility as soon as feasible.

201. The dry storage system selected by Xcel Energy will minimize the handling required for transportation to a permanent repository. The storage canisters are designed to facilitate removal from the storage vaults and placement into compatible transportation casks, which can then be loaded for transportation out-of-state. Ex. 5 (CON App. Supp. S-19); Ex. 28 (McKeown Direct) at 7-10.

202. Xcel Energy has an ongoing obligation to comply with four particular requirements of Minn. Stat. § 216B.1691. Under that statute, Xcel must make good faith efforts to meet four specified goals: a Renewable Energy Objective (REO) under subdivision 2(a), a biomass objective under subdivision 2(b), a wind capacity requirement under subdivision 6(a), and a biomass power purchase agreement requirement under subdivision 6(c).

203. Xcel Energy's compliance with Minn. Stat. § 216B.1691 is pending before the Commission in Xcel Energy's Resource Plan Docket. The Department's Comments in that Docket and Xcel Energy's Resource Plan show that Xcel Energy is in compliance with the renewable energy objectives of Minn. Stat. §216B.1691. Ex. 37 (Fang Direct) at 5-8.

Based on the foregoing Findings, the Administrative Law Judge makes the following:

CONCLUSIONS

1. Any of the foregoing Findings of Fact more properly designated as Conclusions of Law are hereby adopted as such.

2. The Administrative Law Judge and the Minnesota Public Utilities Commission have jurisdiction over the subject matter of this hearing pursuant to Minn. Stat. § 116C.83 and § 216B.243.

3. All relevant procedural requirements of law and rules have been fulfilled prerequisite to the issuance of a Certificate of Need to the Applicant. The PUC provided legally sufficient public notice of the February 2, 2006 (Monticello) and February 16, 2006 (St. Paul) public meetings by publication in a legal newspaper of general circulation in the location where the project is proposed to be located, as required by Minn. R. 4400.2500.

4. The forecasts, power system analyses, and cost analyses presented in these proceedings through Xcel Energy's CON Application, Exhibits, and Xcel Energy witness testimony was reasonably reliable and appropriate for determining the need for the facility.

5. Shutdown of the Monticello plant would adversely affect the future adequacy, reliability, safety and efficiency of the energy supply to Xcel Energy's customers and the people of Minnesota and neighboring states.

6. Replacing the Monticello plant with any other form of new generation would result in significantly higher costs for Xcel Energy to produce electrical power.

7. Replacing the Monticello plant with new generation would result in less reliability, at least during the period when the new plant is under construction.

8. Replacing the Monticello plant with new generation using a coal or natural gas fueled-facility would result in significant negative air quality impacts.

9. Removing the Monticello plant from the electrical supply system would create a 600-megawatt and 4-5 million megawatt hour per year electrical deficit in the region beginning in 2011.

10. Power generated by continued operation of the Monticello Generating Plant is less expensive (including environmental costs) than power that could be generated by any currently available combination of renewable energy sources.

11. The current storage capacity for spent nuclear fuel assemblies at the Monticello plant will be exhausted in 2010. To continue to operate at current levels through 2030, the Monticello plant will require up to 30 spent fuel containers and vaults.

12. No more reasonable and prudent alternative to the Monticello Generating Plant has been demonstrated to exist.

13. Reprocessing is not an option because reprocessing facilities do not operate in the United States. Temporary, off-site storage is not presently available. Permanent, off-site storage is not yet available.

14. Fuel rod consolidation would only nominally increase pool storage capacity and poses risks of occupational exposure and generation of additional radioactive materials. Similarly, replacing existing storage racks with new racks that hold more fuel assemblies would only provide storage for approximately four more years of operation.

15. *Construction and operation of on-site storage is the best alternative* for meeting the storage needs of the Monticello plant.

16. The dry storage facility and continued operation of the Monticello plant will support future regional development by sustaining a highly skilled workforce and contributing to local tax bases and revenues.

17. The dry storage facility and continued operation of the Monticello plant is consistent with the state's energy policy, as outlined in the 2004 Energy Policy and Conservation Report, because it provides safe, reliable, low-cost power and does not emit air pollution.

18. The dry storage system selected by Xcel Energy will comply with Minn. Stat. § 116C.83, subd. 4, because it manages spent nuclear fuel in a manner that facilitates its transfer out of state to a permanent or interim repository as soon as feasible and allows continued operation of the plant.

19. Xcel Energy has complied with the renewable energy objectives of Minn. Stat. § 216B.1691 by its continued acquisition of wind power resources described in its Resource Plan filing. Xcel Energy's future plans to continue to meet the renewable energy objective are to be reviewed in the PUC's Resource Plan.

20. The dry storage facility and continued operation of the Monticello plant would serve the public interest.

21. Xcel Energy has demonstrated that its proposed storage facility satisfies the criteria for a Certificate of Need in Minn. Stat. §§ 116C.83 and 216B.243, subd. 3, and Minn. R. 7855.0120.

22. There are no reasonable and feasible alternatives to the construction and operation of the proposed on-site spent nuclear fuel storage facility at the Monticello plant.

23. The Certificate of Need requested by Xcel Energy should be issued.

Based upon the foregoing conclusions, the Administrative Law Judge makes the following:

RECOMMENDATION

IT IS RESPECTFULLY RECOMMENDED that the Public Utilities Commission issue a Certificate of Need to Xcel Energy for the construction and operation of a dry spent fuel storage facility at the Monticello generating plant with up to 30 spent fuel containers, vaults, and associated equipment necessary to allow the Monticello generating plant to continue in operation through 2030.

Dated: August 4, 2006

STEVE M. MIHALCHICK
Administrative Law Judge

Reported: Court Reported
Shaddix & Associates

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

LeRoy Koppendrayer	Chair
Marshall Johnson	Commissioner
Ken Nickolai	Commissioner
Thomas Pugh	Commissioner
Phyllis A Reha	Commissioner

In the Matter of the Application of Northern States Power Company, d/b/a Xcel Energy, for a Certificate of Need to Establish an Independent Spent Fuel Storage Installation at the Monticello Generating Plant

ISSUE DATE: October 23, 2006

DOCKET NO E-002/CN-05-123

ORDER GRANTING CERTIFICATE OF NEED FOR INTERIM INDEPENDENT SPENT FUEL STORAGE INSTALLATION

PROCEDURAL HISTORY

I. Initial Proceedings

On January 18, 2005, Northern States Power Company, d/b/a Xcel Energy, filed an application for a certificate of need to build a nuclear waste storage facility at its Monticello generating plant The facility is intended to store spent fuel from the Monticello generating plant until the federal Department of Energy transports it to a permanent or temporary national nuclear storage facility The waste would be stored in dry casks in an above-ground facility

On April 7, 2005, the Commission issued its order finding the application substantially complete and its notice and order for hearing The Commission required a supplementary filing, which the Company made on June 15, 2005

On February 2 and 16, 2006, public hearings were conducted in Monticello and St Paul

On March 20, 2006, the Department of Commerce (the Department) issued its Final Environmental Impact Statement (EIS) On August 1, 2006, the Department issued a notice indicating that the Commissioner of the Minnesota Department of Commerce determined the Final EIS to be adequate

The case was assigned to Administrative Law Judge (ALJ) Steve Mihalchick, who conducted contested case proceedings The ALJ issued his Findings of Fact, Conclusions of Law and Recommendations (the ALJ's Report) on August 4, 2006

The Commission met on September 26 and 28 to consider the matter

II. The Parties and their Representatives

The following parties filed testimony or memoranda in this case:

- Xcel Energy, represented by B Andrew Brown, Dorsey and Whitney LLP, 50 S Sixth Street, Minneapolis, Minnesota 55402

- The Minnesota Department of Commerce, represented by Linda Jensen and Valerie Smith, Assistant Attorneys General, 445 Minnesota Street, Suite 1400, St Paul, Minnesota 55101

- The Minnesota Center for Environmental Advocacy (MCEA) and Minnesotans for an Energy-Efficient Economy (ME3) as intervenors, represented by Thomas P Harlan and Katherine Becker Madigan, Madigan, Dahl & Harlan, P A , 701 Fourth Avenue South, Suite 1700, Minneapolis, Minnesota 55415 Elizabeth Goodpaster, Attorney at Law, 26 East Exchange Street, Suite 206, St Paul, Minnesota 55101, also appeared for and on behalf of MCEA

- North American Water Office (NAWO), represented by George Crocker, P O Box 174, Lake Elmo, Minnesota 55042

III. Proceedings Before the Administrative Law Judge

The Administrative Law Judge issued a Prehearing Order establishing time frames for pre-filed testimony Parties filed direct, rebuttal, and surrebuttal testimony in writing and Judge Mihalchick held evidentiary hearings on February 21-23, 2006 in St. Paul The parties filed initial and reply post-hearing briefs and proposed findings and conclusions for his consideration

The Administrative Law Judge held public hearings on the Company's application at two locations: Monticello on February 2, 2006, and St Paul on February 16, 2006 The Administrative Law Judge heard oral comments and admitted several exhibits from the non-party public into the record

On August 4, 2006, the Administrative Law Judge issued his report In brief, he recommended that the Commission issue a certificate of need to Xcel for the construction and operation of a dry cask spent fuel storage facility at the Monticello nuclear generating plant The ALJ recommended that the certificate of need authorize up to 30 spent fuel containers, vaults, and associated equipment necessary to allow the plant to continue in operation through 2030

IV. Proceedings Before the Commission

On August 21, 2006, NAWO filed exceptions to the report of the ALJ, and the Department filed a letter supportive of the ALJ's report, but identifying three areas as needing clarification On August 22, 2006, ME3/MCEA filed its exceptions

The Commission heard argument from all parties on September 26 and 28, 2006, and the record closed under Minn. Stat § 14 61, subd 2 on September 28

Having reviewed the entire record herein, and having heard the arguments of all parties, the Commission makes the following findings, conclusions, and order

FINDINGS AND CONCLUSIONS

V. Factual Background

A. The Monticello Generating Plant

The Monticello generating plant has been in operation since 1970 It is licensed by the Nuclear Regulatory Commission (NRC) to operate through 2010 The plant operates a single unit boiling water reactor powered by nuclear fuel The plant produces approximately 10 percent of Xcel Energy customers' electric energy requirements

The Monticello generating plant has a history of reliable power production The reliability of baseload generating facilities is usually measured in terms of capacity factor – the ratio between the plant's average load and its peak load during a given period of time Monticello has an average capacity factor of 88 3%

The Monticello plant also has an excellent operating record, receiving the General Electric Outstanding Plant Performance Award for boiling water reactors annually for the past 10 years and in 17 of the last 22 years The plant also has "green" indicators from the Nuclear Regulatory Commission's Reactor Oversight Process, the highest performance indicator given by the NRC

Each nuclear fuel assembly provides heat constantly over about a six-year period before its output declines to the point it is no longer useful Currently, spent nuclear fuel assemblies are removed from the reactor and stored on racks in the Monticello plant's spent fuel pool The plant is now running out of storage space The existing spent fuel storage capacity at Monticello will be exhausted by 2010

In March 2005, Xcel filed an application with the NRC to renew the operating license for an additional 20 years, or until 2030

B. The Storage Facility Proposed by the Company

Under Xcel's proposal, up to 30 spent fuel storage canisters would be placed in horizontally configured concrete storage vaults and arranged in rows on a concrete pad within the storage facility The storage facility and 30 containers would enable the Monticello plant to operate through 2030

Xcel proposed to store the spent fuel from the Monticello facility in a system manufactured by Transnuclear, Inc (Transnuclear) The storage site and storage vaults will be monitored with cameras, other security devices, and temperature sensors The storage vaults are made of reinforced concrete and are designed to provide radiological shielding, protection from environmental conditions, structural integrity, and heat removal

Two fences will surround the facility, with a monitored, clear zone between them Within the storage area, spent fuel will be encased in a canister, placed in a transfer cask for removal to modular concrete vaults, then removed from the transfer cask and stored in the vault, which will be placed on a reinforced concrete support pad, 18 - 24 inches thick

The proposed facility is designed for relatively long-term interim storage, based upon the legal obligation of the federal Department of Energy to develop a permanent repository at Yucca Mountain, Nevada, or provide other permanent repositories The date when Yucca Mountain will open, however, remains uncertain

Xcel proposed to begin construction of the proposed storage facility in July 2007, and begin storage of spent fuel beginning in July 2008

C. Parallel Proceedings

Different units of government have jurisdiction over different aspects of Xcel's proposal for the Independent Spent Fuel Storage Installation (ISFSI) Accordingly, the Company has been and continues to be a party to proceedings in several other forums

1. The EIS

Xcel has completed proceedings commenced before the Environmental Quality Board (EQB) in November 2004, which at that time had responsibility for preparing the environmental review for the proposal under Minn Stat §§ 116C 83, subd 6(b), and 116D, the Minnesota Environmental Policy Act The Legislature transferred the authority to prepare the Environmental Impact Statement from the EQB to the Department effective July 1, 2005

On August 1, 2006, the Department issued a notice indicating that the Commissioner of the Department of Commerce determined the Final Environmental Impact Statement to be adequate

2. Proceedings Before the NRC

The Company filed an application with the NRC to renew its operating license for the Monticello plant for an additional 20 years on March 24, 2005 The re-licensing application is still pending

As part of the re-licensing process, the NRC prepared a Generic Environmental Impact Statement (GEIS), which applies to all facilities. Xcel has also prepared an individual supplement for the Monticello facility, a Specific Environmental Impact Statement (SEIS)

The NRC has established requirements for the design, construction and operation of an ISFSI and the use of storage containers as part of an ISFSI and memorialized these requirements in 10 C F R Part 72 The storage technology proposed by Xcel, the Transnuclear NUHOMS 61 BT spent nuclear fuel container, storage vault, and transport system, already has been licensed by the NRC in 2001

VI. Public Opinion

The certificate of need statute requires the Commission to hold at least one public hearing at a time and place convenient for the public to obtain public opinion on the application The statue also requires the Commission to designate a Commission employee to facilitate public participation in the hearing process Minn. Stat § 216B 243, subd 4

The Commission, through the Administrative Law Judge, held afternoon and evening public hearings on this application - on February 2, 2006, in Monticello; and on February 16, in St Paul The Commission designated David L Jacobson as its liaison with the public The Commission encouraged the public to express opinions on the application by attending the public hearings or by filing written comments with the Administrative Law Judge In addition to receiving oral comments, the Administrative Law Judge admitted several exhibits from the public into the record

At the hearings, over 30 persons testified Numerous public and private citizens testified in favor of extending the Monticello generating plant's operating license A number of speakers stressed the socioeconomic benefits to the state and local economies arising from the operation of the plant, which provides reliable, reasonable cost electricity and associated employment and contributions to the tax base in the area

Thirteen private citizens living in close proximity to the plant appeared and spoke at the public hearings One resident expressed concern that environmental data regarding the facility was not reliable because of the financial interests involved. Two residents expressed concern over the potential health impacts of dry cask storage, in addition to the potential impacts of living near the plant Another resident questioned whether there was any longer-term solution available for the disposal of spent fuel A fourth person expressed concern that other producers could ship spent fuel to Monticello

Nine citizens living in the Monticello area expressed opinions in favor of granting the certificate of need One described the positive impact of Xcel on the community, as an employer and private citizen The Nuclear Director for Wright County supported the dry cask storage proposal as meeting the safety concerns of her board The Superintendent of Schools for Monticello expressed his support for approval to maintain low energy costs, and described the disaster planning arranged with Xcel to provide for student safety Other citizens cited the benefits of nuclear power, such as a healthy tax-base, improved employment, and the absence of airborne pollutants compared to gas or coal

Other private citizens, as well as Citizens United for Responsible Energy (CURE), the Sierra Club, and State Senator Ellen Anderson of St Paul expressed opposition to the requested certificate of need, citing the length of time that the spent fuel remains toxic, the continued absence of a long-term storage facility, and the dangers inherent in transporting the spent fuel

The Consumer Affairs unit at the Public Utilities Commission received two comments from the public expressing concern about safety issues at the Monticello plant

VII. Summary of Major Issues

The major issue to be determined in this proceeding is whether Xcel has demonstrated need for the proposed facility, as need is defined in the certificate of need statute, Minn Stat § 216B 243, and its implementing rules, Minn Rules, Chapter 7855

VIII. Summary of Commission Action

The Commission has reviewed the record, examined the Report of the Administrative Law Judge, and heard the arguments of all parties The Findings of Fact, Conclusions of Law, and Recommendations of the Administrative Law Judge are comprehensive, thoughtful, and thorough The Report carefully reviews the arguments of all parties and the evidence

The Commission reaches the same conclusion for the same reasons The Commission finds that Xcel has demonstrated need for a certificate of need for the proposed facility – an interim spent fuel storage installation for thirty dry cask storage canisters Thirty storage canisters will allow the Company and its ratepayers to reap the benefits of full power production at Monticello through 2030

Until then, dry cask storage remains the most prudent, cost-effective option for meeting the load currently served by the Monticello generating plant All of the alternatives examined by the Company or proposed by other parties would cost Xcel, and its ratepayers, more than dry storage canisters

Allowing Xcel to continue dry cask storage until 2030 at the Monticello generating facility will enable it to continue to provide clean, reliable, and low cost energy to the citizens of Minnesota and neighboring states No other form of generation considered for meeting current load compared favorably to this option

The Commission therefore accepts, adopts, and incorporates by reference the Report of the Administrative Law Judge

IX. The Company has Demonstrated Need for the Proposed Facility Under the Certificate of Need Statute and Rules

A. The Legal Standard

1. The Statute

The certificate of need statute, Minn Stat § 216B 243, subds 3 and 3a, requires the Commission to establish criteria for assessing the need for large energy facilities and list factors the Commission must take into account:

> Subd 3 **Showing required for construction.** No proposed large energy facility shall be certified for construction unless the applicant can show that demand for electricity cannot be met more cost effectively through energy conservation and load-management measures and unless the applicant has otherwise justified its need In assessing need, the commission shall evaluate:
>
> (1) the accuracy of the long-range energy demand forecasts on which the necessity for the facility is based;
>
> (2) the effect of existing or possible energy conservation programs under sections 216C 05 to 216C 30 and this section or other federal or state legislation on long-term energy demand;
>
> (3) the relationship of the proposed facility to overall state energy needs, as described in the most recent state energy policy and conservation report prepared under section 216C 18 or, in the case of a high-voltage transmission line, the relationship of the proposed line to regional energy needs, as presented in the transmission plan submitted under section 216B 2425;
>
> (4) promotional activities that may have given rise to the demand for this facility,
>
> (5) benefits of this facility, including its uses to protect or enhance environmental quality, and to increase reliability of energy supply in Minnesota and the region;
>
> (6) possible alternatives for satisfying the energy demand or transmission needs including but not limited to potential for increased efficiency and upgrading of existing energy generation and transmission facilities, load-management programs, and distributed generation;
>
> (7) the policies, rules, and regulations of other state and federal agencies and local governments;

(8) any feasible combination of energy conservation improvements, required under section 216B 241, that can (i) replace part or all of the energy to be provided by the proposed facility, and (ii) compete with it economically;

(9) with respect to a high-voltage transmission line, the benefits of enhanced regional reliability, access, or deliverability to the extent these factors improve the robustness of the transmission system or lower costs for electric consumers in Minnesota,

(10) whether the applicant or applicants are in compliance with applicable provisions of sections 216B 1691 and 216B 2425, subdivision 7, and have filed or will file by a date certain an application for certificate of need under this section or for certification as a priority electric transmission project under section 216B 2425 for any transmission facilities or upgrades identified under section 216B 2425, subdivision 7;

(11) whether the applicant has made the demonstrations required under subdivision 3a; and

(12) if the applicant is proposing a nonrenewable generating plant, the applicant's assessment of the risk of environmental costs and regulation on that proposed facility over the expected useful life of the plant, including a proposed means of allocating costs associated with that risk

Subd 3a **Use of renewable resource.** The commission may not issue a certificate of need under this section for a large energy facility that generates electric power by means of a nonrenewable energy source, or that transmits electric power generated by means of a nonrenewable energy source, unless the applicant for the certificate has demonstrated to the commission's satisfaction that it has explored the possibility of generating power by means of renewable energy sources and has demonstrated that the alternative selected is less expensive (including environmental costs) than power generated by a renewable energy source For purposes of this subdivision, "renewable energy source" includes hydro, wind, solar, and geothermal energy and the use of trees or other vegetation as fuel

2. Certificate of Need Rules

The Commission's certificate of need rules incorporate and expand on the statutory factors Those rules require the Commission to issue a certificate of need when the following requirements have been met:

A the probable direct or indirect result of denial would be an adverse effect upon the future adequacy, reliability, safety, or efficiency of energy supply to the applicant, to the applicant's customers, or to the people of Minnesota and neighboring states, considering:

(1) the accuracy of the applicant's forecast of demand for the energy or service that would be supplied by the proposed facility;

(2) the effects of existing or expected conservation programs of the applicant, the state government, or the federal government;

(3) the effects of promotional practices in creating a need for the proposed facility, particularly promotional practices that have occurred since 1974;

(4) the ability of current facilities and planned facilities not requiring certificates of need to meet the future demand; and

(5) the effect of the proposed facility, or a suitable modification thereof, in making efficient use of resources

B. a more reasonable and prudent alternative to the proposed facility has not been demonstrated by a preponderance of the evidence on the record by parties or persons other than the applicant, considering:

(1) the appropriateness of the size, the type, and the timing of the proposed facility compared to those of reasonable alternatives;

(2) the cost of the proposed facility and the cost of energy to be supplied by the proposed facility compared to the costs of reasonable alternatives and the cost of energy that would be supplied by reasonable alternatives;

(3) the effects of the proposed facility upon the natural and socioeconomic environments compared to the effects of reasonable alternatives; and

(4) the expected reliability of the proposed facility compared to the expected reliability of reasonable alternatives

C it has been demonstrated by a preponderance of the evidence on the record that the consequences of granting the certificate of need for the proposed facility, or a suitable modification thereof, are more favorable to society than the consequences of denying the certificate, considering

(1) the relationship of the proposed facility, or a suitable modification thereof, to overall state energy needs;

(2) the effects of the proposed facility, or a suitable modification thereof, upon the natural and socioeconomic environments compared to the effects of not building the facility;

(3) the effects of the proposed facility, or a suitable modification thereof, in inducing future development; and

(4) the socially beneficial uses of the output of the proposed facility, or a suitable modification thereof, including its uses to protect or enhance environmental quality

D that it has not been demonstrated on the record that the design, construction, operation, or retirement of the proposed facility will fail to comply with those relevant policies, rules, and regulations of other state and federal agencies and local governments

Minn Rules, part 7855 0120

The rule's criteria are interrelated, but will be addressed individually, since the rule requires written findings on each of them Minn Rules, part 7855 0100 All four criteria have been met

B. The Effect of Denying the Certificate on the Adequacy, Reliability, Safety, or Efficiency of Future Energy Supply

The Commission concurs with the Administrative Law Judge that denying the certificate of need would cause an adverse effect on the future adequacy, reliability, safety or efficiency of energy supply to Xcel's customers, the people of Minnesota, and the people of neighboring states

1. Efficiency

The rule requires that denying the certificate of need not adversely affect the efficiency of future energy supply Denying this certificate, and forcing the retirement of the Monticello generating plant in 2010, would adversely affect the efficiency of future energy supply With the exception of the Prairie Island generating plant, Monticello is Xcel's most cost-efficient plant The economic benefits to Xcel ratepayers of re-licensing Monticello is consistently in the range of $1.8 to $1 9 billion dollars in Present Value of Revenue Requirements (PVRR) Many of the efficiencies of continued operation arise from the fact that the fixed costs associated with the Monticello plant have already been incurred In contrast, new installations would require both new capital investment as well as variable operating costs

2. Reliability

The Commission finds the reliability of the Company's energy supply would be negatively affected by the alternatives to dry cask storage proposed by the parties As will be discussed, renewable technologies such as wind, and conservation efforts have not yet been shown to be sufficiently reliable and cost-effective to completely replace the energy produced at the Monticello generating plant

3. Other Factors

The Commission is required to consider several issues when considering the "effect on future energy supply " The Commission concurs with the Administrative Law Judge that Xcel will experience a capacity deficit by 2010 if the Monticello generating plant is closed Replacing the facility would require approximately 600 MW of baseload capacity and associated energy, nearly continuously, beginning in October 2010

The Commission, like the Administrative Law Judge, finds that Xcel's conservation programs can slow the growth in demand for electricity, but cannot reduce demand in a way that would replace Monticello The Commission also agrees with the Administrative Law Judge that Xcel has not engaged in promotional programs that have created the need for spent fuel storage Nor does the

Commission find anything in the record to support a finding that facilities not requiring certificates of need could eliminate the need for the proposed facility

C. The Existence of More Reasonable Alternatives

The certificate of need rules require the applicant to outline in its application all reasonable alternatives to the proposed facility and the applicant's reasons for declining to propose each alternative Minn Rules, part 7855 0610 The rules anticipate that intervenors will both support alternatives identified by the applicant and advance alternatives of their own. The Commission is required to give all alternatives careful scrutiny Minn Rules, part 7855 0120, clause B

There are two aspects to a consideration of alternatives to the ISFSI: 1) alternatives to the ISFSI as a storage medium for spent fuel; and 2) alternatives to the Monticello generating plant for the supply of electric power until 2030

1. Alternative Means of Handling Spent Fuel

The record includes discussion of the following methods of handling spent fuel other than dry cask storage: on-site storage of spent fuel in other types of facilities, reprocessing of spent fuel, use of existing off-site storage facilities, the proposed Private Fuel Storage Initiative (PFSI) in Skull Valley, Utah, and Yucca Mountain

The Administrative Law Judge found as a fact that on-site non-cask storage alternatives -- including rod consolidation, increasing storage pool capacity, re-racking and construction of a new on-site pool -- do not provide viable, cost-effective, alternatives to dry cask storage The Commission accepts and adopts those conclusions

The Commission also agrees with the Administrative Law Judge's rejection of the remaining methods of handling spent fuel considered by the ALJ Several other alternatives must be quickly dismissed as essentially unworkable Reprocessing remains next to impossible, since commercial reprocessing facilities do not currently exist in the United States Nor are there off-site storage locations currently accepting spent fuel

The proposed PFSI in Skull Valley, Utah is currently on hold An application has been filed with the NRC, an EIS has been prepared, regulatory reviews have been completed, and a license has been issued The state of Utah has opposed the project, however, and there is no certainty as to when, or if, construction and eventual operation of the project will occur Moreover, even if the facility is eventually completed, it will not eliminate the need for some storage at the Monticello plant

Intervenors ME3 and MCEA submitted testimony questioning the likelihood that Yucca Mountain would ever open, whether it will be safe, and whether it will have the capacity for the spent fuel generated by the Monticello plant from 2010 to 2030 Intervenors' expert, Dr Gordon Thompson, testified that there are no other viable federal disposal options, and that the most likely scenario

would be that the federal government would "take title" to the spent fuel, and leave it on-site at the generating facility indefinitely

The federal government has affirmed its commitment to construct a repository for spent nuclear fuel from commercial reactors at Yucca Mountain, Nevada Concerns do remain, however, both in terms of the timing of construction and/or eventual acceptance of spent fuel The current schedule proposed by the Department of Energy does not ensure that the facility would be available early enough to prevent the need for on-site storage expansion at Monticello The Department of Energy has notified commercial operators that due to fiscal and other issues at Yucca Mountain, it could not resume its delivery commitment schedule to give commercial operators a place in line for receipt of spent fuel

The Department considered an Innovative Energy Project [1] No such project currently exists in Minnesota However, the Department evaluated a hypothetical integrated gasification combined cycle unit, and found that it would not meet the availability or timing criteria necessary to serve as an alternative to the ISFSI The Commission rejects this alternative for the same reasons

Finally, the Administrative Law Judge found, after evaluation, that the no-build alternative must also be rejected The ALJ found that if the ISFSI is not approved and built, Xcel will have to buy replacement power when the Monticello plant ceases operations in 2010 The no-build alternative is not viable because it would exacerbate the capacity deficit Xcel would have at that time

Intervenors ME3 and MCEA argued that the record in this case is inadequate to prove the need for the ISFSI Intervenors argued that the most glaring omission is the failure of Xcel to provide any support for the contention that the facility would be temporary, and its failure to present any analysis of how the proposed facility can be maintained responsibly for the duration of its use

Intervenors, however, acknowledged that there is no presently available off-site alternative to ISFSI storage Intervenors also did not dispute that there is no presently available or reasonable on-site alternative to ISFSI storage

The Administrative Law Judge concluded upon review of the entire record that the certificate of need should be granted, allowing continued operation of the Monticello plant until 2030

After thorough and careful review of all alternatives considered, the Commission accepts and adopts the Administrative Law Judge's findings and recommendations that no more reasonable and prudent alternative to the Monticello generating plant has been demonstrated to exist and that construction and operation of on-site storage at the Monticello plant is the best alternative for meeting the spent fuel storage needs of the Monticello plant

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[1] Minn Stat § 216B 1694, sub 2(7)

2. Generation Alternatives

a. Parties' Positions

Xcel argued that denying the certificate of need would likely result in the construction of a new fossil fuel baseload plant, because none of the renewable energy alternatives evaluated by the Company or the Department could replace the Monticello plant at a reasonable cost

Xcel and the Department examined multiple alternatives to provide a replacement for the electricity generated by the Monticello generating plant Xcel examined six scenarios consisting of distributed generation (DG) alternatives, as well as six community based options involving demand-side management (DSM), wind and other DG sources that would use small generation sources The Department also evaluated three "central station alternatives" as alternative forms of generation [2]

Distributed generation alternatives were evaluated by the Company and the Department For the EIS, the Department invited 20 experts to participate in a collaborative process to identify possible DG combinations and scenarios, including renewables such as wind, biomass, biodiesel, ethanol, hydro-power, digesters, and DSM, that might serve as alternatives to extension of the Monticello operating license.

The Department calculated the cost of renewable DG alternatives to exceed the cost of extension of the Monticello operating license by $2 708 billion Further, Xcel presented evidence that each of the DG sources create negative environmental effects, including consumption of land, fuel and impact on natural ecosystems Biomass and bio-diesel require significant crop acreage and produce substantial air emissions Ethanol and digesters pose significant supply limitations Wind power currently remains limited by technological efficiency and available sites

Xcel argued that the DSM programs and increased conservation programs proposed simply cannot counter the overall growing demand for electricity and cannot replace a large, continuously operated plant such as Monticello, which generates approximately 600 MW of power DSM can contribute only approximately 100 MW of power under reasonable assumptions

Intervenors, relying on testimony of their expert, Michael Michaud, argued that the modeling conducted by the Department: 1) underestimated the benefits of distributed ownership of generation assets; 2) underestimated the benefits of avoided transmission costs; 3) improperly limited the analysis of externalities to those approved by the Commission; 4) improperly excluded generation units smaller that 10 kW; 5) under-estimated savings from reduced transmission losses; and 6) underestimated wind capacity factors

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[2] These included renewables on a stand-alone basis, a combination of renewables and non-renewable sources, and non-renewable alternatives

Intervenors' expert did not calculate the individual or cumulative economic costs of the claimed errors Mr Michaud proposed an alternative mix of renewable sources to replace the power generated at the Monticello plant, but did not provide an estimate of the associated costs of the proposal

Department and Xcel witnesses rebutted intervenors' expert as follows:

1) The computer modeling utilized by the Department and Xcel, the Strategist program, specifically included generation sources from small, locally owned projects;
2) While disputing the premise that transmission costs can necessarily be avoided, the Department re-ran cost estimates using the most favorable set of assumptions to intervenors, resulting in a modest decline in the cost of renewables of $265 million This amount was deemed insufficient by the Department and Xcel to alter their position with respect to continued use of the nuclear generating plant;
3) Expansion of the list of externalities made renewables less advantageous compared to nuclear power, because many renewables generate air emissions or other environmental harms that nuclear power does not;
4) The modeling used did not utilize a 10 kW cutoff as intervenors claims;
5) Any benefits of reduced transmission losses from dispersed generation would be offset by the investment required to ensure standby service; and
6) The Department and Xcel revised cost estimates to reflect the higher wind capacities asserted, but the extreme cost differential remained

The Department also screened alternatives for "central station generation," ultimately including a coal-fired facility with an interim or bridge source, a wind/gas combination, an integrated gasification combined cycle plant, and DG options in their analysis

Computer modeling of these central station generation alternatives utilized by Xcel and relied upon by the Department indicated that the present value revenue requirements necessary to meet customer demand for electricity would be at least $395 million higher if Monticello is shut down in 2010 compared to continuing operation through 2030 Computer modeling also predicted that the costs of gas plants or a gas/wind alternative would be even higher

The Department also performed "uncertainty analyses" to assess the potential impact of three factors that could not be predicted with adequate certainty: future natural gas prices; continued ownership of Monticello by Xcel; and the length of the storage of nuclear waste at Monticello

The Department's analysis found that the costs related to natural gas had if anything, been under-estimated Thus, the cost of the natural gas combined cycle plant would also have been under-estimated

Uncertainties regarding a possible change in ownership or control of Monticello was raised by the Department, but resolved to its satisfaction by Xcel's commitment to provide adequate notice to the Department and the Commission in advance of any proposed sale or transfer of the facility

Finally, the effect of a longer period of storage at Monticello than expected was evaluated by the Department, but found to result in changes too small to alter the ranking of alternatives. Thus, the Department concluded that uncertainties affecting the three economic analyses raised do not affect its conclusion that the ISFSI is the most economical option

Intervenors ME3 and MCEA argued that the record in this case is legally inadequate to prove the need for the proposed facility Intervenors argued that Xcel had failed to consider adequately the numerous available alternative means of meeting Minnesota's energy needs and to introduce evidence of compliance with Minn Stat §116C 83, subd 3[3] and the Minnesota Environmental Rights Act

b. The Administrative Law Judge's Recommendation

The Administrative Law Judge concluded that no alternative to Xcel's at-reactor cask storage has been shown to be more reasonable or prudent than Xcel's proposed storage facility Replacing the Monticello plant with any form of alternative generation would result in significantly higher costs for Xcel to produce electrical power, potentially less reliability, and significantly negative air quality impacts if coal or natural gas fueled facilities were utilized

The Administrative Law Judge found that the collective savings of all quantifiable adjustments urged by NAWO expert witness Michaud regarding distributed generation would result in a net savings of at most $625 million from the original $2 708 billion cost differential estimate

The Administrative Law Judge found that incremental nuclear externality costs do not significantly change the financial impact of re-licensing The ALJ found with respect to the uncertainty analysis performed by the Department that:

1) it is likely that future natural gas prices have been under-estimated, if anything, resulting in an understated cost of the natural gas combined cycle plant;

2) Xcel agreed to advise the Department and the Commission in advance of any proposed change in ownership or control of Monticello; and

3) the costs associated with a possible longer period of storage at Monticello (from 50 - 200 years) would not change the ranking of alternatives.

The ALJ found that Xcel and the Department's analysis demonstrates that the externality cost of off-site exposure impacts and/or economics attributable to radioactive emissions from routine operations is zero, due to below detectable off-site radiation levels

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[3] Minn Stat §116C 83 sets forth the means for commission authorization for additional dry cask storage and imposes a requirement of legislative review of any decision by the commission on an application for a certificate of need

c. Commission Action

The Commission accepts and adopts the findings of the Administrative Law Judge, that the alternatives considered are not cost competitive with continued operation of the Monticello generating plant and ISFSI

No alternative was shown to be more reasonable and prudent than the proposed storage facility Xcel adequately demonstrated that it is approximately $1 billion less expensive for ratepayers than any alternative analyzed in the record: 1) a partially renewable distributed generation option would cost about $1 2 - $1 3 billion more; 2) a fully renewable DG replacement would cost about $2 6 - $2 7 billion more, and 3) a central station natural gas combined cycle unit would cost between $715 million to $823 million more PVRR than the proposed storage facility

The Administrative Law Judge also examined externality values, or environmental cost factors, in this proceeding However, as recognized by the Administrative Law Judge, while the Commission has established externality values for the emission of certain air pollutants – SO_2, PM_{10}, CO, NO_x, PB and $C0_2$[4] – the Commission has not quantified an externality value for emissions of radioactivity from nuclear facilities The Commission concurs with the Administrative Law Judge's handling of externalities in this matter

Xcel has demonstrated its firm commitment to increased use of wind power, as well as other renewables, in meeting its renewable energy objectives In the course of its recently completed resource plan,[5] Xcel determined that it could expand its reliance on wind generation by 1,680 megawatts over the 15-year planning period (2005 - 2019), as recommended by the Department and environmental intervenors to that proceeding Xcel also committed to adding 300 megawatts of wind under the new community-based energy-development (C-BED) program by 2007, and a total of 500 megawatts of C-BED wind by 2010.

While increased reliance on wind generation is a cornerstone of Minnesota energy policy, wind alone, or in conjunction with other renewables, is not yet a reliable, affordable means by which to replace the 600 MW of generation necessary from continued operation of the Monticello plant

For all the reasons set forth above, the Commission concludes the most reasonable action on this application to is grant the certificate of need to build a nuclear waste storage facility at the Monticello generating plant to store up to 30 canisters

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[4] *See, e g , In the Matter of the Quantification of Environmental Costs Pursuant to Laws of Minnesota 1993, Chapter 356, Section 3*, E-999/CI-93-583, Order Establishing Environomental Cost Values (December 16, 1996) The Commission has issued four different Orders on externalities

[5] *In the Matter of Northern States Power Company d/b/a Xcel Energy's Application for Approval of its 2005-2019 Resource Plan*, E-002/ RP-04-1752, Order Approving Resource Plan as Modified, Finding Compliance with Renewable Energy Objectives Statute, and Setting Filing Requirements (July 28, 2006)

D. Consequences to Society of Granting or Denying Certificate

The certificate of need rules require the Commission to weigh the social consequences of granting the certificate against the social consequences of denying it In making this analysis the Commission is to consider the relationship of the facility to the state's overall energy needs, the effects of the facility on the natural and socioeconomic environments, the effects of the facility in inducing future development, and the socially beneficial uses of the facility's output, including the protection or enhancement of environmental quality The Commission is convinced the benefits of granting the certificate of need outweigh the benefits of denying it

It is clear from the record that denying the certificate of need for the proposed facility would mean the closure of the Monticello plant in 2010, which would result in a four to five million megawatt hours per year loss of electrical supply that would have to be replaced This amount of power could only be replaced by baseload plant or plants with 600 megawatts of capacity, powered by coal or natural gas, with their consequent costs and disadvantages Denial of the certificate would therefore have an adverse effect upon the future adequacy, reliability, safety and efficiency of the energy supply

Denial of the certificate of need would also harm those with more direct economic ties to the Monticello plant -- the approximately 414 permanent plant employees and their families, as well as long term contractors and temporary workers, Wright County and the City of Monticello, whose economies benefit from Monticello salaries and property taxes; the local school district, which benefits from the property taxes and increased prosperity the plant brings

Granting the certificate of need, on the other hand, would continue the positive benefits enjoyed by those with direct economic ties to the plant, as well as to Minnesota citizens generally Numerous witnesses at the public hearings stressed the benefits to the state and local economies from the operation of the Monticello plant and its clean, reliable supply of low cost electricity Members of the public expressed concern that the current state of alternative energy sources was insufficiently reliable to meet the needs of Xcel's industrial customers Business leaders urged the Commission to avoid taking actions that would increase the cost of electricity

Granting the certificate of need and ensuring Monticello's continued operation would be a cost effective and efficient use of existing resources Over the years Xcel has invested significant resources to continue adherence to regulatory requirements, perform maintenance and address component aging. Only limited major capital investments will be necessary to keep the plant operating efficiently beyond 2010

Some members of the public opposed adding additional storage at the Monticello plant One witness suggested that allowing additional on-site storage would delay implementation of alternative energy sources, and urged implementation of renewable technologies to exceed current levels and mandated minimum requirements State Senator Ellen Anderson commented that nuclear waste has been generated for more than 50 years with no realistic plan for permanent

storage Other witnesses commented critically on the assumptions built into the analytical framework utilized with respect to the life span of the storage facility proposed

The Commission is satisfied from the record and the findings by the Administrative Law Judge, that the Monticello plant's continued operation will have a minimal impact on environmental resources over the period of ISFSI operation

The federal Nuclear Regulatory Commission, of course, has primary responsibility for ensuring that nuclear plants pose no significant health or safety risks, and that agency has primary jurisdiction over health and safety issues relating to nuclear operations Still, this Commission has examined those issues as they relate to Minnesota law and concurs with the ALJ that there is no reasonable likelihood of adverse health or safety impacts from the proposed facility

As the ALJ noted, the final EIS points to widespread consensus among medical experts that any public health risk from the regulated use of radioactive materials is very small Any increased cancer risk posed by the facility was calculated to be so small as to be negligible And the amount of radiation exposure that would result from the facility was determined to be indistinguishable from the amount of background radiation always present in the environment Under normal operating conditions, then, the facility does not raise significant health or safety issues

The EIS also examined disaster scenarios – from operational accidents to terrorist attacks to earthquakes and floods – and found that the risks they presented ranged from low to very low And the Monticello plant's consistently outstanding safety record lends additional support to these conclusions [6]

Further, the Company has agreed to work with the Minnesota Department of Health to establish an additional radiation monitoring system, similar to the one used at the Prairie Island ISFSI, to provide continuous, real-time radiation readings for Health Department use The system will use two pressurized ion chambers located on the perimeter of the storage facility that will provide precise radiation measurements twenty-four hours per day This additional measure of protection, designed and operated for Minnesota-specific use, demonstrates the high value the Company places on public health and safety and its willingness to work with state and local authorities to address public concerns in these areas

For all these reasons, the Commission concurs with the ALJ that the proposed facility poses no health or safety risks requiring denial of the proposed certificate of need

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[6] See e g , ALJ Finding 28, which notes the Monticello plant's exemplary safety record

E. Company Compliance with Requirements Imposed by Other Units of Government

As found by the Administrative Law Judge, Xcel has demonstrated that the ISFSI will comply with applicable state and federal laws and policies, including but not limited to license requirements imposed by the Nuclear Regulatory Commission

ORDER

1 The Commission accepts, adopts, and incorporates the findings, conclusions, and recommendations of the Administrative Law Judge in this matter

2 Xcel's application for a certificate of need to construct the proposed interim spent fuel storage installation to store up to 30 canisters is granted

3 Xcel shall provide adequate notice to the Commission and the Department in advance of a proposed sale or transfer of the spent fuel storage facilities at the Monticello generating plant

4. Within 30 days of the date of the Order, Xcel shall file a report of its discussions with the Minnesota Department of Health and the NRC, including any agreements reached for monitoring radiation from the independent spent fuel storage installation at the Monticello generating plant

5 This Order shall become effective immediately

BY ORDER OF THE COMMISSION

Burl W. Haar
Executive Secretary

(S E A L)

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