

Direct Testimony and Schedules
Charles Bomberger

Before the North Dakota Public Service Commission
State of North Dakota

In the Matter of the Application of
Northern States Power Company, a Minnesota Corporation

For Authority to Increase Rates for
Electric Service in North Dakota

Case No. PU-07-____
Exhibit____

Nuclear Operations

December 7, 2007

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1 **I. INTRODUCTION AND QUALIFICATIONS**

2
3 Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

4 A. My name is Charles Bomberger. My business address is 414 Nicollet Mall,
5 Minneapolis, Minnesota 55401.

6
7 Q. BY WHOM ARE YOU EMPLOYED, AND WHAT IS YOUR POSITION?

8 A. I am the Vice President of Nuclear Projects, reporting to the President of
9 Energy Supply, Xcel Energy. Until recently I was the General Manager of
10 Nuclear Asset Management responsible for overseeing Nuclear Management
11 Company, LLC's ("NMC") operation of the Monticello and Prairie Island
12 nuclear power plants.

13
14 Q. WHAT ARE YOUR QUALIFICATIONS AND EXPERIENCE?

15 A. A summary of my qualifications and experience are included in the attached
16 Exhibit___(CB-1), Schedule 1.

17
18 Q. FOR WHOM ARE YOU TESTIFYING?

19 A. I am providing testimony on behalf of Northern States Power Company, a
20 Minnesota corporation ("Xcel Energy" or the "Company").

21
22 Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

23 The purpose of my testimony is to provide a brief description of our nuclear
24 business and plant performance, explain our plans for retention and continuing
25 improvements, and support the nuclear costs included the test-year of this rate
26 case.

II. NUCLEAR BACKGROUND

1
2
3
4 Q. PLEASE PROVIDE A BRIEF DESCRIPTION OF THE COMPANY'S NUCLEAR PLANTS?

5 A. Monticello is a single unit 585 megawatt electric ("Mwe") reactor located in
6 Monticello, MN. Monticello was originally licensed by the Nuclear Regulatory
7 Commission ("NRC") in 1970. The initial license was scheduled to expire in
8 2010. In 2006, the NRC approved a renewed license for Monticello, extending
9 its operating life until 2030. In June 2007, the Minnesota Public Utility
10 Commission ("MPUC") approved the use of dry spent fuel storage at
11 Monticello, clearing the way for Monticello to operate until 2030.

12
13 Prairie Island has two reactor units, each rated at 525 Mwe and located in
14 Welch, MN. Prairie Island's two units were licensed by the NRC in 1973 and
15 1974 respectively. If not renewed, the current operating licenses would expire
16 in 2013 and 2014 respectively. The Company is currently planning to renew
17 the licenses to extend the Prairie Island operating lives until 2033 and 2034
18 respectively. The Company is also planning to submit a Certificate of Need
19 application to the MPUC to expand dry spent fuel storage to support life
20 extension. Both the NRC and MPUC approvals are expected in the 2010
21 timeframe.

22
23 Monticello and Prairie Island provide about 26% of the energy used by its
24 customers in Minnesota, North Dakota and South Dakota.

1 Q. HAVE THERE BEEN ANY SIGNIFICANT CHANGES TO THE COMPANY’S NUCLEAR
2 BUSINESS SINCE THE LAST NORTH DAKOTA RATE CASE IN 1992?

3 A. Yes. From 1999 until 2007, the Company participated in the creation and
4 successful operation of Nuclear Management Company, LLC (“NMC”).
5 Beginning in 2004, as a result of improved operations under the NMC, Xcel
6 Energy’s partners began to sell their nuclear power plants, eventually leaving
7 the Company as the sole remaining partner and leading it to reintegrate nuclear
8 operations back into the Company. Further explanation of the NMC is
9 provided below. Secondly, the Company has obtained permission from the
10 NRC and the MPUC to extend the operation of its Monticello plant until 2030.

11

12 Q. PLEASE FURTHER DESCRIBE THE CIRCUMSTANCES AND CONSIDERATIONS
13 RELATIVE TO THE FORMATION OF NMC.

14 A. In 1992, Northern States Power Co. owned and operated Monticello and
15 Prairie Island under licenses from the NRC. In 1999, the Company made a
16 decision to partner with three other investor owned utilities in Wisconsin and
17 Iowa (Alliant Energy, WeEnergies and Wisconsin Public Service) that operated
18 nuclear power plants to create NMC. A fifth company (CMS Energy) joined
19 the NMC in 2000. The five investor owned utilities (including the Company)
20 that were partners in NMC retained ownership of their respective nuclear
21 assets, but transferred their operating licenses to NMC. The purpose of NMC
22 was to take advantage of synergies between the separate nuclear operations to
23 improve plant safety and operating performance, as well as providing enhanced
24 employment opportunities for employees. Management employees of the
25 separate utility’s nuclear operations were transferred and became employees of
26 NMC under a single management structure. NMC provided management of
27 its owners’ nuclear assets at cost.

1 Q. PLEASE FURTHER SUMMARIZE EVENTS SINCE THE BEGINNING OF OPERATION
2 OF NMC.

3 A. Over the seven years that NMC operated its owners' nuclear power plants
4 (from 2000 through 2006), performance of the owners' nuclear power plants
5 improved. However, for various business reasons not related to the
6 performance of NMC, all of the Company's four partners in NMC made
7 decisions to sell their nuclear assets. Wisconsin Public Service closed on the
8 sale of its Kewaunee Nuclear Power Plant in July 2005. Alliant Energy closed
9 on the sale of its Duane Arnold Energy Center in January 2006. CMS Energy
10 closed the sale of its Palisades Nuclear Power Plant in April 2007. The
11 Company's last partner in NMC, WeEnergies, transferred ownership and
12 operation of its Point Beach Nuclear Power Plant on September 28, 2007,
13 leaving the Company as the last remaining partner in NMC.

14
15 Q. WHAT EFFECT DID THE SALES OF ALL OF THE OTHER PARTNERS' NUCLEAR
16 PLANTS HAVE ON THE COMPANY?

17 A. As a result of the sales of all of the other partners' nuclear power plants, the
18 Company decided to reintegrate NMC nuclear operations into the Company
19 and NMC administrative and general ("A&G") services into Xcel Energy
20 Services, Inc. ("XES"). This decision was based on a clear understanding of
21 the business alternatives available, in the context of retaining ownership and
22 operational control of existing nuclear assets. Based on performance (nuclear
23 safety, operation and financial), perceived level of risk, and resource planning
24 options, a decision was made by the Company to retain plant ownership and
25 pursue license renewal and power uprates for all three nuclear units. Based on
26 the Company's decision to retain ownership of its nuclear assets while faced
27 with the continued departures of other remaining NMC members, evaluation

1 was performed to ensure that the Company's nuclear operations would sustain
2 their current levels of performance or reach higher levels of performance.

3
4 Q. PLEASE FURTHER EXPLAIN THE COMPANY'S ANALYSIS OF ALTERNATIVES
5 RELATIVE TO NMC.

6 A. The Company identified a number of key concerns related to being the sole
7 remaining member of NMC, including: (1) lack of focus by plant personnel on
8 operations due to the uncertainty of NMC's future; (2) loss of key senior
9 management personnel; and, (3) loss of A&G back office support as a result of
10 downsizing from member departures.

11
12 To address these concerns, a decision was made to reintegrate NMC's nuclear
13 operations within the Company and NMC's A&G services within XES.

14
15 Q. HOW WILL THE REINTEGRATION OF NMC'S NUCLEAR OPERATIONS ADDRESS
16 THESE CONCERNS?

17 A. With the reintegration of nuclear operations, we will be able to assure current
18 nuclear employees that the Company is committed to continued ownership
19 and operation of nuclear units so as to provide job stability, thereby avoiding
20 the loss of key employees. In contrast, maintaining NMC as a separate entity
21 could be interpreted as an indication that the Company was uncertain about
22 the future of its nuclear operations. This decision will also allow us to make
23 commitments and retain key NMC nuclear executives, who are being heavily
24 recruited within the nuclear industry. We have previously benefited, and will
25 continue to benefit, from the results of NMC's standardization efforts, system
26 of management, and oversight practices. Equally important, we have ensured
27 the continuity of nuclear back office A&G support functions by placing them

1 under the Company and XES management supervision. Reintegration of
2 nuclear operations into the Company will clarify for both state and federal
3 regulatory organizations, most notably the NRC and Institute of Nuclear
4 Power Operations (“INPO”), that the Company is responsible and directly
5 involved in the day-to-day operations of Monticello and Prairie Island.
6 Further, the Company is in a better position to attract the necessary talent to
7 its workforce to sustain the performance improvements than Northern States
8 Power Co. was prior to the merger creating Xcel Energy Inc. or NMC in its
9 current form.

10
11 Q. WHEN WILL THE REINTEGRATION OF NUCLEAR OPERATIONS OCCUR?

12 A. Nuclear operations cannot be fully reintegrated into the Company until
13 transfer of the NRC operating licenses from NMC back to the Company are
14 approved by the NRC. Approval of the transfer by the NRC is expected in
15 mid-2008. All A&G support functions were transferred back to the Company
16 in 2007.

17
18 Q. HAVE ANY REINTEGRATION COSTS BEEN INCLUDED IN THE TEST YEAR?

19 A. No. Reintegration in 2008 only involves the final transfer of employees from
20 NMC to the Company. NMC employees are being switched to Company
21 benefits January 1, 2008 with any costs being incurred during 2007. As a
22 result, there are no reintegration costs in the 2008 test year.

23
24 Q. WHAT IS THE EFFECT OF LICENSE EXTENSION OF THE MONTICELLO PLANT
25 UNTIL 2030?

26 A. As explained earlier, the initial license for Monticello was scheduled to expire
27 in 2010. Without extension, the company would have been forced to shut

1 down a valuable, reliable and low-cost generation resource. Extension of
2 license helps to ensure the Company's ability to meet customer needs with the
3 most efficient and effective resources.

4
5 Q. PLEASE EXPLAIN THE IMPACT ON CUSTOMER RATES OF THE NRC LICENSE
6 RENEWAL AT THE MONTICELLO PLANT .

7 A. The license renewal of the Monticello plant results in an extension of time
8 over-which the plant is depreciated. By extending the life of the plant through
9 2030, the depreciation expense in the test-year is reduced by approximately
10 \$1.5 million. In addition, there are savings associated with the accrual of
11 decommissioning costs, which are now being calculated over a longer expected
12 life, resulting in test-year savings of approximately \$167,000.

13
14 **III. PERFORMANCE OF MONTICELLO AND PRAIRIE ISLAND**

15
16 Q. WHAT ARE THE CRITICAL PERFORMANCE MEASURES USED TO EVALUATE
17 NUCLEAR PLANT PERFORMANCE.

18 A. There are two primary nuclear plant performance measures, safety and
19 reliability. Safety performance is measured under the NRC's Reactor
20 Oversight Process and under the INPO index. Reliability performance is also
21 measured under the INPO index and by the capacity factors for the
22 Company's nuclear plants.

23
24 Q. HAVE THERE BEEN IMPROVEMENTS IN THE MONTICELLO AND PRAIRIE ISLAND
25 PLANTS' SAFETY PERFROMANCE SINCE 1992?

26 A. Yes. There are two indices that demonstrate improvement in safety since 1992.
27 First, there has been an improvement in standing within the NRC's Reactor

1 Oversight Process. All three reactors (Monticello and Prairie Island Units 1
2 and 2) improved to the NRC's "License Response" column (the most
3 favorable NRC category) from the period of 1st Quarter of 2000 through today
4 for the Monticello plant, and from 1st Quarter of 2001 through 3rd Quarter of
5 2006 for Prairie Island. In 4th Quarter of 2006, Prairie Island had received three
6 cumulative inspection findings of very low significance within the previous 4
7 quarters within the area of Occupational Radiation Safety, which caused it to
8 be removed from the most favorable NRC category. As a result of this rating,
9 the NRC will perform one additional inspection, which is expected to be
10 successfully completed.

11
12 Secondly, there has been an improvement in safety under the INPO index.
13 Approximately 60% of the index is based on safety performance of key
14 systems, and 33% of the index is reliability related. Figure 1 below provides the
15 comparative INPO Index ratings for the period 1990 through 2001. By
16 examining these ratings, you can see that the Company was an industry leader
17 until 1997-98 when the industry (or at least the top quartile) began to out-
18 perform the Company. It is important to note that during this time the
19 Company's overall nuclear performance did not decrease, but rather it was not
20 keeping pace with the improvements made in the industry. Figure 2 below
21 provides the same comparison of the INPO Index for 2002 to 2006. A
22 comparison of Figure 1 and Figure 2 clearly demonstrates that there has been
23 significant improvement and the Company's units now match the top quartile
24 of the nuclear industry on safety and reliability.

25

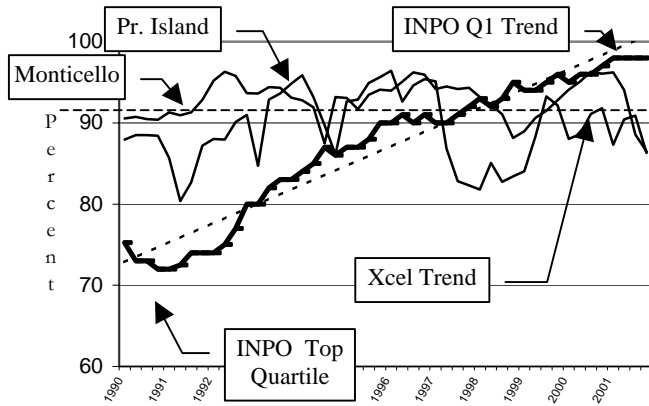


Figure 1 – INPO Results 1990-2001

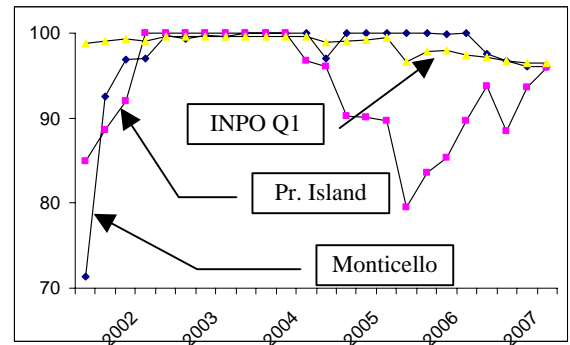


Figure 2 – INPO Results 2002-2006

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Q. HOW DO CUSTOMERS BENEFIT FROM THE COMPANY'S IMPROVEMENT IN SAFETY PERFORMANCE?

A. The NRC determines the regulatory inspection requirements of the plants based on performance indicators and inspection results. For a plant that has all of its performance indicators and inspection findings characterized as green, the NRC will only implement its baseline inspection program, which is least costly. For plants that do not have all green performance indicators and inspection findings, the NRC will perform additional inspections and initiate other actions commensurate with the safety significance of the issues, which is reflected in higher inspection costs. The 2008 test-year in this case reflects the lower NRC costs associated with baseline inspections, as the Company fully believes that the single additional inspection to be conducted in the 1st quarter of 2008 will result in the Occupational Radiation Safety area returning to a green rating. In addition, the INPO rating is one of the factors used to determine our insurance premiums. Consequently, the Company's high INPO ratings result in lower insurance costs.

1 Q. HAS THERE ALSO BEEN IMPROVEMENT IN THE PLANTS' RELIABILITY
2 PERFROMANCE?

3 A. Yes. There are two indices that demonstrate improvement in reliability
4 performance. First, as discussed above, 33% of the INPO Index is based on
5 parameters that measure plant and system reliability. The Company's
6 performance on the INPO Index demonstrates a high level of reliable
7 performance. The second indicator that demonstrates improvement in reliable
8 performance is the high capacity factors for the Monticello and Prairie Island
9 plants. The capacity factor is measured by taking the number of Mwe-hours
10 that have been produced in a given year and dividing them by the total number
11 of Mwe-hours that were possible if the plant had operated at 100% power for
12 the entire year. Figure 3 below shows the combined nuclear capacity factors
13 for the three units from 1990 through 2006. As seen in this figure, between
14 1990 through 2001 the average plant capacity factor was approximately 78%.

15
16 In contrast, Figure 3 shows that from 2002 through 2006, the average capacity
17 factor was over 91.3%. This 91%+ average capacity factor also includes down
18 time for an extended 72-day outage related to the replacement of the Prairie
19 Island Unit 1 steam generators. In addition, both Monticello and Prairie Island
20 sites have set records for annual generation during the 2002 through 2006
21 period, and have experienced the first or second longest continuous operating
22 runs in each plants' history. Currently through September 2007, the average
23 capacity factor has been 87.0% and is forecasted to average 90.2% for the
24 entire year.

25
26 Figure 3 also provides a comparison of the Company's individual capacity
27 factors to industry-wide capacity factors. During the 1990-1999 time frame,

1 the Company went from ranking above the industry average to falling slightly
 2 below the industry average. Again, it should be noted that NSP's overall
 3 performance did not decrease, but rather, it did not improve at the same rate as
 4 the rest of the industry, which started off significantly behind the Company.
 5 For the period 2002 – 2006, the Company is once again at or above the
 6 industry average.

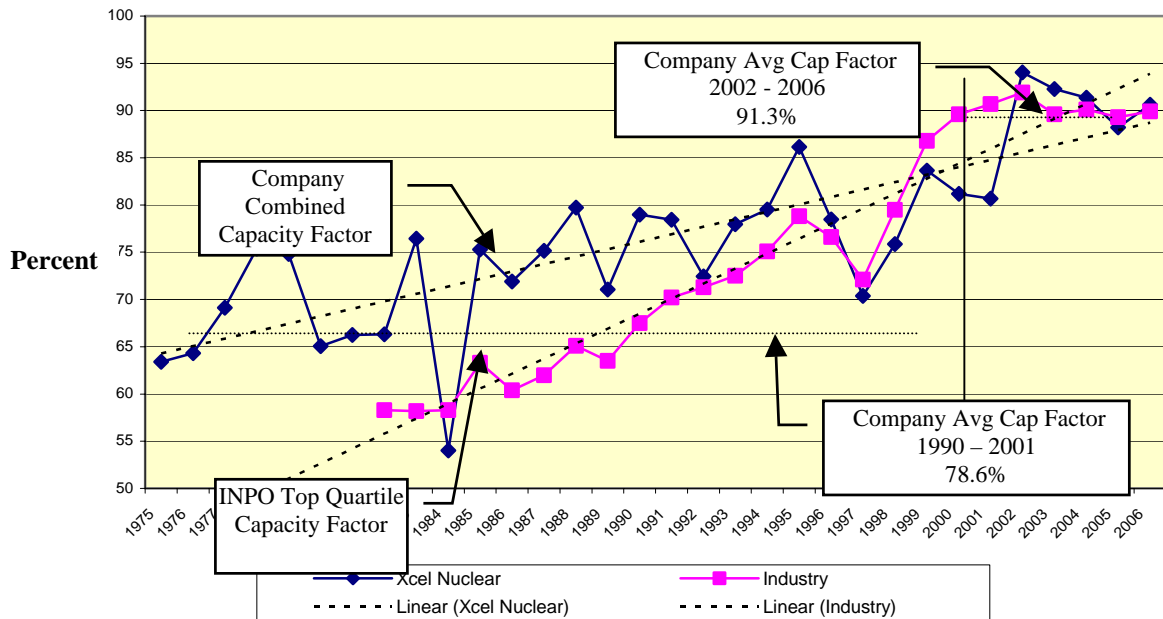


Figure 3 – Company Combined Nuclear Capacity Factor

7
 8 Q. WHAT HAS CAUSED THIS SIGNIFICANT IMPROVEMENT IN THE COMPANY'S
 9 CAPACITY FACTOR?

10 A. There are two principal reasons for improvements in the capacity factor. First,
 11 Monticello and Prairie Island have shortened their refueling outages. This has
 12 been accomplished by utilizing advances in safety assessment techniques
 13 developed by the nuclear industry and agreed to by the NRC to assess
 14 maintenance activities that had routinely been done during refueling outages in
 15 the past and were found to be safe if performed while the unit was online
 16 producing power. In the past, refueling outages averaged approximately 49

1 days. Since 2000, the average refueling outage has been approximately 35 days,
2 and in 2002 Prairie Island set a record with a 19-day refueling outage. Second,
3 Monticello and Prairie Island have improved operations in order to prevent
4 unnecessary forced outages while the plants are operating.

5
6 Q. WHAT DOES THE IMPROVED CAPACITY FACTOR MEAN IN COST SAVINGS TO
7 RATEPAYERS?

8 A. In terms of economic benefit, when compared to the average capacity factor
9 for the Company's fossil plants from 1990-2001 (a 78% capacity factor), the
10 additional 12% to 14% capacity factor now being achieved in our nuclear
11 facilities is equivalent to operating an additional 300 MW baseload plant. The
12 annual average savings since 2002 is approximately \$40 million when
13 compared to dispatch of a system without the additional energy. Even using
14 the more conservative capacity factor basis of 86% (the highest combined
15 capacity factor in the Company's previous 30-year history), the savings are
16 estimated to be \$46 million over a three-year period when compared to
17 dispatch of our system without the energy.

18
19 **IV. MAJOR PLANT INVESTMENTS**
20
21

22 Q. ARE THERE MAJOR INVESTMENTS IN NUCLEAR PLANT INCLUDED IN TEST-YEAR
23 RATE BASE?

24 A. Yes. The Company has invested and continues to invest in the following
25 major projects:

- 26 • Prairie Island License Renewal
- 27 • Prairie Island and Monticello Dry Fuel Storage
- 28 • Prairie Island and Monticello Life Cycle Management

- 1 • Prairie Island and Monticello Extended Power Uprate
- 2 • Prairie Island Unit 2 Steam Generator Replacement

3
4 Q. PLEASE EXPLAIN THE PRAIRIE ISLAND LICENSE RENEWAL.

5 A. The initial NRC operating license for the Prairie Island Unit 1 was issued in
6 1973, and Unit 2 in 1974. As a result, the initial operating licenses would
7 expire in 2013 and 2014 respectively, unless renewed. We are in the process of
8 preparing the license renewal applications for both units and plan on
9 submitting them to the NRC in spring of 2008. Review of the Prairie Island
10 license renewal applications is expected to be completed in 2010 (if there are
11 no contested hearings), and in 2011 (if there are contested hearings). Once the
12 renewed licenses are approved and issued, Prairie Island Unit 1's operating
13 license will extend to 2033, and Unit 2's will extend to 2034.

14
15 Q. WHAT ARE THE PLANNED COSTS OF PRAIRIE ISLAND LICENSE RENEWAL?

16 A. The planned cost was \$18.3 million when the project was approved in 2005
17 and the forecasted cost of license renewal at this time is \$20.6 million. The
18 increase is due to an increase in rates for NRC review fees. Through
19 December 2007, \$10.4 million has been spent on license renewal, with an
20 additional \$7 million forecast to be spent in 2008.

21
22 Q. COULD YOU EXPLAIN THE REASON FOR DRY STORAGE AT MONTICELLO AND
23 PRAIRIE ISLAND?

24 A. Yes. Permanent disposal of spent nuclear fuel is the responsibility of the
25 federal government. The Department of Energy ("DOE") is under contract
26 with nuclear power plant owners to remove and permanently dispose of spent
27 fuel from the power plant sites. Until removed by DOE, it is the nuclear

1 power plant owner's responsibility to temporarily store spent nuclear fuel
2 safely on-site. This was originally done in the plant's spent fuel storage pool.
3 However nuclear plants' spent fuel storage pools were not sized to
4 accommodate the amount of spent fuel produced over twenty, forty or sixty
5 years of operation. Over the years, the Company has expanded the capacity of
6 the spent fuel storage pools at Monticello and Prairie Island to the maximum
7 extent practical. In order to free space up in the spent fuel storage pools, other
8 room to allow for spent fuel storage must be created. Otherwise, the
9 Company would need to shut the plants down. Additional room for spent fuel
10 is created by taking older and cooler spent fuel from the spent fuel storage
11 pools and placing it in dry storage systems on site.

12
13 Q. WHAT IS THE STATUS OF DRY STORAGE AT MONTICELLO AND PRAIRIE ISLAND?

14 A. At Prairie Island, the Company began utilizing dry storage in the early 1990's.
15 To date, Prairie Island has filled and placed 24 dry storage containers in the on-
16 site Independent Spent Fuel Storage Installation ("On-Site ISFSI"). It is
17 currently estimated that five additional dry storage containers will be filled and
18 placed in the Prairie Island On-Site ISFSI to support plant operations until the
19 end of its current operating licenses in 2013 and 2014. At Monticello,
20 sufficient capacity in the spent fuel storage pool existed to support operation
21 until 2010. In order to extend the lives of Monticello and Prairie Island,
22 additional dry storage capacity is needed which requires permission from the
23 MPUC. Monticello has applied and received MPUC approval for sufficient
24 dry storage capacity to operate until the end of its renewed operating license in
25 2030. Prairie Island will apply for MPUC approval for additional dry storage
26 capacity to accommodate life extension in early 2008. Approval is anticipated
27 in June 2010.

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Q. WHAT ARE THE PLANNED COSTS OF MONTICELLO AND PRAIRIE ISLAND DRY STORAGE?

A. At Monticello, the cost of constructing the On-Site ISFSI and placing the first ten of thirty containers needed to support life extension is \$38.7 million, with \$23.5 million expended through December 2007 and \$8.9 million forecast to be spent in 2008. The cost to place ten additional containers in the Monticello On-Site ISFSI in 2012 and ten additional containers in 2020 (for a total of thirty containers needed to support operation until 2030) is estimated to be \$16.7 million. The total cost to place the 30 containers needed to support life extension at Monticello is estimated to be \$55.4 million.

At Prairie Island, the cost of the remaining five containers needed to support plant operations until the end of the current licenses in 2013 and 2014 is \$25.5 million, of which \$7.3 million has been spent through December 2007 and \$7.9 million forecast to be spent in 2008. The estimated cost of additional dry storage to support life extension for the two Prairie Island units until 2033 and 2034 is \$165 million.

Q. COULD YOU EXPLAIN THE REASON FOR LIFE CYCLE MANAGEMENT AT MONTICELLO AND PRAIRIE ISLAND?

A. Yes. The Company has always invested in Monticello and Prairie Island to ensure a high level of safe and reliable operation. Decisions to invest were predicated on a forty-year operating life. When the Company decided to pursue running its nuclear plants for an additional twenty years beyond the original forty-year licensed life, it committed to maintaining the high level of safe, reliable operation that it has achieved in the past. In order to achieve this

1 high level of safe, reliable operation, plant equipment needs to be replaced or
2 refurbished to ensure that it is capable of performing through the new sixty
3 year operating life. Life cycle management captures those major projects
4 necessary to ensure that the plant can operate safely and reliably for sixty years.
5

6 Q. WHAT ARE THE PLANNED COSTS OF MONTICELLO AND PRAIRIE ISLAND LIFE
7 CYCLE MANAGEMENT?

8 A. At Monticello, the cost of life cycle management activities is estimated to be
9 \$48.9 million in 2008, and an additional \$109.5 million from 2009 until 2015.
10 At Prairie Island, the cost of life cycle management activities is estimated to be
11 \$4.3 million in 2008 and an additional \$174.7 million from 2009 until 2015.
12

13 Q. COULD YOU EXPLAIN THE REASON FOR EXTENDED POWER UPRATES AT
14 MONTICELLO AND PRAIRIE ISLAND?

15 A. Yes. As originally licensed, nuclear power plants had large conservatisms in
16 their safety and operating analyses. The advent of improved nuclear
17 instrumentation, controls, equipment and analytical techniques allows the
18 reactors to produce more thermal output, while maintaining or improving
19 margins of safety. The resulting increase in thermal output from the reactor
20 can be used to produce additional electrical output at a lower cost than
21 available generation alternatives. For Monticello, an additional 71 Mwe can be
22 achieved while maintaining safe and reliable operation. For Prairie Island, an
23 additional 82 Mwe can be achieved on each unit for a total of 164 Mwe while
24 maintaining safe and reliable operation.
25

26 Q. WHAT ARE THE PLANNED COSTS OF MONTICELLO AND PRAIRIE ISLAND
27 EXTENDED POWER UPRATES?

1 A. At Monticello, the cost of extended power uprate to achieve 71 Mwe of
2 additional electrical generation capacity is estimated to be between \$89 million
3 and \$130 million, with \$18.9 million expended through December 2007 and
4 \$23.6 forecast to be spent in 2008. The final cost depends on a decision of
5 whether or not to replace the steam dryer and pending decisions on feedwater
6 system design and implementation alternatives. At Prairie Island, the cost of
7 extended power uprate to achieve 164 Mwe of additional electrical generation
8 capacity is estimated to be \$295 million, with \$5.4 million expended through
9 December 2007 and \$6.0 million forecast to be spent in 2008.

10
11 Q. COULD YOU EXPLAIN THE REASON FOR REPLACEMENT FOR THE PRAIRIE
12 ISLAND UNIT 2 STEAM GENERATORS?

13 A. Yes. In a pressurized water reactor, the steam generator is a major component
14 that converts the heat from the reactor into steam that is used to power the
15 steam turbine, which drives the electrical generator to produce the electrical
16 output of the plant. The steam generator is a series of over 3000 U-shaped
17 tubes which carry the high-temperature, high pressure radioactive coolant
18 inside these tubes, heating the non-radioactive water on the outside of the
19 tubes to create steam. The steam generator also has significant safety
20 functions to remove excess heat from the reactor in several accident scenarios.

21
22 The Company's superior steam generator management has allowed Prairie
23 Island's steam generators to last longer than those of most other pressurized
24 water reactors. However, without replacement, we expect to see significant
25 deterioration in performance of the Unit 2 steam generators in the 2013 time
26 frame.

27

1 Q. WHAT IS THE PLANNED COSTS OF THE REPLACEMENT OF THE PRAIRIE ISLAND
2 UNIT 2 STEAM GENERATORS?

3 A. The current plan is to replace the Unit 2 steam generators during the 2013
4 refueling outage. Due to the long lead-time nature of the steam generators, the
5 required planning activities have already been started. The total estimated cost
6 of the project is \$259 million, with \$6.7 expended through December 2007 and
7 \$4.8 million forecast to be spent in 2008.

8

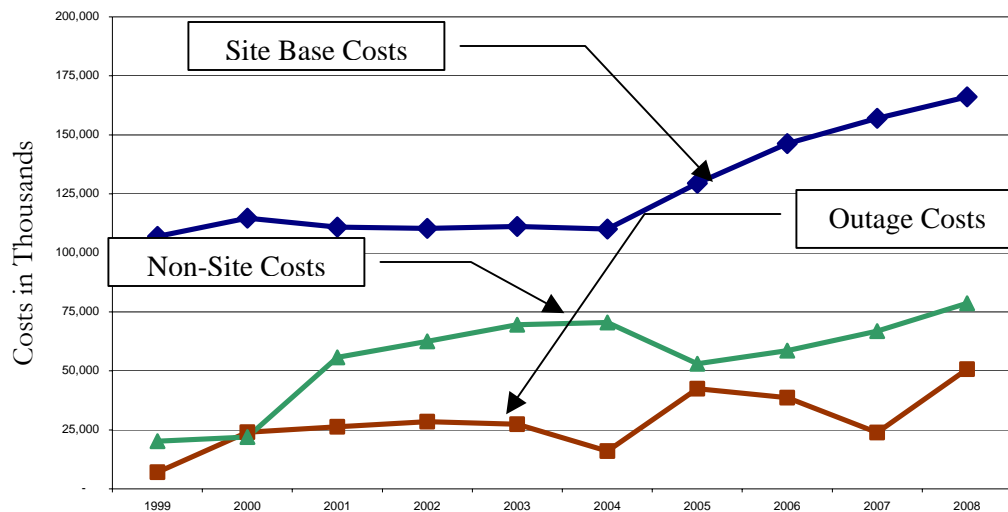
9

V. NUCLEAR OPERATING COSTS

10

11 Q. PLEASE DESCRIBE THE OPERATING COSTS AT MONTICELLO AND PRAIRIE
12 ISLAND.

13 A. There are generally 3 categories of costs associated with operating our nuclear
14 plants. Those categories include: (i) site base costs; (ii) outage costs; and (iii)
15 non-site costs. In Figure 4, I break costs down into these three main
16 categories.



17

18

Figure 4 – Major Nuclear Cost Components (\$100k)

19

1 Q. PLEASE EXPLAIN THE SITE BASE COSTS.

2 A. Site base costs consist of our nuclear labor and non-labor expenses for
3 recurring activities required to operate our plants or departments on a daily
4 basis. Figure 4 shows that the site base Operations & Maintenance (“O&M
5 costs”) costs remained relatively stable from 1999 through 2004. Stability
6 during this period was largely achieved by sharing resources amongst the six-
7 site fleet operated under the NMC to offset regulatory driven increases. As
8 some NMC partners sold their nuclear assets, less and less sharing of resources
9 became possible. As a result, site base O&M costs have increased 10.8% per
10 year from 2004 until 2008.

11

12 Q. PLEASE IDENTIFY THE SITE BASE COSTS REPRESENTED IN THE TEST-YEAR.

13 A. The North Dakota nuclear site base costs included in the test year total
14 approximately \$10 million.

15

16 Q. PLEASE EXPLAIN THE OUTAGE COSTS

17 A. Outage costs are also shown in Figure 4. Monticello undergoes a planned
18 refueling outage approximately every 24 months, while Prairie Island has a
19 refueling outage for each of its reactors approximately every 18 months. As a
20 result, there are typically two refueling outages that occur each year, as is the
21 case for 2008. In those years where we average two outages a year, the outage
22 costs are relatively stable. Outage O&M costs were lower in 2004 and 2007
23 due to the fact that only one scheduled refueling outage occurred. In 2005,
24 these costs were slightly higher because, in addition to our normal refueling
25 outages, we performed American Society of Mechanical Engineers Code
26 (“ASME”) Section XI required ten-year inspections during which additional
27 maintenance is required. In 2008, refueling outage costs are higher because of

1 increased inspections of the steam generator on Prairie Island Unit 2, ten-year
2 inspections of the high pressure turbines on Prairie Island Units 1 and 2 to
3 meet insurance requirements, work on the pressurizer surge line on Prairie
4 Island Unit 2, and a greater amount of valve work than normal on Prairie
5 Island Unit 2.

6
7 While Outage Costs are a significant cost associated with operating our nuclear
8 plants, our improved operations are reflected in fewer unplanned or forced
9 outages, resulting in a decrease in O&M costs associated with these outages.

10
11 Q. PLEASE IDENTIFY THE OUTAGE COSTS REPRESENTED IN THE TEST-YEAR.

12 A. The North Dakota nuclear outage costs total approximately \$2.5million in the
13 test-year. It is important to note that the outage costs represented in the test
14 year, under the direct-expense method currently in place, are very similar to the
15 amount proposed by the Company to be included if our Request for a Change
16 in Accounting is approved, or \$2.3 million. As further explained in the Direct
17 Testimony of Ms. Anne E. Heuer, the Company would make the appropriate
18 adjustments to the rate case upon approval of the new accounting
19 methodology.

20
21 Q. PLEASE EXPLAIN NON-SITE COSTS.

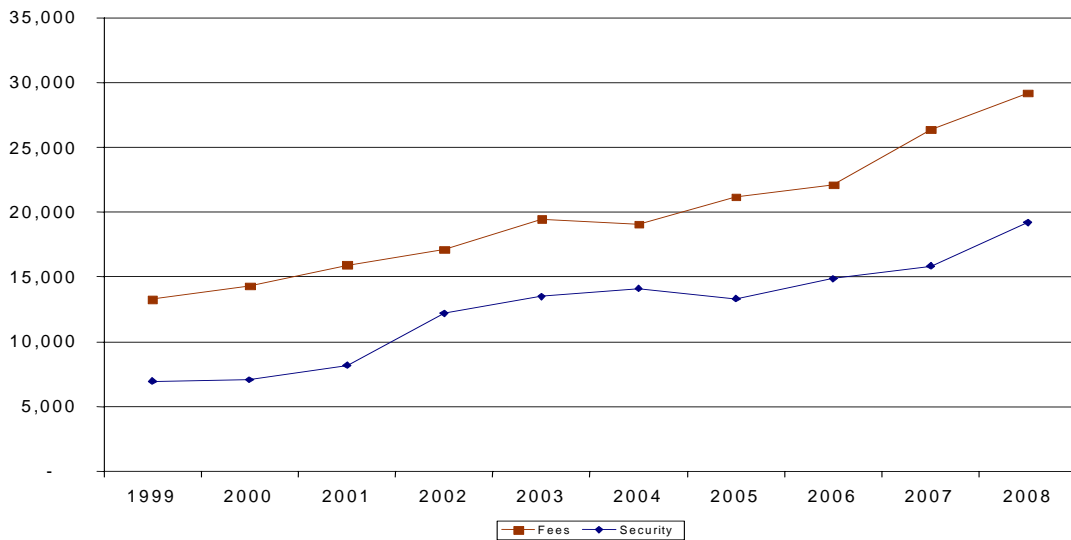
22 A. Figure 5 below shows the two major components of our non-site costs,
23 consisting of expenses typically outside the direct control of each nuclear site
24 and associated with unique involvement in the nuclear industry. The two
25 major cost components shown are security costs and nuclear-related fees.

26

1 The nuclear fees paid by the sites include NRC and state fees (comprising
2 nearly 80% of the total fees), as well as fees paid to INPO, EPRI, and other
3 industry organizations. These combined fees have increased at a rate of over
4 9% per year. It is important to note that NRC fees, while outside our direct
5 control, are determined based on the fact that only baseline inspections are
6 being performed by the NRC. Consequently, NRC's fees are significantly
7 lower than they would be if we did not have our excellent safety history and
8 ratings.

9 The O&M security costs related to our nuclear sites is similar to a majority of
10 other nuclear sites across the United States, NMC contracts with Wackenhut
11 Services to provide the contract security force for our nuclear sites. In 2002,
12 you will note our security costs increased approximately 50% as a result of new
13 minimum security force requirements enacted by the NRC following the
14 September 11, 2001, terrorist attacks. From 2002 until 2007 we experienced a
15 relatively stable period of growth in security costs, averaging 5% growth per
16 year. From 2007 to 2008 there will be a 21% increase due to new NRC
17 requirements in the area of fitness-for-duty causing a sharp increase in security
18 costs.

Figure 5 – Major Non-Site Cost Components (\$100k)



1

2

3 Q. HOW DO THE COMPANY'S COSTS OF OPERATING ITS NUCLEAR PLANTS
4 COMPARE TO OTHER NUCLEAR UTILITIES?

5 A. The Company's total operating costs for Monticello and Prairie Island have
6 been very low. In 2005, Monticello's costs (including a refueling outage) were
7 lower than 20 out of 24 single unit sites in the country. In 2006, Monticello's
8 costs were the lowest site operating costs in the country, when compared to
9 other sites that operate a single unit. In 2005, Prairie Island's costs (with one
10 refueling outage) were the lowest site operating costs in the country, when
11 compared to other sites that operating more than one unit. In 2006, Prairie
12 Island's costs (with two refueling outages) were the second lowest site
13 operating costs in the country, when compared to other sites that operate more
14 than one unit.

15

16 Q. PLEASE EXPLAIN THE NON-SITE COSTS REPRESENTED IN THE TEST-YEAR.

1 A. The North Dakota portion of the non-site costs represented in the test-year
2 total approximately \$4.5million.

3
4 **VI. SPENT FUEL RELATED ISSUES**

5
6 Q. ARE THERE ANY OTHER NUCLEAR COSTS OF WHICH THE COMPANY IS SEEKING
7 RECOVERY?

8 A. Yes. Consistent with what the Company is seeking in Minnesota and
9 Wisconsin the Company is seeking recovery of \$190,000 which represents the
10 North Dakota share of the total \$23 million investment that the Company has
11 made to develop a privately-owned independent spent fuel storage facility.

12
13 Q. PLEASE EXPLAIN THE COMPANY’S EFFORTS TO DEVELOP A PRIVATELY-OWNED,
14 INDEPENDENT SPENT FUEL STORAGE INSTALLATION (“PRIVATELY OWNED
15 ISFSI”).

16 A. When the Company obtained approval for the initial dry storage at Prairie
17 Island, the amount of dry storage that was approved was limited in order to
18 encourage the Company to take all reasonable actions to move spent fuel out
19 of the state. As a result, the Company developed a three-pronged strategy in
20 its pursuit of out-of-state storage: (1) active advocacy for Yucca Mountain; (2)
21 a lawsuit against the DOE related to the current lack of permanent repository;
22 and (3) exploration of alternative storage options. In the absence of a federal
23 government permanent repository, the Company concluded that a privately
24 owned ISFSI was key to being able to keep both the Prairie Island and
25 Monticello plants operational through their current license and any renewal.

26

1 Q. WHEN DID THE COMPANY BEGIN ITS EFFORTS TO PURSUE A PRIVATELY-
2 OWNED ISFSI?

3 A. In 1997, together with seven other utilities, NSP formed Private Fuel Storage
4 (“PFS”) and submitted a license application to the NRC to site a privately-
5 owned ISFSI on a site within the Goshute Indian tribal land in Utah. The
6 NRC approved our request for a license on September 9, 2005.

7

8 Q. IF PFS IS DEVELOPED, COULD IT AVOID THE NEED FOR AN ON-SITE ISFSI AT
9 MONTICELLO?

10 A. No. It is important to recognize that given the significant uncertainty of
11 whether PFS can actually be developed, it can not support renewal of the
12 operating license for Monticello, which is due to expire in 2010, or be used to
13 avoid building a temporary storage facility at Monticello. Consequently, any
14 future plans to construct PFS would be in addition to using the existing Prairie
15 Island and Monticello On-Site ISFSIs.

16

17 Q. WHAT IS THE STATUS OF THE LAWSUIT AGAINST DOE?

18 A. The Company has been awarded \$116 million by the U.S. Court of Federal
19 Claims in its lawsuit against the U.S. Department of Energy (DOE) for
20 damages through 2004. The ruling is subject to appeal and no funds have yet
21 been received. A second lawsuit for damages for 2005 through June 2007 has
22 been filed. Thus, the award has no impact on the 2008 test year budget.

23

VII. CONCLUSION

24 Q. DOES THIS CONCLUDE YOUR TESTIMONY?

25 A. Yes, it does.

1 STATE OF NORTH DAKOTA
2 BEFORE THE
3 PUBLIC SERVICE COMMISSION
4
5

6 In the Matter of the Application of Northern)
7 States Power Company, a Minnesota Corporation)
8 For Authority to Increase Rates for Electric Service) Case No. PU-07-____
9 in North Dakota)

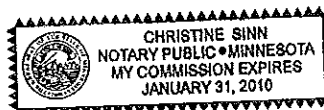
10
11
12
13 **AFFIDAVIT OF**
14 **Charles Bomberger**
15

16
17 I, the undersigned, being duly sworn, depose and say that the foregoing is
18 the Direct Testimony of the undersigned, and that such Direct Testimony and the
19 exhibits or schedules sponsored by me to the best of my knowledge, information
20 and belief, are true, correct, accurate and complete, and I hereby adopt said
21 testimony as if given by me in formal hearing, under oath.
22

23
24 Charles Bomberger
25 Charles Bomberger
26

27
28
29
30 Subscribed and sworn to before me, this 5th day of December, 2007.
31

32
33 Christine Sinn
34 Notary Public
35
36



Charles Bomberger
Vice-President, Nuclear Projects

Summary of Experience and Qualifications

- (1974-1981) I received initial nuclear training in Naval Nuclear power program, qualified as Engineer Officer by Naval Reactors, and served as Radiological Controls Officer responsible for routine health physics operations and oversight of radiological work, emergency preparedness, radiac calibration facility, and environmental monitoring.
- Westec Services (1981-1986); engineering consulting services, including consulting to the Nuclear Regulatory Commission staff, preparation of NRC safety evaluation reports for Control of Heavy Loads and NRC consultant in field evaluations of emergency preparedness exercises at multiple nuclear sites.
- I have been employed by Xcel Energy and its predecessors since 1986. While at Public Service Co. of Colorado (1986 – 1997), I was a project manager in nuclear licensing, responsible for preparation and submittal of the decommissioning plan and associated cost estimate and funding plan for Fort St. Vrain, first commercial nuclear power plant to be decommissioned with complete license termination. Following that assignment, I was Manager, Production Services, responsible for all services provided for generating plants, including outage services, and plant performance and emission testing, and \$160 million fuel procurement and transportation. While with New Century Energies (1997-2000), I served as Managing Director, Internal Audit, and was responsible for the 14-person internal audit department. In this role, I was tasked with

overseeing internal audits of the entire corporation and was accountable to Chairman/CEO and Audit Committee of board of directors. In this capacity, my role was to test and identify deficiencies in control environment within corporate processes and financial controls, and identify and audit areas of highest risk within corporation. After the formation of Xcel Energy, I was the Managing Director, Business Planning & Processes (2000 – 2002), responsible for implementation of annual business planning processes, coordination of corporate goal setting and quarterly review processes and annual corporate planning events. From 2003 until October 2007, I was the General Manager, Nuclear Asset Management, responsible for monitoring the performance of Xcel Energy's nuclear units operated by the Nuclear Management Company (NMC) to ensure that the units met operational and financial performance objectives established by Xcel Energy, establishing and implementing long-range strategy for the nuclear units within Xcel Energy; and, serving as customer interface between Xcel Energy and NMC. In October 2007, I became Vice President, Nuclear Projects; in this assignment, I am responsible for implementing all capital projects for Xcel Energy's nuclear units.

- I am previously certified as a professional engineer (PA) and as a certified internal auditor. I have an MBA from the University of Denver and a BS in Mathematics (with distinction) from the U.S. Naval Academy.