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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Monticello Nuclear Generating Plant
Docket Nos. 50-263
License Nos. DPR-22

Irradiated Fuel Management Plan and Preliminary Decommissioning Cost Estimates for
Monticello Nuclear Generating Plant

- References: 1) Nuclear Management Company, LLC (NMC) letter to US Nuclear Regulatory Commission (NRC), "Application for Renewed Operating License," dated March 16, 2005. (ADAMS Accession No. ML050880241)
- 2) Nuclear Management Company, LLC (NMC) letter to US Nuclear Regulatory Commission (NRC), "Decommissioning Funding Status," dated March 31, 2005. (ADAMS Accession No. ML051110731)

The enclosed Irradiated Fuel Management Plan (Enclosure 1) and Preliminary Decommissioning Cost Estimate (Enclosure 2) are being submitted in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.54(bb) "Conditions of Licenses," and 10 CFR 50.75(f)(2), "Reporting and Recordkeeping for Decommissioning Planning," respectively, for the aforementioned plant. As holder of the plant operating licenses, Nuclear Management Company, LLC (NMC) is submitting these reports on behalf of the plant owner, Xcel Energy. The financial information presented herein reflects information provided to NMC by the plant owner, Xcel Energy.

Pursuant to 10 CFR 50.54(bb), a licensee shall "submit written notification to the Commission for its review and preliminary approval of the program by which the licensee intends to manage and provide funding for the management of all irradiated fuel at the reactor following permanent cessation of operation of the reactor until title to the irradiated fuel and possession of the fuel is transferred to the Secretary of Energy for its ultimate disposal in a repository." Accordingly, the Irradiated Fuel Management Plan (Enclosure 1) is provided for your review and preliminary approval.

Additionally, 10 CFR 50.75(f)(2), "Reporting and recordkeeping for decommissioning planning" states, "each power reactor licensee shall at or about 5 years prior to the projected end of operations submit a preliminary decommissioning cost estimate which includes an up-to-date assessment of the major factors that could affect the cost to decommission." Accordingly, the Preliminary Decommissioning Cost Estimate (Enclosure 2) is provided for your review and approval.

NMC submitted a sufficient application for renewal of an operating license (Reference 1) and therefore, in accordance with 10 CFR 2.109, "Effect of Timely Renewal Application," "the existing license will not be deemed to have expired until the application has been finally determined." Although NMC is seeking license renewal, the Irradiated Fuel Management Plan and Preliminary Decommissioning Cost Estimate are submitted based on the current operating license expiration date for Monticello Nuclear Generating Plant (MNGP)—September 8, 2010. If license renewal for MNGP is granted, the Irradiated Fuel Management Plan and Preliminary Decommissioning Cost Estimate would no longer be applicable and a new plan and cost estimate will be submitted in accordance with 10 CFR 50.54(bb) and 10 CFR 50.75(f)(2), respectively.

This letter contains no new commitments and no revisions to existing commitments.



Edward J. Weinkam
Director, Nuclear Licensing & Regulatory Services
Nuclear Management Company, LLC

Enclosures (2)

cc: Regional Administrator, USNRC, Region III
NRR Project Manager, Monticello Nuclear Generating Plant, USNRC
NRC Resident Inspector, Monticello Nuclear Generating Plant, USNRC
Xcel Energy (ATTN: Charles Bomberger)

Enclosure 1

Irradiated Fuel Management Plan For Monticello Nuclear Generating Plant

Background

The Preliminary Decommissioning Cost Estimate (see Enclosure 2) in accordance with 10 CFR 50.75(f)(2) for Monticello Nuclear Generating Plant (MNGP) evaluated the DECON strategy of decommissioning with an operating license expiration of September 8, 2010. The Irradiated Fuel Management Plan is also based on the DECON analysis and current operating license expiration date. Xcel Energy reserves the right to choose the ultimate decommissioning option in accordance with its business needs, recognizing the need to assure the chosen option meets NRC requirements for decommissioning funding.

Spent Fuel Management Strategy

The NRC requires (10 CFR 50.54(bb)) that licensees establish a program to manage and provide funding for the caretaking of all irradiated fuel at the reactor site until title of the fuel is transferred to the U. S. Department of Energy (DOE). Irradiated spent nuclear fuel interim storage includes approximately 5 ½ years of wet storage for irradiated spent fuel removed from the reactor when plant operations cease and dry storage at a planned on-site Independent Spent Fuel Storage Installation (ISFSI).

This plan assumes that an ISFSI will be constructed to store all spent nuclear fuel and "Greater than Class C" materials generated during the current operating license. Transfer of spent nuclear fuel from the spent fuel pool to dry storage allows for early decontamination and dismantlement of plant structures. The ISFSI will remain operational and provide interim storage of spent fuel until such time that the DOE completes fuel acceptance. Consequently, costs are included within the estimate below for the long-term caretaking of the spent nuclear fuel at MNGP site through the year 2039.

The shipping of spent nuclear fuel assemblies to DOE during decommissioning is based upon several assumptions. First, spent nuclear fuel shipments are assumed to begin in the year 2015. Second, the DOE generator allocation/receipt schedules are based upon the oldest fuel receiving the highest priority. Third, the maximum rate at which the fuel is removed from the commercial sites is based upon an annual capacity at the geologic repository of 3,000 metric tons of uranium (MTU). Any delay in the startup of the repository or decrease in the rate of acceptance will correspondingly prolong the transfer process and result in the fuel remaining at the site longer. In the DECON scenario, the ISFSI will continue to operate until such time that the transfer of spent fuel to the DOE can be completed. Finally, assuming that the DOE commences repository operation in 2015, fuel is projected to be removed from the MNGP site by the end of the year 2039.

Operation and maintenance costs for the storage facilities (the ISFSI and the spent fuel pool for fuel cool-down) are included within the estimate below and address the cost for staffing the facilities, maintenance of necessary operational requirements as well as security, insurance, and licensing fees. The estimate includes the costs to purchase,

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load, and transfer the fuel storage canisters to the ISFSI. A cost-estimate for spent fuel management at MNGP under the DECON scenario may be found in Table 2.

In the event that MNGP ceases operation in 2010, MNGP will continue to comply with existing NRC licensing requirements, including the operation and maintenance of the systems and structures needed to support continued operation of the spent fuel pool and ISFSI, as necessary, under the decommissioning scenario ultimately selected. In addition, MNGP will also comply with applicable license termination requirements in accordance with 10 CFR 50.82 with respect to plant shutdown and post-shutdown activities including seeking such NRC approvals and on such schedules as necessary to satisfy these requirements consistent with the continued storage of irradiated fuel.

Cost Estimate and Funding For Spent Fuel Management Based on the DECON Decommissioning Option

The "Decommissioning Cost Analysis for the Monticello Nuclear Generating Plant" developed by TLG Services, Inc. included cost estimates of approximately \$447 million for decommissioning costs, \$189 million for spent fuel management and \$27 million for greenfield remediation using a DECON scenario (Table 2). The NRC minimum decommissioning financial assurance requirement as reported in Reference 2 and set forth in 10 CFR 50.75(c) for MNGP is approximately \$412.6 million. The NRC minimum was recalculated for an October 2005 triennial nuclear plant decommissioning filing to the Minnesota Public Utilities Commission (MPUC) using NUREG 1307, "Report on Waste Burial Charges," Revision 11, published in June of 2005. This adjustment increased the NRC minimum to \$418.1 million.

As of December 31, 2004, the MNGP decommissioning trust fund balance was \$377.1 million. This fund is being supplemented with annual contributions of approximately \$35 million that should continue to the end of license life. Adjustments to annual contributions amounts require MPUC approval in miscellaneous filings and other state approvals through rate proceedings. To the extent that the trust fund balance exceeds costs required for radiological decommissioning, trust fund monies, in conjunction with Xcel Energy operating revenues, will be used to pay for spent fuel management.

The following items are key costs estimates:

(1) The estimated cost to isolate the spent fuel pool and fuel handling systems is \$9.9 million. This cost is based on spent fuel pool isolation costs at other decommissioning facilities and engineering judgment. This cost is considered part of the activities necessary to maintain the spent fuel in a safe and controlled state both during the initial decommissioning activities and during the fuel cool-down period.

(2) Annual cost for spent fuel management in the ISFSI is estimated at approximately \$6 million (Table 1, years 2020-2038). This cost is based on actual costs at decommissioned facilities, estimated costs for facilities similar to MNGP, and engineering judgment. These costs would be incurred annually, during the storage period, beginning in year 2010 and continuing through removal of all fuel and "Greater Than Class C" radioactive material.

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(3) The ISFSI removal costs are estimated at \$5.15 million.

The decommissioning schedule includes the following program periods and durations for a DECON with dry storage scenario:

Period #	Title	Period Duration, Months
1	Transition and Preparations	18
2	Decommissioning	66
3b	Site Restoration	21
3c/3d	ISFSI Operations	234
3e/3f	ISFSI D&D	6
	Total	345

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Monticello Nuclear Generating Plant Preliminary Decommissioning Cost Estimate

I. Introduction

This report presents a summary of the preliminary estimate of the cost to decommission Monticello Nuclear Generating Plant (MNGP), as required by 10CFR50.75(f)(2). This cost estimate is premised on the assumption that the plant permanently ceases to operate at the expiration of the current operating license—September 8, 2010. The estimate assumes the eventual removal of all contaminated and activated plant components and structural materials, such that the operating licenses may be terminated to permit unrestricted use of the site. Although Nuclear Management Company, LLC (NMC) is currently seeking license renewal for MNGP, this cost estimate is being submitted based on the current operating license expiration date for MNGP. If license renewal for MNGP is granted, this Preliminary Decommissioning Cost Estimate would no longer be applicable and a new estimate will be submitted in accordance with 10CFR50.75(f)(2).

II. Comparison of the Preliminary Cost Estimate to the Minimum Required Decommissioning Fund

The minimum decommissioning financial assurance requirement for MNGP, as reported in Reference 2 and set forth in 10CFR50.75(c), is approximately \$412.6 million. The NRC minimum was recalculated for an October 2005 triennial nuclear plant decommissioning filing to the Minnesota Public Utilities Commission using NUREG 1307, "Report on Waste Burial Charges", Revision 11, published in June of 2005. This adjustment increased the NRC minimum to \$418.1 million. The total preliminary decommissioning cost estimate is approximately \$663 million in 2005 dollars. This estimate includes approximately \$447 million for decommissioning costs, \$189 million for spent fuel management and \$27 million for greenfield remediation (Table 2).

III. Assessment of Major Factors That Could Affect Preliminary Cost Estimate

A. Decommissioning Option/Method

This Preliminary Decommissioning Cost Estimate assumes a DECON decommissioning option with dry storage of spent nuclear fuel. This estimate assumes MNGP cessation of operation in September 2010 and a Department of Energy (DOE) spent fuel repository open in 2015. The existing spent fuel pool system will be modified to reduce the operation and maintenance effort required for safe operation of the spent fuel pool. Spent fuel will be transferred from the spent fuel pool to dry cask storage at the on-site Independent Spent Fuel Storage Installation (ISFSI) for 5 ½ years following MNGP shutdown. All spent fuel shall remain at the ISFSI until it can be transferred to a suitable DOE facility.

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Decommissioning activities will commence upon removal of all fuel from the reactor vessel and modification of spent fuel pool system. This cost estimate scenario includes the decontamination and dismantlement of the facility, spent fuel management and restoration of the site.

B. Potential for Known or Suspected Contamination

The preliminary cost estimate does not assume the remediation of any significant volume of contaminated soil. This assumption may be affected by continued plant operations and/or future regulatory actions, such as the development of site-specific release criteria.

C. LLW Disposition Plan

Low Level (Radioactive) Waste (LLW) disposal costs include processing, packaging, shipping, and burial/vendor costs. This Preliminary Decommissioning Cost Estimate assumes that the vendors currently performing these LLW disposal activities, or potentially other vendors, will be available throughout the decommissioning periods. It is also assumed that burial facilities similar to the Barnwell facility in South Carolina and the Envirocare facility in Utah will be available to support the decommissioning of MNGP. As such, rate schedules for both facilities have been used to generate disposal costs. Due to the high cost per cubic foot of LLW disposal, decontamination and metal processing were incorporated into the decommissioning cost calculations in order to reduce the overall LLW disposal costs.

D. Preliminary Schedule of Decommissioning Activities

A schedule of the decommissioning scenario is illustrated in Table 2. For each of the 5 decommissioning time periods identified in Table 2, the activity and period-dependent costs are estimated. These time periods are briefly described in Section IV, below.

E. Other Factors That Could Significantly Affect the Cost to Decommission

NMC is currently unaware of any major site-specific factors that could have a significant effect on the cost of decommissioning. In order to anticipate unknown or unplanned occurrences during decommissioning, e.g. increased radioactive waste volumes, equipment breakdowns, weather delays, labor strikes, etc., contingencies are applied to the cost estimates. The amount of contingency depends on the status of design, procurement and construction; and the complexity and uncertainties within the defined project scope. The average weighted contingency applied to MNGP decommissioning cost estimate is approximately 17.8%. Individual activity contingencies range from 10% to 75%, depending on the degree of difficulty judged to be appropriate from actual decommissioning experience. Examples include: 15% for staffing/engineering; 25% for LLW disposal; 50% for decontamination and 75% for reactor segmentation.

IV. Preliminary Cost Estimate Considerations

The preliminary decommissioning cost estimate is based on costs associated with the entire decommissioning work scope, including those activities related to the following

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periods of the decommissioning project: (1) Transition and Preparation, (2) Decommissioning, (3b) Site Restoration, (3c/3d) ISFSI Operation, and (3e/3f) ISFSI D&D. The scope of each of those activities is described below. Disposition of LLW is also accounted for in the preliminary decommissioning cost estimate, as described in Section III.C, above.

A summary of activities and time duration for each DECON period follows (see Table 2 for cost estimates for each period):

(1) Transition and Preparation: Includes planning for spent fuel pool modifications, planning for cold and dark, planning for primary systems flush, selection of Decommissioning Operations Contractor, commencement of spent fuel transfer from pool to ISFSI, modification of spent fuel pool systems, primary system decontamination flush, flushing and draining of non-essential systems, performance of baseline radiation survey and vessel and internal removal preparations. Period duration is estimated at 18 months.

(2) Decommissioning: Includes continuation of spent fuel transfer from pool to ISFSI, commencement of spent fuel shipments from ISFSI to DOE, removal of reactor internals and vessel, non-essential systems removal, essential systems removal, structures decontamination, removal of spent fuel racks, and final site survey of reactor plant to confirm satisfactory removal. Period duration is estimated at 66 months.

(3b) Site Restoration: Includes continued spent fuel shipments from ISFSI to DOE and demolition of decontaminated structures, backfill, grading and landscaping of site. Period duration is estimated at 21 months.

(3c/3d) ISFSI Operation: Includes continued on-site dry storage of spent fuel, completion of spent fuel shipment from pool to DOE. Period estimated at 234 months.

(3e/3f) ISFSI D&D: Includes completion of spent fuel shipment from dry storage to DOE, and a final survey of spent fuel storage building and removal. Period duration is estimated at 6 months.

V. Plans for Adjusting Levels of Funding

Until the end of the current MNGP operating license term, or within 5 years of the end of the extended license, Xcel Energy will provide an annual funding status report in accordance with 10 CFR 50.75(f)(1). Upon the assumed permanent shutdown at the end of the current MNGP operating license, Xcel Energy will address the funding adjustment requirements of 10 CFR 50.75(f)(4) and 10 CFR 50.82(a)(8)(iv) to evaluate the status of decommissioning funding financial assurance for MNGP during the period of decommissioning. Xcel Energy intends to perform that evaluation on a regular basis (not to exceed every two years). If necessary, Xcel Energy will adjust its decommissioning funding in accordance with NRC decommissioning funding requirements.

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The decommissioning cost is estimated to be \$663 million in 2005 dollars. The "Decommissioning Cost Analysis for the Monticello Nuclear Generating Plant" developed by TLG Services, Inc. included cost estimates of approximately \$447 million for decommissioning costs, \$189 million for spent fuel management and \$27 million for greenfield remediation using a DECON scenario. The total estimated decommissioning costs by period and decommissioning activity are provided in Tables 1 and 2.

The NRC minimum decommissioning financial assurance requirement for MNGP as reported in Reference 2 and set forth in 10CFR50.75(c) is approximately \$412.6 million. The NRC minimum was recalculated for an October 2005 triennial nuclear plant decommissioning filing to the Minnesota Public Utilities Commission (MPUC) using NUREG 1307, "Report on Waste Burial Charges," Revision 11, published in June of 2005. This adjustment increased the NRC minimum to \$418.1 million.

As of December 31, 2004, the MNGP decommissioning trust fund balance was \$377.1 million. This fund is currently being supplemented with annual contributions of approximately \$35 million (Reference 2). Adjustments to annual contributions amounts require MPUC approval in miscellaneous filings and other state approvals through rate proceedings.

Xcel Energy applies reasonable earnings rates to the decommissioning funds throughout the decommissioning periods described above. In addition, the preliminary decommissioning cost estimate includes reasonable escalation factors for the decommissioning activities. Based on a cash flow analysis for the decommissioning activities to be performed for the periods described above, MNGP believes that there is reasonable assurance that adequate decommissioning funds will be available to decommission MNGP as described herein (assuming a 2010 shutdown). Xcel Energy plans to review the decommissioning fund status on a regular basis as described above.

Table 1 ^(a)
MNGP Schedule of Annual Expenditures: DECON Scenario
(thousands, 2005 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2010	\$ 14,695	\$ 1,714	\$ 619	\$ 13	\$ 4,710	\$ 21,751
2011	\$ 48,871	\$ 8,091	\$ 2,583	\$ 609	\$ 13,528	\$ 73,681
2012	\$ 48,907	\$ 20,287	\$ 2,255	\$ 36,608	\$ 8,692	\$ 116,749
2013	\$ 42,242	\$ 14,579	\$ 1,639	\$ 23,119	\$ 5,679	\$ 87,257
2014	\$ 38,299	\$ 9,390	\$ 1,473	\$ 7,573	\$ 3,792	\$ 60,528
2015	\$ 38,299	\$ 9,390	\$ 1,473	\$ 7,573	\$ 3,792	\$ 60,528
2016	\$ 32,209	\$ 4,418	\$ 891	\$ 7,002	\$ 3,781	\$ 48,300
2017	\$ 17,364	\$ 1,846	\$ 331	\$ 29	\$ 6,897	\$ 26,468
2018	\$ 14,488	\$ 4,470	\$ 196	\$ -	\$ 1,958	\$ 21,113
2019	\$ 8,331	\$ 1,983	\$ 117	\$ -	\$ 1,956	\$ 12,387
2020	\$ 3,848	\$ 169	\$ 59	\$ -	\$ 1,960	\$ 6,035
2021	\$ 3,837	\$ 168	\$ 59	\$ -	\$ 1,954	\$ 6,019
2022	\$ 3,837	\$ 168	\$ 59	\$ -	\$ 1,954	\$ 6,019
2023	\$ 3,837	\$ 168	\$ 59	\$ -	\$ 1,954	\$ 6,019
2024	\$ 3,848	\$ 169	\$ 59	\$ -	\$ 1,960	\$ 6,035
2025	\$ 3,837	\$ 168	\$ 59	\$ -	\$ 1,954	\$ 6,019
2026	\$ 3,837	\$ 168	\$ 59	\$ -	\$ 1,954	\$ 6,019
2027	\$ 3,837	\$ 168	\$ 59	\$ -	\$ 1,954	\$ 6,019
2028	\$ 3,848	\$ 169	\$ 59	\$ -	\$ 1,960	\$ 6,035
2029	\$ 3,837	\$ 168	\$ 59	\$ -	\$ 1,954	\$ 6,019
2030	\$ 3,837	\$ 168	\$ 59	\$ -	\$ 1,954	\$ 6,019
2031	\$ 3,837	\$ 168	\$ 59	\$ -	\$ 1,954	\$ 6,019
2032	\$ 3,848	\$ 169	\$ 59	\$ -	\$ 1,960	\$ 6,035
2033	\$ 3,837	\$ 168	\$ 59	\$ -	\$ 1,954	\$ 6,019
2034	\$ 3,837	\$ 168	\$ 59	\$ -	\$ 1,954	\$ 6,019
2035	\$ 3,837	\$ 168	\$ 59	\$ -	\$ 1,954	\$ 6,019
2036	\$ 3,848	\$ 169	\$ 59	\$ -	\$ 1,960	\$ 6,035
2037	\$ 3,837	\$ 168	\$ 59	\$ -	\$ 1,954	\$ 6,019
2038	\$ 3,837	\$ 168	\$ 59	\$ -	\$ 1,954	\$ 6,019
2039	\$ 3,829	\$ 488	\$ 59	\$ 3	\$ 10,424	\$ 14,803
2040	\$ 1,164	\$ 1,095	\$ 97	\$ 369	\$ 2,397	\$ 5,122
(b)	\$ 381,652	\$ 80,951	\$ 12,855	\$ 82,898	\$ 104,767	\$ 663,122

^(a) TLG Services, Inc. Decommissioning Cost Analysis for Monticello Nuclear Generating Plant.
October 2005.

^(b) Column may not add due to rounding.

Table 2
MNGP Summary of DECON Cost Estimate by Period Cost and Activity Cost
(thousands, 2005 dollars)

	Total Contingency	Total Costs	NRC License Term Costs	Spent Fuel Management Costs	Site Restoration Costs
Period 1 Totals: Transition and Preparations	\$14,680	\$111,041	\$98,316	\$11,984	\$741
Period 2 Totals: Decommissioning	\$64,108	\$377,627	\$339,389	\$37,928	\$310
Period 3b Totals: Site Restoration	\$4,654	\$36,615	\$328	\$9,924	\$26,363
Period 3c/3d Totals: ISFSI Operations	\$15,848	\$132,685	\$8,785	\$123,899	
Period 3e/3f Totals: ISFSI D&D	\$710	\$5,155		\$5,155	
 TOTAL COST TO DECOMMISSION (1)	 \$100,000	 \$663,122	 \$446,819	 \$188,890	 \$27,414

Source:

TLG Service, Inc. Decommissioning Cost Analysis for the Monticello Nuclear Generating Plant. October 2005.

(1) Columns may not add due to rounding.