

May 18, 2006

Mr. John T. Conway  
Site Vice President  
Monticello Nuclear Generating Plant  
Nuclear Management Company, LLC  
2807 West County Road 75  
Monticello, MN 55362-9637

SUBJECT: MONTICELLO NUCLEAR GENERATING PLANT (MNGP) - SPENT FUEL  
MANAGEMENT PLAN AND PRELIMINARY DECOMMISSIONING COST  
ESTIMATE (TAC NO. MC9304)

Dear Mr. Conway:

By letter dated December 20, 2005, Nuclear Management Company, LLC (NMC), submitted "Irradiated Fuel Management Plan and Preliminary Decommissioning Cost Estimate for Monticello Nuclear Generating Plant." By letter dated May 5, 2006, NMC transmitted supplemental information and provided a copy of "Decommissioning Cost Analysis for the Monticello Nuclear Generating Plant" prepared by TLG Services, Inc.

The Nuclear Regulatory Commission (NRC) staff finds that NMC's program for the long-term storage of spent fuel and the preliminary decommissioning cost estimate for MNGP are adequate and provide sufficient details associated with the funding mechanisms. The NRC staff, therefore, concludes that NMC's spent fuel management program for MNGP complies with 10 CFR 50.54(bb) and approves the program on a preliminary basis. In addition, the NRC staff finds that the preliminary decommissioning cost estimate for MNGP complies with the requirements of 10 CFR 50.75(f)(2) and the NRC staff approves the preliminary cost estimate. Details of the NRC staff's review are set forth in the enclosed safety evaluation.

Sincerely,

\RA\

Peter S. Tam, Senior Project Manager  
Plant Licensing Branch III-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-263

cc: See next page

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DATE	5/18/06	5/18/06	2/13/06*	5/18/06

\*Safety evaluation transmitted by memo dated 2/13/06.

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO MONTICELLO NUCLEAR GENERATING PLANT

SPENT FUEL MANAGEMENT PLAN AND

PRELIMINARY DECOMMISSIONING COST ESTIMATE

DOCKET NO. 50-263

1.0 INTRODUCTION

Pursuant to 10 CFR 50.54(bb), nuclear power plants that are within 5 years of expiration of their operating license must submit a spent fuel management and funding program to the Nuclear Regulatory Commission (NRC) for review and preliminary approval. The program should discuss the means by which the licensee intends to manage and provide funding for the management of spent fuel until the spent fuel is transferred to the Department of Energy (DOE) for permanent disposal. In the same time period, 10 CFR 50.75(f)(2) requires the licensee to submit a preliminary cost estimate which includes up-to-date assessment of the major factors that could affect the cost to decommission the reactor.

By letter dated December 20, 2005, Nuclear Management Company, LLC (NMC, the licensee) submitted "Irradiated Fuel Management Plan and Preliminary Decommissioning Cost Estimate for Monticello Nuclear Generating Plant [MNGP]" (NRC Accession No. ML053550522). By letter dated May 5, 2006 (Accession No. ML061380638), NMC transmitted supplemental information and provided a copy of "Decommissioning Cost Analysis for the Monticello Nuclear Generating Plant" prepared by TLG Services, Inc. The following sections document the NRC staff's findings resulting from review of these submittals.

2.0 BACKGROUND

MNGP is located within the city limits of Monticello, in Wright County, Minnesota on the south bank of the Mississippi River. The site is approximately 2150 acres of land. The property is divided by the river with part being in Sherburne County and part in Wright County. The access road extends from the security gate to County Road 75, 3000 feet southeast of the reactor building. Interstate Highway 94 is located 3700 feet southwest. Railroad access is provided by the Burlington Northern Railroad. MNGP is located approximately 30 miles northwest of the Minneapolis-St. Paul area.

The MNGP nuclear steam supply system (NSSS) consists of a single-cycle, forced-circulation, low power density boiling water reactor. This system was supplied by the General Electric

ENCLOSURE

Company (GE) and has a reference core design of 1775 MWt (thermal), with a corresponding (net dependable capability) electrical rating of 600 MWe (electric) when the reactor is at rated power.

The reactor recirculation system consists of the reactor vessel; the two-loop reactor recirculation system with its pumps, pipes, and valves; the main steam piping up to the main steam isolation valves; and the reactor auxiliary systems piping.

GE designed the plant and supplied the NSSS, the initial reactor fuel, and turbine-generator unit and its related systems. This design is identified as BWR-3 by GE. Bechtel Corporation constructed the plant. Construction started on June 19, 1967, and initial fuel loading was completed during the fall of 1970. Following a period of testing, full commercial operation began on June 30, 1971, under Provisional Operating License Number DPR-22. The Full-Term Operating License was issued on January 9, 1981, to expire at midnight September 8, 2010, per Amendment No. 53.

Currently, the licensee intends to construct an independent spent fuel storage installation (ISFSI) at the site and will store the spent fuel in wet storage until the ISFSI is constructed. The licensee estimates that DOE will initiate spent fuel receipt in 2015 and the transfer will be completed in 2039. Any delay in the startup of the repository or decrease in the rate of acceptance of the fuel will increase the transfer time and result in fuel remaining on the site longer than estimated.

By letter dated March 16, 2005 (Accession No. ML050880241), the licensee submitted a licensee renewal application (LRA) to the NRC. The LRA reaffirmed the licensee's commitment to seek licensee renewal for MNGP. The licensee has committed, if MNGP ceases operation in September 2010, 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.

### 3.0 REGULATORY REQUIREMENTS AND CRITERIA

#### 3.1 Regulatory Requirement (10 CFR 50.54(bb))

Regulatory requirement set forth at 10 CFR 50.54(bb) states:

For nuclear power reactors licensed by the NRC, the licensee shall, within 2 years following permanent cessation of operation of the reactor or 5 years before expiration of the reactor operating license, whichever comes first, 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 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.....”

#### 3.2 Criteria at 10 CFR 50.54(bb)

For the NRC to evaluate and provide preliminary approval of the spent fuel management and funding program, the submittal should include:

- The estimated cost to isolate the spent fuel pool and fuel handling systems, or the cost to construct an ISFSI or a combination of wet/dry storage;
- The estimated annual cost for the operation of the selected option (wet or dry storage or a combination of the two) until DOE takes possession of the fuel;
- The estimated cost for the preparation, packaging, and shipping of the fuel to DOE;
- The estimated cost to decommission the spent fuel storage facility; and
- A brief discussion of each of the areas identified and the estimated time periods for these activities.

### 3.3 Regulatory Requirement at 10 CFR 50.75(f)(2)

Regulatory requirement set forth at 10 CFR 50.75(f)(2) provides that a 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.

Section 50.75(f)(4) requires a licensee to include plans to adjust funding levels to demonstrate a reasonable level of financial assurance, if necessary, in the preliminary cost estimate.

The cost estimate should include a comparison of the preliminary cost estimate with the minimum decommissioning funding amount based on the formulas in 10 CFR 50.75(c), and an assessment of the major factors that could affect the preliminary cost estimate.

If necessary, as required by 10 CFR 50.75(f)(4), the preliminary cost estimate shall also include plans for adjusting levels of funds assured for decommissioning to demonstrate a reasonable level of assurance that funds will be available to cover the cost of decommissioning.

### 3.4 Criteria at 10 CFR 50.75(f)(2)

NUREG-1713, entitled "Standard Review Plan for Decommissioning Cost Estimates for Nuclear Power Reactors," Section C1 provides additional guidance on the information that is to be addressed in the preliminary decommissioning cost estimate. The principal factors to be addressed are:

- Decommissioning option/method anticipated
- Potential for known or suspected contamination of the facility or site
- Low-level radioactive waste (LLW) disposition plan
- Preliminary schedule of decommissioning activities
- Any other factors that could significantly affect the cost to decommission

The cost estimate should provide costs for each of the following:

- Pre-decommissioning engineering and planning - decommissioning engineering and planning prior to completion of reactor defueling

- Reactor deactivation - deactivation and radiological decontamination of plant systems to place the reactor into a safe, permanent shutdown condition
- Safe storage - safe storage monitoring of the facility until dismantlement begins (if storage or monitoring of spent fuel is included in the cost estimate, it should be shown separately)
- Dismantlement - radiological decontamination and dismantlement of systems and structures required for license termination (if demolition of uncontaminated structures and site restoration activities are included in the cost estimate, they should be shown separately)
- LLW disposition - LLW packaging, transportation, vendor processing, and disposal.
- Radiological Costs - separate the cost for radiological decommissioning from non-radiological costs

#### 4.0 TECHNICAL EVALUATION

##### 4.1 Evaluation of the Program to Manage and Provide Funding of all Irradiated Fuel

The licensee estimated the total costs of \$189 million associated with the long-term management of spent fuel which includes an estimated cost of \$9.9 million to isolate the spent fuel pool and supporting fuel handling system, and an estimated annual cost of \$6.0 million for maintaining the fuel in the ISFSI from 2020 - 2038. In addition to the licensee's estimated cost to isolate the spent fuel pool and supporting fuel handling system at \$9.9 million, the licensee estimated dry fuel transfer costs at \$12.1 million and capital costs (canisters and overpacks) at \$30.22 million, with these costs occurring during the 5 year period following shutdown. The licensee also estimated the cost to transfer spent fuel to DOE at \$4.6 million. These costs would be incurred beginning the year 2031, and continuing through 2039.

The licensee reaffirmed the commitment to seek licensee renewal for MNGP. If MNGP ceases operation in September 2010, the licensee committed to comply with existing NRC's licensing requirements, including the operation and maintenance of the systems and structures needed to support continued operation of the spent fuel pool. The licensee stated that the ISFSI will be constructed prior to final shut down, and that the cost to construct the ISFSI is, therefore, not included in this estimate.

The NRC staff finds the spent fuel management program estimates to be reasonable based on a cost comparison with similar decommissioning reactors, while acknowledging the large uncertainties and site-specific variances. The NRC staff recognizes the possibility of funding shortfalls, but recognizes the licensee's commitment to fund any additional cost. Currently, the licensee has \$377.1 million in the trust fund with annual contributions of \$35.0 million that will continue to the end of the license. In addition to any excess money from the trust fund that exceeds the costs required for radiological decommissioning, the licensee committed to use operating revenue to pay for spent fuel management. The NRC staff finds that the licensee's proposed spent fuel program addresses the principal areas related to the management of the spent fuel.

#### 4.2 Evaluation of the Preliminary Decommissioning Cost Estimate

In the licensee's December 20, 2005, letter, the licensee estimated the total amount necessary to decommission MNGP to be \$663 million (in 2005 dollars) and includes \$447 million to cover the cost of radiological decommissioning, \$189 million for spent fuel management, and \$27 million for green fields remediation. The licensee's Biennial Decommissioning Funding Status Report (Biennial Report) submitted March 31, 2005 (Accession No. ML051110731), stated that the trust fund balance as of December 3, 2004, was \$377.0 million, and adding the \$35 million contribution for the remaining 5.75 years and using the licensee's real rate of return of 1.31 percent identified in the Biennial Report, as well as taking an additional *prorata* credit into the presumed immediate dismantlement period, sufficient funds are expected to be available to cover both the radiological decommissioning cost and spent fuel management. The Biennial Report is being reviewed under a separate NRC action to determine if the licensee has demonstrated reasonable assurance that funds will be available to decommission MNGP. Since MNGP is within 5 years of license termination, the licensee is required, per regulation, to submit updated information annually for NRC's review.

As part of the review, prior to starting the detailed review of the decommissioning cost estimate, the NRC staff reviewed the estimate to confirm that radiological and non-radiological decommissioning costs were separated and the support systems/structures necessary to support the safe operation had been identified in the estimate. The validity of the cost estimate is based on a reasonable estimate of the cost to decommission the supporting systems and structures, as well as confirming the cost of disposal of the low level waste was also addressed.

The licensee has divided the estimated total cost of \$447 million cost into the following principal categories: (1) radioactive component removal; (2) decontamination and dismantlement; (3) packaging; (4) management and engineering support; (5) low-level waste disposal; and (6) administrative costs. In addition, the licensee has included a time line and annual cost projection that identifies when these activities will take place, and the cost associated with each of these items. The cost estimate developed for MNGP has identified an average weighted contingency factor for the major activities of 17.8 percent. The contingency factors were as high as 50 percent for decontamination, 75 percent for reactor segmentation, and 15 percent for staff and engineering. In addition, the NRC staff reviewed the Work Difficulty factors used for the TLG cost estimate and found they were reasonable. The NRC staff reviewed Appendix A and Appendix B of TLG's cost estimate which listed the unit cost factors that were used to develop the decommissioning cost, and concluded that the unit cost factors were consistent with other cost estimates and in a reasonable range.

The NRC staff has determined that the licensee's preliminary cost estimate reasonably represents the cost to decommission MNGP, and the NRC staff is, under a separate action, reviewing the Biennial Report information for MNGP to determine if the licensee has demonstrated reasonable assurance that the funds will be available to decommission MNGP.

#### 5.0 STATE OF MINNESOTA DISCUSSIONS

Discussions were not held with the State of Minnesota related to the NRC review of the licensee's submittal that addressed both the 10 CFR 50.54(bb) and 10 CFR 50.75(f)(2) requirements.

## 6.0 CONCLUSION

The NRC staff finds that the licensee's program for the long-term storage of spent fuel and the preliminary decommissioning cost estimate for MNGP are adequate and provide sufficient details associated with the funding mechanisms. The NRC staff, therefore, concludes that the licensee's spent fuel management program for MNGP complies with 10 CFR 50.54(bb) and approves the program on a preliminary basis. In addition, the NRC staff finds that the preliminary decommissioning cost estimate for MNGP complies with the requirements of 10 CFR 50.75(f)(2) and the NRC staff approves the preliminary cost estimate.

Principal Contributor: C. Pittiglio

Dated: May 18, 2006



Monticello Nuclear Generating Plant

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