July 20, 2005

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

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE MONTICELLO NUCLEAR GENERATING PLANT LICENSE RENEWAL APPLICATION

Dear Mr. Conway:

By letter dated March 16, 2004, Nuclear Management Company, LLC, (NMC or the applicant) submitted an application pursuant to Title 10 of the *Code of Federal Regulations* Part 54 (10 CFR Part 54), to renew the operating license for Monticello Nuclear Generating Plant (MNGP), for review by the U.S. Nuclear Regulatory Commission (NRC). The NRC staff is reviewing the information contained in the license renewal application (LRA) and has identified, in the enclosure, areas where additional information is needed to complete the review.

These questions were discussed with your staff, Mr. Patrick Burke, and a mutually agreeable date for this response is within 30 days from the date of this letter. If you have any questions, please contact me at 301-415-3777 or e-mail DXM2@nrc.gov.

Sincerely,

**/RA/**

Daniel J. Merzke, Project Manager
License Renewal Section A
License Renewal and Environmental Impacts Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No.: 50-263

Enclosure: As stated

cc w/encls: See next page

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ADAMS Accession no.: ML052020005

Document Name: E:\Filenet\ML052020005.wpd

| OFFICE | PM:RLEP | LA:RLEP | SC:RLEP |
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Monticello Nuclear Generating Plant

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DISTRIBUTION: Letter to J. Conway, Re: RAI for Monticello LRA, Dated: July 20, 2005
**ADAMS Accession No.: ML052020005**

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**MONTICELLO NUCLEAR GENERATING PLANT**
**LICENSE RENEWAL APPLICATION (LRA)**
**REQUEST FOR ADDITIONAL INFORMATION (RAI)**

## 2.1 Scoping and Screening Methodology

**RAI 2.1-1**

Monticello Operations Manual A.6, "Acts of Nature," Revision 20, provides instructions for the response of Monticello Nuclear Generating Plant personnel to extreme natural conditions. Tornados, external flooding, high river water temperature, low river water flow/level, high wind conditions, heavy snowfall, and high ambient (outside) air temperature are addressed in Operations Manual A.6. Section 5 of A.6 provides instructions for protecting structures from flooding in the event that Mississippi River flood waters are predicted to exceed specific elevations. For example, steel plates are required to be bolted over specific structure openings and suitable steel plates are stored onsite to accomplish this task. Another example of an action in Section 5 of A.6 to prevent flooding is to remove the intake structure Amertap hatch covers and install the original floor hatches. The NRC's audit team noted that equipment stored for use, such as steel plates and floor hatches, was not included in the scope of license renewal. The applicant indicated during the audit that it planned to reevaluate its original conclusion that this equipment is not in the scope of license renewal.

10 CFR 54.4(a) describes the criteria for determining systems, structures, and components (SSCs) that are required to be within the scope of license renewal. The staff requires additional information to complete its review. Specifically, the staff requests the applicant:

(a) Provide a technical basis for not including in the scope of license renewal, equipment stored onsite that is required by station procedures to be installed during emergency or abnormal conditions in accordance with the current licensing basis; or

(b) Describe the methodology used to ensure that all equipment stored onsite which station procedures require to be installed during emergency or abnormal conditions, in accordance with the current licensing basis, is addressed in license renewal scoping. In your response, indicate the documentation sources reviewed to ensure that all such equipment was identified and describe additional scoping evaluations performed to address the criteria in 10 CFR 54.4(a). List any additional SSCs included within scope as a result of your efforts, and list those SSCs for which aging management reviews were conducted. For each SSC describe the aging management programs, as applicable, to be credited for managing the identified aging effects.

**RAI 2.1-2**

Monticello License Renewal Procedure LRP 2-1, "Scoping and Screening for License Renewal," Revision 3, Section 4.2.15, provides guidance for establishing system boundaries for non-safety-related (NSR) piping systems connected directly to safety-related (SR) piping systems. The procedure states, in part, that for NSR connected to SR, the NSR SSCs should be included up to the first seismic anchor past the SR/NSR interface, and that the anchor should also be identified on the boundary drawings. Monticello Technical Report, TR-011,

"Component identification for SSCs Within Scope of 10 CFR 54.4(a)(2) Non-Safety Affecting Safety," Revision 3, states, in part, that a review of piping analyses provided information to extend the piping system to the first anchor. In cases where a true anchor did not exist, the piping analysis was extended sufficiently far to ensure the NSR portion would not have an effect on the SR portion. Typically, this was at least extended to encompass two restraints in each orthogonal direction. In those few cases where such restraints did not exist in each orthogonal direction, the boundary was extended to an equivalent anchor such as a wall. As an example, the applicant stated that in certain cases of small-bore piping (i.e., 2" or less) grouted wall penetrations served as the equivalent anchor location. Based on the staff's review of the applicant's scoping evaluation related to the 10 CFR 54.4a(2) criterion, the staff requires additional information to complete its review. Specifically, the staff requests the applicant:

(a) Provide the technical basis for establishing the grouted wall penetrations as an equivalent anchor location; and

(b) Verify that non-grouted wall penetrations were not used as equivalent anchor locations for NSR piping systems connected to SR piping systems.

**3.2 Engineered Safety Features**

**RAI 3.2-1**

In Table 3.2.2-4 of the LRA, the applicant proposes to manage the aging effect of heat transfer degradation due to fouling of the copper alloy heat exchanger tubes in an external lubricating oil environment with an One-Time Inspection Program. The staff requests the applicant provide the following:

(a) Specific material composition of the copper alloys.

(b) Oil analysis program and/or other methods to ensure that the lubricating oil remains free of contaminants which might degrade the tubing.

(c) Preventive maintenance procedures to ensure that heat transfer degradation does not reach unacceptable levels.

**RAI 3.2-2**

In Table 3.2.2-4 of the LRA, the applicant states that heat transfer degradation due to fouling of the copper alloy heat exchanger tubes in a steam environment will be managed with Plant Chemistry and One-Time Inspection Programs. The applicant further states that neither the components nor the material and environment combination are evaluated in NUREG-1801. The staff requests the applicant verify that the steam in the heat exchangers identified above originates from treated water. In addition, the applicant is requested to provide justification for not considering erosion and flow accelerated corrosion (FAC) as aging mechanisms for this material and environment combination.

### 3.3 Auxiliary Systems

**RAI 3.3.2.3-1**

LRA Table 3.3.2-4 identifies stress cracking corrosion (SCC) as an aging effect requiring management for stainless steel piping and fittings in a primary containment air environment. To manage this aging effect, the applicant credits the System Condition Monitoring Program, LRA Section B2.1.32, which utilizes visual inspections of component external surfaces for detection of aging effects. Therefore, the applicant is requested to provide operating experience or other bases used for determining that SCC is an aging effect in this environment. Also, since methods such as VT-1, liquid penetrant, or volumetric inspections are used to detect SCC, the applicant is requested to identify the methods and acceptance criteria used by the System Condition Monitoring Program to detect SCC for these components.

**RAI 3.3.2.3-2**

LRA Tables 3.3.2-6 and 3.3.2-8 identify heat transfer degradation due to fouling as an aging effect requiring management for copper heat exchangers (heat transfer and pressure boundary functions) in a lubricating oil environment. The applicant credits the One-Time Inspection Program to manage this aging effect. Previous staff positions stated the One-Time Inspection Program provides measures to verify the effectiveness of an aging management program and to confirm the absence of an aging effect. For fouling of heat exchangers in a lubricating oil environment, mitigation of the aging effect is dependent on a lubricating oil monitoring program to maintain the integrity of the oil. Therefore, an acceptable aging management program should include a lubricating oil monitoring program to mitigate the aging effect and a one-time inspection to verify the effectiveness of the mitigation program. The applicant is requested to identify an Aging Management Program to mitigate the effects of fouling in the heat exchangers during the period of extended operation and verify the effectiveness of that program with a one-time inspection.

**RAI 3.3.2.3-3**

Tables 3.3.2-3 and 3.3.2-16 identify no aging effects for rubber expansion joints in a raw water environment. Previously, the staff has identified hardening and loss of strength as aging effects for elastomer components in this environment and recommended the Open-Cycle Cooling Water Program to manage these aging effects. The applicant is requested to identify an Aging Management Program to manage hardening and loss of strength for rubber expansion joints in a raw water environment, or provide the technical basis for why these aging effects are not applicable to MNGP.

**RAI 3.3.2.3-4**

Tables 3.3.2-3, 3.3.2-5, 3.3.2-6, 3.3.2-7, and 3.3.2-16 identify no aging effects for rubber expansion joints, piping and fittings, and elastomer ventilation seals in a plant indoor air environment. Previously, the staff has identified hardening and loss of strength as aging effects for rubber and elastomer components in this environment and recommended a plant-specific program to manage these aging effects. The plant-specific program should provide periodic inspections of the components to manage these aging effects. The applicant is requested to identify an aging management program to manage hardening and loss of strength for these rubber and elastomer components located in a plant indoor air environment, or provide the technical basis for why these aging effects are not applicable to MNGP.

**RAI 3.3.2.3-5**

Tables 3.3.2-5 and 3.3.2-17 identify no aging effects for rubber accumulators, piping and fittings in a treated water environment. Previously, the staff has identified hardening and loss of strength as aging effects for rubber and elastomer components in this environment and recommended a plant-specific program to manage these aging effects. The plant-specific program should provide periodic inspections of the components to manage these aging effects. The applicant is requested to identify an aging management program to manage hardening and loss of strength for these rubber components located in a treated water environment, or provide the technical basis for why these aging effects are not applicable to MNGP.

**RAI 3.3.2.3-6**

Tables 3.3.2-6 and 3.3.2-7 identify no aging effects for rubber ventilation seals, piping and fittings in a gas and air internal environment. Previously, the staff has identified hardening and loss of strength as aging effects for rubber and elastomer components in this environment where the internal temperature exceeds 95°F and recommends a plant-specific program to manage these aging effects. The plant-specific program should provide periodic inspections of the components to manage these aging effects. The applicant is requested to identify an aging management program to manage hardening and loss of strength for these rubber components located in a gas and air internal environment where the internal temperature exceeds 95°F.

**RAI 3.3.2.3-7**

Tables 3.3.2-6 and 3.3.2-9 identify no aging effects for stainless steel fasteners/bolting and copper alloy flame arresters in an environment exposed to weather. Previously, the staff has identified loss of material due to pitting and crevice corrosion as aging effects for stainless steel and copper alloy components in this environment and recommended a plant-specific program to manage these aging effects. The plant-specific program should provide inspections of the components to manage these aging effects. The applicant is requested to identify an Aging Management Program to manage loss of material due to pitting and crevice corrosion for these stainless steel and copper alloy components located in an environment exposed to weather, or provide the technical basis for why these aging effects are not applicable to MNGP.

**3.4 Steam and Power Conversion System**

**RAI 3.4-1**

In Table 3.4.2-2 of the LRA, the applicant has identified no aging effects requiring management for rubber expansion joints intended to maintain the pressure boundary function in a plant indoor air environment. The applicant states that neither the components, nor the material and environment combination are evaluated in NUREG-1801. The applicant further states that these elastomer components (neoprene, rubber, etc.) are indoors and not subject to ultra-violet rays or ozone, nor are they in locations that are subject to radiation exposure. These locations are also not subject to temperatures where changes in material properties or cracking could occur (>95°F). Therefore, the applicant contends that no aging management is required.

However, it is industry experience that elastomeric expansion joints degrade due to oxidation in environments that are not necessarily harsh, as discussed in EPRI Report 1008035, "Expansion Joint Maintenance Guide," Revision 1, May 2003, and EPRI Report 1007933, "Aging Assessment Field Guide," December 2003. The staff therefore requests the applicant

discuss their inspection procedures for the rubber expansion joints related to preventive maintenance both for external and internal surfaces of the elastomer.

**RAI 3.4-2**

In Table 3.4.2-3 of the LRA, the applicant has identified the aging effects of changes in material properties and cracking due to irradiation and thermal exposure for rubber expansion joints in an internal steam environment. The intended function of the expansion joints is to maintain holdup of radioactive material. The applicant states that neither the components nor the material and environment combination are evaluated in NUREG-1801. The applicant further states that the aging effect/mechanism is applicable, but does not require management since the intended function for this component is post-accident iodine plate-out and hold-up. According to the applicant, main condenser structural integrity is continuously demonstrated during normal plant operation, thus the intended function is maintained. However, the staff position is that since this component type (rubber expansion joint) is within the scope of license renewal, its aging effects should be managed. Therefore, the applicant is requested to provide the appropriate Aging Management Program to manage the aging effect of changes in material properties and cracking due to irradiation and thermal expansion of the rubber expansion joints in a steam environment.

**4.9 Reactor Building Crane Load Cycles**

**RAI 4.9-1**

In Section 4.9 of the LRA related to the reactor building crane load cycles TLAA, the applicant contends that the current analysis of the fatigue life remains valid for the 60 year extended operating period. It is the staff's understanding that this crane will also handle spent fuel pool shipping casks. A refueling service platform with handling and grappling fixtures services the refueling area and the spent fuel pool. The applicant is requested to provide a fatigue analysis associated with lifts of the spent fuel casks and explain how the heavy load fatigue analysis provided in Section 4.9 of the LRA is the governing analysis for the TLAA.

**B2.1.4 Bolting Integrity Program**

**RAI B2.1.4-1**

Table Item Numbers 3.3.1-18, 3.3.1-24 and 3.4.1-08 in the LRA provide a general discussion of the Bolting Integrity Program as applied to the ESF, auxiliary and SPC systems. The discussion section for each system states that while loss of preload is not specifically identified as an aging effect in the respective AMR table, it is managed for carbon steel and stainless steel closure bolting used in pressure retaining joints by the Bolting Integrity Program through periodic inspections, material selection, thread lubrication control, assembly and torque requirements, and repair and replacement activities. Based on this discussion, the staff considers closure bolting in the ESF, auxiliary and SPC systems to be managed for loss of preload by the Bolting Integrity Program. The applicant is requested to discuss whether all closure bolting in the ESF, auxiliary and SPC systems is managed for loss of preload by the Bolting Integrity Program although the AMR tables do not contain specific line items for this aging effect.

**RAI B2.1.4-2**
The LRA states that the Primary Containment In-Service Inspection Program provides for visual examination of accessible surfaces of drywell, torus, etc. Recent experience with failed bolts on T-quencher supports at Hatch Nuclear Plant Unit 2 has shown that high strength bolts are susceptible to hydrogen induced cracking and may fail after 20 to 25 years of service.
In order to assess the adequacy of Monticello's Bolting Integrity Program, please provide the following information:

> Has the applicant and/or his contractor reviewed the Hatch 2 bolt failure event for applicability to Monticello?
>
> > If yes, what are the results from that review? Why does the applicant believe that this event cannot take place at Monticello?
> >
> > If no, when is the applicant planning to complete the review? Why does the applicant believe that this event is not applicable to its facility?

**RAI B2.1.4-3**
Does the Primary Containment In-Service Inspection Program include requirements for diver's inspection of underwater bolting in the Torus? If not, why not?

**B2.1.32 System Condition Monitoring Program**

**RAI B2.1.32-1**
The System Condition Monitoring Program in LRA Section B2.1.32 manages aging effects through visual inspection and monitoring of external surfaces for leakage and evidence of material degradation. The AMP does not address how inspection of accessible surfaces will provide reasonable assurance that inaccessible surfaces are managed. The applicant is requested to list any inaccessible surfaces of components (including lagged/insulated piping <212°F) that will be managed by this program and discuss the bases for determining that the inaccessible surfaces will be adequately managed.

**RAI B2.1.32-2**
The System Condition Monitoring Program is credited with managing the following aging effects located in various sections of the LRA:

(a) Change in material properties and cracking for neoprene ventilation seals in engineered safety features systems;

(b) Stress cracking corrosion for stainless steel piping and fittings in auxiliary system;

(c) Crevice corrosion for steel and copper alloy components in the auxiliary systems;

(d) Crevice corrosion for copper alloy components in the steam and power conversion systems;

(e) Stress cracking corrosion and crevice corrosion for stainless steel spent fuel pool liner.

It is not apparent how these types of aging effects will be identified during a system walkdown visual inspection. The applicant is requested to discuss the inspection methods and techniques used to detect each of the above aging effects and the acceptance criteria for each aging effect.