December 23, 2004

Mr. Thomas J. Palmisano
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 - CORRECTED PAGES FOR EXEMPTION FROM THE REQUIREMENTS OF TITLE 10 OF THE *CODE OF FEDERAL REGULATIONS*, PART 50, APPENDIX R, SECTION III.G.2.B APPLYING TO FIRE AREA IX/FIRE ZONE 23A - INTAKE STRUCTURE PUMP ROOM (TAC NO. MC1803)

Dear Mr. Palmisano:

The U.S. Nuclear Regulatory Commission's letter of October 28, 2004, approved an exemption from Title 10 of the *Code of Federal Regulations*, Part 50, Appendix R, Section III.G.2.b, for separation of redundant trains with no intervening combustible or fire hazards as it applies to Fire Area IX/Fire Zone 23A. Fire Area IX/Fire Zone 23A corresponds to the intake structure pump room at Monticello Nuclear Generating Plant (MNGP). MNGP staff requested some changes to our exemption evaluation to correct minor errors and clarify the licensing basis in MNGP's Fire Hazards Analysis. Enclosed are corrected pages with the changes identified by vertical bars in the right margin.

Sincerely,

/RA/

L. Mark Padovan, Project Manager, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-263

Enclosure: Corrected Evaluation Pages

cc w/enclosure: See next page

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To evaluate the presence of hazardous chemicals in the intake structure pump room at MNGP, the NRC staff's RAI of June 15, 2004, asked about sodium hypochlorite and the hazards that it might present in the room. NMC's July 16, 2004, RAI response indicated the following:

> Two chemicals may be present in the area: Sodium Hypochlorite and Sodium Bromide. Due to their diluted state, chemical properties, limited quantities and fire protection features provided, sodium hypochlorite and sodium bromide do not present a significant risk to the ability to contain and extinguish a potential fire in the Intake Structure Pump Room.
>
> Sodium Hypochlorite
>
> Sodium hypochlorite is provided in a 10 percent solution. The other ingredients comprising the solution are sodium chloride (7-8 percent), sodium hydroxide (0.5-2 percent) and the remainder is water. The sodium hypochlorite solution has a zero rating for flammability, which indicates that the material will not burn. The sodium hypochlorite solution has a reactivity rating of one, which indicates that the solution will be normally stable, but can become unstable at elevated temperatures and pressures or may react with water with some release of energy, but not violently. The Material Safety Data Sheet (MSDS) also rates sodium hypochlorite with a special symbol 'OX,' which indicates that sodium hypochlorite is an oxidizer. Oxidizers increase the burning rate of other materials and most if not all oxidizers can be rendered harmless by dilution with water.
>
> Sodium hypochlorite is known to decompose into a chlorine gas with temperatures above 85 degrees F. Since the sodium hypochlorite is provided in a water-based solution, it is reasonable to conclude that it will not react further with water. The MSDS does not indicate any adverse effects when mixed with lubricating oil or introduced to cable insulation/jacket materials.
>
> Sodium Bromide
>
> Sodium bromide is used to supplement the sodium hypochlorite addition in the summer. Sodium bromide is stable under normal conditions of use and storage. Sodium bromide is used in a 40 percent solution. The ingredients comprising the solution are sodium bromide (40 percent) and the remainder is water. The sodium bromide solution is rated a zero for flammability, which indicates that the material will not burn. The sodium bromide solution is rated a zero for reactivity, which indicates that the solution is normally stable, even under fire exposure conditions, and is not reactive with water. The MSDS does not indicate any adverse effects when mixed with lubricating oil or introduced to cable insulation/jacket materials. The sodium bromide solution is not considered an oxidizer.
>
> Chemical product is contained and limited to the covered drum and discharge piping in the room. The purpose of the drum is to collect spillage that may occur during chemical

injection, maintenance or cleaning activities. The drum does not provide bulk storage. A manually-operated, normally closed valve isolates the drum to preclude discharge to the drum, absent the activities discussed above. Therefore, typically, there is no liquid draining to the drum. Sodium hypochlorite and/or sodium bromide injection is only permitted for two hours per day, at most. Given that the drum containing the chemical(s) is located on the floor of the Intake Structure Pump Room near a floor drain, and that the cables in the area are in tray and conduit near the ceiling, the chemicals are not considered a hazard to the cables.

Transient combustibles are controlled as described in the response to NRC Request #3 [the NRC staff's RAI of June 15, 2004]. It is highly unlikely that transient combustibles would be brought into direct contact with the chemical solution. Therefore, the potential exposure of the chemicals to transient combustibles is very limited. In addition, evaluations are performed to ensure that the chemicals present in the Intake Structure Pump Room do not cause an adverse reaction with portable fire extinguishers. These evaluations consider the guidance of National Fire Protection Association (NFPA) 10, Standard for the Installation of Portable Fire Extinguishers for the hazards in the area.

Existing fire protection features in the intake structure pump room at MNGP include an automatic fire detection system consisting of spot thermal detectors located throughout fire zone 23A and an automatic suppression pre-action sprinkler system designed to provide a water density of 0.30 gallons per minute per square foot. Furthermore, ionization smoke detectors are located under the shroud for each pair of RHRSW pumps, over the SW pumps/fire pump area, and in the vestibule area near the flammable liquids storage locker.

Item D. 3, "Intervening Combustibles," in Enclosure 1 of NMC's letter of November 17, 2003, discussed intervening combustibles in the intake structure pump room at MNGP. NMC mentioned that the safe shutdown divisions were separated by a minimum of approximately 25 feet between redundant divisions of ESW pumps. The following combustibles exist within the 25-foot horizontal separation zone between the two safe shutdown divisions:

- two SW pump motors
- electric fire pump motor
- screen wash/fire pump motor
- two make-up pump motors
- polyvinyl chloride (PVC) drain lines and drum
- two parallel north/south traveling horizontal cable trays (YT4 and YC3)
- two stacked east/west traveling horizontal cable trays (YS4 and YB3)
- MCC 123/113
- electric fire pump control panel C103

- screen wash/fire pump control panel C115
- circulating water control panel C101

NMC stated that the early warning ionization detector and the installed thermal detector-actuated automatic suppression system in the vicinity of the SW or fire pumps protect against the effects of postulated lube oil ignition from a pump motor leak. Sprinklers are installed along the entire row of pumps along the north wall of the fire zone. The smoke detector, or actuation of the suppression system via the thermal detection, alarm in the control room of MNGP and sprinkler activation will suppress the fire. NMC said that the make-up pumps are normally idle and have thermal detectors and sprinklers located near them. NMC remarked that the detection and suppression systems will act to prevent the fire spreading to redundant safe shutdown cables or components in the unlikely event that lube oil leaks from a motor and is involved in a fire.

NMC's letter of November 17, 2003, identified that PVC drain piping and a high-density polyethylene drum (associated with the sodium hypochlorite system equipment located on the roof of the intake structure) are located near stacked cable trays YS4 and YB3, MCC 123/113, and the electric fire pump control panel. NMC indicated the PVC piping will be replaced with non-combustible piping and the drum will either be relocated outside the separation zone or be replaced with a non-combustible container.

In the same letter, NMC discussed cable insulation in the intake structure pump room at MNGP as follows:

> As previously noted, cable insulation comprises approximately 38 percent of the combustible load in this fire zone. The cabling of concern is contained in the parallel north/south running trays YT4 and YC3, and east/west running trays YS4 and YB3. Cable in these trays is typically not IEEE-383 qualified with regard to fire resistive properties. The heaviest loading of the cable trays is where they meet at a "T" configuration. The concentration of cable loading diminishes toward the north and west ends of the cable trays. It is important to note the light loading at the west end of trays YS4 and YB3 as the fire propagation concern for this zone is in the east/west direction.

that any fire involving the trays will be detected, contained and suppressed by the noted fire protection features prior to becoming a threat to safe shutdown Division II cables.

The analysis provided within this exemption request serves to provide the aforementioned fire hazards analysis identified in GL 86-10 above.

NMC's letter of November 17, 2003, also identified several electrical cabinets as being intervening combustibles. MCC 123/113 is located between redundant shutdown cables. NMC said this non-vital MCC supplies loads within the intake structure. Electric fire pump control panel, C103, is next to the MCC on its west side. NMC indicated that the nearest Division II safe shutdown conduits on the west side of the main pump room floor are approximately 14 feet away while the nearest Division I safe shutdown conduit is about 5 feet southeast of the east end of the MCC. Sprinklers and thermal detectors are located near to the MCC and panel C103. NMC said the electric fire pump does not normally run because either the jockey pump or screen wash/fire pump maintains fire system pressure. NMC stated that a fire originating within either panel C103 or MCC 123/113 would be due to an electrical fault. Electrical circuit protection would interrupt the fault. NMC further explained that the automatic suppression system would contain a fire of significance in the unlikely event it developed and breached the panel or MCC confines. Screen wash/fire pump control panel C115 is installed between the electric fire pump control panel C103 (approx. 8.5 feet) and the Division II safe shutdown cables (approx. 5.5 feet horizontally). It is approximately 24 feet from the nearest Division I safe shutdown cable. The screen wash/fire pump may be running because it is used to remove debris from the traveling screens when the plant is operating. As with panel C103 and MCC 123/113, thermal detectors and sprinklers are located nearby. A fire that originated within Panel C115 would be due to an electrical fault, electrical circuit protection would interrupt the fault, and the automatic suppression system would contain the fire. For circulating water panel C101, NMC said it measures 5 feet by 2 feet by 7 feet and contains low-voltage instrumentation and wiring. The front face of the panel is solid except for annunciator windows, gauges,

- Cable trays YS4 and YB3 located in Fire Area IX/Fire Zone 23A will be individually covered with sheet metal on top and bottom from the electric fire pump control panel (C103) west to the end of the trays.

- The Division I cables associated with the RHR SW pump motor cooling water valves (SV-4937A and SV-4937C) will be re-routed within the Intake Structure Pump room to provide adequate separation from Division II RHR SW components and cables consistent with the exemption request.

NMC indicated in its letters that it would complete these commitments by the end of the next refueling outage after approval of the exemption request.

The NRC staff evaluated NMC's request for exemption considering the following:

- safe shutdown equipment affected
- type, amount, and location of the fixed combustible loading
- amount of the transient combustible loading
- nature of the intervening combustibles
- chemical hazards in the room
- automatic fire detection and automatic fire suppression in the area

The NRC staff reviewed the safe shutdown equipment discussion provided by NMC. NMC has committed to reroute the Division I cables associated with the RHR SW pump motor cooling water valves (SV-4937A and SV-4937C) within the intake structure pump room to provide adequate separation between redundant safe shutdown components and cables consistent with existing divisional wiring separation criteria (greater than 20 feet of separation) identified in the exemption request. Granting of this exemption for intervening combustibles does not relieve NMC of the necessity of addressing the Division I and Division II RHR SW pump motor cooling water valve circuits as "associated circuits."

The NRC staff evaluated the fixed liquid combustibles by considering the quantity and amount of lubricating oil, located in each pump reservoir. The quantities are typical for the pumps involved, and normally are contained within the reservoir. The lubricating oil used is usually of a very high flashpoint and very difficult to ignite. Drains serve to also limit the spread

of liquid combustibles. The solid fixed combustibles, consisting primarily of non-IEEE-383 rated cable insulation placed in cable trays, are used for low-voltage power and control functions. NMC committed to modify cable trays YS4 and YB3 to individually covered them with sheet metal on top and bottom from the electric fire pump control panel (C103) west to the end of the trays, which will further reduce the possibility of occurrence of a fire propagating so as to affect both trains. Overall, the fixed combustibles present a low fire load. The NRC staff evaluated the transient combustibles, which are administratively controlled to a quantity consisting of 2 gallons of general-purpose solvent and three fiberglass ladders. This amount presents a very small combustible load. Drains serve to also limit the spread of liquid combustibles. The NRC staff is satisfied that fixed and transient combustibles are minimal. The staff reviewed the intervening combustibles as part of the overall fixed combustibles review.

The NRC staff reviewed NMC's response to the RAI concerning hazardous chemicals within the pump room. NRC staff reviewed Material Safety Data Sheets for both sodium hypochlorite and sodium bromide, and concurs with NMC's assessment. Further, NMC has committed to eliminate PVC drain piping and the high-density polyethylene drum as intervening combustibles.

The automatic fire detection system has both Zone 23A-wide thermal detectors and hazard-specific ionization smoke detectors. This system meets or exceeds the fire protection requirements of Appendix R, Section III.G.2.b. The Zone 23A-wide automatic pre-action sprinkler system delivers a design density of at least 0.30 gallons per minute per square foot. This system meets or exceeds the fire protection requirements of Appendix R, Section III.G.2.b for the lubricating oil, cable trays, and transient combustible hazards present. In particular, the design water density is substantially greater than the minimum density called for by NFPA - 13,

"Standard for the Installation of Sprinklers," for the type and configuration of intervening combustibles.

In summary, the following attributes of Zone 23A support a basis for approval of the requested exemption:

- Greater than 20 feet of separation exists between redundant safe shutdown components and cables.
- Early-warning ionization detection, installed above the RHR SW and SW pumps, provides an alarm to the control room.
- Activation of the pre-action valve via the thermal detectors results in a "system actuated" signal to the control room.
- Transient combustibles and hot work in the area are administratively controlled.
- The fire load in the zone satisfies the criteria for a low fire load designation.

Based upon the above evaluation, the NRC staff concludes that the requested exemption for Fire Area IX/Fire Zone 23A, the intake structure pump room, provides reasonable assurance that one train of redundant safe shutdown equipment will remain free of fire damage. This is the equivalent of meeting the requirements of 10 CFR Part 50, Appendix R, Section III.G.2.b, since the underlying purpose of Section III.G.2.b is to assure that one train of redundant safe shutdown equipment will be maintained free of fire damage. Therefore, the NRC staff concludes that pursuant to 10 CFR 50.12(a)(2)(ii), special circumstances are present as application of the regulation in these particular circumstances is not necessary to achieve the underlying purpose of the rule. Consequently, NMC's exemption request is acceptable.

4.0 CONCLUSION Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12(a), the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. Also, special circumstances are

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