NMC
Committed to Nuclear Excellence

**Palisades Nuclear Plant**
Operated by Nuclear Management Company, LLC

October 6, 2003 10 CFR 50.55a

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

PALISADES NUCLEAR PLANT
DOCKET 50-255
LICENSE No. DPR-20
INSERVICE TESTING OF SAFETY RELATED PUMPS - REQUEST FOR RELIEF FROM CODE REQUIREMENTS FOR LOW PRESSURE SAFETY INJECTION PUMPS

Nuclear Management Company, LLC (NMC) requests relief from the requirements of the American Society of Mechanical Engineers (ASME) OM Code, "Code for Operation and Maintenance of Nuclear Power Plants," 1998 Edition, 2000 Addenda, Subsection ISTB, "Inservice Testing of Pumps In Light Water Reactor Nuclear Power Plants" (the Code), as they pertain to the categorization of the low pressure safety injection (LPSI) pumps for the Palisades Nuclear Plant.

As an alternative, in accordance with 10 CFR 50.55a(a)(3)(i), NMC requests approval to categorize the LPSI pumps as group B during mode 1, 2, and 3 operations and group A during mode 4, 5 and 6 operations. The proposed alternative and supporting basis are provided in the attached request. The proposed alternative provides an acceptable level of quality and safety. The duration this alternative would be in effect is for the remainder of the current inservice testing interval.

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In addition, in accordance with 10 CFR 50.55a(a)(3)(ii), NMC also requests to extend a previously approved relief request to an updated version of the Code. By letter dated October 12, 1995, the Nuclear Regulatory Commission (NRC) approved a relief request for pump vibration alert levels applicable to the ASME OM Code, 1987 Edition including the 1988 Addenda, Standards Part 6 (OM-6). As stated above, NMC has updated the LPSI pumps inservice test program to the 1998 Edition, including the 2000 Addenda, of the Code. NMC requests the extension of this relief request to the updated version. The requested extension and supporting basis are also provided in the attachment. The duration this alternative would be in effect is for the remainder of the current inservice testing interval.

NMC requests approval of this request by July 1, 2004, to facilitate the reduction of excessive testing of the LPSI pumps at low-flow conditions.

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

Daniel J. Malone
Site Vice President, Palisades Nuclear Plant

CC Regional Administrator, USNRC, Region III
Project Manager, Palisades Nuclear Plant, USNRC, NRR
NRC Resident Inspector – Palisades Nuclear Plant

Attachment

**ATTACHMENT 1**

**NUCLEAR MANAGEMENT COMPANY**
**PALISADES NUCLEAR PLANT**
**DOCKET 50-255**

**October 6, 2003**

# INSERVICE TESTING OF SAFETY RELATED PUMPS REQUEST FOR RELIEF FROM CODE REQUIREMENTS FOR LOW PRESSURE SAFETY INJECTION PUMPS

4 pages follow

**ATTACHMENT 1**
**PALISADES NUCLEAR PLANT**
**INSERVICE TESTING OF SAFETY RELATED PUMPS**
**REQUEST FOR RELIEF FROM CODE REQUIREMENTS FOR**
**LOW PRESSURE SAFETY INJECTION PUMPS**

## COMPONENT IDENTIFICATION

SYSTEM: Low Pressure Safety Injection (LPSI)
PUMP: Low Pressure Safety Injection Pumps (P-67A, P-67B)
CLASS: Class 2

The safety-related pumps listed above perform specific functions for shutdown cooling operations or mitigating the consequences of an accident as defined in the Palisades Nuclear Plant Final Safety Analysis Report (FSAR).

## CODE REQUIREMENT

Pumps shall be categorized and tested in accordance with the American Society of Mechanical Engineers (ASME) OM Code, "Code for Operation and Maintenance of Nuclear Power Plants," 1998 Edition, 2000 Addenda, Subsection ISTB, "Inservice Testing of Pumps In Light Water Reactor Nuclear Power Plants" (the Code), Subsection ISTB-1400, "Owner's Responsibility," and Subsection ISTB-2000, "Supplemental Definitions." Nuclear Management Company, LLC (NMC) has updated the LPSI pumps inservice test program for Palisades, in accordance with 10 CFR 50.55a(f)(3)(v), to this edition of the code.

## BASIS FOR RELIEF

### LPSI Pump Group Categorization

Paragraph ISTB-2000 of the Code defines group A pumps as "pumps that are operated continuously or routinely during normal operation, cold shutdown, or refueling operations," and group B pumps as "pumps in standby systems that are not operated routinely except for testing." Based on these definitions and Palisades' operating procedures, the high pressure safety Injection (HPSI), containment spray (CS), and auxiliary feedwater (AFW) pumps clearly meet the definition of group B pumps. However, the classification of the LPSI pumps is not as obvious. The LPSI pumps clearly meet the definition of group B pumps during normal operation in modes 1-3, where they are in standby and available to perform their safety related injection function. In modes 4-6, LPSI pumps are used continuously for shutdown cooling and appear to meet the definition of group A pumps. Shutdown cooling is typically put into service during mode 4 and there can be a brief period when the LPSI pumps are in standby, available for primary coolant system injection. Paragraph ISTB-1400(b), states, "a

pump that meets both group A and group B definitions shall be categorized as a group A pump." Therefore, the LPSI pumps are classified as group A.

The LPSI pumps are tested quarterly using flow circuits of limited capacity; no alternative flow paths exist for on-line testing. As a result, the LPSI pumps are tested at approximately four-percent of rated capacity. For centrifugal pumps of this size, vibrations are considerably higher at lower flow rates than at normal operating flow rates due to energy dissipation, internal recirculation, and cavitation effects. As a result, higher, yet consistent, vibration levels are measured during surveillance testing.

Results from LPSI pump comprehensive performance test conducted in March 2003 at normal operating flow rates indicate all vibration levels to be below the maximum alert limit specified in the Code. The pumps were determined to be mechanically sound and operating acceptably following the performance of this test. These higher flow tests confirm that reduced flow rate testing leads to higher vibration readings.

The Code does not recognize the detrimental effect of testing at low-flow conditions. Application of the Code rules for categorizing pumps would require these pumps to be categorized as group A and require quarterly vibration testing. Results from this testing could require the pumps to be placed on alert and tested at double the normal test frequency, or could require significant system redesign and modification. Pumps categorized as group B do not require quarterly vibration testing.

LPSI Pump Bearing Acceptance Criteria During Low-Flow Testing

Many of the normal vibration levels experienced when operating the LPSI pumps under low-flow conditions during quarterly testing routinely exceed or challenge the absolute alert acceptance criteria of 0.325 inches per second specified in Table ISTB-5200-1. This necessitates testing at six-week intervals.

Consumers Energy (the previous licensee for the Palisades Nuclear Plant) submitted a relief request, "Palisades Plant Inservice Testing of Safety Related Pumps – Request for Relief from Pump Vibration Alert Levels," dated September 18, 1995. This relief request provided detailed research conducted regarding the effects of low-flow operation on centrifugal pump vibration levels and included extensive spectral analysis of Palisades' LPSI pump performance vibration data from an extended time period under low-flow and substantial-flow conditions. The analysis confirmed the presence and effect of increased vibration levels at low-flow operation. In accordance with 10 CFR 50.55a(a)(3)(ii), this relief request established a new set of vibration alert acceptance criteria and a new set of relative action acceptance criteria for the specific LPSI pump bearings typically affected by this condition.

The vibration acceptance criteria contained in the Table ISTB-5200-1 also present difficulties should a group B test at low-flow conditions be necessary following LPSI

pump maintenance during normal operation in modes 1-3. Therefore, complying with the specified requirements of Table ISTB-5200-1 following maintenance presents the same hardship as categorizing the LPSI pumps as group A during modes 1-3, without resulting in an increase in the level of quality and safety.

The results of the analysis performed for the relief request granted by Nuclear Regulatory Commission (NRC) letter dated October 12, 1995, have not changed. However, this relief request is applicable to only the ASME OM Code, 1987 Edition including the 1988 Addenda, Standards Part 6 (OM-6) requirements. Therefore, NMC requests that during any required group B test of the LPSI pumps conducted at low-flow conditions performed under the 1998 Edition, including the 2000 Addenda of the OM Code, the conditions of this relief request will be applied.

Relationship to Palisades' Technical Specification Surveillance Requirements

Technical specification (TS) surveillance requirement SR 3.5.2.4 requires periodic testing of each pump to verify that the "developed head at the test flow point is greater than or equal to the required developed head." The specified frequency is, " in accordance with the Inservice Testing (IST) Program." Palisades' TS surveillance requirements do not contain any additional (explicit or implied) testing requirements for these pumps beyond those required by the IST Program. This means that, as long as the testing complies with the requirements of the approved IST Program, there is no conflict with Palisades' TS surveillance requirements. Therefore, none of the changes to the IST Program requested in this relief request would conflict with any Palisades' TS surveillance requirements.

## PROPOSED ALTERNATIVE TESTING

Palisades performs IST for the LPSI pumps in accordance with the requirements contained in the ASME OM Code, 1998 Edition, 2000 Addenda, Subsection ISTB. However, Palisades has proposed two alternatives to the Code requirements as described below.

1. LPSI Pump Group Classification

   Subsection ISTB-1400(b), requires that a pump that meets both group A and group B definitions be categorized as a group A pump. In accordance with 10 CFR 50.55a(a)(3)(i), NMC requests approval to categorize the LPSI pumps as group B during mode 1, 2, and 3 operations and group A during modes 4, 5 and 6 operations. The proposed alternative provides an acceptable level of quality and safety.

   As previously stated, LPSI pumps are typically run continuously during modes 4-6, depending on the decay heat rate. As a result, they may be subject

to operation-induced degradation in modes 4-6. Therefore, the LPSI pumps will be treated as group A pumps during any quarterly test that comes due during modes 4-6. Acceptable vibration performance is confirmed during group A pump testing.

2. LPSI Pump Bearing Acceptance Criteria During Low-Flow Testing

In accordance with 10 CFR 50.55a(a)(3)(ii), NMC requests that the relief request, which was previously approved for use with ASME OM Code, 1987 Edition including the 1988 Addenda of OM-6, be applicable to any low-flow LPSI pump post-maintenance testing under the 1998 Edition, including the 2000 Addenda, of the OM Code.

The proposed alternatives in this request are similar to those made by the Calvert Cliffs Nuclear Power Plant by letter dated January 4, 2002. The NRC staff approved the request by letter dated May 16, 2002.

## DURATION RELIEF IS REQUESTED

The duration these alternatives would be in effect is for the remainder of the third ten-year inservice testing interval, currently scheduled to end in the Fall of 2005.