

July 18, 2006

10 CFR 50.54(f)

U. S. Nuclear Regulatory Commission
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Palisades Nuclear Plant
Docket 50-255
License No. DPR-20

Nuclear Management Company Updated Response to Generic Letter 2004-02,
"Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis
Accidents at Pressurized-Water Reactors," for Palisades Nuclear Plant

By letter dated September 13, 2004, the Nuclear Regulatory Commission (NRC) issued Generic Letter (GL) 2004-02. By letter dated March 7, 2005, Nuclear Management Company, LLC (NMC) provided Part 1 of the required response.

In GL 2004-02, the NRC required that the Part 2 response be provided by September 1, 2005. NMC provided the Part 2 response to GL 2004-02 by letter dated August 25, 2005, for the Palisades Nuclear Plant (PNP). In that response, NMC made several references to pursuing an active strainer approach as a resolution path for GSI-191 at PNP.

Subsequent to this submittal, by letter dated May 12, 2006, NMC notified the NRC that PNP had suspended active strainer activities and was in the process of procuring a replacement passive strainer technology. In this letter NMC committed to provide an update to the August 25, 2005 GL response by July 20, 2006. Enclosure 1 contains the updated response for the PNP.

Summary of Commitments

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

Commitment made by letter dated August 25, 2005:

2. NMC will submit license amendment requests on the safety injection refueling water tank volume and on the replacement strainer surveillance requirements, no later than September 1, 2006, for the Palisades Nuclear Plant.

Revised commitment:

2. NMC will submit a license amendment request on the safety injection refueling water tank volume no later than September 1, 2006.

NMC plans to have the final design of the passive strainer complete by March 2007. As NMC completes the necessary 10 CFR 50.59 reviews, a determination will be made on the need for additional license amendment requests.

Commitment made by letter dated August 25, 2005:

5. NMC will provide an update to the generic letter response for Palisades Nuclear Plant, within 60 days of acceptance of the final screen design.

NMC is withdrawing this commitment due to the supplement to the GL that is required no later than December 31, 2007, as described by letter from NRC dated March 28, 2006.

I declare under penalty of perjury that the foregoing is true and correct. Executed on July 18, 2006.



Paul A. Harden
Site Vice President, Palisades Nuclear Plant
Nuclear Management Company, LLC

Enclosure (1)

CC Administrator, Region III, USNRC
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ENCLOSURE 1
UPDATE TO GENERIC LETTER 2004-02
PALISADES NUCLEAR PLANT

In the Part 2 response to Generic Letter 2004-02, NMC made several references to pursuing an active strainer approach as a resolution path for GSI-191 at Palisades Nuclear Plant (PNP). Subsequent to that submittal, by letter dated May 12, 2006, NMC notified the NRC that PNP had suspended active strainer activities and was in the process of procuring a replacement passive strainer technology.

In addition to the activities identified as complete in the original GL 2004-02 response, NMC has completed the following activities:

- NMC has contracted with Performance Contracting, Inc. (PCI) to provide their passive strainer design to resolve GSI-191 for PNP.
- During the 2006 refueling outage, NMC completed the containment latent debris sampling walkdown of the PNP containment. An engineering analysis (EA) was performed by Sargent and Lundy, which documents the results of the containment latent debris sampling walkdown. This EA confirms, based on 46 sample locations within containment, the latent debris quantity in containment is approximately 156 pounds. Therefore, the 200 pounds of latent debris quantity assumption previously used in the debris generation and transportation calculation was conservative.
- NMC responded to Information Notice 2005-26, "Results of Chemical Effects Head Loss Tests in a Simulated PWR Sump Pool Environment," by letters dated November 30, 2005, and December 23, 2005. On February 2, 2006, NMC met with the NRC to discuss the removal of the Tri-Sodium Phosphate (TSP) buffering agent from the PNP containment due to the adverse chemical effects associated with TSP. By letter dated March 20, 2006, NMC submitted the proposed license amendment request to remove the TSP from the PNP containment.

The following identifies the PNP plan for resolving GSI-191 utilizing passive strainers.

PASSIVE STRAINER

NMC is currently engaged in the detailed design of the replacement strainers with a passive, disk type strainer from PCI. The PCI strainer was preliminarily sized using the PNP-specific debris generation and transportation quantities, the PNP-specific ECCS required flows, NUREG/CR-6224, "Parametric Study of the Potential for BWR ECCS Strainer Blockage Due to LOCA Generated Debris," methodology, and the PCI existing performance parametric design curves. The sizing resulted in approximately 3500 square feet of screen surface, which represents the required surface area at the maximum ECCS recirculation flow rate of 3600 gpm. When fully loaded with the PNP predicted debris quantity, the screen head loss is predicted to be about 1.4 feet, using NUREG/CR-6224 methodology. PCI presently intends to use strainer material with 0.045-inch holes to fabricate the rectangular disk strainers, because of the potential adverse effects identified in the preliminary downstream analysis.

The new passive strainers would be located on the containment floor at the 590-foot elevation and would be floor mounted, external to the sump, with discharge pipes connected to two of the six sump down-comer pipes. These down-comer pipes provide flow passages from the containment ground floor, through the reactor pedestal, to the containment sump. The strainers would be designed to withstand post-LOCA conditions, including debris induced differential pressures. The design would be seismically qualified subsequent to the LOCA event.

NMC plans to have the final design of the passive strainer completed by March 2007, with installation planned during the Fall 2007 refueling outage.

TESTING/EVALUATIONS

The NUREG/CR-6224 NRC calculator is planned to be used by PCI for final screen sizing, and to predict head loss based on "worse case scenarios" of different PNP debris conditions. The methodology of WCAP-16530-NP, "Evaluation of Post-Accident Chemical Effects in Containment Sump Fluids to Support GSI-191," Revision 0, would be used to analyze post-accident precipitates, and to incorporate the precipitates into the plant-specific strainer tests. The PCI passive strainer testing would establish and demonstrate the design basis head loss across the strainers for the required thin bed and maximum debris loads. The resulting chemical precipitants from the buffer would be included in the upstream and downstream tests and associated evaluations.

NMC intends to use existing PCI test reports, as well as PNP-specific testing, to ensure the strainers bound the PNP design basis. PCI would provide a certified test report which summarizes that the results of the testing and analyses meet the requirements of the PNP passive strainer specification, and conform to the critical parameters of the design requirements of the PNP-specific strainer system.

NMC is actively working with PCI to ensure strainer qualification testing and reports bounds PNP design conditions. The planned key testing parameters being considered by PNP include: (1) characterization of the size and concentration of debris downstream of the PCI disk strainer, (2) the downstream debris concentration decay rates, (3) head loss across the strainer, (4) performance of the PCI disk strainer in the presence of chemical effects, and (5) assurance that the PCI disk strainer operation is not affected by signs, placards, lead blanket covers, etc. that might be transported to the containment sump.

NMC is participating with the PWROG efforts to determine the downstream chemical and debris effects on fuel clogging. Once the PWROG issues the report, NMC would evaluate the differences between the PWROG acceptance parameters and the PNP specific fuel assembly characteristics, if necessary.

OTHER MODIFICATIONS

PNP has performed an EA which shows an existing small net positive suction head (NPSH) margin for the containment spray system (CSS) pumps with the current sump screens and screen blockage design basis. The addition of the passive strainers would reduce the NPSH margin to the ECCS and CSS pumps. Therefore, NMC plans to throttle the CSS pump containment spray discharge flow to increase the available NPSH to the ECCS and CSS pumps. NMC has contracted with Control Components, Inc (CCI) to provide replacement containment spray isolation valves. These valves will provide throttling without compromising the fail-safe nature of these pneumatically operated valves. NMC is currently engaged in the design work for this modification and plans to have the final design of the containment spray isolation valves completed by December 2006, with installation planned during the Fall 2007 refueling outage. Following these changes, the available NPSH margin for the ECCS and CSS pumps with unblocked sump strainers is predicted to be at least 2.1 feet of water.

The flow paths downstream of the containment sump strainers were previously analyzed to determine the potential for blockage due to debris bypassing the strainers. Evaluations were performed on components in the recirculation flow paths downstream of the strainers including, but not limited to, throttle valves, flow orifices, spray nozzles, pumps, heat exchangers, and valves. The evaluations were performed based on the existing sump screen mesh size of 1/8-inch x 1/8-inch. This evaluation identified that modifications to the high pressure safety injection (HPSI) and CSS pumps wear rings and shaft bushings may be required to accommodate the bypass debris anticipated. These wear issues were identified using the very conservative assumption of a constant downstream debris concentration over mission time. These conservative analyses indicated the pumps may not support continuous operation for the required 30-day mission time.

PNP plans to re-evaluate the downstream analysis due to the change to passive disk type strainers which further reduces the potential adverse effects identified in the preliminary downstream analysis. It is also anticipated that using the WCAP-16406-P, draft Revision 1, including its debris concentration decay factors, may permit the existing pump design to fulfill its design basis mission times without modification. Regardless of the wear effects analysis results, the centrifugal separator in the HPSI pump seal cooling path may be subject to debris plugging. NMC plans to work with the pump vendor to resolve the issue, including removing the centrifugal separator or installing a bypass valve, if necessary.

To minimize the adverse effects of strainer bypass flow, the vents and drain paths to the containment sump would be modified. NMC plans to update the downstream analysis to reflect the actual mesh size used and the bypass fractions determined in the actual strainer tests. The approximately eight square feet of various other sump penetrations, such as down-comers, sump vents, and floor drains, are planned to be covered with perforated plates.

By letter dated March 20, 2006, NMC submitted a proposed license amendment request to remove TSP from the PNP containment due to the adverse chemical effects associated with the TSP. NMC plans to select a long term alternate buffering agent to resolve the adverse chemical effects associated with TSP. The PWROG has recently published WCAP-16596-P, "Evaluation of Alternate Emergency Core Cooling System Buffering Agents," draft Revision 0, which NMC is evaluating.

LICENSE AMENDMENTS

As previously committed, NMC will submit a license amendment request to implement an alternate buffer program after the Westinghouse Owners Group (WOG) Alternate Buffer Project is concluded. NMC will implement an alternate buffer program to achieve a pH of 7.0 – 8.0 post-LOCA with recirculation, during the 2007 fall refueling outage at PNP.

As previously committed, NMC will submit a license amendment request on the safety injection refueling water tank volume no later than September 1, 2006.