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Perry Nuclear Power Plant  
Docket Number 50-440  
License Number NPF-58

Subject: Reply to a Notice of Violation; EA-04-020

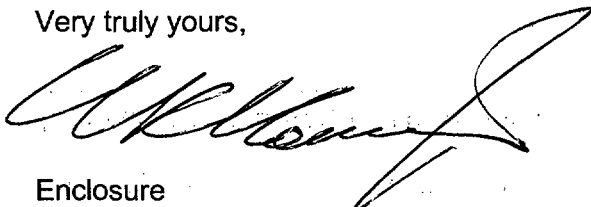
Ladies and Gentlemen:

Enclosed is the response to Notice of Violation, EA-04-020, issued to the Perry Nuclear Power Plant (PNPP) by the Nuclear Regulatory Commission on March 12, 2004. The details of the violation were documented in NRC Inspection Report Number 05000440/2003-010 issued on January 30, 2004. The violation was issued for failure to establish adequate written procedures to periodically vent the highest point on the discharge of the common low pressure core spray and residual heat removal 'A' water leg pump, in violation of Technical Specification 5.4. The violation is associated with a white significance determination process finding.

There are no regulatory commitments contained in this submittal. Any actions discussed in this document that represent intended or planned actions, are described for the NRC's information, and are not regulatory commitments.

If you have any questions or require additional information, please contact Mr. Vernon Higaki, Manager-Regulatory Affairs, at (440) 280-5294.

Very truly yours,



Enclosure

cc: NRC Region III Administrator  
NRC Senior Resident Inspector - PNPP  
NRR Project Manager - PNPP

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REPLY TO A NOTICE OF VIOLATION; EA-04-020

RESTATEMENT OF THE VIOLATION

Technical Specification 5.4 requires, in part, that procedures shall be established, implemented and maintained as recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Regulatory Guide 1.33, Appendix A, Section 4, "Procedure for Startup, Operation, and Shutdown of Safety Related BWR Systems," recommends the establishment of written procedures for venting of emergency core cooling systems.

Contrary to the above, as of August 14, 2003, the licensee had not established adequate written procedures to periodically vent the high point on the discharge of the common Low Pressure Core Spray (LPCS) and Residual Heat Removal (RHR) train 'A' water leg pump. Specifically, the licensee did not include Valve N27F786 in Procedures SVI-E21-T1181, "LPCS Venting and Valve Lineup Verification," Revision 4 or SVI-E12-T1182A, "RHR A LPCI Valve Lineup Verification and System Venting," Revision 2. As a result, gas accumulated in the vertical section of piping on the discharge of the water leg pump and, following a loss of offsite power on August 14, 2003, the accumulated gas expanded, air bound the water leg pump and rendered LPCS and RHR 'A' inoperable.

REASON FOR THE VIOLATION

A procedure content deficiency contributed to the failure of the common LPCS and RHR "A" water-leg pump due to air binding. Another effect of the water-leg pump air binding was the division 1 feedwater leakage control system (FWLCS) and the suppression pool cooling mode of RHR "A" were considered unavailable for a loss of offsite power event. The air binding of the water-leg pump is discussed in the root cause analysis report approved on October 8, 2003 for Condition Report (CR) 03-04764. The CR stated that inadequate venting procedures failed to remove entrapped air from two high point locations in the division 1 LPCS system and LPCS/RHR "A" water-leg pump piping including the FWLCS high point vent valve, 1N27-F786 and the LPCS/RHR "A" crossover piping, 1E21-F511. A review of historical system operating instructions for LPCS showed the FWLCS high point vent valve and the LPCS/RHR "A" crossover piping vent valve had not been included in the past filling and venting instructions.

Additional investigation of the cause of the air binding of the water-leg pump is in progress. Further correspondence will be submitted if there are substantive changes to the information provided to date.

CORRECTIVE STEPS THAT HAVE BEEN TAKEN AND THE RESULTS ACHIEVED

At 2145 hours on August 14, 2003, plant operators completed venting the LPCS/RHR "A" water-leg pump by opening the pump casing vent valve. Following venting, the LPCS/RHR "A" water-leg pump was started and developed normal discharge pressure. The LPCS and RHR "A" systems were then filled and vented. Since the low pressure alarms cleared and the venting was completed, the RHR "A" system was declared operable at 2002 hours on August 15, 2003. LPCS was subsequently declared operable at 0318 hours on August 16, 2003. It was not detected

at this time that air was still contained in FWLCS and that it would prevent the operation of the division 1 FWLCS and the suppression pool cooling mode of RHR "A" following loss of offsite power events.

Additional venting was performed on September 11, 2003, as part of the investigation of the air binding event. Following venting of the division 1 feedwater leakage control system piping and the LPCS/RHR "A" crossover piping, it was recognized that the FWLCS piping and the crossover piping had contained a significant volume of air. At the completion of these venting evolutions, the previously unidentified loss of function of the FWLCS and the suppression pool cooling mode of the RHR "A" train was restored.

The LPCS system operating instruction, SOI-E21, was revised (revision 11 effective September 12, 2003) to include 1N27-F786, 1E12-F511 and two additional valves to vent air from the suction of the LPCS/RHR "A" water-leg pump piping, the LPCS pump piping and the division 1 feedwater leakage control system piping.

Surveillance procedure, SVI-E21-T1181, "LPCS Venting and Valve Lineup Verification" was revised (revision 5 effective September 12, 2003) to provide instructions to vent any collected air from valve 1N27-F786 and valve 1E21-F511.

The LPCS system operating instruction was subsequently revised (revision 12 effective October 23, 2003) to provide explicit instructions for venting that included a required venting time of three to five minutes.

The LPCS surveillance was subsequently revised (revision 6 effective November 7, 2003) to provide explicit instructions for venting that included a required venting time of three to five minutes.

Periodic venting (weekly at first) was established to determine air accumulation rates in this piping. The period of time between venting was gradually increased based on identified air accumulation rates. Although air has been noted during venting evolutions, an air volume sufficient to impact operability has not been observed. The venting is now performed monthly in accordance with the surveillance interval.

#### CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FURTHER VIOLATIONS

No prior site corrective actions exist for similar issues, but industry wide operational experience indicates air binding of pumps in general is an issue. To that end, an extent of condition evaluation was performed that included pumps at the Perry Nuclear Power Plant, which perform a keep fill function and utilize a minimum flow restriction orifice to maintain a required backpressure. The review determined this issue (generation of air in LPCS/RHR "A" water-leg pump) is not present in the other emergency core cooling and reactor core isolation cooling water-leg pumps or the fire jockey pump. This is based on evaluations of the piping configuration differences, flow calculations through the associated minimum flow orifices and venting to determine that the piping is water solid. Additionally, ultrasonic measurement testing was performed utilizing a Shear Wave instrument to verify accessible portions of the division 1 and 2 FWLCS piping were filled with water. Although this review determined that venting instructions on these systems were adequate, the system operating instruction for RHR, SOI-E12, was revised (revision 15 effective October 23, 2003) to include 1E12-F616B, the RHR B/C water-leg pump suction orifice instrument valve, in the RHR B/C venting instructions.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

The RHR "A" system, with the exception of the suppression pool cooling mode, was restored at 2002 hours on August 15, 2003. LPCS was operable at 0318 hours on August 16, 2003. FWLCS and RHR "A" suppression pool cooling mode were restored September 11, 2003, following venting of the division 1 feedwater leakage control system piping and the LPCS/RHR "A" crossover piping. The revised procedures, SOI-E21 and SVI-E21-T1181, were made effective September 12, 2003. A subsequent revision, SOI-E21 revision 12 and SVI-E21-T1181 revision 6, provided instructions to vent for 3 to 5 minutes. The system operating instruction for RHR, SOI-E12, was revised (revision 15 effective October 23, 2003).

All required procedure changes are complete and current venting procedures are considered adequate.