FENOC

FirstEnergy Nuclear Operating Company

Perry Nuclear Power Plant
10 Center Road
P.O. Box 97
Perry, Ohio 44081

December 19, 2008
L-08-383

10 CFR 50.54(f)

ATTN: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT:
Perry Nuclear Power Plant
Docket No. 50-440, License No. NPF-58
Supplemental Information Regarding NRC Generic Letter 2008-01 (TAC No. MD7862)

By letter dated October 14, 2008 (L-08-315), FirstEnergy Nuclear Operating Company (FENOC) committed to supplement the Perry Nuclear Power Plant (PNPP) response to Generic Letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems." This supplement provides a summary of the evaluations of in-field verifications completed as of December 19, 2008.

These evaluations did not change the conclusion in the letter dated October 14, 2008, that the subject systems/functions at PNPP are capable of performing their intended safety function, and that for PNPP, FENOC is currently in or will be in compliance with 10 CFR 50 Appendix B, Criteria III, V, XI, XVI and XVII, with respect to the concerns outlined in GL 2008-01. As detailed therein, a number of enhancements related to this subject have been identified and are being tracked for completion.

There are no new regulatory commitments contained in this submittal. If there are any questions or if additional information is required, please contact Mr. Thomas A. Lentz, Manager - Fleet Licensing, at (330) 761-6071.

I declare under penalty of perjury that the foregoing is true and correct. Executed on December 19, 2008.

Sincerely,

Kurt L. Krueger
Director, Site Operations Department

Attachment: Summary of PNPP GL 2008-01 Inspection Results as of December 19, 2008

cc: NRC Region III Administrator
NRC Resident Inspector
NRC Project Manager

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NRR

Summary of PNPP GL 2008-01 Inspection Results as of December 19, 2008

Supplemental information was committed to be provided by December 19, 2008, in response to Generic Letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems" for the Perry Nuclear Power Plant (PNPP). The following information is provided:

- A summary of the evaluation results of the in-field verifications performed on the currently accessible piping sections, and
- A description of any additional corrective actions determined necessary to ensure compliance with the quality assurance criteria in Sections III, V, XI, XVI, and XVII of Appendix B to 10 CFR Part 50 and the licensing basis and operating license with respect to the subject systems, and
- The schedule for the additional corrective action that is not yet complete, and the basis for that schedule

As previously committed in responses to GL 2008-01, additional in-field verifications will be completed on piping sections located inside containment prior to restart from the next refueling outage, and a summary of those evaluations will be submitted to the NRC within 90 days after startup from that outage.

Scope of the Completed In-Field Verifications

In the nine-month PNPP response to GL 2008-01, it was noted that portions of the following systems would receive in-field verifications:

- High Pressure Core Spray (HPCS) system
- Low Pressure Core Spray (LPCS) system
- Residual Heat Removal (RHR) system (for the following modes of operation: Low Pressure Coolant Injection (LPCI) subsystems A, B, and C, Suppression Pool Cooling, Shutdown Cooling, and Containment Spray)

Additional detail on which portions of the above systems are being in-field verified is contained in the response dated October 14, 2008. The portions of piping verified to date were located in the Auxiliary Building, outside containment.

As noted in the letter dated October 14, 2008, some buried piping does exist on a portion of the High Pressure Core Spray (HPCS) suction piping connection and the Test Return Line to the Condensate Storage Tank (CST). Pipe slope measurements cannot be obtained on these segments, however, the evaluation determined that gas accumulation in these lines is not a concern because:

- for the suction line, As-Built drawings show the buried portions to be either horizontal or sloped at a 45 degree angle in the direction where excess gas would tend to migrate back up to the CST suction line penetration, which is 8 feet above the highest buried horizontal portion of the suction line, and
- for the Test Return Line to the CST, this portion of piping is isolated from the HPCS system injection flow path (this line's function is for pump testing).

In-field verification of system piping was performed by laser scanning. The radiological source term associated with the Perry Nuclear Power Plant (PNPP) Emergency Core Cooling Systems (ECCS) is substantial. To minimize the radiological dose associated with this project, the subject piping was initially scanned with insulation in place. The insulation is metal jacketed fiberglass. To get a comparison between slope data obtained from piping with insulation on and piping without insulation, limited sections of piping were selected to be scanned with the insulation removed. The subsequent scans were completed for pipe slope comparative purposes. Insulation was removed from approximately:

- 9 linear feet of 12 inch diameter piping on the Low Pressure Core Spray system
- 93 linear feet of 18 inch diameter piping on RHR B
- 32 linear feet of 24 inch diameter piping on RHR C

Comparison of the scan data determined that piping elevation measurements obtained with the insulation on and the insulation removed are within the uncertainty of the scan measurement (±0.25 inches). This data validates the assumption that the pipe slopes obtained with the insulation in place is representative of the actual pipe slopes.

A. EVALUATION RESULTS

A Slope Report was generated by Construction Systems Associates (CSA) from data obtained during the laser scanning of the subject piping inside the Auxiliary building. Piping runs were segmented based on plant isometric drawings. The segments were typically about 5 feet (60 inches). The Slope Report was used to assess the potential for accumulating a gas void by:

1. Using the computed slope of the horizontal lines. Typically horizontal pipe runs with a slope greater than 1 degree were evaluated to determine whether the slope resulted in a local high point. If a local high point resulted due to the pipe slope, the volume of gas that could accumulate was determined.

2. Using the centerline elevation of each node, the cumulative change in elevation for each group of nodes over one or more horizontal runs was determined. If a configuration results in a significant (greater than 2 inches) elevation drop over a horizontal run, the potential impact of a void on the system was evaluated. Based on the elevation differences, the potential volume of gas that may accumulate following draining of the system and a subsequent fill and vent was computed.

Slopes determined from the laser scans were generally aligned with the isometric drawing information, typically measured to be within ±1 degree of the isometric values. Some slopes differed from the isometrics by 2 degrees or more. These locations were scrutinized to assess their impact on potential accumulation of gas.

Engineering evaluation of the Slope Report determined that the majority of the piping scanned had no significant slopes or potential pockets where gas could accumulate. However, evaluation of the laser scan data identified certain sections of piping that

could potentially contain a void (gas pocket). The majority of these potential voids were small (volume less than 0.1 cubic feet). Potential voids less than 0.1 cubic feet on large bore piping (diameter greater than 4 inches) are categorized as insignificant, and no further evaluation was performed. Small bore piping with elevation differences greater than the inside diameter were evaluated for the potential impact of a gas pocket on the system. Potential voids possibly greater than 0.1 cubic feet were evaluated for acceptability.

Potentially vulnerable pipe sections were verified to be acceptable by:

- Evaluations that verified estimated volumes of potential voids were acceptable

  Evaluations were performed for potential suction side void locations, which determined they were less than the transient void fraction acceptance criteria of 10 percent during any five second period discussed in the letter dated October 14, 2008. Evaluations were also performed for several of the potential voids on the discharge side showing that they were smaller than the 1.0 cubic foot acceptance criteria discussed in the letter dated October 14, 2008.

- Evaluations that verified sufficient flow to sweep any voids from the pipe run

  During system operation, given sufficient flow velocity, gas that has accumulated will flow through horizontal lines to the next vertical pipe run. Gas would also flow up a vertical run during system operation to the next local high point. Evaluations using Froude numbers determined whether sufficient flows are available to drive gas down vertical runs. If flows are not sufficient to drive a gas void down a vertical run, the adjoining horizontal run may require a high point vent. No locations were identified from the laser scan data that require new vent valves.

B. ADDITIONAL NECESSARY CORRECTIVE ACTIONS, SCHEDULE, AND BASIS

One new corrective action (CA 08-50368-01) was created, with a scheduled completion date of February 20, 2009. The portion of this action that is considered necessary (other enhancements are included within the CA) is the addition of a dynamic flush of the RHR B heat exchanger lines during initial system fill and vents, by revising the RHR B System Operating Instruction to extend the current two minute duration of the RHR B pump run and align the resultant flow during the extended run to pass through the RHR B heat exchangers, to flush out potential voids in their vicinity. During the current operating cycle, this piping has been flushed, which would have flushed gas from these locations. For example, the RHR B subsystem was recently run with flow through the heat exchangers on September 11, 2008 in support of a quarterly surveillance test.