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Constellation Energy Group

Nine Mile Point
Nuclear Station

June 23, 2003
NMP1L 1741

United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Subject: Nine Mile Point Unit 1
Docket No. 50-220
License No. DPR-63

Reply to a Notice of Violation – NRC Inspection Report 50-220/03-003

References: (a) Letter from Mr. Wayne D. Lanning (NRC) to Mr. John T. Conway dated April 12, 2003, Nine Mile Point Nuclear Station – NRC Special Inspection Report 50-220/03-003 – Preliminary White Finding

(b) Letter from Mr. Hubert J. Miller (NRC) to Mr. John T. Conway dated May 23, 2003, Nine Mile Point Nuclear Station – NRC Special Inspection Report 50-220/03-003 – Final Significance Determination for a White Finding and Notice of Violation

Gentlemen:

This letter provides Nine Mile Point Nuclear Station's response to References (a) and (b), which identified a Notice of Violation associated with a white finding. This Notice of Violation involved the long-term degradation of the Reactor Building Closed Loop Cooling System. The response to this Notice of Violation is provided in Attachment 1.

Should you have questions regarding this matter, we will be pleased to discuss them with you.

Very truly yours,

John T. Conway
Vice President, Nine Mile Point
Nuclear Station, LLC

JTC/KLE/
Attachment

cc: Mr. H. J. Miller, NRC Regional Administrator, Region I
Mr. G. K. Hunegs, NRC Senior Resident Inspector

IE01

Attachment 1
NRC REGION I INSPECTION REPORT NO. 50-220/03-003
RESPONSE TO VIOLATION 03-003-01

Title 10 to CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requires, in part, that measures shall be established to assure that conditions adverse to quality are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition.

Contrary to the above, when significant conditions adverse to quality occurred involving degraded reactor building closed loop cooling (RBCLC) system piping, the licensee did not determine the cause of the condition and failed to take appropriate corrective actions to preclude repetition. Specifically, the cause of substantial leaks in the Unit 1 RBCLC system on December 5, 2002, and on May 15, 2002, and numerous leaks prior to May 2002, was not determined, and as a result, corrective actions that were implemented at those times were not effective in precluding repetitive leaks. It was not until another substantial leak occurred on December 12, 2002, that the licensee determined the cause of this significant condition adverse to quality to be notable and widespread wall thinning attributed to a combination of general corrosion, flow-assisted corrosion, and galvanic corrosion, and implemented appropriate corrective actions to preclude repetition.

REASON FOR THE VIOLATION

The causes of the degraded Reactor Building Closed Loop Cooling (RBCLC) piping were inadequate system design, and inadequate corrective actions. The inadequate system design, use of schedule 40 piping with threaded connections, coupled with general corrosion, unintended galvanic cells, and flow assisted corrosion, led to leaks in the system.

In May 2002, Unit 1 was shutdown for a planned outage, to repair leakage in the RBCLC system. Two piping components (flow switches) were replaced and other leaks at threaded connections were seal welded. The cause of the leakage was presumed to be leakage past the threaded connection. Analysis performed on the leaking flow switch after the unit was restarted determined there had been through-wall leakage due to galvanic corrosion. This evaluation was completed in August 2002.

Upon startup from the May 2002 planned outage, additional drywell leakage was observed and confirmed to be from RBCLC. The leakage was monitored throughout the summer and fall of 2002. In December, 2002 a step change in leakage was detected. Upon reviewing the step change, the vendor analysis of the failed flow switch was re-reviewed by the System Engineer and at this time communicated to Senior Station Management. Upon learning of the information, Senior Station Management directed that a plant shutdown be initiated. The reason for failing to determine the cause of the condition in May 2002 was an insufficient casual analysis of the May 2002 leak and the failure to promptly follow-up on the results of the vendor analysis when received.

The leak that was discovered on December 5, 2002, was through the #11 Drywell Equipment Drain sump cooler lower return line where the carbon steel pipe threaded into a bronze check valve. The leakage was attributed to galvanic corrosion at threaded connections that

contained dissimilar metals. This was supported by the failure analysis report for the leaking flow switch from the May 2002 planned shutdown.

Based on this cause determination, a significant extent of condition review and engineering evaluation was completed, centered on threaded connections with dissimilar metals. During the extent of condition evaluation, wall thinning due to general corrosion was identified. However, no wall thinning was discovered remote from dissimilar metal fittings that exceeded calculated allowable limits.

During the December 12, 2002 start up attempt, additional RBCLC leakage was identified at the #11 drywell cooler outlet threaded connection. Upon investigation, the leakage was identified as through wall at a carbon to carbon threaded connection. Although the leak was through a pinhole, the structural integrity of nearby connections was degraded by general wall thinning. The reason for failing to determine the proper cause of the December 5, 2002 leak was that the impact of this wall thinning on threaded piping connections was not adequately evaluated. Specifically, the piping was evaluated as adequate assuming straight threads whereas the actual pipe construction incorporated a tapered thread design.

CORRECTIVE ACTIONS THAT HAVE BEEN TAKEN AND RESULTS ACHIEVED

The following event specific actions have been taken to address the RBCLC degraded condition and preclude recurrence:

(1) Prior to start up from the December 12 shutdown, the RBCLC system within the drywell met either design criteria or the operability criteria of Generic Letter 91-18. This resulted in replacing approximately 85 percent of the schedule 40 threaded connections in the Drywell with predominantly schedule 80 pipe welded connections. Included were piping and connections for the Drywell Area Coolers, Equipment Drain Coolers and Recirculation Pump Seal Cooler Piping.

(2) Modified operating procedures to include monitoring and mitigation strategies to ensure early detection of and to minimize the impact of future RBCLC system leakage.

(3) Replaced extensive portions of RBCLC piping outside the drywell during Refueling Outage (RFO) 17. Included were supplies to HPCI components, Instrument Air Compressors, Reactor Water Cleanup system and Control Room Emergency Vent chillers. Approximately 1400 feet of piping was replaced and 96 threaded bronze valves were replaced with welded carbon steel valves.

(4) Implemented an ultrasonic testing regimen to monitor the corrosion rate of selected RBCLC piping outside the drywell.

(5) Ultrasonic Test results of RBCLC piping outside of the drywell during the December 2002 outage were validated with actual physical measurements taken after the removal of associated piping in RFO 17.

(6) Developed a plan to continue selected piping replacements through Operating Cycle 16 and RFO18. Included are Radwaste loads, miscellaneous vent drain

and instrument lines, Shutdown Cooling and the Recirculation Pump Motor coolers.

Inside the drywell, most of the schedule 40 RBCLC piping with threaded connections has been replaced with schedule 80 piping with predominantly welded connections. The piping that was not replaced was examined by ultrasonic testing and determined to meet design basis criteria. Additionally the large bore piping in the drywell was examined and determined to be design compliant. Therefore, RBCLC piping in the drywell meets the design criteria. Outside the drywell, the RBCLC piping either meets design criteria or GL 91-18 criteria.

The following actions have been taken to address weaknesses in cause determinations:

(1) Senior Management implemented compensatory measures to communicate and reinforce expected behaviors related to implementation of the corrective action program such as capturing actions going forward relating to cause determinations.

(2) Established a group of qualified Significant Issues Team leaders who are knowledgeable in causal analyses and proper investigation techniques.

(3) Communicated to the System Engineering staff the expectation that Kepner Tregoe problem solving techniques be used for component failure analysis.

CORRECTIVE STEPS THAT WILL BE TAKEN TO AVOID FURTHER VIOLATIONS

(1) Replace additional RBCLC piping identified by Engineering during cycle 16 and RFO 18. At the completion of this effort, RBCLC piping less than three inches in diameter will be predominantly schedule 80 welded piping versus schedule 40 throughout. The piping replacement is prioritized based on importance to plant operation, system availability during outage periods and system availability online.

(2) Clarify and reinforce through training, the procedural requirements and expectations for preliminary dispositions. During outages, additional engineering management oversight will be provided over the use of preliminary dispositions

(3) Install a side stream demineralizer in the RBCLC system to improve system chemistry.

(4) Implement oxygen injection as a temporary change to use as a diagnostic tool in the RBCLC system to locate any remaining areas of high general corrosion.

(5) Establish a small bore / low pressure piping health monitoring program

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

The RBCLC system was restored to either meet design criteria or Generic Letter 91-18 criteria prior to startup from the December 12, 2002 shutdown. With the completed hardware modifications and actions to improve cause determinations NMP1 is in compliance. Modifications to RBCLC outside containment will be completed by the end of RFO 18.