



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 9, 2009

Mr. Rick A. Muench
President and Chief Executive Officer
Wolf Creek Nuclear Operating Corporation
Post Office Box 411
Burlington, KS 66839

SUBJECT: WOLF CREEK GENERATING STATION - REQUEST FOR ADDITIONAL INFORMATION RELATED TO RESPONSE TO GENERIC LETTER 2008-01, "MANAGING GAS ACCUMULATION IN EMERGENCY CORE COOLING, DECAY HEAT REMOVAL, AND CONTAINMENT SPRAY SYSTEMS" (TAC NO. MD7896)

Dear Mr. Muench:

By letter dated October 10, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML082950487), Wolf Creek Nuclear Operating Corporation (WCNOC) provided a response to Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," for Wolf Creek Generating Station.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the information provided in letter dated October 10, 2008, and determined that additional information is needed in order to complete the review. A draft copy of the request for additional information was forwarded to Ms. Diane Hooper on June 18, 2009. WCNOC did not request further discussion to clarify the request for additional information and agreed to provide a response within 45 days of the date of this letter.

If you have any questions, please contact me at 301-415-3016.

Sincerely,

A handwritten signature in black ink that reads "James R. Hall for".

Balwant K. Singal, Senior Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-482

Enclosure:
Request for Additional Information

cc w/encl: Distribution via Listserv

REQUEST FOR ADDITIONAL INFORMATION
RESPONSE TO GENERIC LETTER 2008-01, "MANAGING GAS
ACCUMULATION IN EMERGENCY CORE COOLING, DECAY HEAT
REMOVAL, AND CONTAINMENT SPRAY SYSTEMS"
WOLF CREEK NUCLEAR OPERATING CORPORATION
DOCKET NO. 50-482

By letter dated October 10, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML082950487), Wolf Creek Nuclear Operating Corporation (WCNOC) provided a response to Generic Letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," for Wolf Creek Generating Station (WCGS).

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the information provided in letter dated October 10, 2008, and determined that the following additional information is needed in order to complete the review.

Guidance on NRC staff expectations is provided in the NRC letter dated May 28, 2009 (Reference 1). As clarified in Nuclear Energy Institute (NEI) communications, this guidance is generally consistent with NEI guidance provided previously to industry in its letter dated March 20, 2008 (Reference 2). The NRC staff recommends that the licensee provides its response to the Request for Additional Information using the guidance provided by Reference 1.

Potential Gas Intrusion Mechanisms (Section A.2.10 of Submittal dated October 10, 2008)

1. The WCNOC response to GL 2008-01 (Reference 3) stated that the safety injection (SI) accumulator level is monitored from the plant computer and a pre-determined level change causes an email alert to the system engineer. Please provide the follow-up actions the system engineer will perform if a pre-determined level change occurs in a SI accumulator and identify the process that ensures the actions.
2. WCNOC did not address the potential for gas to come out of solution as it passes through the containment emergency sump screens where it may collect and then pass into the pipes leading to the pumps. Please provide analysis that supports resolution of this issue.
3. It is not apparent from the WCNOC response that actions are encompassed suitably in procedures so that an acceptable response will be obtained if a decreasing accumulator level is observed. Please clarify this item.

Enclosure

Gas Volume Acceptance Criteria Versus Location (Section A.2.2 of Submittal dated October 10, 2008)

4. WCNOC stated that the current design acceptance criterion for the subject systems is "full," by which it means water-solid. It further considers that gas volume at high points is an expected condition following a system draindown and refill. Therefore, it uses void criteria that are based on a void fraction at the pump inlet of less than 2 percent even for short-term transients. If these criteria are met, then a degraded but operable condition is assumed until corrective actions that are tracked in the Corrective Action Plan (CAP) can be completed to remove the gas. With the exception of identification of a 0.25 cubic foot discharge pipe criterion that it considers unlikely to cause water hammer, the criteria and associated gas transport methodology for meeting the 2 percent criterion are not identified. Please provide the pipe/component acceptance criteria and associated gas transport methodology for meeting the pump inlet 2 percent criterion.

Pump Acceptance Criteria (Section A.2.11 of Submittal dated October 10, 2008)

5. WCNOC is silent regarding the NRC staff Reference 4 criterion for pump response to gas of 1 percent. Please provide reference to a plant-specific document for updating WCGS's criteria, if needed, with respect to the NRC staff's Reference 4 criteria. If unavailable, please provide plans and schedules for completing the analysis.
6. Please provide a rationale for the inconsistency between the WCGS pump inlet void criterion and the NRC staff's criterion for steady-state void fraction if the efficiency ratio is outside 40 or 120 percent.
7. Long-term industry tasks were identified that will provide additional tools to address GL 2008-01 with respect to pump gas-void ingestion tolerance limits. Please provide reference to a plant-specific document that describes your plan for addressing information that is obtained from long-term industry tasks.

Walkdown Acceptance Criteria and Completed Walkdown Results (Section A.2.6 of Submittal dated October 10, 2008)

8. The NRC staff considers the following criteria to be acceptable for obtaining dimensional data for the subject systems:
 - Straight 10 feet or longer piping run.
 - Piping run that has a vent.
 - Horizontal run that has a reducer, reducing tee, valve, or line size change on the same elevation.
 - 10 feet or longer run made up of segments connected by elbows or fittings.

- For any run with a tee, such that if the tee run segment lengths are added to the pipe length, the total is over 10 feet.
- Pipe 4 inches or greater nominal pipe size of any length.
- Pipe or tubing that provides cooling to subject system components.
- Pipe or tubing that is associated with instrumentation if a gas/liquid combination can occur in piping or tubing that is supposed to contain a single phase so that the instrumentation indication is significantly affected.
- The section of any vertical pipe 1 inch or greater nominal pipe size that is located below a valve that may be closed when in operation so that gas can be trapped below the valve.

The WCGS walkdown acceptance criteria differ from the NRC staff's criteria. Please discuss and justify the effect of the differences.

9. The laser metrology selection criteria focuses on horizontal piping and do not address sloped or vertical configurations. Please address this focus with respect to the NRC staff's criteria that cover sloped and vertical components as well.
10. Some pipe and component sections may have insulation in place. WCNOG did not describe how these items were dimensionally assessed. Describe the dimensional assessment of pipes and component sections that have insulation in place.
11. A 10-foot length of 6-inch diameter pipe could contain 0.5 cubic feet of gas if full at one end and empty at the other due to being sloped. This is inconsistent with the 0.25 cubic feet acceptance criterion that WCNOG previously stated it would apply to voids. The NRC staff uses a criterion of 4-inch diameter that avoids this discrepancy. Please discuss and provide a resolution.
12. Containment Spray (CS) system discharge piping segments were not considered for walkdowns because they are not required to be filled with water prior to system actuation. The CS header and nozzles are stated to be designed to withstand the impulse of a water hammer at the commencement of flow. However, WCNOG did not address potential low elevations in the piping where a water slug could collect with a potential for water hammer. Evaluate the potential for water to collect and cause a water hammer in low points in CS system discharge piping or establish that such low points do not exist.

Incomplete Items and Completion Schedule (Section A.2.6 of Submittal dated October 10, 2008)

13. Following vent installations, the potential cumulative unventable gas void volumes created by slopes in horizontal pipes is stated to be less than 3 cubic feet for systems discharge piping, and less than 0.5 cubic feet for suction piping. These values are

inconsistent with the 0.25 cubic feet criterion. Please address and resolve these differences.

Surveillance Procedures (Section A.2.2 of Submittal dated October 10, 2008)

14. Please address accessibility criteria based on potential radiological dose and potential heat stress hazard. Please contrast this with the need for surveillances to ensure subject system operability since coverage appears to be limited to accessible locations. Please include a definition of "accessible locations" and associated criteria. Please discuss how system operability is assured for inaccessible locations.

Training

15. Training was not identified in the GL but is considered to be a necessary part of applying procedures and other activities when addressing the issues identified in the GL. This was identified in the NEI template (Reference 2) as an item that should be addressed in the GL responses and was discussed in the NEI workshop (Reference 5). This is not addressed in the WCNOC response. Please provide a brief description of planned training and its schedule.

REFERENCES

1. William H. Ruland, U.S. Nuclear Regulatory Commission, to James H. Riley, Nuclear Energy Institute, "Preliminary Assessment of Responses to Generic Letter 2008-01, 'Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems,' and Future NRC Staff Review Plans," dated May 28, 2009 (ADAMS Accession No. ML091390637).
2. Nuclear Energy Institute (NEI), "Generic Letter (GL) 2008-01, 'Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Contain Spray Systems' Evaluation and 3 Month Response Template," Letter to Administrative Points of Contact from Director, Engineering, Nuclear Generation Division, NEI, Enclosure 2, "Generic Letter 2008-01 Response Guidance," dated March 20, 2008.
3. Terry J. Garrett, Wolf Creek Nuclear Operating Corporation, to U.S. Nuclear Regulatory Commission, "Docket No. 50-482: Nine-Month Response to NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," dated October 10, 2008 (ADAMS Accession No. ML082950487).
4. Warren C. Lyon, U.S. Nuclear Regulatory Commission, "Revision 2 to NRC Staff Criteria for Gas Movement in Suction Lines and Pump Response to Gas," dated March 26, 2009 (ADAMS Accession No. ML090900136).
5. Nuclear Energy Institute, "System Gas Accumulation Management Workshop," Laguna Cliffs Spa & Resort, Dana Point, CA, February 11-12, 2009.

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/RA by James R. Hall for/

Balwant K. Singal, Senior Project Manager
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ADAMS Accession No. ML091740391

* Memo dated 6/17/2009

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