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RS-09-173

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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

Clinton Power Station, Unit 1
Facility Operating License No. NPF-62
NRC Docket No. 50-461

Subject: Response to Request for Additional Information Regarding Generic Letter 2008-01

References:

1. NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," dated January 11, 2008
2. Letter from K. R. Jury (Exelon Generation Company, LLC/AmerGen Energy Company, LLC) to U.S. NRC, "Nine-Month Response to Generic Letter 2008-01," dated October 14, 2008
3. Letter from C. S. Goodwin (U.S. NRC) to C. G. Pardee (Exelon Generation Company, LLC), "Clinton Power Station, Unit No. 1 – Request for Additional Information Related to Generic Letter 2008-01, 'Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems' (TAC No. MD7811)," dated November 4, 2009

The NRC issued Generic Letter (GL) 2008-01 (i.e., Reference 1) to request that each licensee evaluate the licensing basis, design, testing, and corrective action programs for the Emergency Core Cooling, Decay Heat Removal, and Containment Spray systems, to ensure that gas accumulation is maintained less than the amount that challenges operability of these systems, and that appropriate action is taken when conditions adverse to quality are identified.

Reference 2 provided the required response to NRC GL 2008-01 for Clinton Power Station. In Reference 3, the NRC requested additional information that is required to complete the review. In response to this request, Exelon Generation Company, LLC is providing the attached information.

There are no regulatory commitments contained in this letter. Should you have any questions concerning this letter, please contact Mr. Kenneth M. Nicely at (630) 657-2803.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 15th day of December 2009.

Respectfully,

Patrick R. Simpson
Manager – Licensing

Attachment: Response to Request for Additional Information

cc: NRC Regional Administrator – Region III
NRC Senior Resident Inspector – Clinton Power Station

ATTACHMENT
Response to Request for Additional Information

NRC Request 1

In Reference 4, the licensee states that "the impact of the voids on system operability is evaluated on a case-by-case basis, with acceptable void volumes being determined as part of the evaluation." Please provide a description of your void volume determination methods and how said voids will be quantified and recorded. Compare your method against the criteria stated in Reference 5.

Response

The phrase "filled with water" is defined as absent of any gas voids that would adversely affect the systems from meeting their design requirements. Exelon Generation Company, LLC (EGC) also uses this definition to define the phrases "sufficiently full" and "acceptable void volumes." Consistent with the NRC position documented in Reference 1, when voids are discovered in piping, EGC determines through an operability determination whether there is a reasonable expectation that the system in question will perform its specified safety function. Therefore, upon discovery of voids in piping, when there is a reasonable expectation that the system in question will perform its specified safety function, EGC considers the piping "filled with water" and in compliance with the associated Technical Specifications Surveillance Requirements. Void volumes in piping systems are typically determined using ultrasonic testing (UT) techniques. Also, Issue Reports (IRs) are initiated in the Corrective Action Program (CAP) if gas intrusion/accumulation issues are identified.

EGC has actively participated in the Nuclear Energy Institute (NEI) Gas Accumulation Team, and the respective pressurized water reactor and boiling water reactor owners' groups, activities focused on developing suitable guidance for licensees in the evaluation of voids in the piping systems. These groups have engaged recognized industry experts and Nuclear Steam Supply System vendors to determine the most appropriate criteria applicable to current reactor designs. The assessment of voids on the suction side, through the pump, on the discharge, and the effects on downstream piping and the reactor has been considered. The criteria are documented in eight separate reports generated to support this effort, all of which have been made available to the NRC.

Reference 2 was submitted to the NRC to summarize and focus these separate industry efforts. The enclosure to Reference 2 references these industry documents and provides insight on their application to evaluation of operability. This industry guidance is being used by EGC until such time that the NRC criteria can be formally issued and evaluated.

NRC Request 2

The licensee states in Reference 4 that "the evaluation process includes consideration of the impact that the void could have on pump operation, water hammer pressure transients, etc." Please further describe the monitoring of pump operation in all modes and specialized monitoring of appropriate plant parameters during shutdown operation.

Response

Suitable administrative measures (i.e., clearance and tagging) combined with existing system operating procedures and routine performance monitoring conducted by plant operations personnel are adequate to ensure measures are in place to verify systems are sufficiently full prior to their restoration and return to service. Available indications (e.g., motor amps, bearing temperatures, and flow) are checked closely during pump starts and then routinely during pump operation.

NRC Request 3

In Reference 4, the licensee states that a review of system design and operating practices by AmerGen, previous licensee for Clinton Power Station, concluded that the systems are adequately monitored and tested for potential gas intrusion mechanism. Discuss in greater detail measures to guard against gas intrusion because of inadvertent draining, system realignments, incorrect maintenance procedures, or other evolutions.

Response

EGC relies on a competent, trained, qualified, and attentive staff to continuously monitor, assess, and control system configuration. Upon recognition of a human performance error or equipment failure, IRs are initiated in the CAP. The CAP provides suitable guidance for the mitigation and disposition of the event.

In addition, the design of the Generic Letter (GL) 2008-01 subject systems includes constant discharge header pressure monitoring. A pressure transmitter in the discharge header piping monitors the discharge header pressure. The set point of the transmitter alarm is based on the static head of water in the discharge piping. If inadvertent draining of the discharge piping was to occur, the main control room would receive an alarm.

NRC Request 4

Provide a brief description of actions that will be taken if surveillance criteria are not met. Summarize any post-surveillance activities, such as gas volume trending and procedural checks, used in response to the failure to meet void acceptance criteria.

Response

EGC performs periodic UT examinations of the GL 2008-01 subject systems to confirm the absence of voids. No voids have been identified during the periodic UT examinations performed to date.

IRs are initiated in the CAP if voids are discovered during periodic UT examinations. The void size is also documented. The IR is then evaluated and dispositioned to determine the cause and identify appropriate corrective actions. Additionally, IRs and UT results are reviewed and trended by Engineering personnel.

NRC Request 5

Discuss the control and revision of work packages due to changes in maintenance work scope, including review and reauthorization of the package and any new temporary procedures.

Response

A major change in work package scope after the original approved package has begun requires work package revision. A major work package revision requires the same approvals as the original work package. To ensure that the clearance order previously created for the equipment removed from service remains adequate for worker protection, the work order package is routed to Operations for review. The applicable system operating procedures are adequate to ensure system configuration is appropriately controlled. On a case-by-case basis, individual work scope changes are assessed to ensure adequate measures are in place to verify systems are sufficiently full prior to their restoration and return to service.

NRC Request 6

Summarize the corrective action program with respect to your response to issues identified in Generic Letter (GL) 2008-01 (Reference 3).

Response

IRs are initiated in the CAP if voids are discovered in the GL 2008-01 subject systems. The void size is also documented. The IR is then evaluated for the impact on system operability and dispositioned to determine the cause and identify appropriate corrective actions. Additionally, IRs and UT results are reviewed and trended by Engineering personnel.

NRC Request 7

Training was not identified in the GL (Reference 3), but is considered to be a necessary part of applying procedures and other activities when addressing the issues identified in the GL. Provide a brief description of training.

Response

GL 2008-01 did not require discussion of training to satisfy the 10 CFR 50.54(f) request; therefore, none was provided in the GL response. However, when any station procedure is modified, an assessment for training needs and change management is required in accordance with procedure AD-AA-101, "Processing of Procedures and T&RMs." The determination is typically a function of the nature of the change and the perceived impact on the organization. If the assessment concludes training is required, the training is generally accomplished prior to, or in parallel with, issuance of the procedure. For fill and vent procedure revisions, the changes have generally been minor, and have been considered enhancements. Procedures that direct the periodic examination of selected piping for the presence of air draw upon pre-existing non-destructive examination (NDE) procedures, which provide guidance for the UT inspection of piping to verify that it is full of water. Close coordination with the NDE group and individuals

performing the inspections was made during the procedure development. The NDE group assisted in development of the new procedure. Training of personnel performing UT inspection is in accordance with EGC procedure ER-AA-335-001, "Qualification and Certification of Nondestructive Examination (NDE) Personnel."

EGC is an active participant in the NEI Gas Accumulation Team, which is currently directing the Institute of Nuclear Power Operations (INPO) in the development of generic training modules for gas accumulation and management. These training modules target the Engineering, Operations, and Maintenance disciplines. EGC plans to evaluate these training modules following completion for applicability to EGC, and may conduct training based upon modules tailored to meet EGC's needs.

References

1. Memorandum from L. D. Wert, Jr. (U.S. NRC) to T. B. Blount (U.S. NRC), "Task Interface Agreement – Emergency Core Cooling System (ECCS) Voiding Relative to Compliance with Surveillance Requirements (SR) 3.5.1.1, 3.5.2.3, and 3.5.3.1 (TIA 2008-03)," dated October 21, 2008

2. Letter from J. H. Riley (Nuclear Energy Institute) to W. H. Ruland (U.S. NRC), "Industry Guidance – Evaluation of Unexpected Voids or Gas Identified in Plant ECCS and Other Systems," dated June 18, 2009

3. NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," dated January 11, 2008

4. Letter from K. R. Jury (Exelon Generation Company, LLC/AmerGen Energy Company, LLC) to U.S. NRC, "Nine-Month Response to Generic Letter 2008-01," dated October 14, 2008

5. "Revision 2 to NRC Staff Criteria for Gas Movement in Suction Lines and Pump Response to Gas," ML090900136, dated March 26, 2009