10 CFR 50.54(f)

Progress Energy

Serial: RNP-RA/10-0010

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United States Nuclear Regulatory Commission
ATTN: Document Control Desk
11555 Rockville Pike
Rockville, Maryland 20852

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
PERTAINING TO NRC GENERIC LETTER 2008-01,
"MANAGING GAS ACCUMULATION IN EMERGENCY CORE
COOLING, DECAY HEAT REMOVAL, AND CONTAINMENT SPRAY SYSTEMS"

Ladies and Gentlemen:

By letter dated January 19, 2010, a request for additional information (RAI) regarding the H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, response to NRC Generic Letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," was provided by the NRC.

Attachment I to this letter provides an Affirmation in accordance with the provisions of Section 182a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f).

Attachment II to this letter provides the response to the RAI.

This letter contains no commitments.

If you have any questions concerning this matter, please contact Mr. Curtis A. Castell, Supervisor –Licensing/Regulatory Programs, at (843) 857-1626.

Sincerely,

Benjamin C. White

Benjamin C. White
Manager – Support Services – Nuclear

Progress Energy Carolinas, Inc.
Robinson Nuclear Plant
3581 West Entrance Road
Hartsville, SC 29550

A034
NRR

BCW/ahv

Attachments:

I. Affirmation

II. Response to Request for Additional Information on NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems"

c: L. A. Reyes, NRC, Region II
T. J. Orf, NRC, NRR
NRC Resident Inspector

AFFIRMATION

The information contained in letter RNP-RA/10-0010 is true and correct to the best of my information, knowledge, and belief; and the sources of my information are officers, employees, contractors, and agents of Carolina Power and Light Company, also known as Progress Energy Carolinas, Inc. I declare under penalty of perjury that the foregoing is true and correct.

Executed On: 3/22/10

E. A. McCartney
Site Vice President, HBRSEP, Unit No. 2

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATON ON NRC GENERIC LETTER 2008-01, "MANAGING GAS ACCUMULATION IN EMERGENCY CORE COOLING, DECAY HEAT REMOVAL, AND CONTAINMENT SPRAY SYSTEMS"

By letter dated January 19, 2010, a request for additional information (RAI) regarding the H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, response to NRC Generic Letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," was provided by the NRC. The following information is provided in response to this RAI.

RAI 1:

Generic Letter (GL) 2008-01 (Reference 3) discussed the loss of high pressure safety injection pumps at Oconee in 1997 as an example of failure of a subject system. This was caused by a failure of level transmitters associated with the letdown storage tank that is commonly referred to as the volume control tank (VCT). The VCT was not identified in the Reference 4 reply to the GL. Either identify the VCT as a part of the subject systems or provide a justification for its exclusion.

Response:

At HBRSEP, Unit No. 2, none of the pumps for the subject systems in the scope of GL 2008-01 take suction from the VCT. The subject systems do not interact with the VCT. Therefore, the VCT is excluded from the subject systems.

RAI 2:

In Reference 5 the licensee stated that "Evaluations considered and utilized, as appropriate, gas transport analysis, Owners Group pump suction void fraction acceptance criteria, Net Positive Suction Head requirements, Reactor Coolant System void acceptance criteria..." Clarify if the analysis to determine the void size acceptance criteria follows NRC guidance (particularly the use of 0.5 second intervals) or provide justification that the current analysis bounds the behavior of the system.

Response:

Progress Energy Carolinas, Inc. (PEC) has actively participated in the Nuclear Energy Institute (NEI) Gas Accumulation Team and the respective Pressurized Water Reactor (PWR) and Boiling Water Reactor (BWR) Owners' Group activities that are focused on developing suitable

guidance for licensees in the evaluation of voids in the piping systems of the PEC plants. These groups have engaged 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 side, and the effects on downstream piping and the reactor have been considered. The criteria are documented in eight separate reports generated to support this effort. These reports have been made available to the NRC staff for their information. These criteria formed the basis of the HBRSEP, Unit No. 2 response.

In order to summarize and focus these separate industry efforts, NEI issued Administrative Points of Contact letter, APC 09-20, "Generic Letter (GL) 2008-01, 'Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems' – Evaluation of Unexpected Voids or Gas Identified in Plant ECCS and Other Systems," dated May 18, 2009. This letter and its enclosure reference these industry documents and provide insight on their application to the evaluation of operability and are not based on NRC guidance. This industry guidance is being used by PEC until such time that the NRC criteria are issued and evaluated.

RAI 3

The responses (References 4 and 5) did not consider the effect a water hammer would have on operability. Justify that water hammers were appropriately excluded from consideration or provide an evaluation of the effect of pressure pulses and water hammers as per Reference 1.

Response:

When a void is found the condition is entered into the Corrective Action Program. The void is evaluated in accordance with Emergency Core Cooling System Gas Management Program. As part of the operability evaluation associated with discharge piping, water hammers are evaluated with respect to structural integrity, and relief valve set-points. Discharge piping is evaluated for Safety Injection (SI) and Residual Heat Removal (RHR) systems. The Containment Spray system is not evaluated on the discharge side, because it is not filled (i.e., voided) downstream of the motor-operated discharge valves.

RAI 4

Describe the monitoring of appropriate plant parameters during normal and shutdown operation, including reduced inventory and mid-loop operation. Such as monitoring level indicators; including the level of the volume control tank, and accumulator and piping pressures. Clarify how often the accumulator water make-ups and water make-up rates are monitored and trended, and if they are used as indication of potential gas intrusion; give that "Leakage through valves from accumulators" was identified in Reference 4 as a potential gas intrusion mechanism.

Response:

Plant operation at HBRSEP, Unit No. 2, is controlled by various operating, alarm response, and surveillance procedures. These procedures address the monitoring and control of pump operation during the modes of plant operation, including shutdown, reduced inventory and mid-loop operation. The operating procedures contain guidance on pump operating limits and expected operating indications in addition to guidance on pump operation in various system modes. The operating procedures contain details for placing the Emergency Core Cooling Systems (ECCS) in standby alignment to ensure the pumps are operable for automatic operation. Guidance is also provided to ensure the ECCS systems are properly filled and vented following maintenance.

In addition to plant procedures, the operators routinely perform monitoring of plant components. The ECCS pumps are monitored remotely by the main control room operators and locally by the auxiliary operators. Written guidance is established in the form of operator logs which direct routine monitoring of plant components and are provided for each operator watch station.

During on-line operations several parameters are monitored. For the SI System, accumulator pressure and level is monitored shiftly as directed by procedure. The discharge side of the SI system has pressure indicators that monitor the hot and cold leg injection portion of the system. These values are trended by the system engineer.

RAI 5

Clarify the frequency of inspections that are used to ensure the subject systems remain functional (this includes inspections for voids as well as monitoring existing voids). If inspections will be less frequent than once every 31 days (NUREG-1431 SR 3.5.2.3), provide a justification.

Response:

HBRSEP, Unit No. 2, has developed an Emergency Core Cooling System Gas Management Program that determines the periodic and conditional monitoring frequency for each local and system high point location. This method is consistent with industry approaches to manage gas accumulation by permitting adjustment of the monitoring frequency. The current combination of procedure controls for system filling and venting and surveillance performed on these systems provides assurance that the systems will be capable of performing the required functions. Additionally, gas intrusion mechanisms are identifiable and changes to the monitoring frequency described below are invoked when gas intrusion mechanisms are identified to exist. Should particular systems or locations show trends of gas formation, then the periodic monitoring frequency would be re-evaluated at that time.

HBRSEP, Unit No. 2, has identified 20 locations that are more vulnerable to void formation and are inspected quarterly, with provisions to increase the frequency, if voids are found. Forty-seven other locations are inspected on an 18-month frequency. The above frequencies are justified based on the results of the inspections performed to date, which have not discovered voids that would have presented challenges to the applicable systems as described in GL 2008-01.

RAI 6

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 for operators and other personnel.

Response:

Operations received continuing training on Significant Operating Event Report (SOER) 97-01, "Potential Loss of High Pressure Injection and Charging Capability from Gas Intrusion." Maintenance is currently scheduled for completion of training in second quarter 2010 continuing training. Engineering Support Personnel Continuing Training was performed in third quarter 2009 to cover GL 2008-01 and the recently developed Emergency Core Cooling System Gas Management Program. In addition Chemistry received training on SOER 97-01 and the Emergency Core Cooling System Gas Management Program.

Examples of objectives that were discussed in continuing training included: (1) under all plant operating conditions, identify the adverse effects of gas intrusion on high pressure injection and charging pumps; (2) under various plant conditions, identify configurations and operating conditions can potentially lead to gas intrusion; and (3) given the events described in SOER 97-01, discuss how similar events could happen at HBRSEP, Unit No. 2, and the actions necessary to recognize and prevent occurrence.

RAI 7

For both inspections and other fill and vent operations, describe the method used to ensure that the gas was successfully vented and not transported to another high point.

Response:

The fill and vent guidelines establish a requirement to perform a confirmatory ultrasonic testing inspection following fill and vent activities. If a void is discovered an evaluation is performed to determine whether the void is acceptable and has no impact on operability of the subject system or void removal is needed. After removal of the void, an ultrasonic test is performed to confirm that the void has been successfully removed. In addition, the gas that is removed is collected for analysis of the type of gas.

It has been concluded that the gas management program would be enhanced by identifying the potential for void transport. Therefore, a change has been initiated for the Emergency Core Cooling System Gas Management Program to include a step to evaluate the potential for gas transport to another high point.

Near the end of a refueling outage, the vulnerable locations as listed in the gas management program are UT inspected. This evolution is referred to as "as-left" inspections. The "as-left" inspections are performed to confirm that the systems are sufficiently full of water.