Progress Energy

Serial: NPD-NRC-2009-073
April 17, 2009

10CFR52.79

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

SHEARON HARRIS NUCLEAR POWER PLANT, UNITS 2 AND 3
DOCKET NOS. 52-022 AND 52-023
SUPPLEMENT 1 TO RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 052 RELATED TO RAW WATER SYSTEM

References: 1. Letter from Tanya Simms (NRC) to James Scarola (PEC), dated December 30, 2008, "Request for Additional Information Letter No. 052 Related to SRP Section 09.02.01 for the Harris Units 2 and 3 Combined License Application"

2. Letter from Garry D. Miller (PEC) to U. S. Nuclear Regulatory Commission (NRC), dated February 13, 2009, "Response to Request for Additional Information Letter No. 052 Related to Raw Water System", Serial: NPD-NRC-2009-018

Ladies and Gentlemen:

Progress Energy Carolinas, Inc. (PEC) hereby submits a supplemental response to the Nuclear Regulatory Commission's (NRC) request for additional information provided in the referenced letter (Reference 1).

A supplemental response to the NRC request is addressed in the enclosure. The enclosure also identifies changes that will be made in a future revision of the Shearon Harris Nuclear Power Plant Units 2 and 3 application.

If you have any further questions, or need additional information, please contact Bob Kitchen at (919) 546-6992, or me at (919) 546-6107.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on April 17, 2009.

Sincerely,

Garry D. Miller
General Manager
Nuclear Plant Development

Enclosures/Attachments

Progress Energy Carolinas, Inc.
P.O. Box 1551
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D084
NRO

cc : U.S. NRC Director, Office of New Reactors/NRLPO
U.S. NRC Office of Nuclear Reactor Regulation/NRLPO
U.S. NRC Region II, Regional Administrator
U.S. NRC Resident Inspector, SHNPP Unit 1
Mr. Manny Comar, U.S. NRC Project Manager

Shearon Harris Nuclear Power Plant Units 2 and 3
Supplement 1 to Response to NRC Request for Additional Information Letter No. 052
Related to SRP Section 09.02.01 for the Combined License Application,
dated December 30, 2008

NRC RAI #	Progress Energy RAI #	Progress Energy Response
09.02.01-6	H-0397	February 13, 2009; Serial NPD-NRC-2009-018
09.02.01-7	H-0398 & H-0447	February 13, 2009; Serial NPD-NRC-2009-018; and supplemental response enclosed – see following pages
09.02.01-8	H-0399	February 13, 2009; Serial NPD-NRC-2009-018

NRC Letter No.: HAR-RAI-LTR-052

NRC Letter Date: December 30, 2008

NRC Review of Final Safety Analysis Report

NRC RAI NUMBER: 09.02.01-7

Text of NRC RAI:

The raw water system (RWS) is relied upon for achieving and maintaining cold shutdown conditions which is necessary for satisfying Technical Specification requirements. In accordance with NRC policy considerations for passive plant designs, non-safety related active systems that are relied upon for achieving and maintaining cold shutdown conditions (i.e., transitioning from Mode 4 to Mode 5) should be highly reliable and able to accommodate single active failures without a loss of the cooldown capability that is needed. The staff found that Section 9.2.11 of the Final Safety Analysis Report (FSAR) does not provide a clearly defined design basis with respect to the RWS cooldown function, and the reliability and capability of the RWS to perform this function for the most limiting situations were not adequately described and addressed. For example, the minimum RWS flow rate, water inventory, temperature limitations, and corresponding bases for providing SWS makeup for the two Shearon Harris units were not described. Also, the suitability of RWS materials for the plant-specific application and measures being implemented to resolve vulnerabilities and degradation mechanisms to assure RWS functionality over time were not addressed. Consequently, Section 9.2.11 of the FSAR needs to be revised to properly describe and address the RWS design bases in this regard and to include design specifications that are necessary to ensure the reliability and capability of the RWS to perform its cooldown function. The following guidance is generally applicable and should be considered as appropriate when revising the FSAR in response to this question:

a. The design bases should specifically recognize and describe cold shutdown functions that are credited, and applicable design considerations that pertain to these functions should be specified, such as reliability, redundancy, backup power, etc. Other parts of the DCD should not be referred to in lieu of providing a complete description of the design-bases in FSAR Section 9.2.11.
b. The system description should explain how the applicable design-bases considerations referred to in (a) are satisfied. For example:
    - the minimum required system functional capability and the bases for this determination should be described (note that a minimum of seven days worth of on-site water inventory should be available for reactor decay heat removal and spent fuel cooling);
    - the description should explain how design-bases considerations are satisfied;
    - the guidance in SRP Sections 9.2.1 and 9.2.5 that are relevant for ensuring the capability and reliability of the RWS to perform its design-bases functions should be considered and addressed as appropriate (materials considerations, net positive suction head, waterhammer, etc.);
    - operating experience considerations that pertain to the capability and reliability of the system to perform its design-bases functions needs to be addressed (note that the relevance of operating experience is independent of safety classification considerations);
    - in order to demonstrate adequate reliability, the system design should include (among other things) the capability of all necessary components (pumps, valves, strainers, instrumentation and controls, etc.) to function during a loss of off-site power and redundancy for single active failure vulnerabilities;

- dual-unit considerations need to be addressed.

c. Major components and features that are important to ensure the capability and reliability of the system to perform its cooldown function should be described. Applicable industry codes and quality group designations that are commensurate with plant-specific RWS reliability considerations should be specified and reflected in Chapter 3, "Design of Structures, Components, Equipment, and Systems." Note that this may be different from what is specified for the standard plant design since it was based solely on regulatory treatment of non-safety systems considerations and did not include consideration of the cooldown function.
d. System design parameters that are important for performing the cold shutdown function should be specified, such as water inventory, flow rate, nominal pipe sizes, limiting flow velocities, and design temperatures and pressures.
e. The RWS operating modes for performing its cold shutdown function should be described, such as interlocks, protective features, and automatic action.
f. Limitations on the capability of the RWS to perform its cold shutdown function should be described, such as minimum required water inventory and temperature restrictions that apply.
g. Instrumentation (e.g., indication, controls, interlocks, and alarms) that are relied upon by plant operators in the main control room and at the remote shutdown panels for performing cooldown functions should be described.
h. System diagrams should show division designations, flow paths, major components and features, nominal pipe sizes, and instrumentation that is relied upon to ensure proper operation of the system by operators in the main control room and at the remote shutdown panels.
i. The more important periodic inspections that will be completed and specified frequencies for ensuring the capability and reliability of the system should be described. For example, design provisions and actions that will be implemented to periodically assess the condition of buried or otherwise inaccessible piping and components should be described.
j. The more important periodic tests that will be completed and specified frequencies for ensuring the capability and reliability of the system should be described. For example, periodic testing of pumps, valves, self-cleaning strainers, and vacuum breakers should be described.
k. Based on the Tier 2 description, plant-specific ITAAC should be established that are appropriate and sufficient for certifying the design of the RWS.
l. The initial test program should test all modes of RWS operation that are credited for performing its cooldown function and confirm acceptable performance for the most limiting assumptions. For example, confirmation that net positive suction head requirements are satisfied for minimum pump suction head and maximum water temperature conditions with all pumps running at full flow, and that waterhammer will not occur during situations when voiding is most likely to occur should be specified. It should be clear from the information provided in Section 9.2.11 of the FSAR what constitutes acceptable performance.

PGN RAI ID #: H-0447

PGN Response to NRC RAI:

In letter number NPD-NRC-2009-018, dated February 13, 2009, Progress Energy provided a response to HAR-RAI-LTR-052. This response supplements the information provided in the previous Progress Energy response to NRC RAI 09.02.01-7.

Subsequent to the original response letter, Progress Energy completed a detailed Failure Modes and Effects Analysis (FMEA) for the HAR 2 & 3 Raw Water System (RWS). Based on the results of the FMEA, modifications were made to the design of the RWS to ensure the RWS is reliable with a single active failure:

1. The check valve in the discharge header for the ancillary raw water pumps immediately downstream of the suction line for the screen wash pumps was eliminated;
2. Normally-open manual isolation valves were added at the interface points with the four process systems downstream of the media filters (upstream of the potable water system, upstream of the fire water storage tanks, upstream of the demineralized water treatment system, and upstream of the service water system); and
3. The automatic recirculation valve upstream of the media filters was eliminated. A new control valve was added to the recirculation line upstream of the media filters along with a pressure control system to control its operation. In addition, normally-open manual isolation valves were added immediately upstream and downstream of the new control valve and a normally-closed bypass valve was provided around the control valve station.

These changes are reflected in revisions to FSAR Figures 10.4-201 and 10.4-202. None of these changes impact the text of the original response to the RAI; the only change is to substitute the revised FSAR figures enclosed with this supplemental letter for those provided in the February 13, 2009 letter.

Associated HAR COL Application Revisions:

The following changes will be made to the HAR FSAR in a future amendment:

1. Replace Figure 10.4-201, Revision 0, with Figure 10.4-201, Revision 03-27-09
2. Replace Figure 10.4-202, Revision 0, with Figure 10.4-202, Revision 03-27-09

Attachments/Enclosures:

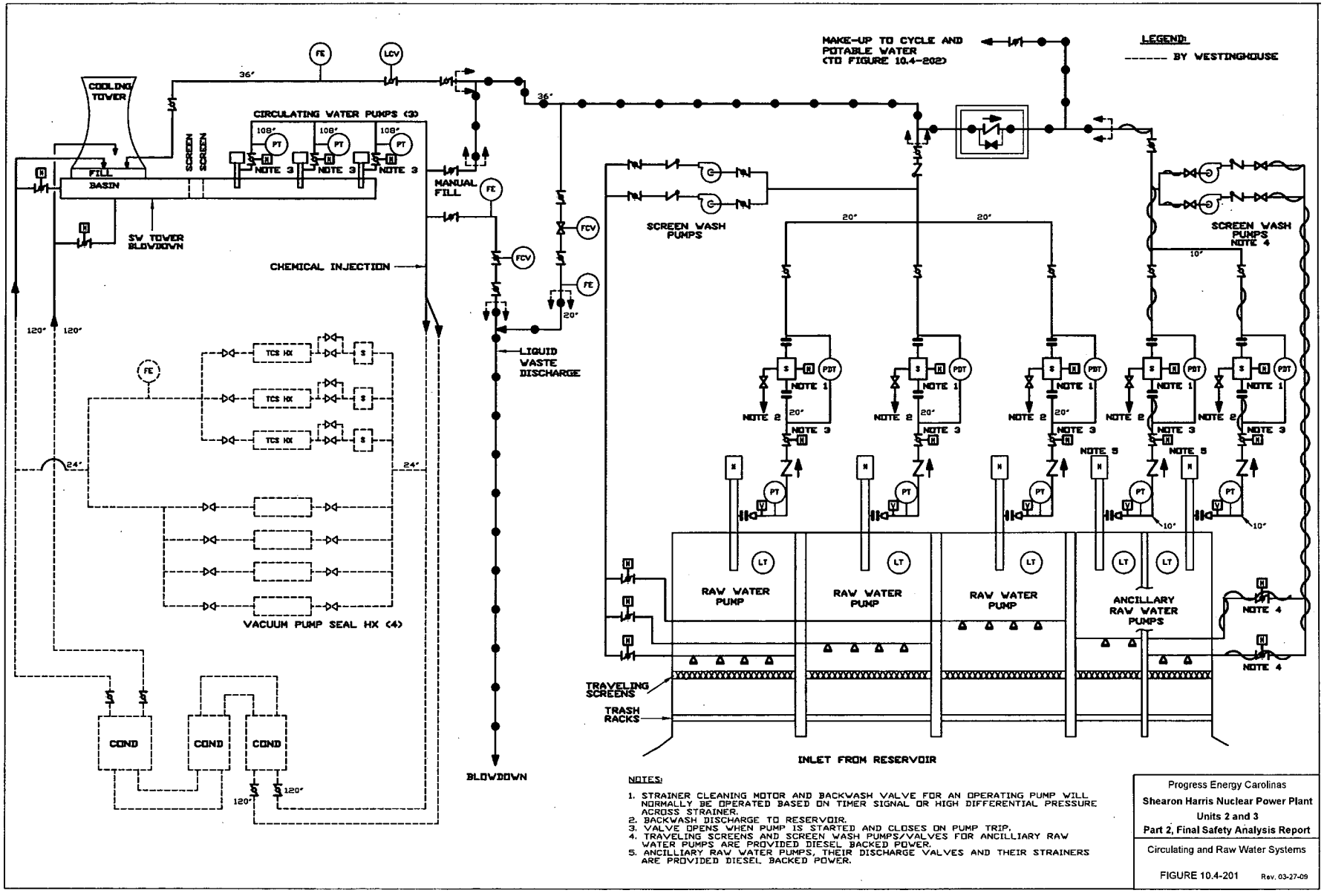
Revised FSAR Figure 10.4-201 (Revision 03-27-09) – Circulating and Raw Water Systems

Revised FSAR Figure 10.4-202 (Revision 03-27-09) – Raw Water Distribution System

List of Attachments [associated with NRC RAI #: 09.02.01-7 (PGN RAI ID #: H-0447)]:

1. Revised FSAR Figure 10.4-201 (Revision 03-27-09) – Circulating and Raw Water Systems (1 page)

2. Revised FSAR Figure 10.4-202 (Revision 03-27-09) – Raw Water Distribution System (1 page)



NOTES:

1. STRAINER CLEANING MOTOR AND BACKWASH VALVE FOR AN OPERATING PUMP WILL NORMALLY BE OPERATED BASED ON TIMER SIGNAL OR HIGH DIFFERENTIAL PRESSURE ACROSS STRAINER.
2. BACKWASH DISCHARGE TO RESERVOIR.
3. VALVE OPENS WHEN PUMP IS STARTED AND CLOSES ON PUMP TRIP.
4. TRAVELING SCREENS AND SCREEN WASH PUMPS/VALVES FOR ANCILLIARY RAW WATER PUMPS ARE PROVIDED DIESEL BACKED POWER.
5. ANCILLIARY RAW WATER PUMPS, THEIR DISCHARGE VALVES AND THEIR STRAINERS ARE PROVIDED DIESEL BACKED POWER.

Progress Energy Carolinas
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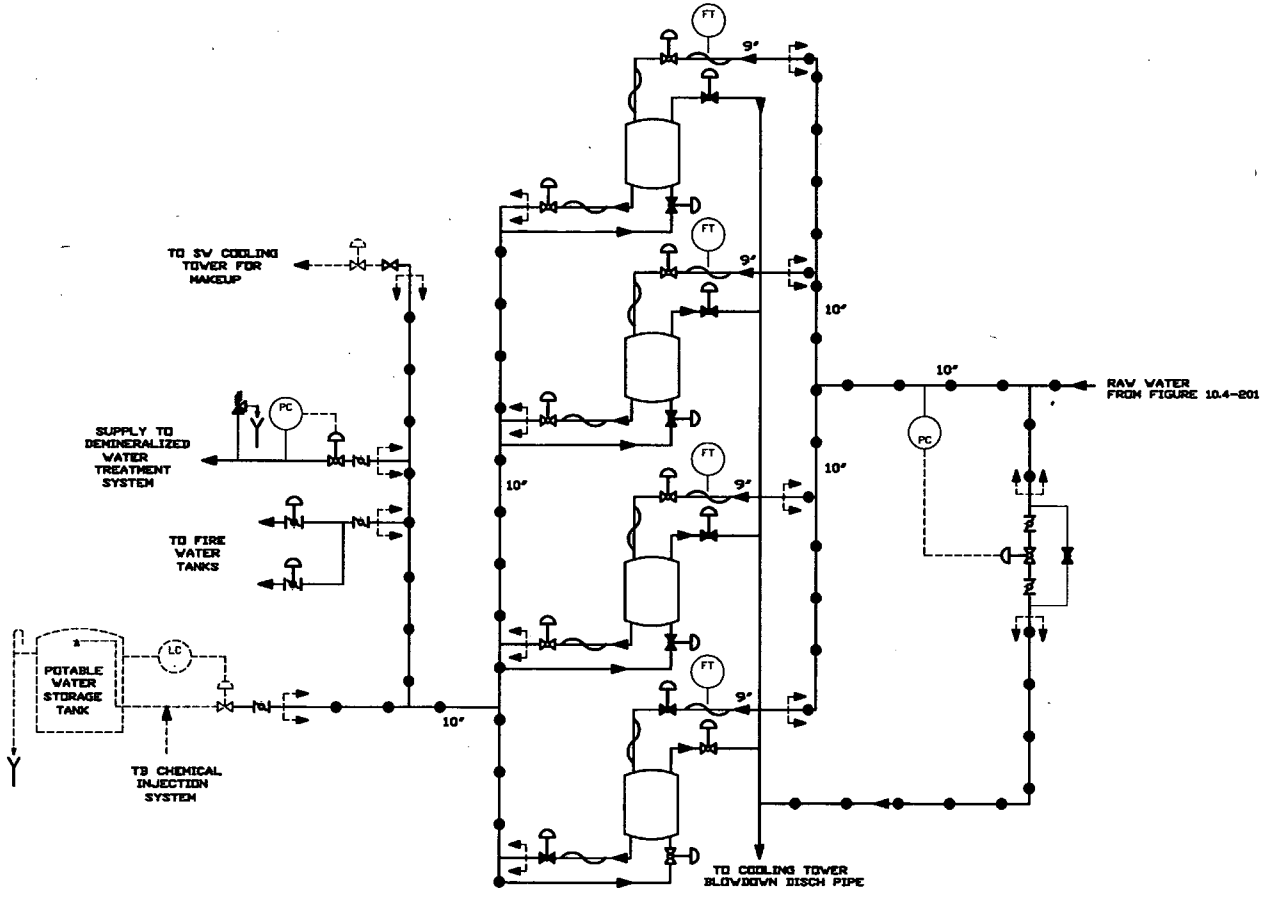
Units 2 and 3
Part 2, Final Safety Analysis Report

Circulating and Raw Water Systems

FIGURE 10.4-201 Rev. 03-27-09



MEDIA FILTERS EACH 50% CAPACITY
ONE SHOWN IN BACKWASH
NOTE 1

NOTES:

1. FILTER BACKWASH IS INITIATED FROM A TIMER AND THE VALVES WILL FAIL IN THE POSITION THAT MAINTAINS THE DISCHARGE FLOW ON A AIR OR ELECTRICAL FAILURE.

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Raw Water Distribution System
FIGURE 10.4-202 Rev. 03-27-09