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10 CFR 50.90

June 28, 2013

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Duke Energy Carolinas, LLC
Oconee Nuclear Station, Units 1, 2, and 3
Docket Numbers 50-269, 50-270, and 50-287,
Renewed Operating Licenses DPR-38, DPR-47, and DPR-55
Licensing Basis for the Protected Service Water System - Responses to
Request for Additional Information - Supplement 5

References:

1. Letter from T. Preston Gillespie, Jr., Vice President, Oconee Nuclear Station, Duke Energy Carolinas, LLC, to the U. S. Nuclear Regulatory Commission, "Tornado and High Energy Line Break (HELB) Mitigation License Amendment Requests (LARs) - Responses to Request for Additional Information," dated December 16, 2011.
2. November 16, 2012, E-mail from John Boska, U.S. NRC, to Timothy D. Brown, Duke Energy Carolinas, LLC.

By letter dated December 16, 2011, Duke Energy Carolinas, LLC (Duke Energy), submitted License Amendment Requests (LARs) for the Oconee Nuclear Station (ONS) proposing revisions to the High Energy Line Break (HELB) licensing bases (Ref. 1). This submittal included proposed Protected Service Water (PSW) Technical Specifications and system descriptions.

On November 16, 2012, Duke Energy received RAI 170 concerning heat load changes in certain areas of the station associated with the operation of the PSW system (Ref. 2). This submittal contains Duke Energy's response to RAI 170.

If you have any questions in regard to this letter, please contact Stephen C. Newman, Regulatory Affairs Senior Engineer, Oconee Nuclear Station, at (864) 873-4388.

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I declare under penalty of perjury that the foregoing is true and correct. Executed on
June 28, 2013.

Sincerely,

A handwritten signature in black ink, appearing to read "Scott L. Batson". The signature is written in a cursive style with a long horizontal flourish extending to the right.

Scott L. Batson
Vice President
Oconee Nuclear Station

Enclosure

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cc: (w/enclosure)

Mr. John P. Boska, Senior Project Manager
(by electronic mail only)
U. S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
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Rockville, MD 20852

Mr. Victor M. McCree, Administrator, Region II
U.S. Nuclear Regulatory Commission
Marquis One Tower
245 Peachtree Center Ave., NE, Suite 1200
Atlanta, GA 30303-1257

Mr. Eddy L. Crowe
NRC Senior Resident Inspector
Oconee Nuclear Station

Ms. Susan E. Jenkins, Manager
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SC Dept. of Health and Environmental Control
2600 Bull St.
Columbia, SC 29201

Enclosure

**Responses to Request for Additional Information
Supplement 5**

RAI #170:

"The NRC staff is aware that the addition of the PSW booster pump and main PSW pump to the auxiliary building will increase the heat load there when they are in use. Please describe the effects of the heat load during an event when the PSW system could be used, such as a major fire in the turbine building which renders inoperable all electrical buses and equipment located in the turbine building. Discuss if any equipment located in the auxiliary building or the reactor building which is qualified under 10 CFR 50.49 and is needed to respond to the event will exceed its qualified environmental conditions, and what steps are being taken to address this concern."

Duke Energy Response

Introduction

Cooling to the Auxiliary Building (AB) relies upon operation of the Low Pressure Service Water (LPSW) system, the AB Chilled Water Systems and switchgear located in the Turbine Building (TB). Normal and emergency cooling to the Reactor Building (RB) relies upon operation of the LPSW system and switchgear located in the TB. During Protected Service Water (PSW) scenarios that affect equipment located in the TB requiring use of the PSW/High Pressure Injection (HPI) System, the potential exists for a loss of power and cooling water to the AB and/or RB ventilation systems. With an extended loss of environmental cooling in these areas and assuming limiting design conditions, the heat load from operation of the PSW/HPI System could lead to temperature increases in the AB and RB. Analyses are being performed detailing the bounding PSW/HPI equipment temperature limits as well as the predicted RB and AB temperature increases. The bounding predicted temperature increases in the AB and RB have been projected to eventually reach the documented temperature design limits of certain PSW/HPI mitigating components over an extended period of operation.

In order to address this concern and ensure PSW/HPI mitigating component design temperature limits will not be exceeded during PSW/HPI System operation, alternate cooling water and power to the existing ventilation systems will be provided to recover from the loss of ventilation to the AB and RB.

The new systems will be installed in two phases. For Phase 1, the ventilation components will support operation of the PSW system for 72 hours to accommodate establishment of a hot shutdown safe and stable condition. Phase 2 will provide for extended PSW/HPI System operation to meet NFPA 805 requirements.

The need to place the AB and RB ventilation systems in service is not projected to be immediate following a PSW scenario and varies based on the plant location and cooling capacity selected. The actions to place the alternate system in service are to be assured by means of staffing, procedures, training and qualifications.

Auxiliary Building

The normal source of power and/or cooling water to the existing plant AB ventilation systems may be impacted by the PSW scenario. As part of the AB alternate ventilation modifications, numerous Air Handling Units (AHUs) and exhaust fans will receive alternate power and/or cooling water. It is unlikely that the full complement of AHUs and exhaust fans will be

necessary to support the operation of the PSW system in the AB. As the AB is a single building with numerous interconnections throughout the various elevations, there is overlap in the operation of the AHUs and exhaust fans. These interconnections can be further enhanced by the opening of doorways. The final selection of needed AHUs and exhaust fans may vary based on the cooling capacity provided to the existing components. Additionally, certain areas within the AB have been identified with very few PSW/HPI components that have limiting design temperatures.

For the AB, a new chilled water system will be installed using portable chillers and permanently installed piping to selected AHUs. The new cooling system will be named the Alternate Chilled Water (AWC) system. The modification to be installed will consist of chillers and necessary piping, valves, etc. to supply chilled water to selected AHUs that supply air to the Control Complex (Control Room, Cable Room and Equipment Room), the Penetration Rooms, and portions of the AB. There will be two main headers - one which generally feeds AHUs normally supplied by the AB Chilled Water Systems (WC or CW) and one which generally feeds AHUs normally supplied by LPSW.

The chillers, AHUs and exhaust fans will be capable of being powered from a new electrical distribution system fed from the PSW switchgear with the appropriate distribution centers, motor control centers and transformers.

Reactor Building

The normal cooling water (LPSW) to the RB ventilation systems may be impacted by the PSW scenario. RB alternate cooling will be provided by means of lake water to one RB Cooling Unit (RBCU). A diesel driven pump will take suction from Lake Keowee and feed lake water through a connection to the LPSW supply lines to one RBCU on each unit. The RBCU fan will also be provided with an alternative power source from the PSW electrical system. If the normal power source was degraded or lost, power transfer equipment would be utilized to transfer the alternate power source to the RBCU.

Design Bases

The new alternate cooling equipment will meet the following design criteria:

- Inclusion in the QA-5 program in accordance with Duke Specification OSS-0254.00-00-4022, the Duke Quality Assurance Topical Report and as discussed in UFSAR Chapter 17.
- Provide for a 72 hour mission time (Phase 1).
- Provide for extended PSW/HPI System operation to meet NFPA 805 requirements (Phase 2).
- Not have seismic operational requirements other than not being permitted to interact with other seismically-protected SSCs during a seismic event.
- Not be protected from a tornado or from an external flood.
- No assumed single failure since the Standby Shutdown Facility provides a diverse safe shutdown system to the PSW/HPI System.
- Lake Keowee is available.

Existing repowered equipment will retain their current quality classification.

Environmental Qualification

PSW is not required to meet the single failure criteria because it provides added “defense-in-depth” protection by serving as a backup to existing safety systems. AB or RB Ventilation is not required during the initial mitigation of an NFPA 805 fire in the TB that disables the 4160 V essential electric power distribution system. However, ventilation is required for long-term recovery and plant cool down. Fires are not design basis events to be considered for environmental qualification per the Oconee Nuclear Station Environmental Qualification Criteria Manual. Therefore, PSW equipment is not within the scope of 10CFR50.49 except for PSW equipment that interfaces with safety-related components that are presently qualified under 10CFR50.49. For examples, reference the Duke Energy response to RAI 165 (letter dated November 2, 2012). Safety-related components that interface with PSW equipment that are presently qualified under 10CFR50.49 will not exceed their existing environmental qualification. PSW components are designed to perform their functions in the environment they are expected to operate.