Progress Energy

James Scarola
Vice President
Harris Nuclear Plant
Progress Energy Carolinas, Inc.

JUN 0 9 2004

United States Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555-0001

Serial: HNP-04-075
10 CFR 50.90

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400 / LICENSE NO. NPF-63

SUBJECT: **Requested Additional Information for License Amendment Request: Steam Generator Water Level Instrumentation Usage, Technical Specifications 4.4.1.3.2 and 3.4.1.4.1.b**

Ladies and Gentlemen:

By letter dated February 4, 2004 (ML040420403), Carolina Power & Light Company, now doing business as Progress Energy Carolinas, Inc. (PEC), requested a license amendment for the Harris Nuclear Plant (HNP) to the Index and to Technical Specifications 4.4.1.3.2, "Reactor Coolant System Hot Shutdown Surveillance Requirements" and 3.4.1.4.1.b, "Reactor Coolant System Cold Shutdown – Loops Filled Limiting Condition For Operation." On April 13, 2004, the NRC faxed PEC a Request for Additional Information with three requests. PEC's responses to those three requests are attached.

This document contains no new regulatory commitment.

Pursuant to 10 CFR 50.91(b), PEC is providing the State of North Carolina with a copy of this letter.

Please refer any questions regarding this submittal to Mr. John Caves at (919) 362-3137.

I declare under penalty of perjury that the attached information is true and correct. (Executed on JUN 0 9 2004).

Sincerely,

James Scarola

JS/has
Attachment

A001

P.O. Box 165
New Hill, NC 27562

T > 919.362.2502
F > 919.362.2095

cc: Mr. R. A. Musser, NRC Senior Resident Inspector
Ms. B. O. Hall, North Carolina DENR Section Chief
Mr. C. P. Patel, NRC Project Manager
Mr. L. A. Reyes, NRC Regional Administrator

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Request 1: *What was the basis for the original TS requirement that the wide range be inoperable before the narrow range could be used for confirmation of the minimum steam generator secondary side water level?*

Response: Prior to the Technical Specification Amendment for the steam generator replacement, Technical Specifications 4.4.1.3.2 and 3.4.1.4.1.b were based solely upon the narrow range instrumentation. The alternate use of the wide range instrumentation was added, for operational flexibility, by the amendment for the steam generator replacement. However, the wording chosen to translate this operational alternate into the Technical Specifications inappropriately introduced the requirement that the wide range instrumentation be inoperable before the narrow range instrumentation can be used. While not technically invalid, the resultant Technical Specifications did not provide the desired operational flexibility. The requested license amendment is an administrative change to reflect a technically valid approach with the desired operational flexibility.

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Request 2: *In the amendment request, it is stated on page A5 (paragraph 1) that the functionality of the narrow range instrumentation is not influenced by the operability of the wide range instrumentation. Provide the technical justification that validates the independence of the wide range instrumentation from the narrow range instrumentation.*

Response: Each steam generator has one wide range steam generator level channel, which includes a separate sensor, process rack cards, and indication.

Each steam generator also has four independent narrow range steam generator level channels, each with a separate sensor, process rack cards, indication, and trip actuation circuitry. The narrow range steam generator level channels generate safety-related signals that actuate a reactor trip as part of the Reactor Protection System. Safety-related systems are designed to meet the independence and separation requirements of General Design Criterion 22 and Section 4.6 of IEEE-279-1971, "Criteria for Protection Systems for Nuclear Power Generating Stations." The protection system relies on the provisions of IEEE-384-1974 relative to overcurrent devices to prevent malfunctions in one circuit from causing unacceptable influences on the functioning of the protection system. The protection system uses redundant instrumentation channels and actuation trains and incorporates physical and electrical separation to prevent faults in one channel from degrading any other protection channel. The physical separation criteria for instrument cabinets within NSSS scope meet the recommendations contained in section 5.7 of IEEE-384-1974. Independence is maintained throughout the system, extending from the sensor through the devices actuating the protective function. The protection system is designed to be independent of the control system. This design meets the channel independence requirements of IEEE-279-1971 and, in particular, paragraph 4.7 which addresses Control and Protection System Interaction and General Design Criteria 24.

Each steam generator has four pairs of instrument taps (one upper and one lower tap per pair). The wide range level transmitter is connected between one pair of taps. Each of the three narrow range level transmitters is connected between a separate pair of taps. The fourth narrow range level transmitter is connected between the upper tap used by the wide range level transmitter and a lower tap used by one of the narrow range level transmitters. Thus, with physical channel separation maintained, no postulated single failure can prevent the narrow range level instrumentation channels from performing their required Technical Specification functions.

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Request 3: The design data report for the plant establishes the acceptable steam generator water levels. However, the applicable uncertainties in the instrumentation are not clearly stated for the wide range and narrow range instruments. Please discuss how uncertainties are treated in determining the setpoints and justified in the analyses. Also, Westinghouse recommended that all licensees using Westinghouse Steam Generators review the WCAP-16115, Steam Generator Level Uncertainties Program," and determine the impact of [it] on plant-specific SG level uncertainty based on the results of the report. Given that the instrument uncertainties are used in establishing the current TS setpoints, identify the WCAP-16115 results that are applicable to these uncertainties for both the narrow range and wide range instrumentation.

Response: This response requires two clarifications. First, Technical Specifications 4.4.1.3.2 and 3.4.1.4.1.b identify values used by the Operators during normal operation rather than setpoints associated with automatic system actuations. Second, the requested license amendment does not propose to change those values and does not propose any modification to the system. The requested license amendment is an administrative change to provide flexibility in monitoring those values during normal operation.

With the above clarifications, the following is a discussion of uncertainties associated with the existing values in Technical Specifications 4.4.1.3.2 and 3.4.1.4.1.b, relative to WCAP-16115, "Steam Generator Level Uncertainties Program." WCAP-16115 was part of a program to evaluate the phenomena, associated with Westinghouse designed steam generators, that affect uncertainties in the steam generator water level control system and Reactor Trip setpoints associated with steam generator water level. WCAP-16115 has been reviewed as part of the response to the Westinghouse NSALs issued in 2002-2003 regarding steam generator water level uncertainties.

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Response 3 (continued):

For the narrow range instrumentation:

While the subject of WCAP-16115 is not directly related to the operating values in Technical Specifications 4.4.1.3.2 and 3.4.1.4.1.b, the Process Measurement Accuracy (PMA) terms discussed in WCAP-16115 were factored into the uncertainty allowance of 6% established by the NSSS vendor. For additional conservatism, Progress Energy added an additional 6% to the vendor recommendation. This uncertainty envelopes the PMA terms discussed in WCAP-16115 in addition to the normal sensor reference and calibration accuracy, sensor temperature and pressure effects, sensor drift, rack calibration accuracy, rack temperature, and rack drift effects. In addition, the Measuring and Test Equipment (M&TE) errors for both the sensor and process rack calibrations are factored into the uncertainty allowance. Therefore, the 30% minimum operating value identified in the existing Technical Specifications was based on the combination of the 16.8% level for the top of the steam generator tube, the 6% uncertainty allowance established by the NSSS vendor, the 6% added by Progress Energy, and an allowance for an easily readable value on the level indicator.

For the wide range instrumentation:

WCAP-16115 does not address any uncertainty issues associated with the wide range steam generator level instrumentation. But, independent of WCAP-16115, the applicable process sensor, rack, and main control board level uncertainties were considered when the steam generator wide range operating value was established. In particular, an uncertainty allowance of 5.3% was determined to include: sensor and process rack reference accuracy, temperature effects, drift, and M&TE errors. In addition, reference leg heat-up effects, sensor static pressure effects, and control board level indication errors were factored into the uncertainties. This uncertainty, combined with the 67% level for the top of the steam generator tubes and an allowance for an easily readable value on the level indicator, resulted in the minimum operating value of 74% that is identified for the steam generator wide range level in the existing Technical Specifications.