CP&L
A Progress Energy Company

James Scarola
Vice President
Harris Nuclear Plant

NOV 2 1 2002

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

SERIAL: HNP-02-141
10CFR50.90

SHEARON HARRIS NUCLEAR POWER PLANT
DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT – RESPONSE TIME TESTING ELIMINATION
SUPPLEMENTAL INFORMATION

Dear Sir or Madam:

In a letter dated August 30, 2002 and in accordance with the Code of Federal Regulations, Title 10, Part 50.90, Carolina Power & Light Company (CP&L) requested a revision to the Technical Specifications (TS) for the Harris Nuclear Plant (HNP). The proposed amendment revises Technical Specifications Definitions 1.13, Engineered Safety Features (ESF) Response Time and 1.29, Reactor Trip System (RTS) Response Time. Also proposed in this change request are revisions to Surveillance Requirements 4.3.1.2 and 4.3.2.2 and BASES Sections B 3 /4.3.1 and B 3 /4.3.2. These changes will revise the definition and surveillance requirements for response time testing of the Engineered Safety Feature Actuation System (ESFAS) and the Reactor Trip System. This letter provides additional information to supplement the information provided in the amendment request.

These changes are in conformance with changes approved in WCAP-13632-P-A, Revision 2, and WCAP-14036-P-A Revision 1. These are proprietary documents developed by Westinghouse and approved by the NRC in August 1995, and October 1998, respectively.

The reason for this request is to permit the option of either measuring or verifying the response time for specific components in the above mentioned systems. WCAP-13632-P-A, Revision 2, is for specific pressure sensors and WCAP-14036-P-A, Revision 1, is for instrument loop channels. This option will give HNP an opportunity to eliminate redundant measurement of channel performance without reducing the reliability of these systems.

Attachment 1 provides additional information that may prove useful as the NRC evaluates the referenced license amendment request.

In accordance with 10 CFR 50.91(b), CP&L is providing the State of North Carolina with a copy of the proposed license amendment.

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

Sincerely,

James Scarola

RTG

Attachment:

1. Supplemental Information in support of the License Amendment request.

James Scarola, having been first duly sworn, did depose and say that the information contained herein is true and correct to the best of his information, knowledge and belief, and the sources of his information are employees, contractors, and agents of Carolina Power & Light Company.

Darlene S. Yarborough

DARLENE S. YARBOROUGH NOTARY *** PUBLIC HARNETT COUNTY, NC

Notary (Seal)
My commission expires:
2-21-2005

c:
Mr. J. B. Brady, NRC Sr. Resident Inspector
Ms. Beverly Hall, Section Chief, Radiation Protection Section, N.C. DENR
Mr. R. Subbaratnam, NRC Project Manager
Mr. L. A. Reyes, NRC Regional Administrator

SHEARON HARRIS NUCLEAR POWER PLANT
NRC DOCKET NO. 50-400/LICENSE NO. NPF-63
REQUEST FOR LICENSE AMENDMENT
FOR RESPONSE TIME TESTING ELIMINATION
FROM TECHNICAL SPECIFICATIONS

SUPPLEMENTAL INFORMATION

Background

The following comments provide additional information that may be helpful in the evaluation of the Harris Plant license amendment submittal:

Harris' response to the requirement for confirmation that the generic analysis in WCAP-13632 – P-A is applicable to the Harris plant for the following:

1. On page E1-3 of 13, HNP provides the plant position with respect to performing a hydraulic response time test (RTT) prior to the installation of a new transmitter/switch...

   The HNP submittal stated: "...applicable plant procedures include requirements that stipulate that pressure sensor response times must be verified by performance of an appropriate response time test"; for clarification the submittal should say "by the performance of a hydraulic response time test"

2. On page E1-3 of 13, HNP provides the plant position with respect to transmitters and switches that use capillary tubes and subjecting these transmitters and switches to RTT after initial installation and following any maintenance or modification activity, which could damage the transmitter capillary tubes.

   The HNP response included the wording: "...will stipulate that pressure sensors (transmitters and switches) utilizing capillary tubes." This wording should say "that transmitters and switches" and delete the reference to pressure sensors for consistency with the wording in the WCAP.

3. On pages E1-3 of 13 and E1-4 of 13 in items identified as "3" and "4", HNP again uses the terminology "pressure sensors" versus "transmitters and switches." Where the term "pressure sensors" is used it is more consistent with the WCAP to use the terminology "transmitters and switches."

4. On page E1-3 of 13 in the item identified as "3", HNP says "HNP has no pressure transmitters..." where it would be more consistent with the WCAP to say "HNP has no transmitters with variable damping."

5. On page E1-6 of 13 the HNP submittal stated that WCAP-14620, "7300 Printed Circuit Card Revision History", shows that these components were not affected by any of the changes between artwork level 4 and 6. Also no other changes were identified which could degrade the cards time response." For clarification, a descriptive evaluation of how the Harris Plant reached this conclusion is included as follows:

   Per WCAP-14036, actual testing of selected Westinghouse 7300 circuitry with degraded components was conducted to validate the component failure analysis and provide baseline and bounding response times for selected components. Test data for the NSA card is summarized in Table 4-8. The data show that the maximum increase in response time for a 50% increase in capacitance of the most sensitive response time capacitor is 12.5 milliseconds. The response time sensitivity to resistor degradation was minimal (2.5 milliseconds). The response time allocation for this card is 37.5 milliseconds based on the results in Table 4-8. The components degraded for this testing were capacitor C83-1 and R294-1.

   A review of the original 7300 card installation records for HNP shows that they were originally all artwork level 4, with the earliest revision level being 12. An inspection of the cards conducted in May of 2002 shows that all of the NSA cards are still artwork level 4 with the exception of certain cards in PIC-01, PIC-02, and PIC-03 that are part of the OTDT (Overtemperature ΔT) Reactor Trip function. These cards are artwork level 6 type NSA cards.

   A review of Westinghouse WCAP-14620, "7300 Printed Circuit Card Revision History", was performed to determine if any changes were made which would adversely affect the card's time response. The conclusion basis that the card's response time is not degraded due to the particular revision is italicized.

   A. Revision 13 corrected errors in the bill of material to agree with the assembly and schematics. (*No component replacement is documented.)*
   B. Revision 14 replaced Motorola 741 operational amplifiers (date code 8004) due to oscillation when connected to external test equipment. (*The operational amplifier is not a component that was identified in WCAP-14036 as being sensitive to undetectable time response degradation.*)
   C. Revision 15 corrected typographical error in Bill of Material for item 88 to reflect drawing 4259A57H02. (*No component replacement documented.*)
   D. Revision 16 added a verification report number and DEON Control Designation to title page of drawing. (*No component replacement documented.*)
   E. Revision 17 replaced Fairchild 741 operational amplifiers (date codes 8200 through 8252) due to moisture entrapment in can. (*The operational amplifier is*

not a component that was identified in WCAP-14036 as being sensitive to undetectable time response degradation.)

F. Revision 18 deleted resistor item 37 from the Bill of Material because it was not required. (*This component is not listed in WCAP-14036 as being sensitive to undetectable time response degradation.)*

G. Revision 19 added ferrite beads to filter out high frequency oscillations in PS17 circuit due to faster transistors. (*PS17 is a power supply circuit on the card and no components on this circuit were identified in WCAP-14036 as sensitive to undetectable time response degradation.)*

H. Revision 20 added commercial dedication instruction, test procedure, and shelf life references to drawing. (*No component replacement documented.)*

I. Revision 21 created new artwork level (level 6) that redesigned card to add new group as well as improve reliability, eliminate problems with obsolescence, and improve manufacturability and testability. (*Per inspection of this card, there are fewer discrete components that would be subject to time response degradation. The equivalent component to resistor R294-1 is now R107. Both are 50 K resistors; however, the newer artwork level 6 card has an improved tolerance of $\pm$0.01% versus the $\pm$0.10% of the old card. The equivalent component to capacitor C83-1 is now C38; both capacitors are the same value of 1 μF.*)

   a. In addition to the above evaluation, it should be noted that the artwork level 6 cards have been successfully response time tested on site per plant procedures MST-I0644, MST-I0645, and MST-I0646 as part of the existing RTT (the latest testing completed during RO10 in October, 2001). This further provides confidence that the changes between artwork level 4 and 6 did not degrade the response time of these cards.

6. With respect to Rosemount Model 1154 transmitters as described on page E1-12 of 13, the following describes how a confidence level was obtained for the value of 0.44 seconds that was selected for the bounding response time.

The response time data of Rosemount transmitters from the past eight refueling outages was obtained from the completed HNP Response Time Tests. A total of 35 data points were analyzed to obtain an enveloping value. The worst case value of Rosemount transmitters other than the pressurizer pressure transmitters was 0.13 seconds. A 95/95 statistical analysis was performed on the group of Rosemount transmitters exclusive of the pressurizer pressure transmitter noise analysis data. This resulted in an upper limit of 0.194 seconds. This correlates well with the vendor manual specification of 0.2 seconds for the range codes used at HNP. However, for conservatism, a 95/95 analysis was performed on the range group of Rosemount transmitters with the highest response times (pressurizer pressure transmitters) using the noise analysis data. This resulted in an upper limit time of 0.542 seconds. However, HNP elected to use a more realistic time of 0.44 seconds for the Rosemount

transmitter time response based upon the most conservative test data obtained during this period. It should be noted that the noise analysis technique used by HNP is conservative compared to the hydraulic ramp method. For example, the pressurizer pressure transmitter response times ranged from 0.013 seconds to 0.020 seconds using the hydraulic ramp method; however, the noise analysis method results in times from 0.32 seconds to 0.44 seconds. In summary, the 0.44 second value for Rosemount transmitters is based upon the following:

- The 0.440 seconds is the worst case test result using a conservative test method.
- The noise analysis testing method used on the pressurizer pressure transmitters produce very conservative results because the process noise is minimal.
- Hydraulic ramp tests on the pressurizer pressure transmitters produced response times significantly less than the 0.44 seconds.
- Rosemount supplied information indicates the response time of these transmitters is significantly lower than 0.44 seconds.
- NUREG/CR-5383 documents response times for these transmitters that are significantly lower than 0.44 seconds

Per section 9 of WCAP-13632, Rev.2, allocations for sensor response times may be obtained from: (1) historical records based on acceptable response time tests (hydraulic, noise, or power interrupt tests), (2) in place, onsite, or offsite (e.g. vendor) test measurements, or (3) utilizing vendor engineering specifications. The time allocated by HNP for the Rosemount transmitters envelopes all of these methods.