March 7, 2003

Mr. James Scarola, Vice President
Shearon Harris Nuclear Power Plant
Carolina Power & Light Company
Post Office Box 165, Mail Code: Zone 1
New Hill, North Carolina 27562-0165

SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1 - ISSUANCE OF AMENDMENT RE: ELIMINATION OF PERIODIC PRESSURE SENSOR AND PROTECTION CHANNEL RESPONSE TIME TESTS (TAC NO. MB6230)

Dear Mr. Scarola:

The Nuclear Regulatory Commission has issued Amendment No. 112 to Facility Operating License No. NPF-63 for the Shearon Harris Nuclear Power Plant, Unit 1. This amendment changes the Technical Specifications in response to your application dated August 30, 2002, as supplemented November 21 and December 16, 2002, and January 23, 2003.

The amendment eliminates the requirements to perform response time testing for several reactor protection system and engineered safety feature functions in conformance with previously approved topical reports.

A copy of the related Safety Evaluation is enclosed. Notice of Issuance will be included in the Commission's regular bi-weekly Federal Register notice.

Sincerely,

/***RA***/

Chandu P. Patel, Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-400

Enclosures:
1. Amendment No. 112 to NPF-63
2. Safety Evaluation

cc w/enclosures:
See next page

March 7, 2003

Mr. James Scarola, Vice President
Shearon Harris Nuclear Power Plant
Carolina Power & Light Company
Post Office Box 165, Mail Code: Zone 1
New Hill, North Carolina 27562-0165

SUBJECT: SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1 - ISSUANCE OF AMENDMENT RE: ELIMINATION OF PERIODIC PRESSURE SENSOR AND PROTECTION CHANNEL RESPONSE TIME TESTS (TAC NO. MB6230)

Dear Mr. Scarola:

The Nuclear Regulatory Commission has issued Amendment No. 112 to Facility Operating License No. NPF-63 for the Shearon Harris Nuclear Power Plant, Unit 1. This amendment changes the Technical Specifications in response to your application dated August 30, 2002, as supplemented November 21 and December 16, 2002, and January 23, 2003.

The amendment eliminates the requirements to perform response time testing for several reactor protection system and engineered safety feature functions in conformance with previously approved topical reports.

A copy of the related Safety Evaluation is enclosed. Notice of Issuance will be included in the Commission's regular bi-weekly Federal Register notice.

Sincerely,
/***RA***/
Chandu P. Patel, Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-400
Enclosures:
1. Amendment No.112 to NPF-63
2. Safety Evaluation

cc w/enclosures:
See next page

Distribution:

PUBLIC	OGC
PDII-2 Rdg.	G. Hill (2)
H. Berkow	R. Dennig
A. Howe	P. Loeser
E. Dunnington	ACRS
C. Patel	P. Fredrickson, RII

cc: Harris Service List
Accession Number ML030660349

OFFICE	PM:PDII/S2	LA:PDII/S2	OGC	SC/PDII-2
NAME	CPatel	EDunnington	RHoefling/ NLO	AHowe
DATE	2/20/03	2/19/03	2/24/03	3/6/03

OFFICIAL RECORD COPY

CAROLINA POWER & LIGHT COMPANY, et al.

DOCKET NO. 50-400

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No.112
License No. NPF-63

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Carolina Power & Light Company, (the licensee), dated August 30, 2002, as supplemented November 21 and December 16, 2002, and January 23, 2003, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications, as indicated in the attachment to this license amendment; and paragraph 2.C.(2) of Facility Operating License No. NPF-63 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, as revised through Amendment No. , are hereby incorporated into this license. Carolina Power & Light Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/***RA***/

Allen G. Howe, Chief, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: March 7, 2003

ATTACHMENT TO LICENSE AMENDMENT NO.112

FACILITY OPERATING LICENSE NO. NPF-63

DOCKET NO. 50-400

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove Pages	Insert Pages
1-3	1-3
1-5	1-5
3/4 3-1	3/4 3-1
3/4 3-17	3/4 3-17
B 3/4 3-2	B 3/4 3-2
---	B 3/4 3-2a

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 112 TO FACILITY OPERATING LICENSE NO. NPF-63

CAROLINA POWER & LIGHT COMPANY

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1

DOCKET NO. 50-400

1.0 INTRODUCTION

By letter dated August 30, 2002, as supplemented November 21 and December 16, 2002, and January 23, 2003, the Carolina Power & Light Company (CP&L, the licensee) submitted a request for changes to the Shearon Harris Nuclear Power Plant, Unit 1 (HNP), Technical Specifications (TS). The requested changes would revise the requirement to perform response time testing (RTT) for several reactor protection system (RPS) and engineered safety feature (ESF) functions. The basis for this request is presented in two approved Westinghouse Owners Group (WOG) topical reports, WCAP-13632-P-A, Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," and WCAP-14036-P, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests."

The November 21 and December 16, 2002, and January 23, 2003, letters provided clarifying information and did not change the initial proposed no significant hazards consideration determination or expand the scope of the initial application.

2.0 REGULATORY EVALUATION

The current standard technical specifications require nuclear power plants to periodically perform RTT for instrument channels in the RPS, emergency core cooling system (ECCS), and isolation actuation system (IAS). The intent of these tests is to ensure that changes in instrumentation response time beyond the limits assumed in the plant's safety analyses are detected and combined with instrument calibrations to ensure that the instrumentation is operating correctly.

The Institute of Electrical and Electronics Engineers (IEEE) Standard 338-1977, which is endorsed in Regulatory Guide (RG) 1.118, Rev. 2, defines a basis for eliminating RTT. Specifically, Section 6.3.4 of IEEE Standard 338-1977 states, in part, the following basis:

> "Response time testing of all safety-related equipment, per se, is not required if, in lieu of response time testing, the response time of the safety system equipment is verified by functional testing, calibration check, or other tests, or

both. This is acceptable if it can be demonstrated that changes in response time beyond acceptable limits are accompanied by changes in performance characteristics which are detectable during routine periodic tests."

The WOG performed two analyses to assess the impact of elimination of RTT for instruments and instrument loops. These analyses also discussed alternate test methodologies that would show that the instrumentation was functioning correctly. The first of these analyses was WOG Licensing Topical Report WCAP-13632, "Elimination of Pressure Sensor Response Time Testing Requirements," dated August 1995. It was approved by the NRC staff as documented in a safety evaluation report (SER) dated September 5, 1995. The second, WCAP-14036-P, Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," dated December 1995, was approved by the NRC staff as documented in an SER dated October 6, 1998. Each of these SERs stipulated certain conditions that individual plant licensees must meet when implementing the guidelines in WCAP-13632 and WCAP-14036 on a plant-specific basis. The licensee has used these WCAPs to justify the proposed changes. The licensee's amendment request and the NRC staff's acceptance is based on these WCAPs.

3.0 TECHNICAL EVALUATION

The NRC staff has reviewed the licensee's regulatory and technical analyses in support of its proposed license amendment. The detailed evaluation is provided in the following subsections.

3.1 TS Changes

There are two types of RTT elimination changes contained within the CP&L request. The first is to eliminate periodic pressure sensor RTT in accordance with WCAP-13632, and the second change is to eliminate protective channel RTT for the Reactor Trip System (RTS) and Engineered Safety Feature Actuation Systems (ESFAS) in accordance with WCAP-14036.

For the first change, the licensee proposes to no longer perform RTT on the following sensors:

Barton 752 with Model 351 Sealed Sensor
Barton 763
Barton 764
Rosemount 1153
Rosemount 1154

All of these sensor types are listed in the NRC staff's SER dated September 5, 1995, approving WCAP-13632. Since the NRC staff has already reviewed the generic analysis, no further review of these sensor types is required, and the licensee needs only to meet the conditions for plant-specific amendments.

For the second change, the licensee proposed elimination of RTT for the RTS and ESF systems, and instead will depend upon calibration and other periodic testing as described in WCAP-14036 in order to determine the proper operation and functioning of the above system instrumentation. In those cases where the TS require the licensee to verify that a protective system can meet its protective function in a prescribed time, a bounding response time will be

added to those portions of the protective system actually tested for response time in order to determine the total system response time. The requirement to actually measure the response times would be eliminated, and instead, the response times will be verified by summing allocated times for sensors, the process protection system, the nuclear instrumentation system, and the logic system. These allocated values will be added to the measured times for the actuated devices and compared to the overall analysis limits.

The actual TS change is to revise the TS definition for "Engineered Safety Features (ESF) Response Time" and "Reactor Trip System (RTS) Response Time" to provide for verification of response time for selected components provided that the components and the methodology for verification have been previously reviewed and approved by the NRC. The TS requirements for response time verification will continue to be implemented by surveillance requirements (SRs) 3.3.1.15 and 3.3.2.8.

The specific sections of the HNP TS to be changed are as shown below.

3.1.1 Definitions Section, 1.13 ENGINEERED SAFETY FEATURE RESPONSE TIME, page 1-3.

Proposed Change: Add two sentences to the definition. The definition currently reads:

> The ENGINEERED SAFETY FEATURES (ESF) RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF Actuation Setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays where applicable.

With the addition of the proposed sentences, the definition will state:

> The ENGINEERED SAFETY FEATURES (ESF) RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its ESF Actuation Setpoint at the channel sensor until the ESF equipment is capable of performing its safety function (i.e., the valves travel to their required positions, pump discharge pressures reach their required values, etc.). Times shall include diesel generator starting and sequence loading delays where applicable. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of measurement, response time may be verified for selected components provided that the components and the methodology for verification have been previously reviewed and approved by the NRC.

3.1.2 Definitions Section, 1.29 REACTOR TRIP SYSTEM (RTS) RESPONSE TIME, page 1-5.

Proposed Change: Add two sentences to the definition. The definition currently reads:

> The REACTOR TRIP SYSTEM RESPONSE TIME shall be the time interval from when the monitored parameter exceeds its Trip Setpoint at the channel sensor until loss of stationary gripper coil voltage.

With the addition of the proposed sentences, the definition will state:

> The REACTOR TRIP SYSTEM RESPONSE TIME shall be the time interval from when the monitored parameter exceeds its Trip Setpoint at the channel sensor until loss of stationary gripper coil voltage. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured. In lieu of measurement, response time may be verified for selected components provided that the components and the methodology for verification have been previously reviewed and approved by the NRC.

Evaluation: Addition of these sentences in the above two definitions will allow the licensee to verify the component response times rather than performing an actual RTT. These changes are in accordance with WCAP-14036-P, Revision 1, and the NRC staff SER approving that report, and are therefore acceptable to the staff.

3.1.3 Section 3/4.3.1, REACTOR TRIP SYSTEM INSTRUMENTATION, SURVEILLANCE REQUIREMENTS paragraph 4.3.1.2, page 3/4 3-1.

Proposed Change: Modify the paragraph to use the term “verify” rather than “demonstrate” or ”test.” The paragraph currently reads:

> 4.3.1.2 The REACTOR TRIP SYSTEM RESPONSE TIME of each Reactor trip function shall be demonstrated to be within its limits, specified in the Technical Specification Equipment List Program, plant procedure PLP-106, at least once per 18 months. Each test shall include at least one train such that both trains are tested at least once per 36 months and one channel per function such that all channels are tested at least once every N times 18 months where N is the total number of redundant channels in a specific Reactor trip function as shown in the “Total No. of Channels" column of Table 3.3-1.

With the modifications, the paragraph will state:

> 4.3.1.2 The REACTOR TRIP SYSTEM RESPONSE TIME of each Reactor trip function shall be verified to be within its limit, specified in the Technical Specification Equipment List Program, plant procedure PLP-106, at least once per 18 months. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once every N times 18 months where N is the total number of

redundant channels in a specific Reactor trip function as shown in the “Total No. of Channels" column of Table 3.3-1.

Evaluation: These modifications will allow the licensee to verify the component response times rather than performing an actual RTT. These changes are in accordance with WCAP-14036-P, Revision 1, and the NRC staff SER approving that report, and are therefore acceptable to the staff.

3.1.4 Section 3/4.3.2, ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION, SURVEILLANCE REQUIREMENTS paragraph 4.3.2.2, page 3/4 3-17.

Proposed Change: Modify the paragraph to use the term “verify” rather than “demonstrate” or ”test.” The paragraph currently reads:

> 4.3.2.2 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be demonstrated to be within its limits specified in the Technical Specification Equipment List Program, plant procedure PLP-106, at least once per 18 months. Each test shall include at least one train such that both trains are tested at least once per 36 months and one channel per function such that all channels are tested at least once per N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the “Total No. of Channels" column of Table 3.3-3.

With the modifications, the paragraph will state:

> 4.3.2.2 The ENGINEERED SAFETY FEATURES RESPONSE TIME of each ESFAS function shall be verified to be within its limit specified in the Technical Specification Equipment List Program, plant procedure PLP-106, at least once per 18 months. Each verification shall include at least one train such that both trains are verified at least once per 36 months and one channel per function such that all channels are verified at least once per N times 18 months where N is the total number of redundant channels in a specific ESFAS function as shown in the “Total No. of Channels" column of Table 3.3-3.

Evaluation: These modifications will allow the licensee to verify the component response times rather than performing an actual RTT. These changes are in accordance with WCAP-14036-P, Revision 1, and the NRC staff SER approving that report, and are therefore acceptable to the staff.

3.1.5 Basis Section on REACTOR TRIP SYSTEM INSTRUMENTATION AND ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION, page B 3/4 3-2.

Proposed Change: Delete the last sentence at the end of the third paragraph, and insert several new sentences. Add a new paragraph between the third and fourth paragraphs. The third paragraph currently reads:

The measurement of response time at the specified frequencies provides assurance that the reactor trip and the Engineered Safety Features actuation associated with each channel is completed within the time limit assumed in the safety analyses. No credit was taken in the analyses for those channels with response times indicated as not applicable. Response time may be demonstrated by any series of sequential, overlapping, or total channel test measurements provided that such tests demonstrate the total channel response time as defined. Sensor response time verification may be demonstrated by either: (1) in place, onsite, or offsite test measurements, or (2) utilizing replacement sensors with certified response time.

With these modifications, the third and new fourth paragraphs will read:

The measurement of response time at the specified frequencies provides assurance that the reactor trip and the Engineered Safety Features actuation associated with each channel is completed within the time limit assumed in the safety analyses. No credit was taken in the analyses for those channels with response times indicated as not applicable. Response time may be demonstrated by any series of sequential, overlapping, or total channel test measurements provided that such tests demonstrate the total channel response time as defined. Response time may be verified by actual response time tests in any series of sequential, overlapping or total channel measurements or by the summation of allocated sensor, signal processing and actuation logic response times with actual response time tests on the remainder of the channel. 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) inplace, onsite, or offsite (e.g. vendor) test measurements; or (3) utilizing vendor engineering specifications. WCAP-13632-P-A, Rev. 2, "Elimination of Pressure Sensor Response Time Testing Requirements," provides the basis and methodology for using allocated sensor response times in the overall verification of the channel response time for specific sensors identified in the WCAP. Response time verification for other sensor types must be demonstrated by test.

WCAP 14036-P-A, Rev. 1, "Elimination of Periodic Response Time Tests," provides the basis and methodology for using allocated signal actuation logic response times in the overall verification of the protection system channel response time. The allocations for sensor, signal conditioning, and actuation logic response times must be verified prior to placing the component into operational service and re-verified following maintenance or modification that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for the repair are the same type and value. Specific components identified in the WCAP may be replaced without verification testing. One example where response time could be affected is replacing the sensing element of a transmitter.

Evaluation: These changes describe the rationale that allows the licensee to verify the component response times by using an approved methodology instead of performing an

actual RTT. These changes are in accordance with WCAP-14036-P, Revision 1, as approved by the NRC staff SER and are, therefore, acceptable to the staff.

3.2 Verification of Plant-Specific Conditions

The NRC staff stipulated several conditions in the generic SER approving WCAP-13632 that must be met by the individual licensee referencing the topical report before the guidance could be implemented in plant-specific TS change proposals. From the licensee's submittal, the NRC staff verified that the licensee has met or will meet the applicable conditions as follows:

A) Condition: Perform a hydraulic RTT prior to installation of a new transmitter/switch or following refurbishment of the transmitter/switch (e.g., sensor cell or variable damping components) to determine an initial sensor-specific response time value.

Licensee Response: "Consistent with the proposed TS changes (including the associated Bases for 4.3.1.2 and 4.3.2.2) the applicable plant procedures include requirements that stipulate that pressure sensor response times must be verified by performance of a hydraulic response time test prior to placing a sensor into operational service and re-verified following maintenance that may adversely affect sensor response time."

Evaluation: This response fulfills the condition in the NRC staff generic SER, and is therefore acceptable to the staff.

B) Condition: For transmitters and switches that use capillary tubes, perform an RTT after initial installation and after any maintenance or modification activity that could damage the capillary tubes.

Licensee Response: "Plant procedure revisions (and/or other appropriate administrative controls) will stipulate that transmitters and switches utilizing capillary tubes, e.g., containment pressure, is subjected to RTT after initial installation and following any maintenance or modification activity, which could damage the transmitter capillary tubes."

Evaluation: This response fulfills the condition in the NRC staff generic SER, and is therefore acceptable to the staff.

C) Condition: If variable damping is used, implement a method to assure that the potentiometer is at the required setting and cannot be inadvertently changed or perform hydraulic RTT of the sensor following each calibration.

Licensee Response: "HNP has no transmitters with variable damping installed in any RTS or ESFAS application for which RTT is required (reference Enclosure 1; Tables 1 and 2); therefore, no HNP procedure changes are required.

Evaluation: Since HNP does not use sensors that use variable damping, this condition is not applicable.

D) Condition: Perform periodic drift monitoring of all Model 1151, 1152, 1153, and 1154 Rosemount pressure and differential pressure transmitters for which RTT elimination is proposed, in accordance with the guidance contained in Rosemount Technical Bulletin No. 4, and continue to remain in full compliance with any prior commitments to Bulletin 90-01, Supplement 1. As an alternative to performing periodic drift monitoring of Rosemount transmitters, licensees may complete the following actions: (1) ensure that operators and technicians are aware of the Rosemount transmitter loss of fill-oil issue and make provisions to ensure that technicians monitor for sensor response time degradation during the performance of calibrations and functional tests of these transmitters, and (2) review and revise surveillance testing procedures, if necessary, to ensure that calibrations are being performed using equipment designed to provide a step function or fast ramp in the process variable and that calibrations and functional tests are being performed in a manner that allows simultaneous monitoring of both the input and output response of the transmitter under test, thus allowing, with reasonable assurance, the recognition of significant response time degradation.

Licensee Response: "During RFO 7 in the spring of 1997, the last Rosemount transmitter covered by NRC Bulletin 90-01 was changed out. Therefore, all of the affected transmitters have either reached the appropriate "time at pressure" criteria required for exclusion or they have been replaced with a refurbished or new transmitter. The concerns identified by NRC bulletin 90-01 have been resolved."

Evaluation: Since HNP does not use Rosemount transmitters for which periodic drift monitoring is required, this condition is not applicable.

The NRC staff confirmed that the licensee's responses satisfactorily addressed the above conditions in the NRC staff generic SER, and are therefore acceptable to the staff.

The NRC staff SER approving WCAP-14036 also had a condition that must be met by the individual licensee referencing the topical report before the guidance could be implemented in plant-specific TS change proposals. The condition is as follows.

Condition: Since the performance of RTT is a TS requirement, licensees referencing WCAP-14036 must submit a TS amendment to eliminate that requirement for the identified equipment. In that amendment request, the licensee must verify that the failure modes and effects analysis (FMEA) performed by the WOG is applicable to the equipment actually installed in the licensee's facility, and that the analysis is valid for the versions of the boards used in the protection system.

Licensee Response: In its August 30, 2002, submittal, the licensee stated:

> The FMEA provided by the WOG in WCAP-14036-(P)(A), Revision 1, is applicable to the installed equipment in the population for which this change request is being submitted with the exception of three summing amp cards that are 6NSA artwork level. These cards are located in Process Instrument Cabinets (PICs) 1 and 2:

Cabinet	Slot	Card Type
PIC-01	0231	6NSA1
PIC-02	0231	6NSA1
PIC-02	0243	6NSA1

The WCAP designated components R294-1 and C83-1 in block G as the most sensitive components to any time response degradation. 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 card's time response. Therefore, the changes on this card from the above 4NSA artwork level have been evaluated as having no adverse impact on the time response of the card. Other versions of these cards in use at HNP will not be included in this response time elimination request. The Nuclear Instrumentation System is addressed in section 4.6 of WCAP-14036-P-A, Revision 1.

Evaluation: This response fulfills the condition in the NRC staff's generic SER, and is therefore acceptable to the staff.

3.3 Bounding Response Times

In addition to the above conditions, when a plant accident analysis determines that a mitigation system is required to actuate in a certain response time, the testing for that response time is generally required by TS. The license amendment request will eliminate some of the testing previously required. The two topical reports mentioned above provide adequate justification that calibrations and other surveillance testing will prove that the instruments are functioning properly. When the testing is not done to a portion of the instrument loop, but the TS requires the verification of assumptions made in the accident analysis, some assumed or bounding value for the untested portion of the loop must be added to the tested portion to arrive at a total system response time. WCAP-14036 included those maximum or bounding response times for the equipment that was analyzed in that report. WCAP-13632 did not have similar bounding response times approved for the sensors that were addressed in that topical report. The bounding sensor response time value tables shown below and the notes to the tables were included in attachment 1, Tables 1 and 2, in the August 30, 2002, submittal by the licensee.

Table I
Reactor Trip System Function / Allocation Time

Function	Sensor	Time **Note 2**	Process	Time **Note 4**	SSPS Relays	Time **Note 6**
Pressurizer Pressure High	Rosemount 1154SH9RA	0.54 Sec.	7300	0.100 Sec.	Input + SSPS Logic	0.020 Sec.
Pressurizer Pressure Low	Rosemount 1154SH9RA	0.54 Sec.	7300	0.100 Sec.	Input + SSPS Logic	0.020 Sec.
Pressurizer Pressure Low-SI	Rosemount 1154SH9RA	0.54 Sec.	7300	0.100 Sec.	Input + SSPS Logic	0.020 Sec.
Pressurizer Level High	N/A	N/A	N/A	N/A	N/A	N/A
Loss of Flow-Single Loop	Rosemount 1154HP5RA	0.15 Sec.	7300	0.100 Sec.	Input + SSPS Logic	0.020 Sec.
Loss of Flow-Two Loops	Rosemount 1154HP5RA	0.15 Sec.	7300	0.100 Sec.	Input + SSPS Logic	0.020 Sec.

Table I
Reactor Trip System Function / Allocation Time

Function	Sensor	Time **Note 2**	Process	Time **Note 4**	SSPS Relays	Time **Note 6**
Power Range Neutron Flux High Setpoint	Note 1	N/A	RIS	0.065 Sec. WCAP-14036, Sect 4.5	Input + SSPS Logic	0.020 Sec.
Power Range Neutron Flux Low Setpoint	Note 1	N/A	NIS	0.065 Sec. WCAP-14036, Sect 4.5	Input + SSPS Logic	0.020 Sec.
Power Range High Flux Rate	Note 1	N/A	NIS	0.200 Sec. WCAP-14036, Sect 4.5	Input + SSPS Logic	0.020 Sec.
OTDT (Vary Neutron Flux) Includes I MSec. for Isolation Amplifier per WCAP-14036-P-A, Rev.1, Section 4.6	Note 1	N/A	NIS/7300	0.401 Sec. WCAP-14036, Sect 4.5	Input + SSPS Logic	0.020 Sec.
OTDT (Vary T_{avg})	Note 3	N/A	7300 Note 5	0.4375 Sec.	Input + SSPS Logic	0.020 Sec.
OTDT (Vary Dt)	Note 3	N/A	7300 Note 5	0.4375 Sec.	Input + SSPS Logic	0.020 Sec.
OTDT (Vary Pressure)	Rosemount 1154SH9RA	0.54 Sec.	7300	0.400 Sec.	Input + SSPS Logic	0.020 Sec.
OPDT (Vary DT)	Note 3	N/A	7300 Note 5	0.4375 Sec.	Input + SSPS Logic	0.020 Sec.
OPDT (Vary T_{avg})	Note 3	N/A	7300 Note 5	0.4375 Sec.	Input + SSPS Logic	0.020 Sec.
SG Water Level Lo-Lo	Barton 764	0.400 Sec.	7300	0.100 Sec.	Input + SSPS Logic	0.020 Sec.
SG Water Level Low With Feed Flow/Steam Flow Mismatch	N/A	N/A	N/A	N/A	N/A	N/A
RCP Undervoltage	Note 3	N/A	N/A	N/A	Input + SSPS Logic	0.020 Sec.
RCP Underfrequency	Note 3	N/A	N/A	N/A	Input + SSPS Logic	0.020 Sec.
Containment Press Hi-1 SI	Barton 752 With Model 351 Sealed Sensor	1.400 Sec.	7300	0.100 Sec.	Input + SSPS Logic	0.020 Sec.
Steam Line Pressure Low-SI	Barton 763	0.200 Sec.	7300	0.100 Sec.	Input + SSPS Logic	0.020 Sec.

RPS Functions Acronyms

OPDT - Overpower Δ Temperature
OTDT - Overtemperature Δ Temperature
NIS - Nuclear Instrumentation System
RCP - Reactor Coolant Pump
SG - Steam Generator
SI - Safety Injection

Table 2
Engineered Safety Feature Function / Allocation Time

Function	Sensor	Time **Note 2**	Process	Time **Note 4**	SSPS Relays	Time **Note 6**
Pressurizer Pressure Low-SI (ECCS)	Rosemount 1154SH9RA	0.54 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.124 Sec.
Pressurizer Pressure Low-Feedwater Isolation	Rosemount 1154SH9RA	0.54 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.088 Sec.
Pressurizer Pressure Low-Containment Isolation Phase a	Rosemount 1154SH9RA	0.54 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.124 Sec.
Pressurizer Pressure Low-Containment Vent Isolation	Rosemount 1154SH9RA	0.54 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.088 Sec.
Pressurizer Pressure Low-Aux Feedwater Pumps	Rosemount 1154SH9RA	0.54 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.088 Sec.
Pressurizer Pressure Low-SW System	Rosemount 1154SH9RA	0.54 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.088 Sec.
Pressurizer Pressure Low-Emergency Fan Coolers	Rosemount 1154SH9RA	0.54 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.088 Sec.
Pressurizer Pressure Low-Control Room Emergency HVAC	Rosemount 1154SH9RA	0.54 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.088 Sec.
Sg Water Level Lo-Lo (Motor Driven AFW Pumps)	Barton 764	0.400 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.124 Sec.
Sg Water Level Lo-Lo (Turbine Driven AFW Pumps)	Barton 764	0.400 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.124 Sec.
Sg Water Level Hi-Hi (Feedwater Isolation)	Barton 764	0.400 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.160 Sec.
Sg Water Level Hi-Hi (Trip Turbine & FW Pumps)	Barton 764	0.400 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	O.124 Sec.
Sg Water Level Hi-Hi (Fw Bypass Valves)	Barton 764	0.400 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.088 Sec.
Containment Pressure Hi-3 Containment Spray	Barton 752 with Model 351 Sealed Sensor	1.400 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.124 Sec.
Containment Pressure Hi-3 Containment Isolation Phase B	Barton 752 with Model 351 Sealed Sensor	1.400 Sec.	7300	0.100 Sec.	Input + SSPS Logic+ Master + Slave Relays	0.088Sec.

Table 2
Engineered Safety Feature Function / Allocation Time

Function	Sensor	Time **Note 2**	Process	Time **Note 4**	SSPS Relays	Time **Note 6**
Containment Pressure Hi-2 Steam Line Isolation	Barton 752 with Model 351 Sealed Sensor	1.400 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.088 Sec.
Containment Pressure Hi-1 SI (ECCS)	Barton 752 with Model 351 Sealed Sensor	1.400 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.124 Sec.
Containment Pressure Hi-1 Feedwater Isolation	Barton 752 with Model 351 Sealed Sensor	1.400 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.160 Sec.
Containment Pressure Hi-1 Containment Isolation Phase a	Barton 752 with Model 351 Sealed Sensor	1.400 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.160 Sec.
Containment Pressure Hi-1 Containment Ventilation Isolation	Barton 752 with Model 351 Sealed Sensor	1.400 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.124 Sec.
Containment Pressure Hi-1 Aux Feedwater Pumps	Barton 752 with Model 351 Sealed Sensor	1.400 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.088 Sec.
Containment Pressure Hi-1 ESW System	Barton 752 with Model 351 Sealed Sensor	1.400 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.088 Sec.
Containment Pressure Hi-1 Emergency Fan Coolers	Barton 752 with Model 351 Sealed Sensor	1.400 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.088 Sec.
Steam Line Pressure Low-SI (ECCS)	Barton 763	0.200 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.124 Sec.
Steam Line Pressure Low- Feedwater Isolation	Barton 763	0.200 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.124 Sec.
Steam Line Pressure Low-AFW Pumps	Barton 763	0.200 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.088 Sec.
Steam Line Pressure Low-ESW System	Barton 763	0.200 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.088 Sec.
Steam Line Pressure Low- Emergency Fan Coolers	Barton 763	0.200 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.088 Sec.
Steam Line Pressure Low-Steam Line Isolation	Barton 763	0.200 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.088 Sec.
Steam Line Pressure Low-Containment Isolation Phase A	Barton 763	0.200 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.088 Sec.
Steam Line Pressure Low-Containment Ventilation Isolation	Barton 763	0.200 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.124 Sec.

Table 2
Engineered Safety Feature Function / Allocation Time

Function	Sensor	Time **Note 2**	Process	Time **Note 4**	SSPS Relays	Time **Note 6**
Steam Line Pressure Rate High-Steam Line Isolation	Barton 763	0.200 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.088 Sec.
Differential Pressure Between Steam Line High-Aux Feedwater Isolation	Barton 763	0.200 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.124 Sec.
Refueling Water Storage Tank Lo-Lo Level Switchover	Rosemount 1153DB5RA	0.48 Sec.	7300	0.100 Sec.	Input + SSPS Logic + Master + Slave Relays	0.088 Sec.
Radiation Level High Containment Ventilation Isolation	Note 7	N/A	N/A	N/A	SSPS Logic + Master + Slave Relays	Note 7
RCS Wide Range Pressure High with SI Alternate Miniflow Valves	Note 3	N/A	7300	0.100 Sec.	SSPS Logic + Master + Slave Relays	0.088 Sec.

Engineered Safety Features Actuation System (ESFAS) Function Acronyms

AFW - Auxiliary Feedwater
ECCS - Emergency Core Cooling System
ESW - Emergency Service Water
FW - Feedwater
HVAC - Heating, Ventilation, Air Conditioning
SI - Safety Injection
SW - Service Water

Notes Applicable to Tables 1 and 2

1. Neutron detectors are exempt from response time testing per Plant Program Procedure PLP-106, "Technical Specification Equipment List Program and Core Operating Limits Report," Attachment 1 notation.

2. WCAP-13632, Revision 2, Table 9-1, allocated response time for Barton sensors used at HNP is as follows:

Model 752	400 milliseconds
Model 763/763A	200 milliseconds
Model 764	400 milliseconds
Model 351 Sealed Sensor	1 second

WCAP-13632, revision 2, did not provide an allocated response time for Rosemount 1154 or 1153 instruments. HNP uses these model Rosemount transmitters for three functions that require response time testing. This includes RC Flow (Model 1154HP5RA), Pressurizer Pressure (Model 11 54SH9RA), and RWST Level (Model 1153DB5RA). To obtain baseline data as directed in Table 9-1 of WCAP-13632-P-A, Revision 2, the previous response times of all the 1153 and 1154 instruments were reviewed. The longest time of 0.44 seconds was obtained for a pressurizer pressure transmitter on 9/28/95 and 4/28/00. HNP performed a 95/95 statistical analysis of this data from R03 through R010. For each Rosemount transmitter model, a separate 95/95 analysis of the hydraulic ramp data and the noise analysis data was performed. The more conservative response time result from the two testing methods based on a 95/95 analysis was used for the allocated times in the Table for each model. Based on the results of this analysis, the following response times are allocated for each Rosemount model transmitter:

Model 1154HP5RA	0.15 seconds
Model 1154SH9RA	0.54 seconds
Model 1153DB5RA	0.48 seconds

HNP has chosen to use the above sensor time allocation for the Barton and Rosemount models listed above.

3. These sensors were not included in Westinghouse evaluation of Elimination of Response Time Testing. Therefore, allocated sensor time is not used for these variables. These components will continue to be tested as required.

4. WCAP-14036-P-A, Revision 1, evaluated the following 7300 cards for response time elimination with below or older artwork levels:

7NMD
4NCH
4NRA
6NLP
4NSA
9NAL

All of these are applicable to HNP. The only exception is that three summing amp cards are 6NSA artwork level. However, the changes on this card from the above 4NSA artwork level have been evaluated as having no adverse impact on the time response of the card. Other versions of these cards in use at HNP will not be included in this response time elimination request. The Nuclear Instrumentation System is addressed in section 4.6 of WCAP-14036-P-A, Revision 1.

5. An additional 0.0375 sec. is added to the allocation in WCAP-14036-P-A, Revision 1, due to an additional NSA card installed as part of the bypass manifold elimination.

6. WCAP-14036-P-A, Revision 1, was evaluated for response time elimination of HNP relays. The Solid-State Protection System (SSPS) slave relays used are Potter & Brumfield Motor Driven Relays (MDRs). The SSPS input and master relays are G.P. Clare GP1 series, Midtex/AEMCO 156, or Potter & Brumfield KH series type relays. The bounding response time for reactor trip times is 2 times the nominal input relay release time of 10 milliseconds, or 20 milliseconds. The bounding response time allocation for ESE functions is the combination of the longest pick-up or dropout time for each relay in the total circuit signal path for ESF component actuation. Therefore, an additional 36 milliseconds must be allocated for each MDR type separation relay (if installed) between the slave relay and end device. Bounding SSPS response time for ESF functions equals 26 milliseconds (input relay) plus 26 milliseconds (master relay) plus 36 milliseconds (for each slave relay). This equates to 88 milliseconds for functions with one slave relay or 124 milliseconds for ESF functions with two slave relays in series.

7. Response time testing of Radiation Monitors is not required per Plant Program Procedure PLP-106, "Technical Specification Equipment List Program and Core Operating Limits Report," Table Notation 7. However, components downstream of the sensors, including SSPS logic and relays, will continue to be tested as required.

The NRC staff has reviewed these values and the methods by which the values were determined, and has found them acceptable.

3.4 Use of Anticipated Response Times other than Manufacturer's Design Response Times

The licensee stated that in some instances, the manufacturer's design response time data is not available. In those instances, the licensee proposed using a response time value based upon actual values measured during past response time tests at HNP. The licensee provided the data for actual response times by letter dated December 16, 2002.

These administrative values for actual response time were established based upon review of the operating historical response time data. The NRC staff determined a statistically valid administrative value by determination of the mean and 2 sigma standard deviation value of response time (value which represents 95-percent confidence level by definition). The NRC staff then determined the one-sided tolerance limit factor for a normal distribution for a 95/95-percent confidence level. This was done using guidance in "Applying Statistics," NUREG-1475, Table T-11b: One sided tolerance limit factor for a normal distribution.

The results of these calculations are as shown below:

Sensor	Rosemount 1154HP5RA
Function	RC Flow
Mean	0.046 seconds
Std Dev	0.020 seconds
Sample Size	21
One-sided tolerance limit factor (95/95 Multiplier IAW NUREG 1475)	2.373
One-sided tolerance limit	0.094 seconds
HNP administrative response time value	0.15 seconds

Sensor	Rosemount 1154SH9RA
Function	Pressurizer Pressure
Mean	0.392 seconds
Std Dev	0.043 seconds
Sample Size	7
One-sided tolerance limit factor (95/95 Multiplier IAW NUREG 1475)	3.399
One-sided tolerance limit	0.539 seconds
HNP administrative response time value	0.54 seconds

Sensor	Rosemount 1153DB5RA
Function	RWST Level
Mean	0.126 seconds
Std Dev	0.149 seconds
Sample Size	3
One-sided tolerance limit factor (95/95 Multiplier IAW NUREG 1475)	7.656
One-sided tolerance limit	0.475 seconds
HNP administrative response time value	0.48 seconds

In each case, the HNP administrative response time value is more conservative than the one-sided tolerance limit; therefore, the licensee's values are acceptable to the NRC staff.

Based upon the above review, the NRC staff concludes that the licensee has implemented the provisions of the generic SERs for RTT elimination and satisfied the applicable plant-specific conditions in accordance with the approved WCAP-13632 and WCAP-14036. Therefore, the NRC staff concludes that the proposed HNP TS modifications for selected instrument RTT elimination are acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the State of North Carolina official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes the surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (67 FR 61676). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: Paul J. Loeser

Date: March 7, 2003

cc:

Mr. William D. Johnson
Vice President and Corporate Secretary
Carolina Power & Light Company
Post Office Box 1551
Raleigh, North Carolina 27602

Resident Inspector/ Harris NPS
c/o U. S. Nuclear Regulatory Commission
5421 Shearon Harris Road
New Hill, North Carolina 27562-9998

Ms. Karen E. Long
Assistant Attorney General
State of North Carolina
Post Office Box 629
Raleigh, North Carolina 27602

Public Service Commission
State of South Carolina
Post Office Drawer 11649
Columbia, South Carolina 29211

Ms. Beverly Hall, Acting Director
Division of Radiation Protection
N.C. Department of Environment
and Natural Resources
3825 Barrett Drive
Raleigh, North Carolina 27609-7721

Mr. Terry C. Morton
Manager
Performance Evaluation and
Regulatory Affairs CPB 7
Carolina Power & Light Company
Post Office Box 1551
Raleigh, North Carolina 27602-1551

Mr. Benjamin C. Waldrep
Plant General Manager - Harris Plant
Carolina Power & Light Company
Shearon Harris Nuclear Power Plant
P. O. Box 165, Mail Zone 3
New Hill, North Carolina 27562-0165

Mr. John H. O'Neill, Jr.
Shaw, Pittman, Potts & Trowbridge
2300 N Street, NW.
Washington, DC 20037-1128

Mr. Robert J. Duncan II
Director - Site Operations
Carolina Power & Light Company
Shearon Harris Nuclear Power Plant
Post Office Box 165, Mail Zone 1
New Hill, North Carolina 27562-0165

Mr. Robert P. Gruber
Executive Director
Public Staff NCUC
4326 Mail Service Center
Raleigh, North Carolina 27699-4326

Chairman of the North Carolina
Utilities Commission
Post Office Box 29510
Raleigh, North Carolina 27626-0510

Ms. Linda Coleman, Chairperson
Board of County Commissioners
of Wake County
P. O. Box 550
Raleigh, North Carolina 27602

Mr. Gary Phillips, Chairman
Board of County Commissioners
of Chatham County
P. O. Box 87
Pittsboro, North Carolina 27312

Mr. James W. Holt, Manager
Support Services
Carolina Power & Light Company
Shearon Harris Nuclear Power Plant
P. O. Box 165, Mail Zone 1
New Hill, North Carolina 27562-0165

Mr. John R. Caves, Supervisor
Licensing/Regulatory Programs
Carolina Power & Light Company
Shearon Harris Nuclear Power Plant
P. O. Box 165, Mail Zone 1
New Hill, NC 27562-0165