

April 22, 2002

Mr. G. R. Peterson
Site Vice President
Catawba Nuclear Station
Duke Energy Corporation
4800 Concord Road
York, South Carolina 29745-9635

SUBJECT: CATAWBA NUCLEAR STATION, UNITS 1 AND 2 RE: ISSUANCE OF
AMENDMENTS (TAC NOS. MB2108 AND MB2109)

Dear Mr. Peterson:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 197 to Facility Operating License NPF-35 and Amendment No. 190 to Facility Operating License NPF-52 for the Catawba Nuclear Station, Units 1 and 2. The amendments consist of changes to the Technical Specifications in response to your application dated May 25, 2001, as supplemented by letter dated January 24, 2002.

The amendments eliminate response time testing requirements for selected sensors and specified instrumentation loops for the Engineered Safety Features and the Reactor Trip System.

A copy of the related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

/RA/

Chandu P. Patel, Project Manager, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-413 and 50-414

Enclosures:

1. Amendment No. 197 to NPF-35
2. Amendment No. 190 to NPF-52
3. Safety Evaluation

cc w/encls: See next page

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DUKE ENERGY CORPORATION
NORTH CAROLINA ELECTRIC MEMBERSHIP CORPORATION
SALUDA RIVER ELECTRIC COOPERATIVE, INC.
DOCKET NO. 50-413
CATAWBA NUCLEAR STATION, UNIT 1
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 197
License No. NPF-35

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment to the Catawba Nuclear Station, Unit 1 (the facility) Facility Operating License No. NPF-35 filed by the Duke Energy Corporation, acting for itself, North Carolina Electric Membership Corporation and Saluda River Electric Cooperative, Inc. (licensees), dated May 25, 2001, as supplemented by letter dated January 24, 2002, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as 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 set forth in 10 CFR Chapter I;
 - 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 hereby amended by page 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-35 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 197, which are attached hereto, are hereby incorporated into this license. Duke Energy Corporation shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

John A. Nakoski, Chief, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment:
Technical Specification
Changes

Date of Issuance: April 22, 2002

DUKE ENERGY CORPORATION
NORTH CAROLINA MUNICIPAL POWER AGENCY NO. 1
PIEDMONT MUNICIPAL POWER AGENCY
DOCKET NO. 50-414
CATAWBA NUCLEAR STATION, UNIT 2
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 190
License No. NPF-52

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment to the Catawba Nuclear Station, Unit 2 (the facility) Facility Operating License No. NPF-52 filed by the Duke Energy Corporation, acting for itself, North Carolina Municipal Power Agency No. 1 and Piedmont Municipal Power Agency (licensees), dated May 25, 2001, as supplemented by letter dated January 24, 2002, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as 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 set forth in 10 CFR Chapter I;
 - 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 hereby amended by page 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-52 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 190, which are attached hereto, are hereby incorporated into this license. Duke Energy Corporation shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

John A. Nakoski, Chief, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment:
Technical Specification
Changes

Date of Issuance: April 22, 2002

ATTACHMENT TO LICENSE AMENDMENT NO. 197

FACILITY OPERATING LICENSE NO. NPF-35

DOCKET NO. 50-413

AND LICENSE AMENDMENT NO. 190

FACILITY OPERATING LICENSE NO. NPF-52

DOCKET NO. 50-414

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

| <u>Remove</u> | <u>Insert</u> |
|---------------|---------------|
| 1.1-3 | 1.1-3 |
| 1.1-5 | 1.1-5 |
| B 3.3.1-50 | B 3.3.1-50 |
| B 3.3.1-51 | B 3.3.1-51 |
| B 3.3.2-47 | B 3.3.2-47 |
| - | B 3.3.2-48 |

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 197 TO FACILITY OPERATING LICENSE NPF-35
AND AMENDMENT NO. 190 TO FACILITY OPERATING LICENSE NPF-52

DUKE ENERGY CORPORATION, ET AL.

CATAWBA NUCLEAR STATION, UNITS 1 AND 2

DOCKET NOS. 50-413 AND 50-414

1.0 INTRODUCTION

By letter dated May 25, 2001, as supplemented by letter dated January 24, 2002, Duke Energy Corporation, et al. (the licensee), submitted a request for changes to the Catawba Nuclear Station, Units 1 and 2 (CNS), Technical Specifications (TS). The requested changes would eliminate response time testing (RTT) requirements for selected sensors and specified instrumentation loops for the engineered safety features (ESF) and the reactor trip system (RTS).

The supplement dated January 24, 2002, provided additional information that did not change the scope of the May 25, 2001, application nor the initial proposed no significant hazards consideration determination.

2.0 BACKGROUND

The Westinghouse Owner's Group (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 analysis was WOG Licensing Topical Report WCAP-13632, "Elimination of Pressure Sensor Response Time Testing Requirements," dated August 1995. It was approved by the 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 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.

3.0 EVALUATION

This evaluation will be in two parts. The first will be an evaluation of the response time eliminations, and of the wording of the TS changes, and the second part will be of the plant specific information required by the SER's on WCAP-13632 and WCAP-14036.

3.1 RTT Elimination Changes

There are two types of RTT elimination changes contained within the CNS 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 RTS and the Engineered Safety Feature Actuation System in accordance with WCAP-14036.

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

- Barton 386A
- Barton 580A
- Barton 763
- Barton 764
- Rosemount 1153
- Rosemount 1154
- Tobar 32PA
- Veritrak 76PG

Six of the sensor types, the Barton models 763 and 764, Rosemount models 1153 and 1154, Tobar 32PA and Veritrak 76PG are all listed in the staff SER dated September 5, 1995, approving WCAP-13632. Since the 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.

The other two sensor types, the Barton 386A and 580A, were not submitted as a part of WCAP-13632, and were therefore not approved in the staff SER. In the licensee's May 25, 2001, submittal, Appendix A contained justification for the two additional types of sensors. In this Appendix, the licensee provided an analysis of the differences between the model 386A and the approved model 764. This analysis covered both the differential pressure unit and the electronic signal processing circuit. The licensee also provided a letter from ITT Barton Instrument Company confirming the licensee's analysis. The analysis stated:

"According to the manufacturer, the only difference between the ITT Barton Model 386A and Model 764 differential pressure Electronic transmitter are in manufacturing methodology. The Model 386A is temperature compensated for continuous operation up to +150° F. The Model 764 is temperature compensated for continuous operation up to +320° F. There are no material differences between the two models."

A similar analysis was provided for the Barton model 580A, comparing it to the model 288A approved in the staff SER dated September 5, 1995, approving WCAP-13632. This analysis covered both the differential pressure unit and the indication switch, and again the licensee provided a letter from ITT Barton Instrument Company confirming the licensee's analysis. In this analysis, the licensee's conclusion stated:

“ITT Barton Model 288A and ITT Barton Model 580A indicating pressure switches are similar except for different materials used in housing and switches. According to the manufacturer the differences in these materials have no effect on response time value. Since the tested switch and the switches at Catawba both contain silicon fill fluid, the fill fluid viscosity of the installed switches is not a concern for assuring technical specification compliance.”

The staff accepts the licensee’s conclusion that the failure modes and effects analysis (FMEA) performed in Electric Power Research Institute NP-7243 on the Barton model 764 is applicable to the model 386A, and the FMEA performed on the Barton model 288A is applicable to the model 580A. Therefore both sensors are eligible for RTT elimination.

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 systems’ instrumentation. In those cases where the TS requires 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 3.3.1.15 and 3.3.2.8.

The specific sections of the CNS TS to be changed are as follows:

Section 1.1, Definitions, ENGINEERED SAFETY FEATURE (ESF) RESPONSE TIME, page 1.1-3.

Proposed Change: Add a sentence to the definition. The definition currently reads:

The 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.

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

The 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.

Section 1.1, Definitions, REACTOR TRIP SYSTEM (RTS) RESPONSE TIME, page 1.1-5.

Proposed Change: Add a sentence to the definition. The definition currently reads:

The RTS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RTS 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.

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

The RTS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RTS 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 will allow the licensee to verify the component response times rather than performing an actual RTT. These changes are in accordance with the WCAP-14036-P, Revision 1, and the staff SER approving that report. Therefore, these changes are acceptable to the staff.

Basis Section 3.3.1, RPS Instrumentation, Surveillance Requirements, page B 3.3.1-50.

Proposed Change: Add two paragraphs after the paragraph ending, "The response time may be measured by a series of overlapping tests such that the entire response time is measured," and before the paragraph starting, "As appropriate, each channel's response must be verified every 18 months on a STAGGERED TEST BASIS." These paragraphs will read:

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) in place, onsite, or offsite (e.g. vendor) test measurements, or (3) utilizing vendor engineering specifications. WCAP-13632-P-A Revision 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. In addition, while not specifically identified in the WCAP, ITT Barton 386A and 580A-O sensors were compared to sensors which were identified. It was concluded that the WCAP results could be applied to these two sensor types as well. Response time verification for other sensor types must be demonstrated by test.

WCAP-14036-P-A Revision 1, "Elimination of Periodic Protection Channel Response Time Tests" provides the basis and methodology for using allocated signal processing and 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 in operational service and re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of 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 assembly of a transmitter.

Bases Section B 3.3.1, RTS Instrumentation, Reference, Page B 3.3.1-51.

Proposed Change: Add reference 8 and 9, to read:

8. WCAP-13632-P-A Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," Sep., 1995.
8. WCAP-14036-P-A Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," Oct., 1998.

Basis Section 3.3.2, ESFAS Instrumentation, Surveillance Requirements, page B 3.3.2-47.

Proposed Change: Add two paragraphs at the top of the page, before the paragraph starting, "ESF RESPONSE TIME tests are conducted on an 18 month STAGGERED TEST BASIS." These paragraphs will read:

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) in place, onsite, or offsite (e.g. vendor) test measurements, or (3) utilizing vendor engineering specifications. WCAP-13632-P-A Revision 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. In addition, while not specifically identified in the WCAP, ITT Barton 386A and 580A-O sensors were compared to sensors which were identified. It was concluded that the WCAP results could be applied to these two sensor types as well. Response time verification for other sensor types must be demonstrated by test.

WCAP-14036-P-A Revision 1, "Elimination of Periodic Protection Channel Response Time Tests" provides the basis and methodology for using allocated signal processing and 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 in operational service and re-verified following maintenance that may adversely affect response time. In general, electrical repair work does not impact response time provided the parts used for repair are of 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 assembly of a transmitter.

(b)4. Bases Section B 3.3.2, ESFAS Instrumentation, Reference, Page B 3.3.2-47.

Proposed Change: Add reference 8 and 9, to read:

8. WCAP-13632-P-A Revision 2, "Elimination of Pressure Sensor Response Time Testing Requirements," Sep., 1995.
9. WCAP-14036-P-A Revision 1, "Elimination of Periodic Protection Channel Response Time Tests," Oct., 1998.

Evaluation: These changes describe the rationale that allows the licensee to verify the component response times by using approved methodology instead of performing an actual RTT. These changes are in accordance with WCAP-14036-P Revision 1, as approved by the staff SER. Therefore, these changes are acceptable to the staff.

3.2 Verification of Plant Specific Conditions

The 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 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's Response: The Post-Maintenance Retest Manual references all RTT procedures to the instruments that require RTT post maintenance or testing. Use of this manual ensures that all new installations and refurbishments will require the appropriate RTT.

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

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

Licensee's Response: Catawba does not have any sensor that uses capillary tubing.

Evaluation: Since Catawba does not use capillary tubing, this condition is not applicable.

- 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: Catawba does not have any sensor that uses variable damping.

Evaluation: Since Catawba does not use sensor that uses 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: Rosemount Technical Bulletin No. 4 does not apply to Catawba because the serial numbers of the Catawba transmitters are greater than 500,000. Catawba's response to NRC Bulletin 90-01, Supplement 1 was reviewed and approved by the NRC in a letter dated January 27, 1995. Implementation of these proposed TS amendments will not change Catawba's response to this NRC Bulletin.

Evaluation: Since Catawba does not have Rosemount transmitters with serial numbers less than 500,000, no change is necessary as a result of RTT, and no further analysis is required.

The staff confirmed that the licensee's submittals referenced in its response are consistent with the above condition. The licensee's responses fulfill the conditions in the staff's generic SER for WCAP-13632, and are therefore, acceptable.

The staff's SER approving WCAP-14036 also had a requirement 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 requirement 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 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 the May 25, 2001, submittal by the licensee, in Attachment 3, "Description of Proposed Changes and Technical Justification," the licensee stated:

"The WCAP FMEA is applicable to the equipment actually installed at Catawba Units 1 and 2, and the analysis is valid for the versions of boards utilized."

Evaluation: This response fulfills the condition in the staff's generic SER for WCAP-14036, and is therefore, acceptable to the staff.

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 licensee's 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. These bounding sensor response time values were not included in the original request from the

licensee, but were included in the licensee's submittal dated January 24, 2002. The bounding response time values, provided below, were includes as Tables 1 and 2 of that submittal.

Table I - Reactor Trip

| Function | Sensor Notes 2 & 3 | Sensor Time | 7300 / NIS String Note 4 | 7300 Time Note 11 | SSPS Relays Note 5 | SSPS Time Note 5 | Rx Trip Time Note 6 | Total Time | Req'd Time <=/ |
|---------------------|--------------------|-------------|-----------------------------------|--------------------|--------------------|------------------|---------------------|------------------|----------------|
| Pzr Press - Low | ITT Barton 763 | 0.75 s | NLP + NAL | 0.1 S | Input | 0.02s | 0.3 s | 1.17 s | 2.0 s |
| Pzr Press - High | ITT Barton 763 | 0.75 s | NLP + NAL | 0.1 s | Input | 0.02 s | 0.3 s | 1.17 s | 2.0 s |
| S/G Level - Low Low | ITT Barton 764 | 0.75 s | NLP + NAL | 0.1 's | Input | 0.02 s | 0.3 s | 1.17 s | 2.0 s |
| RCS Flow - Low | Rosemount 1154HP5 | 0.75 s | NLP + NAL | 0.1 s | Input | 0.02 s | 0.3 s | 1.17 s | 2.0 s |
| OPDT (Vary Tavg) | RDF 21232 | Note 1 | NRA + NSA + NSA + NSA + NAL | 0.4 s | Input | 0.02 s | 0.3 s | 0.72 s | 1.5 s |
| OPDT (Vary Delta T) | RDF 21232 | Note 1 | NRA + NSA + NSA + NAL | 0.4 s | Input | 0.02s | 0.3 s | 0.72 s | 1.5 s |
| OPDT (Vary Flux) | Detectors Exempt | Note 1 | NIS (1 ms) + NSA + NCH + NSA +NAT | 0.4 s Note 10 | Input | 0.02 s | 0.3 s | 0.721 s | 1.5 s |
| OTDT (Vary Tavg) | RDF 21232 | Note 1 | NRA + NSA + NSA + NSA + NAL | 0.4 s | Input | 0.02 S | 0.3 s | 0.72 s | 1.5 s |
| OTDT (Vary Delta T) | RDF 21232 | Note 1 | NRA + NSA + NSA + NAL | 0.4 s | Input | 0.02 s | 0.3 s | 0.72 s | 1.5 s |
| OTDT (Vary Press) | ITT Barton 763 | 0.75 s | NLS + NSA + NSA + NAL | 0.4 s | Input | 0.02 s | 0.3 s | 1.47 s | 1.5 s |
| OTDT (Vary Flux) | Detectors Exempt | Note 1 | NIS (1 ms) + NSA + NCH +NSA + NAL | 0.401 s Note 10 | Input | 0.02 s | 0.3 s | 0.721 s | 1.5 s |
| RCP Undervoltage | RIS 90634-100 | Note 1 | N/A | N/A | Input | 0.02 s | 0.3 s | 1.27 s Note 7 | 1.5 s |
| RCP Underfrequency | RIS90634-IOOA | Note 1 | N/A | N/A | Input | 0.02 s | 0.3 s | 0.52 s Note 8 | 0.6 s |
| NIS Level - Low | Detectors Exempt | Note 1 | NIS FMEA (Note 9) | 0.065 s | Input | 0.02 s | 0.3 s | 0.385 s | 0.5 s |
| NIS Level - High | Detectors Exempt | Note 1 | NIS FMEA (Note 9) | 0.065 s | Input | 0.02 s | 0.3 s | 0.385 s | 0.5 s |

| | | | | | | | | | |
|---|-----------------|--------|-----------|-------|-------|--------|-------|--------|-------|
| Containment Pressure ESFAS (SI) Input to Reactor Trip | ITT Barton 386A | 0.75 s | NLP + NAL | 0.1 s | Input | 0.02s | 0.3 s | 1.17 s | 2.0s |
| Pressurizer Pressure ESFAS (SI) Input to Reactor Trip | ITT Barton 763 | 0.75 s | NLP + NAL | 0.1 s | Input | 0.02 s | 0.3 s | 1.17 s | 2.0 s |

RPS Functions Acronyms

Pzr - Pressurizer

RCS - Reactor Coolant System

OPDT - Overpower Δ Temperature

S/G - Steam Generator

RCP - Reactor Coolant Pump

OTDT - Overtemperature Δ Temperature

SI - Safety Injection

NIS - Nuclear Instrumentation System

ESFAS - Engineered Safety Features Actuation System

Table 2 - Engineered Safety Features

| Function | Sensor Notes 2 & 3 | Sensor Time | 7300 / NIS String Note 4 | 7300 Time Note 11 | SSPS Relays Note 5 | SSPS Time Note 5 | Total Time | Req'd \leq Note 12 |
|---|---|-------------|--------------------------|-------------------|--------------------------------|------------------|------------|----------------------|
| Containment Press - High (SI) | ITT Barton 386A | 0.75 s | NLP + NAL | 0.1 s | Input + Master + Slave + Slave | 0.124s | 0.974 s | 1.0 s |
| Containment Press - High High (CS & CI(DB & SLI)) | ITT Barton 386A | 0.75 s | NLP + NAL | 0.1 s | Input + Master + Slave | 0.088S | 0.938 s | 1.0 s |
| Steam Pressure - Low (SI-1) | Tobar 32PA Veritrak 76PG Rosemount 1153 GD9 | 0.75 s | NLP + NAL | 0.1 s | Input + Master + Slave | 0.088 s | 0.938 s | 1.0 s |
| Steam Pressure- Neg Rate High (SLI) | Tobar 32PA Veritrak 76PG Rosemount 1153 GD9 | 0.75 s | NLP + NAL | 0.1 s | Input + Master + Slave | 0.088 s | 0.938 | 1.0 s |
| Pzr-Pressure- Low (SI) | ITT Barton 763 | 0.75 s | NLP + NAL | 0.1 s | Input + Master + Slave + Slave | 0.124 s | 0.974 s | 1.0 s |
| RWST Level - Low | Rosemount 11531 DB5 | 0.75s | NLP + NAL | 0.1 s | Input + Master + Slave | 0.088 s | 0.938 s | 1.0 s |
| SIG Level - Low Low (AFW) | ITT Barton 764 | 0.75 3 | NLP + NAL | 0.1 s | Input + Master + Slave | 0.088 s | 0.938 s | 1.0 s |
| SIG Level - Hi-h High (TT & FWI) | ITT Barton 764 | 0.75 s | NLP + NAL | 0.1 s | Input + Master + Slave | 0.088 s | 0.983 s | 1.0 s |
| AFW Suction Transfer | ITT Barton 580A | 0.75 s | N/A | N/A | N/A | N/A | N/A | 1.0 s |

Engineered Safety Features Actuation System (ESFAS) Function Acronyms

SI - Safety Injection
CS - Containment Spray
TT - Turbine Trip
SLI - Steamline Isolation

FWI - Feedwater Isolation
AFW - Auxiliary Feedwater
CIΦA - Containment Isolation Phase A
CIΦB - Containment Isolation Phase B

Table 1 and 2 Notes

1. Sensors for these functions were not evaluated in WCAP-13632-P-A R2. Therefore, allocated sensor response times are not used and sensors will continue to be tested as required. NIS detectors are exempt from RTT per Technical Specifications.
2. Allocated sensor response times for the ITT Barton (model 763 - Pressurizer Pressure, model 764 - Steam Generator Level), Tobar (model 32PA - Steamline Pressure) and Veritrak (model-76PG - Steamline Pressure) pressure sensors specified in Tables 1 and 2 are based on historical records (Method 1) of acceptable RTT obtained from the CNS response time testing program. The historical response time test data for these sensors is documented in various test reports from Analysis & Measurement Services (AMS) produced from on-site in-situ testing performed via noise analysis method. The test reports span a time period from March 1991 through August 2001. These test results are not included but are available for NRC inspection upon request.

Due to equipment obsolescence, the Veritrak and Tobar transmitters used for Steamline Pressure will be replaced with Rosemount model 1153GD9 transmitters through the modification process. These style transmitters are covered by WCAP-13632-P-A R2, and the sensor response time will be measured upon initial installation to verify that they are below the allocated response time for the function. A review of data from AMS in-situ testing performed at the Duke Power McGuire Nuclear Station indicates that this will be acceptable.

3. Allocated sensor response times for the ITT Barton (model 386A - Containment Pressure, model 580A - Auxiliary Feedwater Pump Suction Pressure) and Rosemount (model 1153DB5) - Refueling Water Storage Tank Level, model 1154HP5 - Reactor Coolant System Flow) pressure sensors specified in Tables 1 and 2 are based on historical records (Method 1) of acceptable RTT obtained from the CNS response time testing program. The historical response time test data for these sensors is documented in CNS plant test procedures performed via step input method. The test data span a time period from April 1985 through September 2001. These test results are not included but are available for NRC inspection upon request.
4. 7300 cards installed at CNS were evaluated in Section 4.5 of WCAP-14036-P-A R1 (card types NLP, NSA, NAL, NCH, and NRA). The allocated response times for 7300 are derived from Table 8-1 of the WCAP. There is a NLL lag card in each of the Delta T and the Tavγ 7300 circuits which has a setpoint of zero seconds (e.g., no lag value). These NLL cards have been hard configured to eliminate the lag circuit. All other NLL type time domain cards will have their time domain characteristics verified within calibration procedures. This is consistent with discussion in Section 4.0 of WCAP-14036-P-A R1.

5. Relays evaluated in Section 4.3 of WCAP-14036-P-A R1 and used in the CNS SSPS are as follows:

- Input and Master Relays: G. P. Clare GP1 Series, Midtex/AEMCO 156, or Potter & Brumfield KH Series
- Slave Relays: Westinghouse Type AR and/or Potter & Brumfield MDR series

The following allocated response times for the SSPS relays are in accordance with Section 4.8 of WCAP-14036-P-A R1; logic circuit response time was determined to be insignificant.

- Reactor Trip Functions: 20 msec (input relay)
- ESFAS Functions: 26 msec + 26 msec + 36 msec = 88 msec (input + master + slave),
OR
26 msec + 26 msec + 36 msec + 36 msec = 124 msec (input + master + 2 slaves in series)

6. Time includes: Reactor Trip breaker time ≤ 150 ms and Stationary Gripper Release Time ≤ 150 ms.
7. Time includes: Undervoltage module delay time ≤ 0.7 sec and Westinghouse assumed EMF Delay Time 250 ms.
8. Time includes: Underfrequency module delay time ≤ 0.2 sec.
9. The Power Range NIS cards installed at CNS were evaluated in Section 4.6 of WCAP-14036-P-A R1 (Detector Current Monitor, Summing and Level Amplifier, Level Trip Bistable, and Isolation Amplifier).
10. Includes allowance for both NIS and 7300.
11. The allocated response times are derived from Table 8-1 of the WCAP.
12. This value is 1 second of the Allowed Total Response Time. The use of the 1 second value is an internal Catawba limit which supports plant overall time verification process.

The staff has reviewed these values and the method by which the values were obtained, and has found them acceptable.

4.0 SUMMARY

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

5.0 STATE CONSULTATION

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

6.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change surveillance requirements. The NRC staff has determined that the amendments involve 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 amendments involve no significant hazards consideration, and there has been no public comment on such finding [66 FR 64290]. Accordingly, the amendments meet 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 amendments.

7.0 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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

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