CP&L
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SEP 14 1992

R. B. STARKEY, JR.
Vice President
Nuclear Services Department

SERIAL: NLS 92-207
10 CFR 50.90
TSC 92TSB01

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

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 & 50-324/LICENSE NOS. DPR-71 & DPR-62
REQUEST FOR LICENSE AMENDMENT
STEAM LEAK DETECTION INSTRUMENTATION NUMAC UPGRADE

Gentlemen:

In accordance with the Code of Federal Regulations, Title 10, Parts 50.90 and 2.101, Carolina Power & Light Company hereby requests a revision to the Technical Specifications for the Brunswick Steam Electric Plant (BSEP), Units 1 and 2.

The proposed amendment revises the Technical Specifications to reflect the replacement of existing Riley, GEMAC and Fenwal steam leak detection equipment with General Electric NUMAC leak detection equipment. The proposed amendment also revises surveillance requirements for steam leak detection instrumentation associated with the reactor water cleanup system, the high pressure coolant injection system, and the reactor core isolation cooling system. The specific changes include:

(1) delete the CHANNEL CHECK surveillance test for the reactor water cleanup system isolation high differential flow function,

(2) extend and standardize the CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION surveillance frequencies for the reactor water cleanup system isolation differential flow function and the reactor water cleanup, high pressure coolant injection, and reactor core isolation cooling system isolation ambient and differential temperature functions,

(3) increase the reactor water cleanup system isolation differential flow time delay TRIP SETPOINT and ALLOWABLE VALUE from "less than or equal to 45 seconds" to "less than or equal to 30 minutes,"

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(4) increase the reactor water cleanup system isolation differential flow TRIP SETPOINT and ALLOWABLE VALUE from "less than or equal to 53 gal/min" to "less than or equal to 73 gal/min,"

(5) delete the instrument response time requirement for the high pressure coolant injection system isolation steam line tunnel temperature - high function, and

(6) delete the instrument response time requirement for the reactor water cleanup system isolation area temperature - high and area ventilation differential temperature - high functions,

(7) delete the instrument response time requirement for the reactor water cleanup system isolation differential flow - high function, and

(8) revise the description of the reactor water cleanup isolation differential flow delay trip function to reflect elimination of the time delay relays per the new system configuration,

(9) add a new reactor water cleanup system isolation area temperature function for piping outside of the reactor water cleanup room,

Enclosure 1 provides a detailed description of the proposed changes and the basis for the changes.

Enclosure 2 details, in accordance with 10 CFR 50.91(a), the basis for the Company's determination that the proposed changes do not involve a significant hazards consideration.

Enclosure 3 provides an environmental evaluation which demonstrates that the proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental assessment needs to be prepared in connection with issuance of the amendment.

Enclosure 4 provides page change instructions for incorporating the proposed revisions.

Enclosure 5 provides the proposed Technical Specification pages for Unit 1.

Enclosure 6 provides the proposed Technical Specification pages for Unit 2.

Carolina Power & Light Company is providing, in accordance with 10 CFR 50.91(b), the State of North Carolina with a copy of the proposed license amendment.

The Brunswick Unit 1 steam leak detection system modification is scheduled for installation during Refueling Outage No. 10, which is currently planned to begin March 4, 1993. The corresponding Unit 2 modification is scheduled for installation during Brunswick Unit 2 Refueling Outage No. 11, which is currently planned to begin September 9, 1993. CP&L requests that the proposed amendment for Unit 1 be issued by March 1, 1993 and for Unit 2 by September 1, 1993. In order to allow for procedure revisions and orderly incorporation into copies of the Technical

Specifications, CP&L requests that the proposed amendments, once approved by the NRC, be issued with an effective date to be no later than 90 days from the issuance of the amendment.

Please refer any questions regarding this submittal to Mr. M. R. Oates at (919) 546-6003.

Yours very truly,

R. B. Starkey, Jr.

WRM/wrm (numactsc.wpf)

Enclosures:

1. Basis for Change Request
2. 10 CFR 50.92 Evaluation
3. Environmental Considerations
4. Page Change Instructions
5. Technical Specification Pages - Unit 1
6. Technical Specification Pages - Unit 2

R. B. Starkey, Jr., 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 officers, employees, contractors, and agents of Carolina Power & Light Company.

Eleanor C. Chappell
Notary (Seal)

My commission expires: 2/6/96

ELEANOR C. CHAPPELL NOTARY PUBLIC WAKE COUNTY, N.C.

cc: Mr. Dayne H. Brown
Mr. S. D. Ebneter
Mr. R. H. Lo
Mr. R. L. Prevatte

ENCLOSURE 1

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2
NRC DOCKET NOS. 50-325 & 50-324
OPERATING LICENSE NOS. DPR-71 & DPR-62
REQUEST FOR LICENSE AMENDMENT
STEAM LEAK DETECTION INSTRUMENTATION NUMAC UPGRADE

BASIS FOR CHANGE REQUEST

BACKGROUND:

The leak detection systems covered by this license amendment request include ambient and differential temperature monitoring for the reactor water cleanup, high pressure coolant injection and reactor core isolation cooling systems and differential flow monitoring for the reactor water cleanup system.

The temperature monitoring portions of the reactor water cleanup, high pressure coolant injection, and reactor core isolation cooling system leak detection instrumentation involved in this request utilize ambient and differential air temperature measurements. Two types of temperature instrument channels are presently used. The first type of channel consists of local thermocouples that provide inputs to temperature switch modules in the control room, which in turn perform indication, alarm, and isolation functions. The temperature switch modules utilized in these channels have historically experienced a high drift rate, have been prone to spurious alarms and trips, and have been difficult to maintain.

The second type of instrument channel consists of local temperature switches whose contacts provide input to control room relay logic. These local switches have the disadvantage of not providing indication for the monitored areas and have been the cause of significant personnel radiation exposure due to the time spent inside the reactor building performing monthly testing of these switches.

The reactor water cleanup system differential flow leak detection involves comparison of the reactor water cleanup system inlet flow to the sum of the two output flows (one is return to the feedwater system; the other is reject flow to the main condenser or the radwaste system). The existing reactor water cleanup system differential flow leak detection instrumentation has several technical limitations. The function consists of a complex three element flow loop with analog computing modules and density compensation is not provided to account for varying process water temperatures. As a result, this instrument channel is subject to significant signal drift and inaccuracy. The loop inaccuracy is particularly evident during reactor water cleanup system transient conditions, such as system fill and start-up. These limitations have led to unwarranted process isolation signals that unnecessarily challenge the reactor water cleanup system containment isolation function, degrade operator confidence in the control system, create additional work load for operations personnel in dealing with the control system, and result in an excessive number of licensee event reports documenting those unnecessary system isolations.

Carolina Power & Light Company plans to upgrade the leak detection instrumentation described above by installation of a General Electric microprocessor based NUMAC system. The NUMAC system will process signals from the ambient and differential temperature sensors of the reactor water cleanup , high pressure coolant injection , and reactor core isolation cooling systems and from the flow sensors in the reactor water cleanup system. The NUMAC system will reduce instrument drift, improve instrument accuracy, simplify maintenance activities, enhance the operator/equipment interface, and provide a means of density compensation for the reactor water cleanup system differential flow measurement. In conjunction with NUMAC installation, the local ambient temperature switches will be replaced with thermocouples connected to NUMAC channels.

As a result of the significant system performance and reliability improvements that will result from this installation, the following changes to the BSEP Technical Specifications are proposed:

ITEM 1:

CURRENT REQUIREMENT:

Technical Specification Table 4.3.2-1 (Isolation Actuation Instrumentation Surveillance Requirements), Item 3.a (Reactor Water Cleanup System Isolation, Differential Flow - High) currently specifies the performance of a CHANNEL CHECK on a D (Daily) frequency.

PROPOSED CHANGE:

Revise the surveillance frequency for the reactor water cleanup system, differential flow - high containment isolation actuation instrument CHANNEL CHECK from D (Daily) to NA (Not Applicable)

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BASIS:

The NUMAC system performs a continuous self-test and alerts the operator via annunciation when a problem is detected. The following diagnostic and self-test features are provided:

1. Continuous monitoring of each flow and each density compensation input signal for out-of-bounds values.

2. Continuous monitoring of the two internal power supplies (NUMAC remains functional with only one internal power supply).

3. Continuous monitoring of the external power input.

4. A self-check of each channel to confirm functionality at least once per 30 minutes.

5. Continuous monitoring to assure that the system is not left in an inoperable condition (card out-of-file, status switch left in the inop mode).

Based on installation of the improved NUMAC system and the NUMAC system's self-diagnostic features, the D (Daily) surveillance frequency for the reactor water cleanup system differential flow - high containment isolation actuation instrument CHANNEL CHECK is no longer needed.

ITEM 2:

CURRENT REQUIREMENT:

Technical Specification Table 4.3.2-1 (Isolation Actuation Instrumentation Surveillance Requirements) currently specifies the following CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION frequencies for trip functions affected by the NUMAC installation modification:

Item 3.a (Reactor Water Cleanup System Isolation, Δ Flow - High) specifies a CHANNEL FUNCTIONAL TEST on a M (Monthly) frequency.

Item 3.b (Reactor Water Cleanup System Isolation, Area Temperature - High) specifies a CHANNEL FUNCTIONAL TEST on a M frequency.

Item 3.c (Reactor Water Cleanup System Isolation, Area Ventilation Δ Temperature - High) specifies a CHANNEL FUNCTIONAL TEST on a M frequency.

Item 3.f (Reactor Water Cleanup System Isolation, Differential Flow - High - Time Delay Relay) specifies a CHANNEL FUNCTIONAL TEST on a M frequency.

Item 4.a.4 (High Pressure Coolant Injection System Isolation, HPCI Steam Line Tunnel Temperature - High) specifies a CHANNEL FUNCTIONAL TEST on a M frequency and a CHANNEL CALIBRATION on a Q (Quarterly) frequency.

Item 4.a.7 (High Pressure Coolant Injection System Isolation, HPCI Steam Line Ambient Temperature - High) specifies a CHANNEL FUNCTIONAL TEST on a M frequency.

Item 4.a.8 (High Pressure Coolant Injection System Isolation, HPCI Steam Line Area Δ Temperature - High) specifies a CHANNEL FUNCTIONAL TEST on a M frequency.

Item 4.a.9 (High Pressure Coolant Injection System Isolation, HPCI Equipment Area Temperature - High) specifies a CHANNEL FUNCTIONAL TEST on a M frequency and a CHANNEL CALIBRATION on a Q frequency.

Item 4.b.4 (Reactor Core Isolation Cooling System Isolation, RCIC Steam Line Tunnel Temperature - High) specifies a CHANNEL FUNCTIONAL TEST on a M frequency.

Item 4.b.7 (Reactor Core Isolation Cooling System Isolation, RCIC Steam Line Ambient Temperature - High) specifies a CHANNEL FUNCTIONAL TEST on a M frequency.

Item 4.b.8 (Reactor Core Isolation Cooling System Isolation, RCIC Steam Line Area Δ Temperature - High) specifies a CHANNEL FUNCTIONAL TEST on a M frequency.

Item 4.b.9 (Reactor Core Isolation Cooling System Isolation, RCIC Equipment Room Ambient Temperature - High) specifies a CHANNEL FUNCTIONAL TEST on a M frequency and a CHANNEL CALIBRATION on a Q frequency.

Item 4.b.10 (Reactor Core Isolation Cooling System Isolation, RCIC Equipment Room Δ Temperature - High) specifies a CHANNEL FUNCTIONAL TEST on a M frequency and a CHANNEL CALIBRATION on a Q frequency.

Item 4.b.11 (Reactor Core Isolation Cooling System Isolation, RCIC Steam Line Tunnel Temperature - High Time Delay Relay) specifies a CHANNEL FUNCTIONAL TEST on a M frequency.

PROPOSED CHANGE:

Revise Technical Specification Table 4.3.2-1 (Isolation Actuation Instrumentation Surveillance Requirements) such that the required CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION frequencies for the trip functions affected by the NUMAC installation modification are extended as follows:

Item 3.a (Reactor Water Cleanup System Isolation, Δ Flow - High): revise the CHANNEL FUNCTIONAL TEST from M (Monthly) to SA (Semi-Annual) frequency.

Item 3.b (Reactor Water Cleanup System Isolation, Area Temperature - High): revise the CHANNEL FUNCTIONAL TEST from M to SA frequency.

Item 3.c (Reactor Water Cleanup System Isolation, Area Ventilation Δ Temperature - High): revise the CHANNEL FUNCTIONAL TEST from M to SA frequency.

Item 3.f (Reactor Water Cleanup System Isolation, Differential Flow - High - Time Delay Relay): revise the CHANNEL FUNCTIONAL TEST from M to SA frequency.

Item 4.a.4 (High Pressure Coolant Injection System Isolation, HPCI Steam Line Tunnel Temperature - High): revise the CHANNEL FUNCTIONAL TEST from M to SA frequency and the CHANNEL CALIBRATION from Q (Quarterly) to R (Refuel) frequency.

Item 4.a.7 (High Pressure Coolant Injection System Isolation, HPCI Steam Line Ambient Temperature - High): revise the CHANNEL FUNCTIONAL TEST from M to SA frequency.

Item 4.a.8 (High Pressure Coolant Injection System Isolation, HPCI Steam Line Area Δ Temperature - High): revise the CHANNEL FUNCTIONAL TEST from M to SA frequency.

Item 4.a.9 (High Pressure Coolant Injection System Isolation, HPCI Equipment Area Temperature - High): revise the CHANNEL FUNCTIONAL TEST from M to SA frequency and the CHANNEL CALIBRATION from Q to R frequency.

Item 4.b.4 (Reactor Core Isolation Cooling System Isolation, RCIC Steam Line Tunnel Temperature - High): revise the CHANNEL FUNCTIONAL TEST from M to SA frequency.

Item 4.b.7 (Reactor Core Isolation Cooling System Isolation, RCIC Steam Line Ambient Temperature - High): revise the CHANNEL FUNCTIONAL TEST from M to SA frequency.

Item 4.b.8 (Reactor Core Isolation Cooling System Isolation, RCIC Steam Line Area ▲ Temperature - High): revise the CHANNEL FUNCTIONAL TEST from M to SA frequency.

Item 4.b.9 (Reactor Core Isolation Cooling System Isolation, RCIC Equipment Room Ambient Temperature - High): revise the CHANNEL FUNCTIONAL TEST from M to SA frequency and the CHANNEL CALIBRATION from Q to R frequency.

Item 4.b.10 (Reactor Core Isolation Cooling System Isolation, RCIC Equipment Room ▲ Temperature - High): revise the CHANNEL FUNCTIONAL TEST from M to SA frequency and the CHANNEL CALIBRATION from Q to R frequency.

Item 4.b.11 (Reactor Core Isolation Cooling System Isolation, RCIC Steam Line Tunnel Temperature - High Time Delay Relay): revise the CHANNEL FUNCTIONAL TEST from M to SA frequency.

BASIS:

CHANNEL FUNCTIONAL TESTs:

The proposed change would increase the CHANNEL FUNCTIONAL TEST surveillance interval from M (Monthly) to SA (Semi-Annual) for the identified temperature and differential flow monitoring Technical Specification Trip Functions. The NUMAC system provides a comprehensive self-test feature that is capable of detecting most of the potential failures that the CHANNEL FUNCTIONAL TEST is intended to identify.

As described in Item 1 above, the NUMAC system performs a continuous self-test and alerts the operator via annunciation when a problem is detected. The following diagnostic and self-test features are provided:

1. Continuous monitoring of each flow and each density compensation input signal for out-of-bounds values.

2. Continuous monitoring of the two internal power supplies (NUMAC remains functional with only one internal power supply).

3. Continuous monitoring of the external power input,

4. A self-check of each channel to confirm functionality at least once per 30 minutes.

5. Continuous monitoring to assure that the system is not left in an inoperable condition (card out-of-file, status switch left in the inop mode).

CHANNEL CALIBRATIONs:

The proposed change would increase the CHANNEL CALIBRATION surveillance interval from Q (Quarterly) to R (Refueling) for four of the temperature monitoring Technical Specification Trip Functions. The NUMAC system features a high degree of stability, thereby permitting longer intervals between calibrations without significant instrument drift.

A primary reason for performing a CHANNEL CALIBRATION is to detect and manage instrument drift. For the temperature channels (both ambient and differential), three primary potential sources of instrument drift exist: (1) the NUMAC processing unit, (2) the analog-to-digital (A to D) converter located in the NUMAC system, and (3) the temperature sensors (thermocouples). The NUMAC processing units utilize digital circuitry and are essentially drift free. The NUMAC input analog-to-digital converter is subject to nominal drift due to the analog signal processing involved. The external temperature sensing devices are subject to virtually no signal drift. The thermocouples are inherently stable devices with little potential for significant drift. They can be expected to either operate within manufacturer's specifications or else fail completely. Carolina Power & Light calculations utilizing NUMAC-specified accuracy and drift values demonstrate that adequate margin exists between the actual field calibration setpoint and the existing, or proposed revised, Technical Specification ALLOWABLE VALUES to justify a 22.5 month calibration interval (18 months plus the 25 percent surveillance interval extension allowed by Technical Specification 4.0.2).

ITEM 3:

CURRENT REQUIREMENT:

Technical Specification Table 3.3.2-2 (Isolation Actuation Instrumentation Setpoints), Item 3.f (Reactor Water Cleanup System Isolation, Differential Flow - High - Time Delay Relay) currently specifies a TRIP SETPOINT and ALLOWABLE VALUE of less than or equal to 45 seconds.

PROPOSED CHANGE:

Revise the Technical Specification Table 3.3.2-2 (Isolation Actuation Instrumentation Setpoints), Item 3.f (Reactor Water Cleanup System Isolation, Differential Flow - High - Time Delay Relay) to increase the TRIP SETPOINT and ALLOWABLE VALUE from "less than or equal to 45 seconds" to "less than or equal to 30 minutes."

BASIS:

The existing setpoint of less than or equal to 45 seconds has led to many unwarranted system isolations of the reactor water cleanup system and has been a chronic problem for Operations personnel during initial system fill, pressurization and startup. LERs 1-92-015, 2-91-010, 2-90-011, 2-88-010 and 2-88-003 provide documentation of specific cases where incorrect leakage indications resulted in unnecessary system isolations.

The reactor water cleanup high differential flow alarm/trip is based on the difference between the input flow from the reactor coolant system and the sum of the two output flows (one is return to the feedwater system; the other is reject flow to the main condenser or the radwaste system). The difference between the input and output flows is assumed to be leakage. The proposed NUMAC system will incorporate the enhanced feature of process flow density compensation based on process temperature. This will provide the operator more accurate reactor water cleanup system leak rate information. See Figures 1 and 2 for a basic diagram of the RWCU Differential Flow Instrument/Control System.

The sole design basis for the reactor water cleanup system high differential flow isolation function is to assure compliance with 10CFR100 and 10CFR20. The high differential flow isolation function is not intended for protection of reactor pressure vessel water level or for limiting the reactor building environment for equipment qualification purposes. Current reactor water cleanup system high energy line break scenarios rely on ambient temperature detection as the isolation initiation signal.

General Electric Company's proprietary report GE-NE-770-14-0592 evaluates the consequences of a 300 gal/min reactor water cleanup system cold leak remaining unisolated for 30 minutes. That analysis utilized conservative source terms and assumptions. The resultant control room, site boundary and low population zone doses are within the limits prescribed in Standard Review Plan 6.4 and 10CFR100 and are less than dose consequences previously evaluated for other BNP events. These documents provide the basis for establishment of 300 gal/min as CP&L's engineered ANALYTICAL LIMIT for use in setpoint calculations related to this differential flow function and for the establishment of 30 minutes as the ALLOWABLE VALUE/TRIP SETPOINT LIMIT for this differential flow isolation time delay function.

Plant sump monitoring instrumentation, room flood alarms and plant leakage response procedures preclude the possibility that adverse room flooding conditions could result from the increased time delay on the automatic RWCU system isolation.

As a comparison, Plant Hatch has a two hour override on the RWCU differential flow-high trip signal to assist the operators during system start-up and during system transients. The FitzPatrick Plant has no RWCU differential flow-high trip.

ITEM 4:

CURRENT REQUIREMENT:

Technical Specification Table 3.3.2-2 (Isolation Actuation Instrumentation Setpoints), Item 3.a (Reactor Water Cleanup System Isolation, Differential Flow - High) currently specifies a TRIP SETPOINT and ALLOWABLE VALUE of less than or equal to 53 gallons per minute.

PROPOSED CHANGE:

Revise the TRIP SETPOINT and ALLOWABLE VALUE for the reactor water cleanup system isolation, differential flow - high containment isolation function from "less than or equal to 53 gal/min" to "less than or equal to 73 gal/min."

BASIS:

CP&L's calculation ORWCU-0010, prepared in accordance with the methodology defined in ISA S67.04, "Setpoints for Nuclear Safety-Related Instrumentation," defines the magnitude of the uncertainty associated with the reactor water cleanup system isolation differential flow trip function setpoint. The uncertainties are characterized as either "measurable" or "unmeasurable." The measurable uncertainties are those attributable to effects that may be present during surveillance testing. The unmeasurable uncertainties are those related to effects that will not be present during surveillance testing (e.g., flow orifice effects, seismic events, post-accident environmental conditions).

The requested increase in the Technical Specification ALLOWABLE VALUE is intended to establish a difference between the actual field calibration setpoint and the new ALLOWABLE VALUE that is large enough to bound the sum of the measurable uncertainties present during surveillance testing conditions and a nominal additional "LER avoidance" margin. The CP&L calculation demonstrates that satisfaction of the proposed ALLOWABLE VALUE during surveillance testing will assure that the 300 gal/min ANALYTICAL LIMIT will not be exceeded during any postulated plant events.

ITEM 3:

CURRENT REQUIREMENT:

Technical Specification Table 3.3.2-3 (Isolation System Instrumentation Response Times) Item 4.a.4 (High Pressure Coolant Injection System Isolation, HPCI Steam Line Tunnel Temperature - High) currently specify a response time of ≤ 13 seconds.

PROPOSED CHANGE:

Revise the instrument response time requirement for the high pressure coolant injection system isolation steam line tunnel temperature - high trip function from ≤ 13 seconds to NA (Not applicable).

BASIS:

The response time requirements for containment isolation instrumentation are based on the need to limit damage to safety-related equipment or to mitigate the consequences of an accident or equipment failure. The sensing devices for the high pressure coolant injection system isolation steam line tunnel temperature - high trip function channel are thermocouples. Thermocouples are inherently stable devices with little potential for shift in response time. They can be expected to either respond within manufacturer's time constant specifications or else fail completely. A given

break in the high pressure coolant injection system steam supply line will always result in a predictable response from the sensing thermocouples, regardless of how long the thermocouple has been installed (i.e., the response time of a thermocouple is constant). Therefore, the response time of a thermocouple need not be routinely measured.

Isolation of the high pressure coolant injection system is required in the event of a process high energy line break (HELB) and has been analyzed in the CP&L Report No. 9527-058-S-MS-001, "Reactor Building Environmental Report". The isolation trip signal initiators considered in that analysis included both temperature channels and high flow sensors. The high flow trips were used in the analysis to mitigate the large (≥ 300% flow) break and the temperature channels were used to mitigate smaller breaks. The high temperature isolation trip function is capable of providing a timely response to either size break.

The worst case 10 inch double ended guillotine break was analyzed. The rapid ambient temperature increase from this break creates an immediate response from the temperature sensor thermocouples. In addition, smaller breaks which cause a slower increase in ambient temperatures, also provide timely isolation signals. Smaller breaks yield a lower mass-energy release and thus reduced environmental consequences. The temperature sensors do not react as quickly to the more slowly increasing temperatures from these smaller breaks; however, this is not of concern since the environmental effects of a small break are not as severe as for large breaks. Thus, the response times of these sensors need not be as quick. Therefore, the thermocouple response time is not critical in assuring high energy line break mitigation (i.e., valve isolation) and response time testing is not necessary.

It should be noted that other boiling water reactors similar to the Brunswick Plant do not have response time testing requirements in their Technical Specifications for these same Trip Functions.

ITEM 6:

CURRENT REQUIREMENT:

Technical Specification Table 3.3.2-3 (Isolation System Instrumentation Response Times) Item 3.b (Reactor Water Cleanup System Isolation, Area Temperature - High) and Item 3.c (Reactor Water Cleanup System Isolation, Area Ventilation Differential Temperature - High) currently specify a response time of "≤ 13 seconds."

PROPOSED CHANGE:

Revise the instrument response time requirement for the reactor water cleanup system area temperature - high and area ventilation differential temperature - high isolation functions from ≤ 13 seconds to N/A (Not Applicable).

BASIS:

The response time requirements for containment isolation instrumentation are based on the need to limit damage to safety-related equipment or to mitigate the consequences of an accident or equipment failure. The sensing devices for the reactor water cleanup system isolation area temperature - high and ventilation area differential temperature - high instruments are thermocouples.

Thermocouples are inherently stable devices with little potential for shift in response time. They can be expected to either respond within manufacturers time constant specifications or else fail completely. A given break in the reactor water cleanup system piping will always result in a predictable response from the sensing thermocouples, regardless of how long the thermocouple has been installed (i.e., the response time of a thermocouple is constant). Therefore, the response time of a thermocouple need not be routinely measured.

Isolation of the reactor water cleanup system is required in the event of a process high energy line break (HELB) and has been analyzed in the CP&L Report No. 9527-058-S-MS-001, "Reactor Building Environmental Report." The isolation trip signal initiators considered in that analysis for the RWCU line break were the temperature channels. The high temperature isolation trip function is capable of providing a timely response to either a double ended guillotine break or smaller breaks.

It should be noted that several other boiling water reactors similar to the Brunswick Plant do not have response time testing requirements in their Technical Specifications for these same Trip Functions.

ITEM 7:

CURRENT REQUIREMENT:

Technical Specification Table 3.3.2-3 (Isolation System Instrumentation Response Times) Item 3.a (Reactor Water Cleanup System Isolation, ▲ Flow - High) currently specifies a response time of ≤ 45 seconds.

PROPOSED CHANGE:

Revise the instrument response time requirement for the reactor water cleanup system isolation, ▲ flow - high trip function from ≤ 45 seconds to NA (Not applicable).

BASIS:

The intent of response time requirements for containment isolation instrumentation is to monitor for subtle performance changes in trip channels whose prompt response is taken credit for in event detection and mitigation. The analysis performed to justify the proposed increases in the differential flow time delay TRIP SETPOINT and ALLOWABLE VALUES (item 3 above) and the differential flow TRIP SETPOINT and ALLOWABLE VALUES (item 4 above) demonstrates that rapid response time from the differential flow trip channel is not critical.

The involved differential pressure transmitters, thermocouples and NUMAC equipment are subject to very little change in response time relative to the 30 minute setting proposed for the isolation time delay associated with that function. Any subtle response time changes that might occur would be insignificant relative to margins present in the model and result of General Electric Report GE-NE-770-14-0592.

The current Technical Specification identifies the existing 45 second differential flow delay time as both a response time requirement (Table 3.3.2-3, Item 3.a) and as a setpoint (Table 3.3.2-2, Item 3.f). It is CP&L's position that this duplication is unnecessary and that the "30 minute" differential flow delay time parameter would best be treated as a setpoint, rather than as a response time. The surveillance testing of this parameter when treated as a setpoint will continue to ensure that the trip channel performance is adequate to satisfy the performance assumptions utilized in the GE leakage analysis report.

ITEM :

CURRENT REQUIREMENT:

Technical Specification Tables 3.3.2-1 (Isolation Actuation Instrumentation), 3.3.2-2 (Isolation Actuation Instrumentation Setpoints), 3.3.2-3 (Isolation System Instrumentation Response Times) and Table 4.3.2-1 (Isolation Actuation Instrumentation Surveillance Requirements) currently identify Item 3.f in each table as "Reactor Water Cleanup System Isolation, ▲ Flow - High - Time Delay Relay."

PROPOSED CHANGE:

In each of those tables, drop the word "relay" so that the revised description of Item 3.f will read "Reactor Water Cleanup System Isolation, ▲ Flow - High - Time Delay."

BASIS:

In the existing configuration of the differential flow trip function, the time delay function is performed by actual time delay relays. Within the replacement NUMAC system, the time delay function is performed via software within the NUMAC microprocessor.

This item description change is necessary to avoid potential confusion in future application and interpretation of this Technical Specification line item.

ITEM 9:

CURRENT REQUIREMENT:

None.

PROPOSED CHANGE:

Add to Technical Specification Tables 3.3.2-1, 3.3.2-2, 3.3.2-3, and 4.3.2-1 a new reactor water cleanup system isolation actuation instrumentation function covering piping outside of the reactor water cleanup system room.

BASIS:

Two area high temperature instrumentation channels for initiating reactor water cleanup system isolation were installed and declared operable on February 13, 1991 (Unit 1) and August 10, 1990 (Unit 2). The design and function of these leak detection instruments is similar to the existing leak detection temperature monitoring instruments currently identified in the Technical Specifications; therefore, response times and surveillance frequencies that are the same as those established for existing leak detection temperature monitoring instrumentation are being proposed.

CONCLUSION:

The proposed changes as described above are intended to reflect the physical configuration changes that will result from the NUMAC installation, to optimize and standardize surveillance requirements consistent with the improved reliability and technology that the NUMAC system provides relative to the existing Riley, GEMAC and Penwal instrumentation, to accommodate the results of upgraded setpoint uncertainty and line break consequence calculations, and to recognize an additional RWCU isolation trip function installed several years ago.

It is concluded that these changes are all fully justifiable. Continued safe operation of the Brunswick Steam Electric Plant is assured.

ENCLOSURE 2

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2
NRC DOCKET NOS. 50-325 & 50-324
OPERATING LICENSE NOS. DPR-71 & DPR-62
REQUEST FOR LICENSE AMENDMENT
STEAM LEAK DETECTION INSTRUMENTATION NUMAC UPGRADE

10 CFR 50.92 EVALUATION

The Commission has provided standards in 10 CFR 50.92(c) for determining whether a significant hazards consideration exists. A proposed amendment to an operating license for a facility involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated, (2) create the possibility of a new or different kind of accident from any accident previously evaluated, or (3) involve a significant reduction in a margin of safety. Pursuant to 10 CFR 50.91(a)(1), Carolina Power & Light Company has reviewed this proposed license amendment request and determined that its adoption would not involve a significant hazards consideration. The bases for this determination are as follows:

Standard 1:

The proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated because:

Item 1:

The proposed change will eliminate the requirement to perform a daily CHANNEL CHECK for the reactor water cleanup system high differential flow isolation function. No accident initiators or precursors are changed by the proposed elimination of the daily CHANNEL CHECK for the affected steam leak detection instrument. Based on the significantly reduced drift rate of the NUMAC-based system and the NUMAC system's self-test and self-diagnostic features, the affected leak detection instrumentation will continue to perform its design isolation function. Therefore, the proposed change will not significantly increase the probability of an accident previously evaluated.

The proposed change will not alter the assumptions used in analyses of reactor water cleanup system leaks. The NUMAC system drift characteristics are superior to those of the existing GEMAC and Fenwal leak detection equipment. The microprocessor-based NUMAC system being installed has diagnostic and self-test features that will simplify maintenance activities and improve the operator/equipment interface. The proposed deletion of the daily CHANNEL CHECK for the affected leak detection instrumentation will not degrade the ability of the equipment to perform its isolation function. In addition, other leak detection instrumentation specified by the Technical Specifications will continue to provide alternate

means of detecting and mitigating the consequences of reactor water cleanup system leaks. Therefore, the proposed changes to the surveillance intervals will not significantly affect the consequences of an accident previously evaluated.

Item 2:

The proposed changes will: (1) revise the requirement to perform a CHANNEL FUNCTIONAL TEST from a monthly frequency to a semi-annual frequency for the reactor water cleanup system high differential flow, high area temperature, high area ventilation differential temperature, and high differential flow time delay relay isolation functions, for the high pressure coolant injection system high steam line tunnel temperature, high steam line ambient temperature, high steam line area differential temperature and high equipment area temperature and for the reactor core isolation cooling system high steam line tunnel temperature, high steam line ambient temperature, high steam line area differential temperature, high equipment room ambient temperature, high equipment room differential temperature and high steam line tunnel temperature time delay relay isolation trip functions, and (2) revise the requirement to perform a CHANNEL CALIBRATION from a quarterly frequency to a refueling frequency for the high pressure coolant injection system high steam line tunnel temperature and high equipment area temperature, and for the reactor core isolation cooling system high equipment room ambient temperature, and high equipment room differential temperature isolation trip functions. No accident initiators or precursors are changed by the proposed changes to the surveillance intervals for the affected steam leak detection instruments. Based on the significantly reduced drift rate of the NUMAC-based system and the NUMAC system's self-test and self-diagnostic features, the affected leak detection instrumentation will continue to perform its design isolation function. Therefore, the proposed changes will not significantly increase the probability of an accident previously evaluated.

The proposed changes to the surveillance intervals for the affected steam leak detection instruments will not change or alter the assumptions used in analyses of either reactor water cleanup, high pressure coolant injection, or reactor core isolation cooling system leaks. The NUMAC system possesses drift characteristics superior to those of the existing GEMAC leak detection equipment. The microprocessor-based NUMAC system being installed has diagnostic and self-test features that will simplify maintenance activities and improve the operator/equipment interface. The proposed changes to the surveillance frequencies for the affected leak detection instrumentation will not degrade the ability of the equipment to perform its isolation function. In addition, other leak detection instrumentation specified by the Technical Specifications will continue to provide alternate means of detecting and mitigating the consequences of reactor water cleanup system and reactor core isolation cooling system leaks. Therefore, the proposed changes to the surveillance frequencies will not significantly affect the consequences of an accident previously evaluated.

Item 3:

The proposed change revising the TRIP SETPOINT and ALLOWABLE VALUE for the reactor water cleanup system high differential flow time delay relay from " $\leq$ 45 seconds" to

"≤ 30 minutes" will not significantly increase the probability of an accident previously evaluated. The sole design basis function for the reactor water cleanup system high differential flow isolation function is to assure compliance with the offsite and control room dose limitations imposed by 10 CFR 100 and 10 CFR 20. The high differential flow isolation function is not intended for protection of reactor pressure vessel water levels or for limiting the reactor building environment for environmental qualification purposes. The proposed change to the reactor water cleanup system high differential flow isolation function will not affect any initiating mechanism for a previously evaluated accident. Therefore, the proposed change will not significantly increase the probability of an accident previously evaluated.

The proposed change revising the TRIP SETPOINT and ALLOWABLE VALUE for the reactor water cleanup system high differential flow time delay relay will not significantly affect the consequences of an accident previously evaluated. General Electric Company's proprietary report GE-NE-770-14-0592 evaluates the consequences of a 300 gal/min reactor water cleanup system cold leak remaining unisolated for 30 minutes. That analysis utilized conservative source terms and assumptions. The resultant control room, site boundary and low population zone doses are within the limits prescribed in Standard Review Plan 6.4 and 10CFR100 and are less than dose consequences previously evaluated for other BNP events. Plant sump monitoring instrumentation, room flood alarms and plant leakage response procedures preclude the possibility that adverse room flooding conditions could result from the increased time delay on the automatic RWCU system isolation. Therefore, the proposed change will not significantly affect the consequences of an accident previously evaluated.

Item 4:

The proposed change revising the TRIP SETPOINT and ALLOWABLE VALUE for the reactor water cleanup system high differential flow time delay relay from "≤ 53 gal/min" to "≤ 73 gal/min" will not significantly increase the probability of an accident previously evaluated. The sole design basis function for the reactor water cleanup system high differential flow isolation function is to assure compliance with the offsite and control room dose limitations imposed by 10 CFR 100 and 10 CFR 20. The high differential flow isolation function is not intended for protection of reactor pressure vessel water levels or for limiting the reactor building environment for environmental qualification purposes. The proposed change to the reactor water cleanup system high differential flow isolation function will not affect any initiating mechanism for a previously evaluated accident. Therefore, the proposed change will not significantly increase the probability of an accident previously evaluated.

The proposed change revising the TRIP SETPOINT and ALLOWABLE VALUE for the reactor water cleanup system high differential flow trip function will not significantly affect the consequences of an accident previously evaluated. General Electric Company's proprietary report GE-NE-770-14-0592 evaluates the consequences of a 300 gal/min reactor water cleanup system cold leak remaining unisolated for 30 minutes. That analysis utilized conservative source terms and assumptions. The resultant control room, site boundary and low population zone doses are within the limits prescribed in Standard Review Plan 6.4 and 10CFR100 and are less than dose consequences previously evaluated for other BNP events, and documents that 300 gal/min v[illegible] the engineered ANALYTICAL LIMIT. The

proposed TRIP SETPOINT and ALLOWABLE VALUE increase establishes a surveillance test acceptance criteria that will assure that the 300 gal/min ANALYTICAL LIMIT cannot be exceeded during any postulated plant condition. Therefore, the proposed change will not significantly affect the consequences of an accident previously evaluated.

Item 5:

The proposed change to delete the instrument response time requirement for the high pressure coolant injection system steam line tunnel temperature - high isolation function will not significantly increase the probability of an accident previously evaluated. No accident initiators or precursors are changed by the proposed change to the HPCI steam line tunnel temperature - high response time requirement. Therefore, the proposed change will not significantly increase the probability of an accident previously evaluated.

The proposed change to delete the instrument response time requirement for the affected steam leak detection instrument will not change or alter the assumptions used in analyses of high pressure coolant injection system steam line breaks. The current Reactor Building Environmental Report does not take credit for the response times of the high pressure coolant injection system temperature trip functions since leak detection and isolation initiation for large breaks (≥ 300% flow) is provided by high flow instrumentation. The high flow instrumentation provides a faster, more direct indication of large breaks. The worst case is the 10 inch high pressure coolant injection double-ended guillotine break. The temperature based leak detection instrumentation is intended to detect small breaks (<300% flow) that are below the threshold of the high flow instrumentation. The response time of the temperature based leak detection instrumentation is not a critical parameter since the reduced flow rates associated with smaller breaks permits a longer response time for detection and isolation initiation of the leak. For the high pressure coolant injection small line break (< 300% flow), the temperature profile extrapolation of the postulated high energy line break conditions in the reactor building at the 20 foot and -17 foot elevations, until valve closure is achieved, is within the previously established environmental qualification profiles and does not exceed the peak temperatures. Thus, the response time of the instrumentation is not critical in assuring high energy line break mitigation/valve isolation and response time testing is not warranted . The proposed changes to delete the response time requirement for the affected leak detection instrumentation will not degrade the ability of the equipment to perform its isolation function. The NUMAC system possesses drift characteristics superior to those of the existing GEMAC leak detection equipment. The microprocessor-based NUMAC system being installed has diagnostic and self-test features that will simplify maintenance activities and improve the operator/equipment interface. Based on the significantly reduced drift rate of the NUMAC-based system and the NUMAC system's self-test and self-diagnostic features, the affected leak detection instrumentation will continue to perform its design isolation function. In addition, other leak detection instrumentation specified by the Technical Specifications will continue to provide alternate means of detecting and mitigating the consequences of high pressure coolant injection system steam line leaks. Therefore, the proposed change will not significantly affect the consequences of an accident previously evaluated.

Item 6:

The proposed change to delete the instrument response time requirement for the reactor water cleanup system area temperature - high and area ventilation differential temperature - high isolation functions will not significantly increase the probability of an accident previously evaluated. No accident initiators or precursors are changed by the proposed change to the reactor wa' cleanup system area temperature response time requirements. Therefore, the pr posed change will not significantly increase the probability of an accident previously evaluated.

The reactor water cleanup system area temperature trip function is provided to detect system steam leaks. The system utilizes thermocouples as the temperature sensing devices. Thermocouples are inherently stable devices with little potential for significant change in response time. The CHANNEL FUNCTIONAL TESTS and CHANNEL CALIBRATIONS required by Technical Specifications provide adequate assurance of the instruments' ability to sense a reactor water cleanup system steam leak and to isolate the system. The NUMAC system possesses drift characteristics superior to those of the existing GEMAC leak detection equipment. Also, the NUMAC system has diagnostic and self-test features that will simplify maintenance activities and improve the operator/equipment interface. Based on the significantly reduced drift rate of the NUMAC system, as well as the system's self-test and self-diagnostic features, the proposed change to delete the instrument response time requirement for the affected steam leak detection instruments will not chan s or alter the assumptions used in analyses of reactor water cleanup system steam line breaks, nor will the deletion degrade the ability of the equipment to perform its isolation function. Therefore, the proposed change will not significantly affect the consequences of an accident previously evaluated.

Item 7:

The proposed change to delete the instrument response time requirement for the reactor water cleanup system differential flow - high isolation function will not significantly increase the probability of an accident previously evaluated. No accident initiators or precursors are changed by the proposed change to the reactor water cleanup system differential flow response time requirements. Therefore, the proposed change will not significantly increase the probability of an accident previously evaluated.

The reactor water cleanup system differential flow trip function is provided to detect system leaks at temperatures below the sensitivity of the system's temperature trip channels. CHANNEL FUNCTIONAL TESTs and CHANNEL CALIBRATIONs required by Technical Specifications provide adequate assurance of the instrumer s' ability to sense a reactor water cleanup system steam leak and to isolate the system. Based on the significantly reduced drift rate of the NUMAC system, as well as the system's self-test and self-diagnc features, the proposed change to delete the instrument response time requirement for the affected steam leak detection instruments will not change or alter the assumptions used in alyses of reactor water cleanup system steam line breaks, nor will the deletion degrade ability of the equipment to perform its isolation function.

Therefore, the proposed change will not significantly affect the consequences of an accident previously evaluated.

Item 8:

The proposed change to update the descriptive title of this Technical Specification is required only to reflect the configuration change associated with the NUMAC upgrade. The time delay function will still exist but will be performed within the NUMAC software rather that by a discrete time delay relay equipment item. This change will not significantly increase the probability of an accident previously evaluated. Installation of this instrumentation will have no impact on accident precursors or initiators. Therefore, the proposed change will not significantly increase the probability of an accident previously evaluated.

The proposed change to update the descriptive title will not significantly affect the consequences of an accident previously evaluated. This description change will not adversely affect radiological releases from a postulated reactor water cleanup system leak. Thus, the proposed change will not significantly affect the consequences of an accident previously evaluated.

Item 9:

The proposed change to add new requirements to the Technical Specifications for a new reactor water cleanup system isolation actuation instrumentation function covering piping outside of the reactor water cleanup system room will not significantly increase the probability of an accident previously evaluated. Installation of this instrumentation will have no impact on accident precursors or initiators. Therefore, the proposed change will not significantly increase the probability of an accident previously evaluated.

The proposed change to add new requirements to the Technical Specifications for a new reactor water cleanup system isolation actuation instrumentation function covering piping outside of the reactor water cleanup system room will not significantly affect the consequences of an accident previously evaluated. Installation of the new instrumentation will not adversely affect radiological releases from a postulated reactor water cleanup system leak. Indeed, addition of the leak detection instruments for piping outside of the reactor water cleanup system room will enhance the ability to detect and isolation reactor water cleanup system leaks. Thus, the proposed change will not significantly affect the consequences of an accident previously evaluated.

Standard 2:

The proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated because:

Item 1:

The proposed change will eliminate the requirement to perform a daily CHANNEL CHECK for the reactor water cleanup high differential flow isolation function. No accident initiators or precursors are changed by the proposed elimination of the daily CHANNEL CHECK for the affected steam leak detection instrument. The proposed change will not adversely affect the availability of the steam leak detection instrument to detect and mitigate reactor water cleanup system leaks. The instrument involved will continue to function as currently designed. No new modes of plant operation will be created as a result of the proposed changes. In addition, the proposed change to eliminate the daily CHANNEL CHECK surveillance for the steam leak detection instrument will not cause the initiation of any accidents nor create any new credible single failure. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Item 2:

The proposed change will optimize and standardize the CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION surveillance frequency requirements for the high pressure coolant injection, reactor core isolation cooling and reactor water cleanup systems ambient and differential temperature and the reactor water cleanup system differential flow isolation trip functions. The proposed change will not adversely affect the availability of the steam leak detection instrument to detect and mitigate high pressure coolant injection, reactor core isolation cooling or reactor water cleanup system leaks. The instruments involved will continue to function exactly as currently designed. No new modes of plant operation will be created as a result of the proposed changes. In addition, the proposed change to the surveillance testing requirements for the steam leak detection instrumentation will not cause the initiation of any accidents nor create any new credible single failure. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Item 3:

The proposed change revising the TRIP SETPOINT and ALLOWABLE VALUE for the reactor water cleanup system high differential flow time delay relay from "$\leq$ 45 seconds" to "$\leq$ 30 minutes" will not create the possibility of a new or different kind of accident from any accident previously evaluated. The proposed change to the TRIP SETPOINT and ALLOWABLE VALUE for these instruments will not adversely affect the availability of the instrument to detect and mitigate reactor water cleanup system leaks. The instrument will otherwise continue to function exactly as currently designed. No new modes of plant operation will be created as a result of the proposed change. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Item 4:

The proposed change revising the TRIP SETPOINT and ALLOWABLE VALUE for the reactor water cleanup system high differential flow time delay relay from "≤ 53 gal/min" to "≤ 73 gal/min" will not create the possibility of a new or different kind of accident from any accident previously evaluated. The proposed change to the TRIP SETPOINT and ALLOWABLE VALUE for these instruments will not adversely affect the availability of the instrument to detect and mitigate reactor water cleanup system leaks. The instrument will otherwise continue to perform the same function as does the current design. No new modes of plant operation will be created as a result of the proposed change. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Item 5:

The proposed change to delete the instrument response time requirement for the High Pressure Coolant Injection System Steam Line Tunnel Temperature - High isolation function will not create the possibility of a new or different kind of accident from any accident previously evaluated. The replacement NUMAC instrumentation involved will continue to perform the same function as does the existing hardware configuration. The proposed change deleting the instrument response time requirement for these leak detection instruments will not cause the initiation of any accidents nor create any new credible single failure. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Item 6:

The proposed change to delete the instrument response time requirement for the Reactor Water Cleanup System Area Temperature and Area Ventilation Differential Temperature isolation functions will not create the possibility of a new or different kind of accident from any accident previously evaluated. The replacement NUMAC instrumentation involved will continue to perform the same function as does the existing hardware configuration. The proposed change deleting the instrument response time requirement for these leak detection instruments will not cause the initiation of any accidents nor create any new credible single failure. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Item 7:

The proposed change to delete the instrument response time requirement for the Reactor Water Cleanup System Differential Flow Time Delay Relay isolation functions will not create the possibility of a new or different kind of accident from any accident previously evaluated. The replacement NUMAC instrumentation involved will continue to perform the same function as does the existing hardware configuration. The proposed change deleting the instrument response time requirement for these leak detection instruments will not cause the initiation of any accidents nor create any new credible single failure. Therefore,

the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Item 8:

The proposed change to update the descriptive title of this Technical Specification is required only to reflect the configuration change associated with the NUMAC upgrade. The time delay function will still exist but will be performed within the NUMAC software rather that by a discrete time delay relay equipment item. This change will not cause the initiation of any accidents, will not create any new credible single failure, and will not alter any accident initiator or precursor. Furthermore, no new modes of plant operation will be created as a result changing this line item's description. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Item 9:

The proposed change to add new requirements to the Technical Specifications for a new reactor water cleanup system isolation actuation instrumentation function covering piping outside of the reactor water cleanup system room will not create the possibility of a new or different kind of accident from any accident previously evaluated. Addition of the new instrumentation will not cause the initiation of any accidents, will not create any new credible single failure, and will not alter any accident initiator or precursor. Furthermore, no new modes of plant operation will be created as a result of adding the new reactor water cleanup system leak detection instrumentation. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

Standard 3:

The proposed amendment does not involve a significant reduction in the margin of safety because:

Item 1:

The proposed deletion of the daily CHANNEL CHECK for the reactor water cleanup differential flow trip function will not significantly reduce a margin of safety. Due to the NUMAC system's enhanced self-test and self-diagnostic features and the NUMAC system's enhanced operator interface, elimination of this daily CHANNEL CHECK will not reduce the reliability of the instrumentation. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Item 2:

The proposed changes to the surveillance intervals for the affected steam leak detection instruments will not significantly reduce a margin of safety. Due to the improved drift characteristics of the NUMAC-based leak detection instrumentation, the NUMAC system's enhanced self-test and self-diagnostic features, and the NUMAC system's enhanced operator interface, decreasing the surveillance frequencies of the leak detection instrument functions involved will not reduce the reliability of the instrumentation. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Item 3:

The proposed change revising the TRIP SETPOINT and ALLOWABLE VALUE for the reactor water cleanup system high differential flow time delay from "≤ 45 seconds" to "≤ 30 minutes" will not significantly reduce a margin of safety. The sole design basis function for the reactor water cleanup system high differential flow isolation function is to assure compliance with 10 CFR 100 and 10 CFR 20. The high differential flow isolation function is not intended for protection of reactor pressure vessel water levels or for limiting the reactor building environment for environmental qualification purposes. General Electric Company's proprietary report GE-NE-770-14-0592 evaluates the consequences of a 300 gal/min reactor water cleanup system cold leak remaining unisolated for 30 minutes. That analysis utilized conservative source terms and assumptions. The resultant control room, site boundary and low population zone doses are within the limits prescribed in Standard Review Plan 6.4 and 10CFR100 and are less than dose consequences previously evaluated for other BNP events. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Item 4:

The proposed change revising the TRIP SETPOINT and ALLOWABLE VALUE for the reactor water cleanup system high differential flow from "≤ 53 gal/min" to "≤ 73 gal/min" will not significantly reduce a margin of safety. The sole design basis function for the reactor water cleanup system high differential flow isolation function is to assure compliance with 10 CFR 100 and 10 CFR 20. The high differential flow isolation function is not intended for protection of reactor pressure vessel water levels or for limiting the reactor building environment for environmental qualification purposes. General Electric Company's proprietary report GE-NE-770-14-0592 evaluates the consequences of a 300 gal/min reactor water cleanup system cold leak remaining unisolated for 30 minutes. That analysis utilized conservative source terms and assumptions. The resultant control room, site boundary and low population zone doses are within the limits prescribed in Standard Review Plan 6.4 and 10CFR100 and are less than dose consequences previously evaluated for other BNP events. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Item 5:

The proposed change to delete the instrument response time requirement for the High Pressure Coolant Injection System Steam Line Tunnel Temperature - High isolation function will not significantly reduce a margin of safety. Leak detection system thermocouples are inherently stable devices which exhibit little drift or changes in response time characteristics over long periods of time. Thus, eliminating response time testing of the affected instrument channels will not result in a degradation of the leak detection system's ability to respond. The periodic performance of required CHANNEL FUNCTIONAL TESTS and CHANNEL CALIBRATIONS for the High Pressure Coolant Injection System Steam Line Tunnel Temperature - High isolation function provides adequate assurance of the ability of the instrument to respond. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Item 6:

The proposed change to delete the instrument response time requirement for the Reactor Water Cleanup System area temperature and area ventilation differential temperature trip functions will not significantly reduce a margin of safety. Leak detection system thermocouples are inherently stable devices which exhibit little drift or changes in response time characteristics over long periods of time. Thus, eliminating response time testing of the affected instrument channels will not result in a degradation of the leak detection system's ability to respond. The periodic performance of required CHANNEL FUNCTIONAL TESTs and CHANNEL CALIBRATIONs for these Reactor Water Cleanup temperature channel trip functions will provide adequate assurance of the ability of the instrument to respond. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Item 7:

The proposed change to delete the instrument response time requirement for the Reactor Water Cleanup System differential flow trip function will not significantly reduce a margin of safety. The involved differential pressure transmitters, thermocouples and NUMAC equipment are subject to very little change in response time relative to the 30 minute setting proposed for the isolation time delay associated with that function. Any subtle response time changes that might occur would be insignificant relative to margins present in the model and the result of GE report GE-NE-770-14-0592. Thus, eliminating response time testing of the affected instrument channels will not result in a degradation of the leak detection system's ability to respond. The periodic performance of required CHANNEL FUNCTIONAL TESTs and CHANNEL CALIBRATIONs for these Reactor Water Cleanup differential flow channel trip function will provide adequate assurance of the ability of the instrument to respond. Therefore, the proposed change does not involve a significant reduction in a margin of safety.

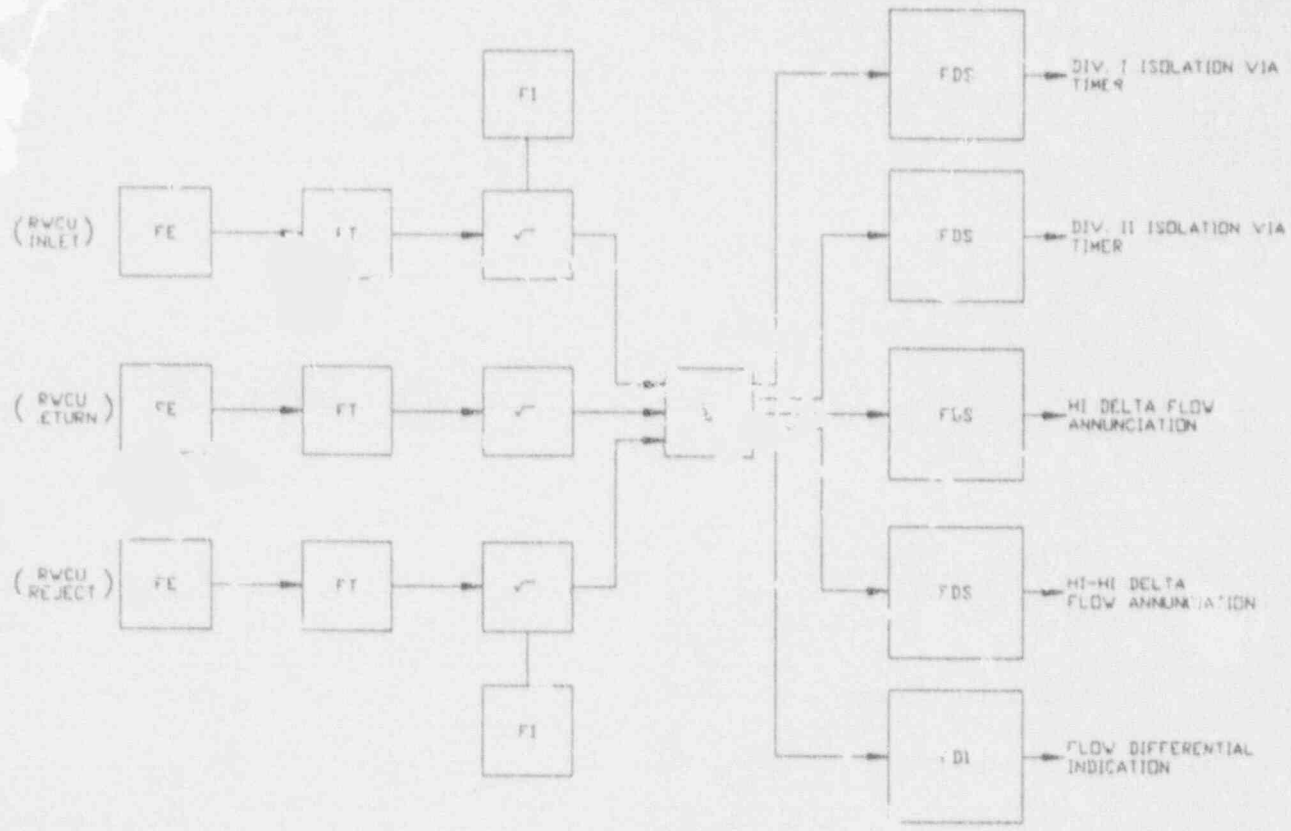
Item 8:

The proposed change to update the descriptive title of this Technical Specification is required only to reflect the configuration change associated with the NUMAC upgrade. The time delay function will still exist but will be pe formed within the NUMAC software rather that by a discrete time delay relay equipment ;em. This change will not will not significantly reduce a margin of safety.

Item 9:

The proposed change to add new requirements to the Technical Specifications for a new reactor water cleanup system isolation actuation instrumentation function covering piping outside of the reactor ater cleanup system room will not significantly reduce a margin of safety. Installation of new leak detection instrumentation covering piping outside of the reactor water cleanup system room provides additional assurance of the timely detection and mitigation of reactor water cleanup system leaks. Therefore, the proposed change actually increases the margin of safety.

FIGURE 1

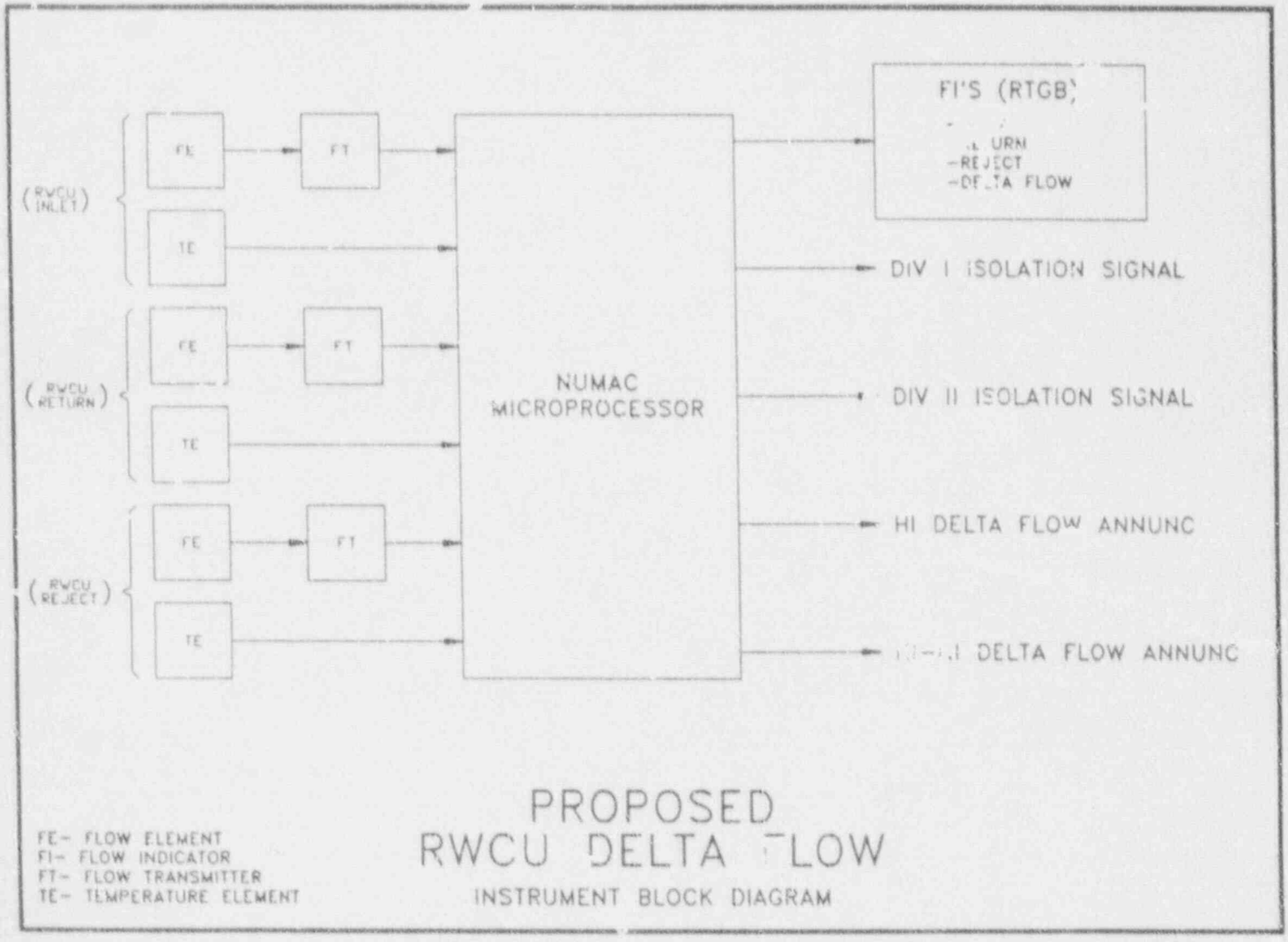


FE- FLOW ELEMENT
FT- FLOW TRANSMITTER
√- SQUARE ROOT CONVERTER
Σ- SUMMER
FDS- FLOW DIFFERENTIAL SWITCH
FDI- FLOW DIFFERENTIAL INDICATOR

EXISTING RWCU DELTA FLOW

INSTRUMENT BLOCK DIAGRAM

FIGURE 2



PROPOSED
RWCU DELTA FLOW
INSTRUMENT BLOCK DIAGRAM

ENCLOSURE 3

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2
NRC DOCKET NOS. 50-325 & 50-324
OPERATING LICENSE NOS. DPR-71 & DPR-62
REQUEST FOR LICENSE AMENDMENT
STEAM LEAK DETECTION INSTRUMENTATION NUMAC UPGRADE

ENVIRONMENTAL CONSIDERATIONS

10 CFR 51.22(c)(9) provides criterion for and identification of licensing and regulatory actions eligible for categorical exclusion from performing an environmental assessment. A proposed amendment to an operating license for a facility requires no environmental assessment if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant hazards consideration; (2) result in a significant change in the types or significant increase in the amounts of any effluents that may be released offsite; (3) result in an increase in individual or cumulative occupational radiation exposure. Carolina Power & Light Company has reviewed this request and determined that the proposed 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 needs to be prepared in connection with the issuance of the amendment. The basis for this determination follows:

Proposed Change:

The proposed changes include reflection of the physical configuration changes that will result from the NUMAC installation, optimization and standardization of surveillance requirements consistent with the improved reliability and technology that the NUMAC system provides relative to the existing Riley, GEMAC and Fenwal instrumentation, accommodation of the results of upgraded setpoint uncertainty and line break consequence calculations, and recognition of an additional RWCU isolation trip function installed several years ago.

Basis:

The change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) for the following reasons:

1. As demonstrated in Enclosure 2, the proposed amendment does not involve a significant hazards consideration.

2. The proposed amendment does not result in a significant change in the types or significant increase in the amounts of any effluents that may be released offsite.

   The only line break for which the detection and/or mitigation action will be any different after the proposed modification and Technical Specification change is the reactor water cleanup cold leak as mitigated by the differential flow instrumentation. The isolation time

delay on this break will be increased from 45 seconds to 30 minutes. The types of potential effluents remain unchanged. The increased isolation time delay will result in a proportional increase in the amount of potential effluent; however, the results of GE report GE-NE-770-14-0592 demonstrate that the magnitude of those releases will be significantly less than the applicable regulatory limits and significantly less than those of BNPs bounding high energy line break as described in UFSAR Section 15.6.3 Main Steam Line Break Accident. As such, the change has no impact on the types and will not increase the amounts of any effluents that may be released beyond the values previously evaluated and approved for BNP.

3. The proposed amendment does not result in an increase in individual or cumulative occupational radiation exposure.

The only line break for which the detection and/or mitigation action will be any different after the proposed modification and Technical Specification change is the reactor water cleanup cold leak as mitigated by the differential flow instrumentation. The isolation time delay on this break will be increased from 45 seconds to 30 minutes. The increased isolation time delay will result in a proportional increase in the potential resultant radiation exposures; however, the results of GE report GE-NE-770-14-0592 demonstrate that the magnitude of those exposures will be significantly less than the applicable regulatory limits and significantly less than those of BNPs bounding high energy line break as described in UFSAR Section 15.6.3 Main Steam Line Break Accident. Therefore, the amendment has no affect on either individual or cumulative occupational radiation exposure beyond the values previously evaluated and approved for BNP.