CP&L

Carolina Power & Light Company

Brunswick Steam Electric Plant
P. O. Box 10429 • Southport, N. C. 28461

May 1, 1991

RUSSELL B. STARKEY, JR.
Vice President
Brunswick Nuclear Project

SERIAL: NLS-91-125

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
SUPPLEMENT TO REQUEST FOR TEMPORARY WAIVER OF COMPLIANCE
REACTOR WATER CLEANUP SYSTEM DIFFERENTIAL FLOW ISOLATION
INSTRUMENT

Gentlemen:

By letters dated April 26, 1991 (Serial: NLS-91-118) and April 28, 1991 (Serial: NLS-91-122), Carolina Power & Light Company requested a temporary NRR Waiver of Compliance for the Brunswick Steam Electric Plant, Units 1 and 2. The proposed waiver applies to the reactor water cleanup system high differential flow isolation actuation instrumentation trip setpoint and allowable value specified in Technical Specification Table 3.3.2-2, Item 3.a.

On April 30, 1991, representatives from Carolina Power & Light Company and the NRC Staff met to discuss the technical bases for the temporary Waiver of Compliance. The purpose of this letter is to respond to Staff questions received during the meeting and to revise the requested Waiver of Compliance based on the Staff feedback. The additional information supporting the proposed Waiver of Compliance is provided in Enclosure 1.

Carolina Power & Light Company is preparing an emergency license amendment to revise the reactor water cleanup system high differential flow isolation actuation trip setpoint and allowable value. The emergency license amendment will be submitted to the NRC Staff no later than May 8, 1991. Revised Technical Specification pages, as they are expected to appear in the emergency license amendment, are included in Enclosures 2 and 3.

On the basis of the information provided in our submittals dated April 26, 1991, April 28, 1991, and the information herein, Carolina Power & Light Company requests this temporary waiver until such time as the NRC is able to review and approve an emergency license amendment request. In order to avoid the delay of the start-up of Brunswick Units 1 and 2, CP&L now requests that this Waiver of Compliance be granted

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prior to 1800 on May 2, 1991. The Plant Nuclear Safety Committee has reviewed and approved submittal of the information provided herein.

Please refer any questions regarding this submittal to Mr. M. R. Oates at (919) 546-6063.

Yours very truly,

R. B. Starkey, Jr.

RBS/WRM

Enclosure

cc: Mr. Dayne H. Brown
Mr. S. D. Ebneter
Mr. N. B. Le
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
SUPPLEMENT TO REQUEST FOR TEMPORARY WAIVER OF COMPLIANCE
REACTOR WATER CLEANUP SYSTEM DIFFERENTIAL FLOW ISOLATION INSTRUMENT

ADI ITIONAL BASIS FOR WAIVER OF COMPLIANCE

On April 30, 1991, representatives from Carolina Power & Light Company and the NRC Staff met to discuss the technical bases for the temporary Waiver of Compliance. The purpose of this letter is to respond to Staff questions received during the meeting and to revise the requested Waiver of Compliance based on the Staff feedback. The information presented to the NRC Staff is summarized below:

REACTOR BUILDING FLOODING ASSESSMENT

A reactor water cleanup system low temperature leak less than the isolation flow rate could cause flooding in the reactor building. The water would flow down the stairwells to the South Core Spray Room and/or the South Residual Heat Removal Room in the -17 foot elevation of the building. Both the South Core Spray Room and the South Residual Heat Removal Room have separate sumps and sump pumps. Excessive sump pump operation causes an alarm in the control room which would cause investigation of the leak source. A large leak that exceeds sump pump capacity would cause flooding. Water levels of 6 inches and 12 inches in each room are annunciated in the control room. If the water level in either room exceeds 6 inches, the Secondary Containment Control Procedure (part of the Emergency Operating Procedures) would be entered. This procedure requires identification of the leak source and isolation of the source, if possible. The room water levels would be monitored and additional actions taken, such as a reactor scram and depressurization, if warranted. The residual heat removal and core spray pumps and motor-operated valves are elevated several feet off the room floor. No safety-related equipment would be affected until the room water level exceeds 12 inches. The approximate floor areas of the rooms correspond to 4,500 gallons/foot in the South Core Spray Room and 17,000 gallons/foot in the South Residual Heat Removal Room. The Secondary Containment Control Procedure for leak identification and isolation referred to above also applies to leaks originating from systems other than the reactor water cleanup system, such as the service water system or the fire protection system.

INSTRUMENT SETPOINT BASIS

The RWCU Differential Flow - High Allowable Value of 100 gpm has been determined using the ISA-S67.04-1988 methodology. Table 1 identifies the uncertainties contributing to the Allowable Value. The Trip Setpoint is established far enough below the Allowable Value to accommodate the cumulative effects of instrument drift uncertainty, calibration uncertainty, all other random uncertainties and biases introduced by process effects, and a maximum of 10 percent analytical margin for the normal operating conditions. Seismic and accident effects are not included. A more restrictive tolerance is established as an acceptance criteria for periodic testing of the loop. That value excludes immeasurable loop uncertainty factors such as flow orifice effects, transmitter static pressure effects, and process temperature biases. The test acceptance criteria is controlled in engineering documents and plant procedures.

The basis for establishment of the instrument setpoint, as described above, will be included in the emergency Technical Specification change as a revision to the applicable Technical Specification Bases section. Draft Bases revisions are also included in Enclosures 2 and 3.

REPORTABILITY

When establishing the actual field instrument setpoint for a given isolation actuation function, instrument uncertainties and margin for instrument drift are taken into account. This ensures that isolation will occur prior to reaching the established Allowable Value. In the case of the reactor water cleanup system high differential flow isolation actuation instrument, the actual setpoint in the field is currently established as 43 gpm. The actual field value is well below the proposed 100 gpm Allowable Value. As discussed above, the Trip Setpoint is established far enough below the Allowable Value to accommodate the cumulative effects of instrument drift uncertainty, calibration uncertainty, all other random uncertainties and biases introduced by process effects, and a maximum of 10 percent analytical margin for the normal operating conditions. The acceptance limits will be established by these uncertainities from the Allowable Value. Seismic and accident effects are not included in the Allowable Value. Should the as-found setpoint exceed the acceptance limits, the condition would represent a reportable event since the reactor water cleanup system high differential flow function is comprised of a single instrument channel with no redundant means for providing the same protective function (cold water leak protection).

SIGNIFICANT HAZARDS ANALYSIS

Based on the additional information provided in our April 28, 1991 submittal and the April 30, 1991 meeting with the Staff, Carolina Power & Light Company was requested

to review the conclusions of our previously submitted significant hazards analysis. The Company's basis for concluding the requested Waiver of Compliance does not involve a significant hazards consideration is summarized below.

1. The proposed waiver does not involve a significant increase in the probability or consequences 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 a design basis accident nor will the proposed change significantly increase the probability of malfunction of any safety related equipment during the requested extension.

   The proposed waiver will not significantly increase the consequences of the previously analyzed reactor water cleanup system accident. The proposed change to increase the high differential flow isolation Allowable Value from "less than or equal to 53 gpm" to "less than or equal to 100 gpm" and to remove the associated Trip Setpoint may result in a slight increase in offsite and control room doses. Table 2 provides a summary of the dose consequences for the existing 53 gpm Trip Setpoint/Allowable Value limit (both for the isolation time required by the Technical Specifications and the hypothetical un-isolated leak for 30 day case), the proposed 100 gpm Allowable Value (both for the isolation time that would be required by the Technical Specifications and the hypothetical un-isolated leak for 30 day case), and the dose consequence analysis value of 300 gpm. Table 2 also summarizes the applicable regulatory dose limit against which these dose consequences were compared. As shown in Table 2, the increase in dose consequences resulting from either the realistic case (i.e., isolation within 80 seconds in accordance with Technical Specifications) or the postulated 30 day leak without isolation case is insignificant in comparison with the applicable regulatory limit. Therefore, the Company has determined that the proposed setpoint revision will have an acceptable effect on the overall safety of the plant and does not significantly increase the probability or consequences of an accident previously evaluated.

2. The proposed waiver does not create the possibility of a new or different kind of accident from any accident previously evaluated. Only the primary containment isolation system components of the reactor water cleanup system perform a safety function. The isolation function will continue to exist and perform its intended

safety function of limiting offsite and control room doses within the limits of 10 CFR 100 and 10 CFR 20.

3. The proposed waiver does not involve a significant reduction in the margin of safety. The proposed change to increase the high differential flow isolation Allowable Value from "less than or equal to 53 gpm" to "less than or equal to 100 gpm" and to remove the specific Trip Setpoint will result in a slight increase in offsite and control room doses. However, as shown in Table 2 and described in Item 1 above, the consequences of a reactor water cleanup system leak isolation based on the existing 53 gpm setpoint versus the consequences of a reactor water cleanup system leak isolation based on the proposed 100 gpm Allowable Value in comparison to either the consequences of a 300 gpm un-isolated leak for 30 days or the applicable regulatory limits is not significant. Therefore, the Company has determined that the proposed revisions to the high differential flow isolation Trip Setpoint and Allowable Value will have an acceptable effect on the overall safety of the plant and does not involve a significant reduction in the margin of safety.

Table 1

RWCU Differential Flow Leak Detection Instrument Loop Calibration	Calc ID: 0RWCU-001
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SETPOINT DIAGRAM NO. 2

Mode 2: Inlet Flow = 67 gpm@120°F, No Return, All Reject
Leak = 43 gpm@545°F,
Inlet Temp = 300°F, Reject Temp = 120°F
Bias = -6.64, +U = 38.34, -U = 75.02
(Ref: Worksheet 2, Example 7, Pg. 153)

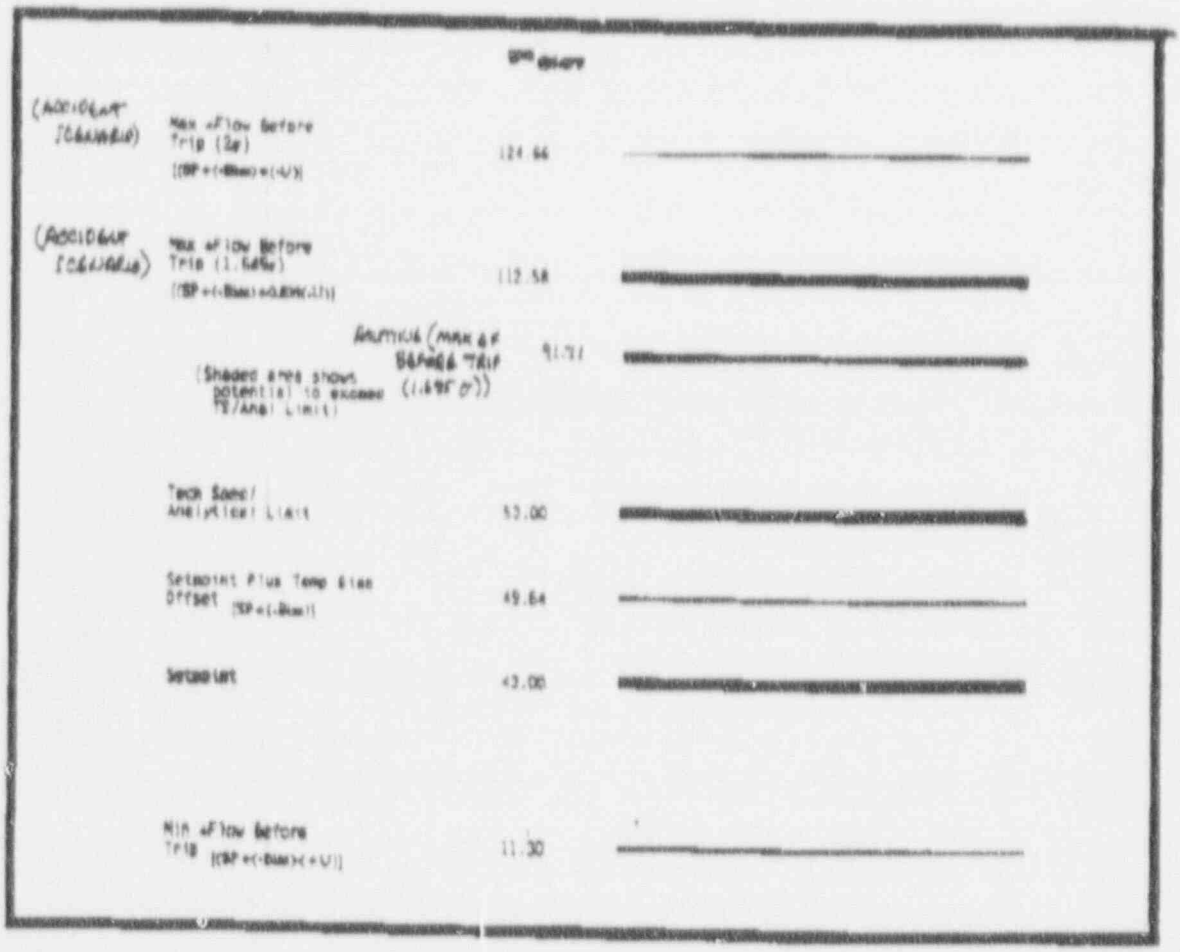

TABLE 2

COMPARISON OF DOSE CONSEQUENCES

RWCU COLD WATER LINE BREAK

Assumed Break Size and Time	Exclusion Area	Low Population Zone	Control Room
53 gpm/80 seconds	2.45E-7 Rem	5E-9 Rem	2.45E-7 Rem
53 gpm/30 days	0.00795 Rem	0.00018 Rem	0.00795 Rem
100 gpm/80 seconds	4.63E-6 Rem	1E-8 Rem	4.63E-6 Rem
100 gpm/30 days	0.015 Rem	0.00034 Rem	0.015 Rem
300 gpm/30 days	0.045 Rem	0.001 Rem	0.045 Rem
Regulatory Limit	25 Rem Whole Body 300 Rem Thyroid	25 Rem Whole Body 300 Rem Thyroid	5 Rem Whole Body 30 Rem Thyroid