



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
SUPPORTING AMENDMENT NO. 149 TO FACILITY OPERATING LICENSE NO. DPR-71
AND AMENDMENT NO. 179 TO FACILITY OPERATING LICENSE NO. DPR-62
CAROLINA POWER & LIGHT COMPANY, et al.
BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2
DOCKET NOS. 50-325 AND 50-324

1.0 INTRODUCTION

By letter dated February 29, 1988, Carolina Power & Light Company (CP&L or the licensee), requested Technical Specification (TS) changes for the Brunswick Steam Electric Plant, Units 1 and 2. The February 29, 1988 letter was superseded by application dated September 20, 1989. Additional information was also provided by letters dated December 5, 1989 February 15, 1990, August 9, and October 24, 1990. The August 9, and October 24, 1990, submittals provided clarifying information that did not change the proposed no significant hazards consideration published in the Federal Register. The proposed changes revise TS 3/4.3.2 to modify Instrument Tables 3.3.2-1, 3.3.2-2, 3.3.2-3, and 4.3.2-1. Instrument Table 3.3.2-1 addressed isolation actuation instrumentation minimum channel operability, whereas Table 3.3.2-2 contains the isolation actuation instrumentation setpoints. Table 3.3.2-3 provides for isolation system instrumentation response times, and Table 4.3.2-1 addresses isolation actuation instrumentation surveillance requirements. The licensee also requests that the actual identification of containment isolation valves and secondary containment isolation dampers be removed from the TS and be located in a licensee control document that would only be changed pursuant to 10 CFR 50.59.

The licensee grouped the changes into five categories. The following staff evaluation is also formatted by the same categories. Category 1 would delete valve group 7 in Table 3.3.2-1. Category 2 would add new items and revise current items in Tables 3.3.2-1, 3.3.2-2, 3.3.2-3, and 4.3.2-1. Category 3 changes revise the tables to: (1) provide consistency, (2) correct administrative errors, and (3) provide clarification without impacting operation of the system. Category 4 changes revise the response times and associated footnotes in Table 3.3.2-3 to provide a more accurate description of the instrumentation. Category 5 changes relocate the primary containment isolation valve list, currently provided as Table 3.6.3-1, and the secondary containment automatic isolation damper list, currently provided as Table 3.6.5.2-1, to Plant Procedure RCI-02.6.

2.0 EVALUATION

Category 1 Changes

Category 1 changes would delete valve group 7 in Table 3.3.2-1. Valve group 7 currently includes the following items: Primary Containment Isolation/Reactor Vessel Water Level-Low, Level 1; Secondary Containment Isolation/Drywell Pressure High; Reactor Water Cleanup (RWCU) System Isolation/Drywell Pressure High; Shutdown Cooling System Isolation/Reactor Vessel Water Level-Low, Level 1; Shutdown Cooling System Isolation/Reactor Steam Dome Pressure High. The trip signal identified in the items would isolate certain valves in the systems identified. For example, a high reactor steam dome pressure would isolate certain valves of the shutdown cooling system. The valves, by groups, are identified in TS Table 3.6.3-1 entitled "Primary Containment Isolation Valves," and TS Table 3.6.3-2 entitled "Secondary Containment Automatic Isolation Dampers." The licensee states that Table 3.6.3-1 does not identify any valves as group 7 valves. Therefore, since there are no group 7 valves currently identified in the TS, the licensee reasons that the above named items identifying group 7 valves should be deleted. In addition, the licensee provided various reasons why valve group 7 should not be identified in Table 3.3.2-1. The reasons can be grouped as: (1) custom to standard technical specification conversion, (2) logic design changes, and (3) license amendments that were issued over ten years ago to support these efforts.

The staff reviewed Table 3.6.3-1 which contains an identification of the containment isolation valves for each unit. No group 7 valves are identified. The staff also reviewed the Updated Final Safety Analysis (UFSAR) Table 6.2.4-2 entitled "Automatic Primary Containment Isolation Valves." UFSAR Table 6.2.4-2 lists only one set of valves associated with group 7: high pressure coolant injection (HPCI) turbine exhaust vacuum breaker isolation. These two valves are addressed in the licensee's category 2 proposed changes where a new valve group 7 is proposed. Based upon the above evaluation, the staff concluded that valve group 7 in Table 3.3.2-1 should have been removed years ago and there are no group 7 valves except for the HPCI turbine exhaust vacuum breaker isolation valves which will be addressed in the following evaluation. The staff finds the change to delete valve group 7 in Table 3.3.2-1 acceptable.

Category 2 Changes

Category 2 changes add new items and revise current items in Tables 3.3.2-1, 3.3.2-2, 3.3.2-3, and 4.3.2-1. The licensee proposes to add the following new items: 1h (Reactor Building Exhaust Radiation-High), 3f (Delta Flow-High - Time Delay Relay), 4.a.10 (Drywell Pressure-High), 4.b.11 (RCIC Steam Line Tunnel Temperature - High Time Delay Relay), 4.b.12 (Drywell Pressure-High) and Footnotes (i), (j), (k), and (l) for Table 3.3.2-1 only.

The licensee proposes to revise the following items for Table 3.3.2-1 only: 1.c.2 (Main Steam Line Pressure-Low), 1.c.3 (Main Steam Line Flow-High), 1.c.4 (Main Steam Line Flow-High-Unit 2 only), 1.d (Main Steam Line Tunnel Temperature-High), 1e (Condenser Vacuum Low), 1.f. (Turbine Building Area Temperature - High), 4.b.2 (HPCI Steam Line Flow-High Time Delay Relay), 4.b.3 (RCIC Steam Supply Pressure-Low), and 5.b (Reactor Steam Dome Pressure-High). The details of these proposed changes follow.

The licensee proposes to add reactor building exhaust radiation-high trip function to the TS tables under PRIMARY CONTAINMENT ISOLATION. The licensee states that this signal causes the group 6 isolation valves to close during a loss-of-coolant accident. The licensee proposes the same applicable operational condition and action statement as the other group 6 valves under Item 1. The staff reviewed UFSAR Table 7.3-3 entitled "Isolation Signals and Setpoints." Reactor Building Exhaust High Radiation is listed as a signal for primary containment isolation, group 6. The staff agrees that this signal should be added to the TS and agrees that the operability and surveillance requirements are appropriate.

The licensee proposes to add the differential (delta) flow-high time delay relay trip function to the TS tables under REACTOR WATER CLEANUP SYSTEM ISOLATION. The licensee stated that current TS do not specifically reference operability surveillance requirements for the existing RWCU Delta Flow-High time delay relay. These relays do not initiate any isolation signal. However, they are an important part of the instrumentation. RWCU isolation under high flow conditions is already included in the Table 3.3.2-1 as Item 3.a, Delta Flow-High. The licensee proposes similar operability requirements to those already contained in Item 3.a., Delta Flow-High. The staff reviewed UFSAR Table 7.3.1-3 entitled "Isolation Signals and Setpoints." The RWCU high Delta Flow time delay is listed as a signal for primary containment isolation group 3. The staff agrees that the signal should be added to the TS and agrees that the operability and surveillance requirements are appropriate.

The licensee proposes to add drywell pressure-high trip function to the TS tables under HPCI System Isolation. This signal, when combined with existing signal, HPCI Steam Supply Pressure-Low, will close HPCI turbine exhaust vacuum breaker valves, which are identified by a new valve group 7. The HPCI steam supply pressure-low (4.a.3) will continue to close the group 4 valves. The HPCI system has vacuum breaker valves on a vacuum relief line for the HPCI turbine exhaust. These lines help prevent the creation of a water column in the exhaust line. Preventing filling of this column reduces the piping loads which could exist if the turbine is restarted. The valves isolate on coincident HPCI steam line pressure-low and drywell pressure-high. Proposed footnote k reflects this logic makeup. The licensee is proposing an operability requirement similar to other HPCI isolation signals. The staff reviewed UFSAR Table 7.3.1-3 entitled "Isolation Signals and Setpoints." Drywell pressure-high is an isolation signal with HPCI steam supply low pressure for primary

containment isolation group 7. In addition, UFSAR Table 6.2.4-2 entitled "Automatic Primary Containment Isolation Valves" identifies these valves as group 7 valves which close on low steam supply pressure coincident with high drywell pressure. The staff agrees that the signal should be added to the TS and that the operability and surveillance requirements are appropriate.

The licensee proposes to add the RCIC steam line tunnel temperature-high time delay relay trip function to the TS Table 3.3.2-3 under Reactor Core Isolation Cooling (RCIC) System Isolation. The licensee states that the current TS do not specifically reference operability and surveillance requirements for the existing RCIC steam line tunnel high temperature time delay relay. These relays do not initiate any isolation signal; however, they are an important part of the instrumentation. RCIC isolation under high steam line temperature conditions is already included in the table as Item 4.b.7, RCIC steam line ambient temperature high. The licensee proposes the same operability requirements as already contained for item 4.b.7. The staff reviewed UFSAR Table 7.3.1-3 entitled "Isolation Signals and Setpoints." The RCIC steam line tunnel temperature high time delay is listed as a signal for primary containment isolation, group 5. The staff agrees that the signal should be added to the TS and operability and surveillance requirements are appropriate.

The licensee proposes to add the drywell pressure-high trip function to the TS Table 3.3.2-3 under Reactor Core Isolation Cooling System Isolation. This request is the same as the HPCI above. The staff performed a similar review of the licensee's request and reviewed the UFSAR. A new valve group 9 will be used for the RCIC turbine exhaust vacuum breaker isolation valves. Group 5 valves will continue to close under RCIC low steam pressure (4.b.3). The staff agrees that the signal should be added to the TS and agrees that the operability and surveillance requirements are appropriate.

In TS Table 3.3.2-1, footnote (i) is proposed to be added for valve group 8 for shutdown cooling system isolation under high reactor steam dome pressure conditions (Item 5.b.). Footnote (i) states "does not isolate E11-F015A, B." This fact is not reflected in the TS, according to the licensee. The staff reviewed UFSAR Table 6.2.4-2 entitled "Automatic Primary Containment Isolation Valves." This table states in footnote (d) that for these valves "does not isolate on high reactor pressure. Isolates on low level only in shutdown cooling mode." The staff agrees to the addition of footnote (i).

In TS 3.3.2-1, footnote (j) is proposed to be added for valve group 1 for Item 1.c.2, 1.c.3, 1.c.4 (BSEP-2 only), 1.d, 1.e, and 1.f. Footnote (j) states "does not isolate B22-F019 or B32-F20." This fact is not reflected in the TS, according to the licensee. The staff reviewed UFSAR Table 6.2.4-2 entitled "Automatic Primary Containment Isolation Valves." This table states in footnote (b) that these valves only isolate on reactor low water level and main steam line high radiation. Thus, the valves would not isolate for the signals associated with the above items. The staff agrees to the addition of footnote (j) as discussed above.

Category 3 Changes

Category 3 changes revise the tables to: (1) provide consistency, (2) correct administrative errors, and (3) provide clarification without impacting operation of the system. The licensee further subdivided this category into six subchanges. The staff's evaluation is formatted accordingly.

The licensee proposes to specify individualized valve groups on separate lines in Table 3.3.2-1 to show that their operability requirements are different (Subchange A). An in depth analysis of this change was provided in the licensee's December 5, 1989 submittal as follows.

Currently, valve groups actuated by an isolation signal are specified under the trip function regardless of whether the actuated valve groups are associated with that isolation function. As an example, valve groups 2, 6, and 8 are listed under both trip functions 1.a.1, Primary Containment Isolation, and 5.a, Shutdown Cooling System Isolation, even though valve groups 2 and 6 are associated with primary containment isolation and valve group 8 with shutdown cooling system isolation. As a result, the Technical Specifications are not consistent in specifying the correct action if the operability requirements are not met. In the above case, Item 1.a.1 requires Action 20 for valve groups 2, 6, and 8 whereas Item 5.a specifies Action 27 for these groups. Action 20, as specified by Item 1.a.1, is appropriate for valve groups 2 and 6 because both are associated with primary containment. Action 27, specified in Item 5.a, is appropriate for valve group 8 since it is associated with shutdown cooling system isolation. The nature of the action specified by Action 27 would not compensate for the inoperability of the valve group 2 and 6 instrumentation and, as such, is inappropriate for that condition.

Similar changes are necessary for Items 2.a, 2.b, and 2.c. These items address the operability requirements for the secondary containment isolation system instrumentation, however the secondary containment isolation dampers are not identified as a valve group operated by the items. This change adds footnote (1) which references the secondary containment isolation dampers. The specified Action 23 is correct for the secondary containment isolation dampers, however, it is not for valve groups 2, 3, and 6 which are related to secondary containment. The correct actions for these valve groups are specified by the primary containment isolation section for valve groups 2 and 6 and the reactor water cleanup system isolation system section for valve group 3. These sections are specifically provided for these isolation functions and contain the appropriate actions. The proposed changes do not reflect a change in the design or operation of the instrumentation. The staff agrees with the licensee's rationale and the proposed changes are acceptable because they clarify the valve groupings and their respective functions.

The licensee proposes to revise titles of the items in Tables 3.3.2-1, 3.3.2-2, 3.3.2-3, and 4.3.2-1 to provide consistency with other titles, correct administrative errors, and provide a more accurate description of the instrumentation (Subchange B). The licensee states that the changes

do not reflect changes in the design or operation of the instrumentation. The corrected titles are listed on pages E1-9 and E1-10 of the September 20, 1989 submittal. The staff reviewed the revised titles, and the changes are acceptable.

The licensee proposes to replace Footnote * with (f) in Item 2.a in Table 4.3.2-1 (Subchange C) on page 3/4 3-28. The footnote wording itself does not change. This is administrative in nature and is acceptable.

The licensee proposes to delete the word "or" from the end of Item a.2 under the "Primary Containment Integrity" definition on page 1-5 (Subchange D). According to the licensee, the conjunction is out of place and should be deleted. The licensee states that there is no technical basis for the current wording, nor does the conjunction represent any logic. The staff agrees that the "or" makes no sense in Item a.2 on page 1-5, and the change is acceptable.

The licensee proposes to delete Footnote * under Specification 4.6.3.1 (BSEP-1 only) (Subchange E). Footnote * was added to the TS via Amendment No. 72 to provide a one-time extension of the 18 month surveillance interval for four reactor instrumentation system isolation valves. The licensee stated that the surveillance has been completed and the footnote is no longer applicable. Based on the licensee's statements that the surveillance was completed and the footnote is no longer applicable, the change is acceptable.

The licensee proposes to delete Item 1.a.2, Reactor Vessel Water Level-Low, Level 2, from Tables 3.3.2-1, 3.3.2-2, 3.3.2-3, and 4.3.2-1 (Subchange F). Unit 1 Amendment No. 122, dated February 6, 1989 and Unit 2 Amendment No 146, dated April 18, 1989, revised the reactor vessel water level trip function for the valve group 1 isolation valves from low, level 2 to low, level 3. This resulted in only valve group 3 being actuated by the low, level 2 trip function. Valve group 3 isolates the reactor water cleanup system and is addressed specifically in Item 3.3 for the low, level 2 instrumentation. Item 1.a.2 is being deleted because the instrumentation no longer actuates any valve groups that need to be addressed under Item 1. This change does not represent any physical change to the design or operation of any systems. It only more accurately describes the trip function associated with the group 3 valves. The staff agrees that there is unnecessary duplication and agrees to the change.

Category 4 Changes

Category 4 changes consist of revising certain response times and associated footnotes in Table 3.3.2-3 to provide a more accurate description of the instrumentation.

The licensee proposes to change the wording of footnote (a) slightly and move the reference of this note from specific table items (currently Item 4.a.1 and 4.b.1) to the heading entitled "RESPONSE TIME". Currently, part of footnote (a) states "Isolation system instrumentation response time specified includes the delay for diesel generator starting assumed in the accident analysis." The licensee desires to change the words "the delay" to "any delay. Some valves depend upon diesel generator AC power when loss of offsite power is assumed and some do not. The change is necessary when the footnote is placed at the heading "RESPONSE TIME." Thus, footnote (a) now addresses instrumentation response time as: (1) time for the instrument to respond, (2) any delay caused by the use of timers, and (3) any delay due the diesel generator starting. This time when added to the valve isolation time, as addressed in footnote (e), will give the isolation system response time. The staff agrees to the change.

The current TS specify an instrumentation response time of 1.0 second for the trip function instrumentation in Items 1.a.2, 1.c.1, 1.c.3, 2.c, and 3.e. A reference to Footnote (d), which states "Isolation actuation instrumentation response time only," is also provided. This footnote indicates that any time delay needed for diesel generator starting is not subject to the response time requirement since the requirement applies only to the instrumentation.

The trip functions covered by Items 1.a.2, 1.c.1, and 1.c.3 actuate both AC powered valves and the main steamline isolation valves (MSIV). Item 2.c and 3.e cover functions that actuate only AC powered valves. The MSIV are not dependent on AC power for closure. The response times currently specified are appropriate for the MSIV, but not for other AC powered valves actuated by this instrumentation since they are dependent upon the diesel generators. The proposed change establishes a 13-second response time requirement for the valves other than the MSIV to accommodate the diesel generator start time. A new footnote (f) is added with the new 13-second response time which states, "Isolation system instrumentation response time for associated valves except MSIV" for those functions that actuate both the MSIVs and AC powered valves. The proposed change also revises Footnote (d), which is associated with the 1.0-second response time to state, "Isolation system instrumentation response time for MSIVs only. No diesel generator delays assumed."

The above described changes do not represent a change to the plant. The changes clarify the existing information contained in the Table and more accurately portray it. On this basis, the changes are acceptable.

The last change associated with Category 4 changes replaces the response time for isolation of RWCU under high differential flow condition. The current value is less than or equal to thirteen seconds. The value proposed is 45 seconds. The licensee stated that a 45-second time delay is provided for this instrumentation to prevent spurious isolation signals resulting from RWCU pump starts or flow path changes. The time delay is not currently included in the TS response time. The staff reviewed UFSAR

Table 7.3.1-3 entitled "Isolation Signals and Setpoints" and confirmed the use of the 45-second timer. The licensee also confirmed by letter dated February 15, 1990, that the high energy line break analysis supports the 45-second time delay. Therefore, the staff finds the change acceptable.

Category 5 Changes

Category 5 changes relocate the primary containment isolation valve list, currently provided as Table 3.6.3-1, and the secondary containment automatic isolation damper list, currently provided as Table 3.6.5.2-1, to Plant Procedure RCI-02.6. This approach is similar to a TS change made for another nuclear plant owned and operated by the licensee. The procedure is referenced where the Table information used to be contained to ensure that any change to the Table would be subject to the provisions of 10 CFR 50.59. A paragraph is also added to the Bases statement to explain the removal of these Tables.

The staff does not believe that the listing of the actual valves/dampers need to be provided in the TS. Removal of such detailed listings of plant equipment from TS have been the subject of license amendments in the recent past. For example, snubber listings have been deleted from various plant TS because the actual snubber identification numbers listed in the TS were not needed for plant safety. The licensee's request to delete the actual valve/damper identification numbers is similar to the example, and the staff agrees to the change.

The licensee stated that CP&L has completed a review of the primary containment isolation system TS and determined that Table 3.6.3-1 needs to be revised to accurately reflect the as-built design of the primary containment isolation system. The staff requested the licensee to explain the differences between the TS valve listing and the similar listing in the procedure. The licensee's responses in their letter dated December 5, 1989, indicate that the current Technical Specifications list only automatic isolation valves with stroke time requirements. Technical Specification Interpretation 85-01 expanded the applicability of Technical Specification Section 3.6.3 to include the list of the primary containment isolation valves contained in existing Plant Procedure SD-12. It will also specify the same isolation times as currently specified by the Technical Specifications. The list of valves and requirements specified by the new procedure, therefore, will be the same as that currently specified by the Technical Specifications as expanded by the Technical Specification Interpretation. The proposed relocation primary containment isolation system valve listing is acceptable because it is consistent with TS simplifications already accepted in other nuclear plants, and this change does not impact on plant safety or operations.

3.0 ENVIRONMENTAL CONSIDERATIONS

These amendments change a requirement with respect to installation or use of a facility component located within the restricted areas as defined in 10 CFR Part 20 and change surveillance requirements. The staff has determined that these amendments involve no significant increase in the

amount, and no significant change in the types, of any effluents that may be released off site and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that these amendments involve no significant hazards consideration, and there has been no public comment on such finding. Accordingly, these 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 these amendments.

4.0 CONCLUSION

The Commission made a proposed determination that these amendments involve no significant hazards consideration which was published in the Federal Register (55 FR 8219) on March 7, 1990, and consulted with the State of North Carolina. No public comments or requests for hearing were received, and the State of North Carolina did not have any comments.

The staff 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, and (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.

Dated: December 5, 1990

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