



Carolina Power & Light Company

SERIAL: NLS-84-444

OCT 31 1984

Director of Nuclear Reactor Regulation
Attention: Mr. D. B. Vassallo, Chief
Operating Reactors Branch No. 2
Division of Licensing
United States Nuclear Regulatory Commission
Washington, DC 20555

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 & 50-324/LICENSE NOS. DPR-71 & DPR-62
PROCEDURE GENERATION PACKAGE (PGP)

Dear Mr. Vassallo:

In a letter dated July 27, 1984, Carolina Power & Light Company (CP&L) was requested to provide information regarding the Brunswick Procedure Generation Package (PGP). Enclosure 1 provides this information. In addition, the PGP has been revised in response to this request. A copy of the revised PGP is provided in Enclosure 2.

Should you have further questions regarding this matter, please contact Mr. John S. Dietrich at (919) 836-6154.

Yours very truly,

for S. R. Zimmerman
Manager
Nuclear Licensing Section

MAT/cfr (734MAT/cfr)

Enclosures

cc: Mr. D. O. Myers (NRC-BNP)
Mr. J. P. O'Reilly (NRC-RII)
Mr. M. Grotenhuis (NRC)

8411070040 841031
PDR ADDCK 05000324
F PDR

A001
11

ENCLOSURE 1

TO SERIAL: NLS-84-444

**CP&L Response to NRC Comments of July 27, 1984
on the Brunswick Procedures Generation Package**

NRC GENERAL COMMENTS

1. NRC Comment:

A single list of acceptable abbreviations provided at some specific location would be useful. Currently, Appendices I and II have their own list of abbreviations while Appendix III does not.

CP&L Response:

The list of abbreviations in the PSTG has been deleted. The Writers' Guide now contains the abbreviations applicable to the PGP.

2. NRC Comment:

The titles of Appendices I and II are different from those listed in the general Table of Contents for the PGP.

CP&L Response:

The titles in the General Table of Contents have been revised.

3. NRC Comment:

The attachments to Appendix III are very important. These attachments should be identified in the PGP Table of Contents. It is also suggested that attachments be more clearly identified; e.g., the cover page of Attachment C to Appendix III should also carry the caption "Deviations From the Generic Guidelines."

CP&L Response:

The attachments have been added to the Table of Contents and the titles have been added to the cover pages.

4. NRC Comment:

The numbering systems for the appendices and the attachments should be improved to make the document easier for the procedure writer to use. At present there are eight sections in this document and each one has its own number sequence (page X of Y). One method would be to include the appendix number with the page number (i.e., III page 9 of 13 for the ninth page of Appendix III).

CP&L Response:

The appendix and attachment numbers have been added to each page.

5. **NRC Comment:**

Appendix I, Plant-Specific Technical Guidelines (PSTG) for Emergency Operating Procedures (EOPs), would be easier to use if it had a Table of Contents.

CP&L Response:

A Table of Contents has been added to the PSTG.

PLANT-SPECIFIC TECHNICAL GUIDELINES

1. **NRC Comment:**

The PSTG indicates that processes were used to convert the general guidelines into the PSTG (pages 2, 3, and 7 of 15). Modify the PGP to describe the processes used to translate the generic guidelines into the PSTG and to the procedures.

CP&L Response:

These procedures are described in Sections B and C of the PGP.

2. **NRC Comment:**

Several deviations from the generic technical guidelines appear to be conservative, but the steps are more complex and require more operator actions to accomplish. Additional analyses or technical justification should be provided to show that the operators could, in fact, be expected to complete these actions in the required time frame. The deviations of this type include the following:

- a. Step DW/T-3, page 26 of 52, Appendix I (deviation Item B-2, page 2 of 5, Appendix III, Attachment C).
- b. Step SP/L-3.3, page 33 of 52, Appendix I (deviation Item B-11, page 3 of 5, Appendix III, Attachment C).

CP&L Response:

The deviation from the step no longer requires the use of two limits (see Appendix III, Attachment C). The limit is now less complex than the generic guidelines in that restricting flow rate is not required.

3. **NRC Comment:**

Technical justification should be provided for the pressure limits chosen for the PSTG, Step PC/P-6, first item, page 29 of 52, Appendix I (deviation Item B-7, page 3 of 5, Appendix III, Attachment C). The deviation appears to use an approach which allows no operating margin while the approach for the generic technical guidelines does.

CP&L Response:

Additional justification for this deviation has been added to Appendix III, Attachment C.

4. NRC Comment:

Step C1-6, RPV Water Level Decreasing, RPV Pressure High or Intermediate, on page 37 of 52, would postpone RPV depressurization until the RPV water level reached the top of the active fuel. Conversely, the generic technical guideline (Step C1-7, RPV Water Level Decreasing, RPV Pressure High or Intermediate) requires emergency RPV depressurization for the case where the CRD is not operating but at least two injection systems are lined up for injection with both pumps running (regardless of level). The proposed Brunswick deviation may not be sufficiently conservative even though it would allow additional time to restore RPV level before depressurizing the RPV. Provide analysis or justification to support the deviation.

CP&L Response:

Additional justification for this deviation has been added to Appendix III, Attachment C.

5. NRC Comment:

The numbering system for the Brunswick deviations from the generic technical guidelines should be consistent with the numbering system in the generic technical guidelines or the deviations should be cross-referenced to the generic guidelines. For example, Step C2-1.1 in the generic technical guidelines calls for initiating the isolation condenser (IC). Brunswick does not have an IC. Therefore, there should be a deviation to this step. However, deviation C2-1.1 does not refer to the IC.

CP&L Response:

The numbering system for Appendix III, Attachment C (deviations from generic guideline), follows the same format as the generic guideline and the PSTG. Additional clarification was added by including a Table of Contents that parallels the PSTG.

6. NRC Comment:

In the second paragraph of Section C of the PGP on page 7 of 15, it is stated that no validation of the PSTG is needed because the generic guidelines are used as the bases for the PSTG. However, in the fourth paragraph of Section C, it is stated that guideline steps have been rearranged to reduce confusion and to establish priority of certain safety functions. Describe the provision implemented or to be implemented to ensure that this arrangement of steps has not interrupted an important sequence of events that was established in the generic technical guidelines to mitigate the emergency.

CP&L Response:

Additional detail has been added to Section C to clarify the methods used to develop the PSTG from the generic guideline. The PSTG steps were not rearranged from the generic guideline. The PSTG steps were not rearranged from the generic guideline except as noted in Appendix III, Attachment C. The steps from the RPV Control Guideline section of the PSTG were prioritized in the EOP by diagnosing plant conditions and placing emphasis on the appropriate parameter (reactor level, pressure, power). This is discussed in detail in Section B of the PGP.

7. NRC Comment:

As a part of the PSTG or the Validation/Verification (V/V) Program, it is necessary to evaluate available instrumentation and controls against the information and control needs of the operators. A description of the method to be used to determine the adequacy of Control Room instrumentation and controls in meeting the information and control needs of the operators (i.e., it has or will be determined that the parameters are correct and that the instrument and control characteristics [e.g., range, accuracy, scaling, etc.] meet the needs identified) should therefore be provided in the PSTGs or V/V Program description, as appropriate. Since the BWR Owners' Group Guidelines identify information and control needs at a high level, it is also necessary to describe the process used to identify plant-specific parameters and other plant-specific information and control capability needs and how the characteristics of needed instruments and controls will be, or have been, determined. These latter processes may be described in either the PGP or the Detailed Control Room Design Review Program Plan, with appropriate cross-referencing.

CP&L Response:

The task analysis methodology for determining plant-specific parameters, information and control needs, and instrument and control characteristics necessary during emergency operation will be described in the Detailed Control Room Design Review Program Plan. This plan will be submitted to the NRC by December 31, 1984.

WRITERS' GUIDE

1. NRC Comment:

The Writers' Guide does not provide directions to the EOP writer on how to go from the PSTG to either the flowcharts or the End Path Manual(s) and what information is to be included in each. Modify the PGP to include additional information for the procedure writer.

CP&L Response:

Additional detail has been added to Sections B and C of the PGP to explain the process used.

2. NRC Comment:

It is not clear what information is intended to be conveyed by Figure 3 on page 14 of 35. Additional explanation should be included in the Writers' Guide.

CP&L Response:

This figure is intended to specify the location of the procedures in the End Path manual only. The procedures were placed in the manual according to their expected frequency of use (e.g., the LEPs and contingency procedures are not expected to be used as often as the end path procedures; therefore, these procedures are located at the top corners of the binder). No other information was intended to be conveyed by this figure.

3. NRC Comment:

Figure 1 (page 2 of 35) is not drawn according to the instructions in the Writers' Guide. Examples are that the path-to-path arrow symbol to direct operators to other paths (flowcharts) is not used for paths 1, 2, and 5, and the GO TO PATH 3 information is presented in an action box rather than using path-to-path arrows. Changes should be made to make this area consistent. There is also a decision point on Figure 1 (Auxiliary Power Available from SAT?), where, regardless of the outcome, the operator is to continue on this path. Clarify what this path is and clarify why this is a decision point. In addition, on the flowchart in Figure 1, the ANY AUTOMATIC SCRAM box is below the GO TO PATH 3 instruction, which apparently means you never reach this point. Explain what is intended by placing this step beyond the exit point to path 3.

CP&L Response:

Figure 1 has been amended for clarity. Following any reactor scram, the operator will pick up any one of the five flowcharts. The initial entry point for any flowchart is the information box at the top. The operator will enter at this point, manually scram the reactor, and access the key parameters.

As an example, if all control rods were not inserted following a scram, the operator would take the NO path from the first key parameter. The next block directs the operator to GO TO PATH 1. The next block, an information block, is the point at which the operator should enter path 1.

Path 4 is designed for low water level conditions or loss of off-site power conditions. If path 4 was entered, the operator would take the NO path from one of the two key parameters associated with path 4; e.g., if off-site power was unavailable, the operator would take the NO path from this key parameter and execute that portion of the flowchart associated with loss of off-site power.

4. NRC Comment:

Attachments, including tables, figures, and other decision aids, can be very useful in reducing the need for calculations and complicated logic statements. Modify the Writers' Guide to include information about when a table, figure, or other attachment should be used (NUREG-0899, Subsection 5.5.8).

CP&L Response:

Additional information has been added to Section 4.8.10 of the Writers' Guide to clarify when attachments should be used.

5. NRC Comment:

Conditional statements or logic statements will need to be used in conjunction with the end path procedures. It is important that these statements have a common, unambiguous, easily-read form. Modify the Writers' Guide to provide instructions for formatting logic statements in end path procedures. It may also be helpful to provide examples of logic statements that should be avoided (NUREG-0899, Subsection 5.6.10).

CP&L Response:

Examples of the formatting of logic statements has been added to Section 4.8.2 of the Writers' Guide.

6. NRC Comment:

The Writers' Guide states (Section 4.8.7, page 25 of 35) that referencing other procedures should be held to a minimum. However, since there is a need to reference other procedures, modify the Writers' Guide to specify the form and content of the references. Also, it is not clear if one can enter an end path procedure at any step (section/subsection) or if one always enters an end path procedure at the beginning of the procedure. If one can branch to a step, section, or subsection, then the content of the reference needs to be specified in Section 4.8.7.b on page 25 of 35. Modify the Writers' Guide accordingly (NUREG-0899, Section 5.2.2).

CP&L Response:

Section 4.8.7 of the Writers' Guide has been modified to specify the form and content of referencing steps.

When entering the end path procedure from the flowchart, the end path procedure is always entered at the beginning. The section of the end path procedure that describes the steps to depressurize the reactor are referenced from various procedures in the End Path Manual. The content of this reference has been added to Section 4.8.7.b of the Writers' Guide.

7. NRC Comment:

Action steps need to be written for a variety of situations. Modify the Writers' Guide to address the formatting for the following types of action steps:

- a. Steps for which a number of alternative actions are equally acceptable (NUREG-0899, Section 5.7.4).
- b. Steps of a continuous or periodic concern/applicability which are often needed to perform repeatedly a given action, such as monitoring or controlling some plant parameter (NUREG-0899, Section 5.7.5).

CP&L Response:

Sections 4.8.13 and 4.8.14 were added to the Writers' Guide to address these steps.

8. NRC Comment:

It appears that flowcharts should be required (like other procedures) to include a scope statement or have a title that indicates the scope. Modify the Writers' Guide to address this concern or justify the lack of scope statements or titles for flowcharts.

CP&L Response:

The EOP Users' Guide contains a section to describe the scope of each flowchart. The operators are trained to use the flowcharts following any reactor scram. A scope statement written into the flowcharts would be unnecessary information that would only delay execution of the immediate actions contained on the flowcharts.

9. NRC Comment:

The Writers' Guide says that "important" automatic actions shall be included for verification purposes on the flowcharts. Modify the Writers' Guide to include criteria or guidance for the writer to use in determining which actions are considered important.

CP&L Response:

Additional detail has been added to Section 3.14 of the Writers' Guide to define the criteria for "important" automatic actions.

10. NRC Comment:

The discussion of printed operator aids should include instruction for placement of the aids (NUREG-0899, Subsection 5.5.4).

CP&L Response:

Section 5.5.4 of NUREG-0899 deals with the place-keeping aids. It was assumed that this comment deals with place-keeping aids. The flowchart steps are checked off by the operator as they are accomplished. Section 4.7.3 of the Writers' Guide contains the guidance for place-keeping aids in the End Path Manual procedures.

11. NRC Comment:

The Writers' Guide states that the unit number shall not be designated on the flowchart (Section 3.3, page 3 of 35). The reason for this is not provided. Also, unit numbering is not discussed for the End Path Manual procedures, but there is a Unit 0 designation on Figure 4 (page 16 of 35). Modify the Writers' Guide to clarify the intent regarding unit designation in the End Path Manual procedures (NUREG-0899, Subsection 5.5.1).

CP&L Response:

The flowcharts and End Path Manual procedures are common to both units at Brunswick. The Unit 0 designation is an administrative control that indicates a procedure is common to both units. Additional detail has been added to Section 3.3, and Section 4.8.12 was added to the Writers' Guide to clarify the unit designators.

12. NRC Comment:

A number of conditions and requirements for Cautions and Notes are addressed in the Writers' Guide. However, an additional requirement should be included in the Writers' Guide to reduce the possibility for an operator missing an important portion of the Caution or Note; i.e., Notes and Cautions should be written so that they are completed on one page and can be read without interruption by intervening steps (NUREG-0899, Subsection 5.5.3).

CP&L Response:

Additional detail has been added to Sections 3.16, 4.8.3 and 4.8.4 to ensure Cautions and Notes are completed on the same page as the instructional step to which they apply.

13. NRC Comment:

The Writers' Guide uses both end path procedures and End Path Manual procedures on page 18 of 35. Modify the Writers' Guide to define each of these or modify the Writers' Guide to limit the use to the preferred one.

CP&L Response:

The End Path Manual is the binder that contains the five sections that are listed in Section 4.0 of the Writers' Guide. When the term End Path Manual procedures is used, it is referring to any of the procedures that are contained in the manual. When end path procedure is used, it is referring to the end path procedure section of the End Path Manual.

14. NRC Comment:

Using a standard copier, Section 7 on page 35 of 35, to make copies of the procedures does not necessarily mean that the functional criteria that the procedures be clearly legible will be met. Modify the guidance to include a statement on procedure legibility.

CP&L Response:

An additional statement has been added to Section 7 to ensure that procedures are legible.

15. NRC Comment:

Because of the unique method of implementing the EOPs (i.e., by the use of flowcharts), provide additional detail in the PGP as to how the flowcharts are implemented, where the flowcharts are located, how they are used by the operators, and how the flowcharts interface with narrative style procedures.

CP&L Response:

Additional detail has been provided in the Emergency Operating Procedures Generation Package to clarify how flowcharts are implemented, how they are used by operators, and how they interface with narrative style procedures.

An additional section (3.29) was added to the Writers' Guide to specify the location of the EOP in the Control Room.

16. NRC Comment:

Clarify whether the End Path Manual procedures can be entered without going to the flowcharts. If there are any entry conditions that direct the operator straight to the end path procedures without going to and/or through the flowcharts, discuss these entry conditions and indicate whether they are identified on the flowcharts or elsewhere.

CP&L Response:

The End Path Manual procedures cannot be entered without going through the flowcharts. The flowchart will always direct the operator to the appropriate procedure in the End Path Manual.

VALIDATION/VERIFICATION PROGRAM

1. NRC Comment:

There does not appear to be a systematic program for validating/verifying the procedures. Certain methods for validating/verifying are described, but no integrated plan is presented. Since the purpose of the validation/verification of the PGP is to describe the program for validating/verifying, modify the PGP to program this information.

CP&L Response:

The program for verification/validation is described in Appendix III of the PGP. The EOP committee described in Section D of Appendix III will be responsible for maintenance of the EOP. Anytime the EOP is required to be revised, the EOP committee will determine what verification/validation will be required.

2. NRC Comment:

It is important that a team approach (e.g., operating crews, technical writers, and subject matter experts) be used in the development and in the validation/verification of the procedures. Modify the validation/verification program description to discuss the makeup of the team personnel that will be used and their roles and responsibilities.

CP&L Response

The desktop reviews and simulator exercises were accomplished during licensed operator training. The personnel involved were operating crews. The instructor for the classroom training and part of the simulator training was a member of the EOP Upgrade group who was responsible for developing the training material. The comments from these sessions were returned to the EOP Upgrade group for resolution. A Shift Operating Supervisor and a Reactor Operator performed the Control Room walk-through, Phases I and II. Meetings were held between these personnel and the EOP Upgrade group to resolve discrepancies. The preimplementation review of the EOP was accomplished by personnel from each group (Quality Assurance, On-Site Nuclear Safety, Operations, Engineering) as assigned by their respective committee members. Three of the four groups had licensed Senior Reactor Operators for the review. The EOP Upgrade group was responsible for resolution of the discrepancies noted during the review.

3. NRC Comment:

Although the scenarios used for the simulator exercises and the Control Room walk-throughs are listed, it is not clear whether the full complement of the procedures (flowcharts and all of the procedures in the End Path Manual) will be exercised by the scenarios. It is stated that all of the flowcharts were exercised by the scenarios, but no statement to this effect was made about the end path procedures. Modify the program description to indicate which portions of the end path procedures will be exercised during the Verification/Validation Program on the simulator and in the Control Room.

CP&L Response:

The procedures in the End Path Manual were used during simulator exercises. It was not possible to exercise each section of each procedure with simulator exercise. As an example, Local Emergency Procedure 01 deals with alternate coolant injection methods. The majority of this procedure requires manipulations outside the Control Room. During a simulator exercise of the procedure, the Control Room personnel would be directed to enter this procedure. Their response would be to dispatch an Auxiliary Operator to perform the section of the procedure that requires actions outside the Control Room. In order to validate/verify the actions outside the Control Room, the outside Control Room walk-through was performed.

4. NRC Comment:

For those parts of the procedures that cannot be exercised on the simulator, specify the alternative validation/verification methods to be used.

CP&L Response:

Some portion of all sections of the End Path Manual procedures were exercised on the simulator. Since every portion of each procedure could not be exercised on the simulator, desktop reviews, Control Room walk-through Phase II, outside Control Room walk-through, back panel walk-through, and the EOP committee reviews were performed. (See Sections A, C, and D of Appendix III.) These reviews ensured that each and every step of all procedures received a thorough validation and verification.

5. NRC Comment:

Revisions to EOPs should be validated/verified as appropriate. Modify the program description (discussed on pages 11 and 15 of 15 in the PGP) to include the criteria for determining when it is appropriate to validate/verify revisions to EOPs. Also, provide a commitment that instructions will exist to validate/verify such revisions.

CP&L Response:

The EOP committee (see Section D of Appendix III) will be an ongoing EOP review committee at Brunswick. The committee will approve revisions to the Brunswick EOP and determine if and to what extent the revision requires validation and verification. In conjunction with the Detailed Control Room Design Review Task Analysis, a permanent procedure will be developed which will describe the requirements and the processes for future validation and verification of the EOP.

6. **NRC Comment:**

The information provided for the Validation/Verification Program does not differentiate between the EOPs for Brunswick Units 1 and 2 or the differences between the two units. Modify the description to specify how unit differences will be addressed in the validation/verification process.

CP&L Response:

The unit differences were addressed by the EOP group during the procedure development. The differences were verified during the desktop reviews and EOP committee reviews by reviewing the individual steps that specified unit differences. Sections 3.3 and 4.8.12 of the Writers' Guide address how unit differences are addressed in the EOP.

7. **NRC Comment:**

See Question 7 of Plant-Specific Technical Guidelines.

CP&L Response:

The task analysis methodology for determining plant-specific parameters, information and control needs, instrument and control characteristics necessary during emergency operation will be described in the Detailed Control Room Design Review Program Plan. This plan will be submitted to the NRC by December 31, 1984.

8. **NRC Comment:**

It is very important that there is a one-to-one correspondence between Control Room controls/instrumentation and the reference to controls/instrumentation in the procedures. In the main body of the PGP, page 8 of 15, and in the Validation/Verification Program write-up, page 9 of 13, it is stated that the objective of the Validation/Verification Program is to ensure just such a correspondence. However, it is not clear how this objective will be accomplished. Modify the PGP to describe the method to be used to ensure correspondence between Control Room instrumentation and controls and nomenclature used in the EOPs.

CP&L Response:

The method of ensuring a one-to-one correspondence between the EOP and instrumentation is provided in Section C of Appendix III. The method used was a step-by-step walk-through of each step in the EOP, both inside and outside the Control Room, to ensure the instrumentation required by the EOP is available.

TRAINING PROGRAM

1. NRC Comment:

For training purposes, it is important that all operators are trained on all aspects of the procedures (i.e., the flowcharts, the end path procedures, the containment control procedures, the system recovery procedures, the contingency procedures, and the local emergency procedures). Modify the PGP to include a statement to this effect.

CP&L Response:

Additional detail has been added to Section F of the Emergency Operating Procedures Generation Package. This section describes how each part of each procedure was reviewed in the classroom or on the simulator.

2. NRC Comment:

It is very likely that not all aspects of the procedures can be exercised on the simulator(s) used by the Brunswick staff. Modify the description of the training program to describe how training will be accomplished for those portions of the procedures.

CP&L Response:

The description of the training program was modified to clarify that training was received on all portions of the EOP.

3. NRC Comment:

When an emergency event occurs, it is important that each member of the operating crew knows his(her) roles and responsibilities. It is not clear from the description of the flowcharts and End Path Manual who in the Control Room is to do what. (Are the flowcharts used only by the ROs? Who uses the End Path Manual -- the SRO, the Shift Supervisor, or somebody else? Are parts of the End Path Manual to be removed for individual ROs to carry around and use?) Modify the PGP to describe the roles and responsibilities regarding use of the procedures.

CP&L Response:

The following statement is contained in the operating instruction section of the plant Operating Manual:

The Shift Operating Supervisor will be responsible for ensuring personnel on their respective shifts are aware of their duties and responsibilities during emergency operations.

The following is the recommended method for using the EOPs:

- a. The Shift Foreman on the affected unit should read from the EOPs. This allows him to remain apart from specific problems and gives him the overall picture of the unit status.

- b. The Control Operator on the affected unit should operate the RTGB until assistance is provided.
- c. The Senior Auxiliary Operator, Senior Control Operator, relief Control Operator, or the Shift Foreman on the unaffected unit should assist the affected unit Control Operator on RTGB.

NOTE: Shift Foreman on unaffected unit is last resort.

- d. The Shift Technical Advisor should continue with providing technical advice and ensuring no parameter changes are unnoticed.
- e. The Shift Operating Supervisor should ensure himself that the plant is responding as designed and make the required notifications per the plant's Emergency Response Plan and OI-22.

The Shift Operating Supervisor will be responsible for emergency plan implementation and site problems.

4. **NRC Comment:**

It is important that the operators receive training on a wide variety of scenarios, including multiple and sequential failures. Modify the program description to address the scenarios used for training and reasons for using those scenarios.

CP&L Response:

Simulator exercises were selected to meet the following objectives:

- a. Control manipulations required by the Harold Denton letter, dated March 28, 1980, Enclosure 4.
- b. Exercise all portions of the flowcharts.
- c. Exercise all procedures in the End Path Manual that the simulator is capable of simulating.
- d. Exercise flowchart branching; i.e., path-to-path arrow changes, key parameter changes, path-specific parameter changes.

The scenarios used for training are the same ones used for validation and verification. The objectives of simulator exercises for training has been included in Section F of the PGP.

ENCLOSURE 2

TO SERIAL: NLS-84-444