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 DENTON, H. R. Office of Nuclear Reactor Regulation, Director (post 851125)

SUBJECT: Forwards schedule of submittal of addl info requested as result of 860710-11 audit of util emergency operating procedures. Audit comments documented in NRC 860804 trip rept & discussed at 860814 meeting at plant.

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Carolina Power & Light Company

SERIAL: NLS-86-318

AUG 29 1986

Mr. Harold R. Denton, Director  
Office of Nuclear Reactor Regulation  
United States Nuclear Regulatory Commission  
Washington, DC 20555

SHEARON HARRIS NUCLEAR POWER PLANT  
UNIT NO. 1 - DOCKET NO. 50-400  
EMERGENCY OPERATING PROCEDURES

Dear Mr. Denton:

Carolina Power & Light Company hereby submits a schedule for submittal of additional information requested as a result of an audit of the Shearon Harris Nuclear Power Plant (SHNPP) Emergency Operating Procedures conducted on July 10 and 11, 1986. Audit comments were documented in the NRC's trip report dated August 4, 1986 and were discussed, along with the attached schedule, during a meeting held on August 14, 1986 at SHNPP.

If you have any questions on the attached schedule or require additional information, please contact me at (919) 836-6231.

Yours very truly,

A. B. Cutter - Vice President  
Nuclear Engineering & Licensing

ABC/JHE/crs (4062JDK)

Attachment

cc: Mr. B. C. Buckley (NRC)  
Mr. Brent Clayton (NRC-DPLA)  
Mr. G. F. Maxwell (NRC-SHNPP)  
Dr. J. Nelson Grace (NRC-RII)

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## GENERAL SCHEDULE

### NRC COMMENT:

- A. Certain plant-specific information which is called for in the Westinghouse ERG's has not yet been provided in the Harris EOPs. The applicant should perform a systematic review of training to assure that the information that is missing has been included in the training program. Evidence that current operators have all of the required skills and knowledge necessary to implement the EOPs should be documented for NRC review.
- B. Develop or provide evidence of a training program that systematically assures that information gaps in flowcharts and textual procedures are addressed specifically during future training; the program should include development of standards for the evaluation of task-level performance so that the applicant can identify whether all operators possess the appropriate enabling skills and knowledge to implement the EOPs.

### CP&L RESPONSE:

During discussion with NRC personnel on August 14, 1986, the scope of these items were clarified. It was shown by discussion and several examples that CP&L has taken a systematic approach to ensure that Emergency Operating Procedures (EOPs) are supplemented by formal training as necessary to compensate for lack of detail in EOP's. The auditor had noted some instances in which plant specific information provided in the EOPs was not detailed and wished to ensure that appropriate training had been conducted to enable the operator to use the EOP's effectively.

Prior to the August 14 meeting, CP&L had developed a matrix of EOP paragraphs versus plant specific information provided to determine where detail might be lacking and additional training might be appropriate.

CP&L will perform a review of EOPs and training program to ensure that where plant specific information is required in EOP's that the information provided is sufficiently detailed or has been covered adequately by training programs.

If required, additional training and/or EOP revision will be completed to ensure operator skill in using the EOPs. These items will be completed prior to fuel load. Those steps where no additional plant specific information is given will be listed and documentation on how operators were trained on those tasks will be provided by 10/1/86.



NRC COMMENT:

- A. Provide a textual version of the EOP flowcharts in an easily accessible format in the Control Room. The text should contain details provided in the WOG ERGs and include plant-specific information as called for in the WOG ERGs.
- B. Review the "End Path Procedures" (EPPs) and the "Function Restoration Procedures" (FRPs) to provide additional plant-specific information as called for in the WOG ERGs.
- C. Specific deficiencies in EOPs that were identified during the NRC on-site visit will be resolved.
- D. All EOPs will be reviewed and revised to be consistent with the current writer's guide.

CP&L RESPONSE:

Item IIA. Textual versions of EOP flowcharts are currently provided. They will be revised to provide additional detail by 12/12/86.

Item IIB. This item is covered by action in response to items IA and B above. Where plant specific information provided is incomplete and would add clarity to the EOPs, additional information will be added by 12/12/86.

Also as discussed in a telephone conversation with the NRC review team on 8/21/86, CP&L will develop and maintain a procedural cross reference of steps containing plant specific information. The cross reference will list the generic WOG step and the corresponding SHNPP step. Comments on any difference will be made as appropriate. This document will be made available to procedure writers, training personnel, and plant operators. The cross reference will be completed by 10/1/86.

CP&L RESPONSE:

Item IIC. The writers guide and/or EOPs will be modified as required for consistency. The writer's guide specific & IID. deficiencies will be corrected by 10/31/86. Flowpath deficiencies will be corrected by 12/12/86. The EPPs and FRPs will be reviewed by a contract Human Factors expert. Those items that she/he determines to be significant will be corrected by 12/12/86. Other discrepancies will be addressed as delineated in the response to the detailed comments. The following are examples of significant items:

1. Logic structure that could be confusing to the user, such as statements with more than one object. Example: IF....IF NOT....OR....
2. Steps that could lead to an incorrect or confusing transition.
3. Contingent transitions occurring from the left hand column.
4. Action verbs used whose meaning is not defined or unclear.
5. Confusing step structure (multiple actions in the same substep or the substep contained on more than one page).
6. Confusing commands (all commands should be in the imperative).
7. Non routine actions with no expected responses.

NRC COMMENT:

- A. Submit revised PGP including:
  - 1. Revised writer's guide resolving NRC identified deficiencies.
  - 2. Revised description of V&V program.
  - 3. Revised description of training program on EOPs.
- B. Revise EOPs consistent with revised writer's guide.
- C. Validate the revised EOPs.
- D. Train operators on revised EOPs and implement in Control Room.
- E. Provide technical basis for the plant-specific information that will be added to the procedures as a result of actions II.A. and II.B. above.

CP&L RESPONSE:

- Item IIIA. We will submit a revised PGP by 4/15/87.
- Item IIIB. EOPs will be revised consistent with revised writer's guide by 12/87.
- Item IIIC. Revised EOPs will be validated by 12/87.
- Item IIID. Operators will be trained on revised EOPs and EOPs implemented in the Control Room by 2/88.
- Item IIIE. This will be accomplished in our Step Deviation Document. It will be revised by 2/88.

## GENERAL COMMENTS

### NRC COMMENT:

#### 1. Referencing and Branching

The SHNPP EOP network utilizes a common entry point for all procedures, with transitions to all other EOPs taking place out of the Path 1 Procedure. The system includes numerous transitions within and between all procedures. Therefore, it is particularly important that the definitions and instructions provided in the writer's guide on referencing and branching be clear and consistent. At present the guidance provided is not sufficient to ensure efficient movement in and between procedures by the operators. In addition, the EOPs reviewed do not reflect implementation of the instructions which have been provided in the writer's guide on referencing and branching.

The following aspects of referencing and branching should be addressed:

- a. . The writer's guide should be expanded to include clear definitions of referencing and branching and examples of the use and format of each.

### CP&L RESPONSE:

The writer's guide will be revised and the EOP's reviewed and revised by 12/87.

### NRC COMMENT:

- b. In order to sufficiently emphasize GO TO statements, we recommend that the words be capitalized.

### CP&L RESPONSE:

The writer's guide will be revised to require GO TO statements to be capitalized and the End Path Procedures (EPPs) and Function Restoration Procedure (FRPs) will be revised to capitalize all GO TO statements by 12/87.

### NRC COMMENT:

- c. If it is necessary to branch to a step in another procedure, the procedure number, procedure title, and the entire step number should be included in the reference, e.g., GO TO EPP-20, "LOCA OUTSIDE CONTAINMENT," Step 17.b.

CP&L RESPONSE:

This item was completed 8/14/86.

NRC COMMENT:

- d. Because transitions to other procedures or sections of procedures can be disruptive and confusing, some method for easily identifying sections or subsections, such as tabbing, should be specified.

CP&L RESPONSE:

In the EOP network the operator is branched to the beginning of other procedures in all cases except two. All individual procedures are tabbed. Our Human Factors consultant has evaluated this item and feels it could be disruptive since the users are familiar with the sequential order of the tabs now in use.

NRC COMMENT:

- e. The writer's guide states that "as a general rule," all contingent transitions will occur from the right hand column. The writer's guide should specifically discuss the expected situations in which contingent transitions may occur from the left hand column.

CP&L RESPONSE:

The writer's guide will be revised to state that contingent transitions are to occur from the right hand column. Our review found only two instances of contingent transitions from the left hand column. These will be corrected by 12/12/86.

NRC COMMENT:

- f. A review of several of the SHNPP EOPs indicates that the guidance provided in the writer's guide on referencing and branching has not been consistently applied. In addition to the use of the words "Go To," the EOPs use "Reference," "Refer to," "Return to," and ". . . using . . . ." The EOPs should be revised to correspond with the direction provided in the writer's guide.

CP&L RESPONSE:

The writer's guide will be revised to more clearly define when to use "Refer to," "Return to," and ". . . . using . . . .". The EOP's will be reviewed for consistency of usage by 12/87.

NRC COMMENT:

2. Notes and Cautions

Cautions are statements used in the EOPs to provide critical information about potentially hazardous conditions and their consequences. Notes provide important supplemental information intended to aid personnel in performing an action step. Both are extremely important in the clear presentation of instructions and information to operators in the EOPs. The SHNPP provides accurate definitions of cautions and notes in the writer's guide and notes, however, the following points will need to be addressed to ensure that notes and cautions will be clearly and consistently utilized in the SHNPP EOP network:

- a. While the writer's guide indicates that actions statements are not to be included in notes and cautions, a review of several EOPs evidences a number of both cautions and notes in which instructions are provided. All notes and cautions should be evaluated for content and structure and changes made as necessary.

CP&L RESPONSE:

SHNPP's notes and cautions are consistent with the Westinghouse Owners Group (WOG) Emergency Response Guidelines (ERGs). Our operators have been trained on the basis for the notes and cautions and are familiar with the current structure. All notes and cautions will be reviewed and revised as necessary by 12/87.

NRC COMMENT:

- b. A number of caution statements were found which did not address a hazardous condition and/or did not indicate consequences. These should be revised.

CP&L RESPONSE:

SHNPP's notes and cautions are consistent with the Westinghouse Owners Group (WOG) Emergency Response Guidelines (ERGs). Our operators have been trained on the basis for the notes and cautions and are familiar with the current structure. All notes and cautions will be reviewed and revised as necessary by 12/87.

NRC COMMENT:

- c. While the information provided in notes is not of the critical nature of cautions, it is extremely important to execution of the procedures. Thus, emphasis is required to prevent the operator from overlooking the supplemental information. We recommend that notes be surrounded by lines, to differentiate from cautions while drawing attention to their content.

CP&L RESPONSE:

The writer's guide will be revised to require that notes be surrounded by lines and the EPPs/FRPs will be revised to include lines by 12/12/86.

NRC COMMENT:

- d. The information/caution symbol utilized in the flowcharts does not allow for differentiation between notes and cautions. Because caution statements provide information used to prevent actions by Control Room Operator, which could injure personnel, damage equipment, or endanger public health and safety, it is important they be distinguished from note (information) statements, which provide less critical information. The writer's guide should be revised so that the symbols for information statements and caution statements are different, and so that caution statements are sufficiently emphasized on flowcharts.

CP&L RESPONSE:

The writers guide will be revised to define a different symbol for notes on the flowpaths and the PATHS will be revised by 12/12/86.

NRC COMMENT:

- e. The writer's guide should state that caution and information statements will be placed on the flowpath directly before the step to which they apply.

CP&L RESPONSE:

This item was completed on 8/14/86.

NRC COMMENT:

3. Accessibility/Availability

- a. Because they will be used in stressful situations and under time constraints, EOPs must be accessible to operators and easily identifiable. The current system of EOP storage and designation should be revised to include prescribed storage location and some sort of clear visual difference, such as colored binders, to differentiate EOPs from other procedures.

CP&L RESPONSE:

The EOPs' will be placed in colored binders and stored in an easily accessible location. The appropriate plant procedure will be revised to specify the explicit requirements. This will be completed by 12/12/86.

NRC COMMENT:

- b. It is important that operators know where to find all equipment and controls referenced in the EOPs. Section 5.7.18 (1) states that identification of equipment, controls and displays "may not always match engraved names on panels, but will be complete." Section 5.7.10 correctly instructs procedure writers to "use a consistent system of identification which corresponds with component identification posted on equipment and control panels." The writer's guide should be revised to be consistent with Section 5.7.10 and to indicate clear guidelines for including information on the location of equipment and controls.

CP&L RESPONSE:

Procedural identification of equipment and controls does match the engraved labels. The writer's guide was revised to explicitly require this on 8/14/86.

NRC COMMENT:

4. Legibility

The use of flowchart format for the Path Procedure EOPs raises serious legibility issues for SHNPP. Despite the restriction of detail included on the flowcharts, the amount of information is still great and by its bulk restricts the size of symbols and type appearing on the flowcharts. However, in order for the flowcharts to be useful to operators in times of emergency, it is critical that they be formatted in a legible and clear manner. In this regard, the following issues should be addressed in the writer's guide:

- a. The type size and symbol size to be used on the flow charts should be defined in the writer's guide. Consideration should be given to the way the boards will be mounted or used and the environmental conditions, e.g., D.C. lighting.

CP&L RESPONSE:

The type size and symbol size used on the flowpaths was defined in the writer's guide on 8/14/86. Consideration has been given to the way the boards are mounted and used and the environmental conditions. Our Human Factors consultant will be involved in the revision process on the flowpath and will assist us in optimizing the flowpath legibility and usability.

NRC COMMENT:

- b. The current use of all capital letters on the flowcharts restricts legibility. A mix of capital and lowercase letters provide a contrast that is much easier to read. The writer's guide should be revised to indicate that a mix of capital and lowercase letters will be used on the flowcharts.

CP&L RESPONSE:

During the development process for the flowpaths, we experimented with the use of capital and lowercase letters. The users preferred the format with all capital letters. Our present format has shown no degradation of performance under stressful conditions.

NRC COMMENT:

- c. The current single spacing of type on the flowcharts, combined with the bulk of information, restricts the readability of the procedures. Some way in which space can be provided between the lines should be defined in the writer's guide and EOPs prepared in accordance with the instructions.

CP&L RESPONSE:

CP&L will experiment with different methods of increasing readability of the flowpaths. The current intent is to provide more space between the lines. A Human Factors consultant will be involved in the revision process on the flowpath and will assist us in optimizing the flowpath legibility and usability. In this response and several that follow, we are stating our intent. There is the possibility that we may not be able to meet our intent. When trying to implement the recommended changes, some benefits may have to be sacrificed. Our Human Factors expert will be involved in our ongoing EOP revision process. If she/he agrees that the sacrificed benefits outweigh the benefits gained by implementing a change, only then will we not implement the change and fail to meet our intent. This item will be completed by 12/12/86.

## SPECIFIC COMMENTS

### NRC COMMENT:

#### 1. Flowcharts

Utilization of flowcharts in the SHNPP EOP network is in conflict with a number of human factors guidelines. In order to try to offset the problems raised by such use, the following aspects of flowchart design and production must be addressed:

- a. When several flowpath lines run parallel to each other, operators may have difficulty following the correct line. SHNPP personnel have indicated that flowpaths leading to the same destination will be grouped together, with greater spacing between paths leading to different destinations. This intent must be explicitly indicated in the writer's guide.

### CP&L RESPONSE:

We will revise the writer's guide to address this concern and the PATHS will be revised by 12/12/86.

### NRC COMMENT:

- b. The writer's guide should be expanded to include guidance for the use and formatting of foldouts with Path Procedures.

### CP&L RESPONSE:

Out intent is to put the foldouts in the lower right hand corner of the flowpaths. The writers guide and the flowpaths will be revised by 12/12/86.

### NRC COMMENT:

- c. Movement in flowcharts should correspond to natural reading movement of left-to-right and top-to-bottom. The writer's guide should include instructions to this effect and should also include directions to minimize upward and/or right-to-left movement. To aid the operator in situations where such unnatural movement is necessary, we recommend that some type of directional indicator be used on lines on the flowcharts.

### CP&L RESPONSE:

The writer's guide will be revised as recommended and directional arrows will be added to the flowpaths by 12/12/86.

NRC COMMENT:

- d. The entry point into a flowchart should be clearly identified so that the operators enter the flowpath at the correct point. The writer's guide should be revised to include clear directions on the use of arrows as entry point indicators. In addition, it should be stated that every effort will be made to locate entry arrows in positions which correspond to natural reading movement, e.g., move the entry point of Path 1 to the upper left hand corner of the page.

CP&L RESPONSE:

The writer's guide will be revised to define an entry point indicator and its location. Our intent is to move the entry point to the upper left corner of the PATH. The flowpaths and the writers guide will be revised by 12/12/86.

NRC COMMENT:

- e. Formatting instructions for the use of arrows as entry point indicators need to be provided in the writer's guide. Guidance on the size, color, the use of alpha characters on arrows, and the inclusion of procedure titles on the arrows should be provided. In addition, examples shown should be made consistent with the directions included in the text of the writer's guide.

CP&L RESPONSE:

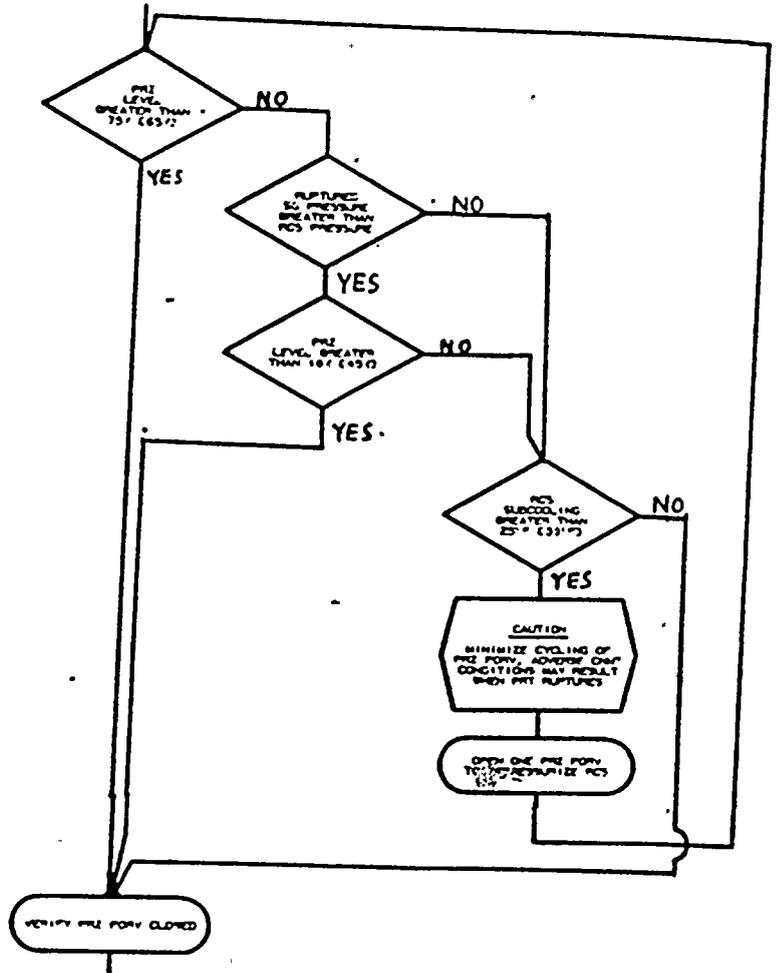
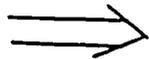
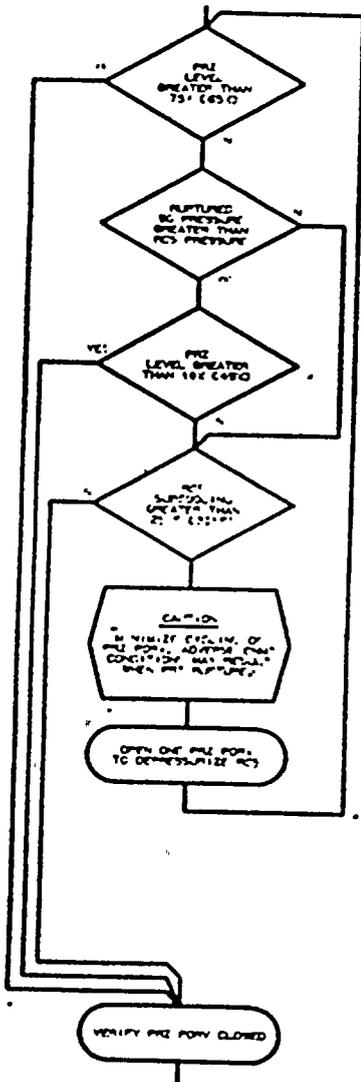
The writer's guide will be revised to address the listed concerns by 10/31/86. We do not intend to include procedure titles on the arrows due to space limitations. We recognize the need to provide a backup mechanism to prevent incorrect transitions, and feel an adequate process is already in place. Procedures transitioned to from the flowpath (or other EPPs) deal with specific events or contingencies. By the time the operator gets to a transition in the network, he has been led through a diagnostic process that identifies the event or contingency and he is aware of the event. The first section of each EPP is its purpose, which describes the event or contingency, the procedure is designed to combat. If the operator went to an incorrect EPP, he would read the purpose of the EPP and recognize that this EPP is not designed to combat the event in progress, and recheck his transition.

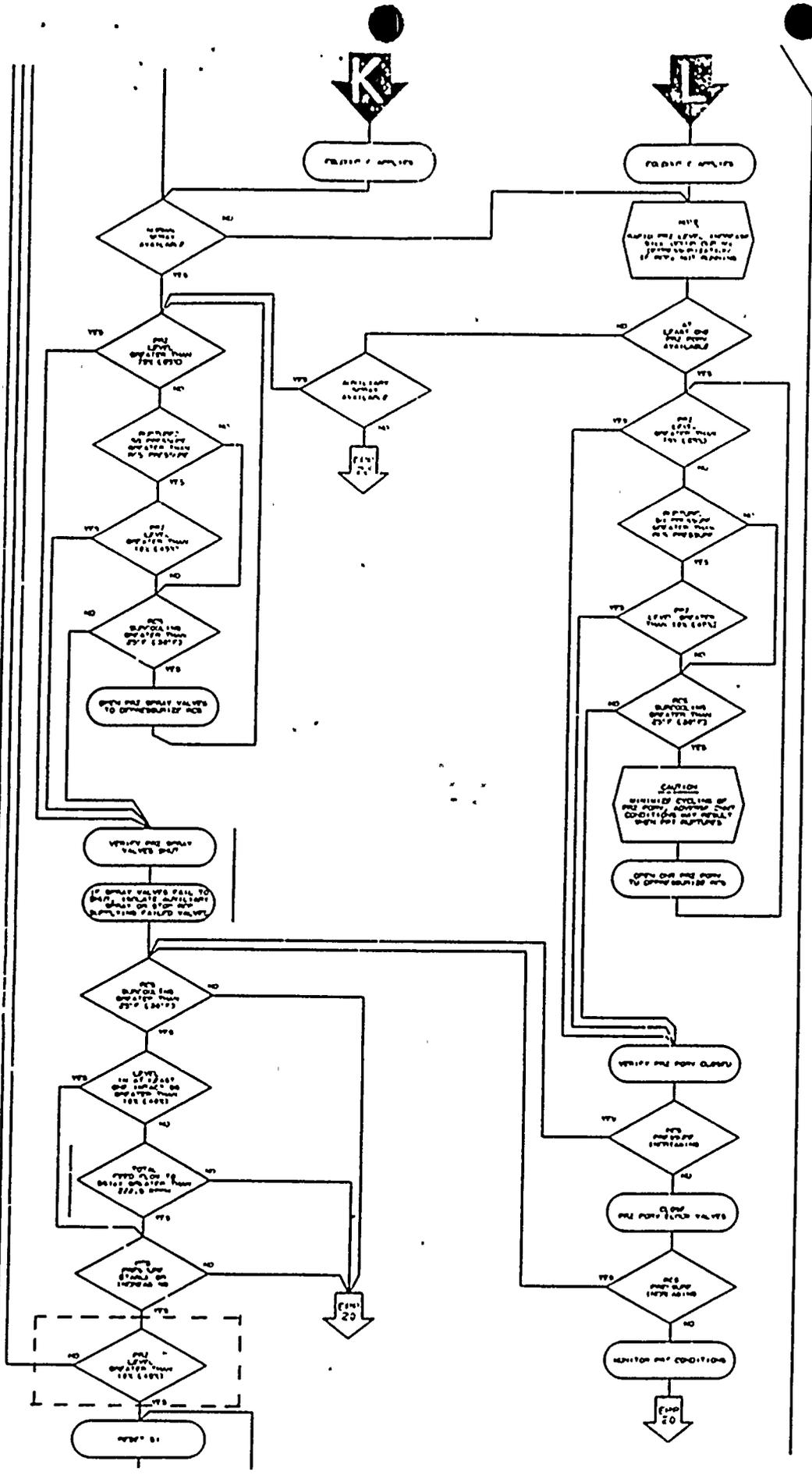
NRC COMMENT:

- f. Decision symbols used on flowcharts should be consistent in size, color, and design. The writer's guide should be expanded to include explicit instructions on the location of the "yes" and "no" indicators on decision symbols including a commitment to use the same format in every possible situation (e.g., if the response is "yes," movement is down, if the response is "no," movement is to the right).



These blocks if re-arranged would still result in crossed lines and inefficient use of space.





If the NO were to exit out the right of the indicated box it would have to cross other lines, or the board would have to be restructured, greatly increasing its size.

NRC COMMENT:

- g. Flowcharts cannot present as much detail as can be efficiently presented in written procedures. The writer's guide should specifically address the level of detail to be included or excluded in the Path Procedures. This level of detail should be adequate for a newly trained operator to use the Path Procedures, but not so great that the flowcharts are cluttered and unusable.

CP&L RESPONSE:

This item was completed on 8/14/86.

NRC COMMENT:

- h. The writer's guide should be revised to specify the size of the boards on which the Path Procedures will be printed.

CP&L RESPONSE:

This item was completed on 8/14/86.

NRC COMMENT:

2. Two-Column Format

The two column format defined in the SHNPP writer's guide defines the left column as an instruction column including expected responses, and defines the right column as the "response not obtained" column presenting contingency actions which are to be taken if the expected result is not achieved in the left hand column. This structure is equivalent to the logic sequence, IF (left column expected response), THEN (proceed down left column instructions). IF NOT (left column expected response), THEN (right column).

A review of a sample of SHNPP EOPs evidenced a number of errors in the use of the two column format:

- a. In many cases, an expected response was stated as "CHECK FOR FLOW." The expected response should be shown as "FLOW" or "FLOWING" or a quantitative description of the state expected. The term "CHECK" is an instruction and should be used as such.

CP&L RESPONSE:

The writer's guide will be revised to address this and the EOP's will be reviewed and revised by 12/87.

NRC COMMENT:

- b. The instruction "CHECK IF" was found in several of the EOPs. The use of "IF" is unnecessary here, as it is built into the two column format.

CP&L RESPONSE:

The writer's guide will be revised to address this and the EOPs' will be reviewed and revised by 12/87.

NRC COMMENT:

- c. A number of examples were found in the EOPs where the expected response to an action had not been included in the left column. The EOPs should be reviewed and these statements completed.

CP&L RESPONSE:

The current writer's guide states that "Expected results of routine tasks need not be stated." EOP's will be reviewed and revised by 12/87.

3. Writing Instruction Steps

NRC COMMENT:

- a. Table 1.0 of the writer's guide is a list of acceptable verbs for use in the EOPs. It is critical to the operators' understanding of the procedures that a limited number of clearly defined action verbs be used in the EOPs. The EOPs reviewed utilized a great number of verbs not found in Table 1.0, including "try," "perform," "do," "break," "continue," and "rack out." The EOPs and the writer's guide should be revised so that only approved verbs are used in the procedures.

CP&L RESPONSE:

Writer's guide will be revised and the EOPs will be reviewed for consistency and revised as necessary by 12/87.

NRC COMMENT:

- b. In some cases, operators were instructed to perform an action "as necessary" or "as required." Guidance needs to be provided defining clearly when actions are necessary or required.

CP&L RESPONSE:

Writer's guide will be revised and the EOPs will be reviewed for consistency and revised as necessary by 12/87.



NRC COMMENT:

- c. Care must be taken to provide complete instructions while not confusing the operator with an excess of detail. Directions such as "Use faulted or ruptured SG" should be expanded to indicate for what purpose it should be used.

CP&L RESPONSE:

This occurs in only one instance and will be corrected by 12/12/86.

NRC COMMENT:

- d. In order to clearly communicate to the operator what action is required and to minimize confusion, instruction steps should be limited to one required action. The writer's guide should be revised to this effect.

CP&L RESPONSE:

The writer's guide will be expanded in this area. High level instruction steps are limited to one idea; lower level instruction steps are limited to one action. EOP's will be checked for consistency and revised by 12/87.

NRC COMMENT:

- e. The writer's guide should specifically address the definition of and formatting for the following types of action steps: (1) steps that verify whether the objective of a task or a sequence of actions has been achieved; (2) steps of a continuous or periodic nature; (3) steps for which a number of alternative actions are equally acceptable; and (4) steps performed concurrently with other steps.

CP&L RESPONSE:

The writers guide will be revised by 10/31/86 to address this concern.

NRC COMMENT:

- f. Because of the confusion that can result when logic terms are used in EOPs, examples of the correct use of AND, IF NOT, IF . . . . THEN, and IF . . . . WHEN should be provided in the writer's guide.

CP&L RESPONSE:

The writer's guide will be revised by 10/31/86.

## WRITER'S GUIDE DEFICIENCIES

### NRC COMMENT:

1. The SHNPP writer's guide lacks formatting instructions for the placement of procedure designation, revision number and page number on each page of the EOPs. Figure 4 of the writer's guide shows the page number located in the bottom right hand corner of the page and the procedure designation and revision number located in the bottom left hand corner of the page. The text of the writer's guide should be expanded to include placement instruction for those items and the examples given should be consistent with the written directions.

### CP&L RESPONSE:

This item was completed on 8/14/86.

### NRC COMMENT:

2. To minimize confusion, delays, and errors in the execution of EOP steps, the following concerns should be addressed in the writer's guide:
  - a. Action steps should be structured to minimize the physical interference between personnel moving around the Control Room while carrying out procedure steps.
  - b. Action steps should be organized and sequences so operators are not overloaded or underutilized, e.g., alternate actions of turbine operator and reactor operator.
  - c. Actions steps should be structured to avoid unintentional duplication of tasks.

### CP&L RESPONSE:

This item was completed on 8/14/86

### NRC COMMENT:

3. An example of each EOP network component (EPP, PPG, etc.) should be appended to the writer's guide. These should be consistent with the guidance of the writer's guide and could therefore, be used to illustrate many, if not all, of the guidelines.

### CP&L RESPONSE:

The same document (Plant Operating Manual) that contains the writer's guide also contains the EOP network. Any user of the writer's guide will have easy access to the EPPs and FRPs. There is no benefit to amending readily available procedures to the writer's guide. We will amend some example pages of each EOP network component by 10/31/86.

NRC COMMENT:

4. The writer's guide should provide a clear definition of each component of the EOP network that includes a description of what it is, when it is to be used, who uses it, its' purpose, and how it will be used in the Control Room.

CP&L RESPONSE:

Writer's guide will be revised by 10/31/86.

NRC COMMENT:

5. It is important that operators know where printed operator aids are located within the EOPs. The writer's guide should be expanded to include explicit directions for the location of printed operator aids in the EOPs.

CP&L RESPONSE:

Writer's guide will be revised by 10/31/86.

NRC COMMENT:

6. To ensure that the flow of information from procedures to operators is uninterrupted, the writer's guide should state that each action step, caution, and note will be wholly contained on a single page.

CP&L RESPONSE:

This item was completed on 8/14/86.

NRC COMMENT:

7. The writer's guide does not clearly indicate whether each Path Procedure must be contained on a single board. While a review of the actual procedures indicates that Path Procedures are to be limited to a single board, the writer's guide should be expanded to include guidance on this point.

CP&L RESPONSE:

This item was completed on 8/14/86.

NRC COMMENT:

8. The writer's guide does not differentiate between the inclusive and exclusive OR. Although OR will normally be used in the inclusive sense, if priorities cannot be established among equally acceptable alternatives, then it will become necessary to use the exclusive OR. The writer's guide should be expanded to include instructions for the use of both the inclusive and the exclusive OR.

CP&L RESPONSE:

Exclusive OR's are not used in our procedure. Writer's guide will be revised by 10/31/86.

NRC COMMENT:

9. The writer's guide should state that instructions should be written as directive i.e., in the imperative mode. Several examples should be provided such as "Start charging pumps" rather than "Charging pumps should be started."

CP&L RESPONSE:

This item was completed on 8/14/86.

NRC COMMENT:

10. In Figure 4, as well as in a number of the EOPs themselves, some operator actions are identified with bullets. There are no formatting instructions in the writer's guide for the use of bullets in this manner. The writer's guide should be expanded to include explicit direction for the use of bullets in the EOPs.

CP&L RESPONSE:

This item was completed on 8/14/86.

NRC COMMENT:

11. To ensure that EOPs will at all times be legible, the writer's guide should indicate that no part of the EOPs will be handwritten.

CP&L RESPONSE:

This item was completed on 8/14/86.

NRC COMMENT:

12. While the actual Critical Safety Function Status Trees evidence widespread use of color, the directions provided in the writer's guide for production of the CSFSTs do not address color usage. The writer's guide should be expanded to include directions for the preparation of CSFSTs that is complete and explicit.

CP&L RESPONSE:

The writer's guide will be revised to provide complete and explicit instruction by 10/31/86.

NRC COMMENT:

13. In order to assist the operator in verifying that he/she is using the correct procedure, entry conditions should be stated at the beginning of each EOP. While this may not be necessary for use of the flowchart EOPs at SHNPP, the entry conditions should be added to the beginning of every non-flowchart EOP and these directions added to the writer's guide.

CP&L RESPONSE:

The first section of all EPPs and FRPs is its purpose. We feel that the purpose section, as discussed in the response to Specific Comment 1e adequately address this concern.

NRC COMMENT:

14. The action verb "align" is capitalized in the example given in Table 1.0. The text of the writer's guide contains no instructions to capitalize action verbs. Table 1.0 should be corrected.

CP&L RESPONSE:

This item was completed on 8/14/86.

NRC COMMENT:

15. Table 1.0, the list of action verbs, includes the verb "initiate," but states that "begin is preferred." "Begin" should be included in Table 1.0, and "initiate" dropped from the table.

CP&L RESPONSE:

This item was completed on 8/14/86.

NRC COMMENT:

16. Section 5.7.8 of the writer's guide states, "when two actions are included in one step, use the connective AND rather than two sentences." The emphasis of conjunctions as logic terms could lead operators to mistake a list for a logical sequence. The writer's guide should specify that conjunctions should be formatted in a way that they cannot be confused with logic terms.

CP&L RESPONSE:

The writer's guide will be revised as recommended and the EPPs and FRPs will be made consistent with the new guidance by 12/87.

NRC COMMENT:

17. Section 5.9.5 (4) of the writer's guide states that addition and subtraction by the user should be avoided "if possible." The writer's guide should be revised to indicate that addition and subtraction should be avoided at all times.

CP&L RESPONSE:

In several instances in the EOPs, the operator must determine subcooling margin (saturation temperature minus plant temperature). In some instances (e.g., equipment failure), it is necessary for the operator to manually do this by subtracting the two temperatures. Section 5.7.6 of the writers guide also addresses mathematical calculations and says they should be avoided in the EOPs. Printed operator aids are provided in the EOPs so the operator won't have to perform calculations. The writers guide will be revised to provide more detail in these areas by 10/31/86

NRC COMMENT:

18. Sections 5.7.8 (4.d) and 5.7.17 of the writer's guide state that capitalization and underlining "may" be used for additional emphasis. The overuse of emphasis techniques will detract from their effectiveness. The writer's guide should discuss the situations in which each emphasis technique is to be used.

CP&L RESPONSE:

The writer's guide will be revised to provide additional guidance and the EPPs and FRPs will be reviewed and revised by 12/87.

NRC COMMENT:

19. Section 5.7.8 (5) of the writer's guide instructs procedure writers to list the objects of an action verb if there are more than two objects. The example given identifies the listed objects with alpha characters. Operator confusion could result when objects are identified in this way, i.e., in the same manner as substeps. The writer's guide should specify another means of identification (e.g., bullets) to eliminate this source of confusion.

CP&L RESPONSE:

This item was completed on 8/14/86.

## TRAINING PROGRAM

### NRC COMMENTS:

1. The extensive use of flowcharts in the EOPs as described in the writer's guide reduces the amount of information that procedures can provide to operators. The training program must compensate for this lack of written information, i.e., the operators knowledge of plant procedures must be greater. A training program description must be provided which specifically describes how the training program will maintain the high level of operator knowledge necessary for the use of flowchart EOPs. This program description should address training for EOPs distinct from training on other plant operating procedures.
2. The PGP should describe a program of retraining to be used in the event of revision of EOPs, including explicit designation of how the need for retraining is to be determined (e.g., assignment of an individual to monitor revisions and retraining).
3. Although the PGP states that a simulator will be used for operator training, the training program description should be expanded to address the following items:
  - a. Discuss the method to be used to train the operators in areas where the simulator is not like the Control Room or does not react like the plant, and in parts of the EOPs that cannot be run on the simulator.
  - b. Indicate the use of a wide variety of scenarios including multiple (simultaneous and sequential) failures, to fully exercise the EOPs on the simulator and thus expose the operators to a wide variety of EOP uses.
4. The PGP should include a commitment to train every operator on every EOP prior to EOP implementation in the Control Room.
5. The training program should indicate that operators will perform their assigned roles during training and that operators will be trained as teams.
6. The PGP should indicate that operators will be evaluated after training and that all operators will be evaluated.

### CP&L RESPONSE:

As discussed with the NRC in a meeting on August 14, 1986, the training program for licensed operators is in general agreement with the NRC's comments, however this is not documented in the PGP submitted to the NRC. Therefore, CP&L will review the training program in view of the NRC's comments and as necessary identify revisions. The results of this review will be provided to the NRC by 10/1/86. The PGP will be revised to include the more detail on the training program. As indicated in response to Item III. A, this submittal will be made by 4/15/87.

## VERIFICATION/VALIDATION PROGRAM

### NRC COMMENT:

1. The verification and validation program should include a system for insuring reverification and revalidation of EOPs after revision. This system should include specific means for determining when the reverification/revalidation should take place (e.g., identifying an individual responsible for making the determination) and should address retraining of operators in connection with the plant EOP training program.
2. The verification and validation program indicates that a combination of simulator exercises, table top reviews, and Control Room walkthroughs will be used in the verification and validation process. It should be expanded to indicate that the simulator validation will be exhaustive, utilizing scenarios that exercise every aspect of all of the EOPs. (CP&L Note: During a conference call on 8/21/86 between CP&L and NRC personnel, the words "every aspect" were deleted from the preceding sentence).
3. The verification and validation program should be expanded to include a description of the criteria to be used to select the scenarios to be run during the validation/verification process. These criteria should be based on what is needed to validate the procedures and should ensure that single, sequential, and concurrent failures are included. For parts of EOPs that cannot be validated on the simulator, the criteria for selecting any additional validation that may be needed should be specified.
4. The types of persons involved in the verification and validation process (i.e., Engineers, Procedure Writer, Operations Personnel and Human Factors Experts) and the roles and responsibilities of these individuals should be specified.
5. Section 3 of the verification and validation program discusses the comparison of EOPs with Control Room staffing. This section should be revised to specifically state that verification and validation will ensure that EOPs are compatible with the minimum Control Room staffing.
6. The verification and validation program description should describe the specific items (i.e., provide checklists) that are to be verified and validated. This should include appropriate items from both the plant specific technical guidelines and the writer's guide.
7. Particular attention should be paid to deviations from and additions to the generic technical guidelines that are of safety significance during the verification and validation program. The verification and validation program description should discuss how the deviation and additions are to be verified and validated.

NRC COMMENTS: (Cont'd)

8. The verification and validation program should include a description of the plan by which the adequacy of Control Room instrumentation and controls will be determined and a description of the plan by which the correspondence between EOPs and Control Room instrumentation will be determined should be included (this may be done in conjunction with the Control Room Design Review).

CP&L RESPONSE:

All comments relative to Verification and Validation (V&V) will be addressed by SHNPP in our revised V&V description. We will implement the recommendations contained in the above comments. This will be submitted to the NRC by 4/15/87.