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SNRC-1472

JUL 15 1988

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Request for Additional Information
Procedures Generation Package
Shoreham Nuclear Power Station - Unit 1
Docket No. 50-322

Reference: NRC letter from Walter Butler to John D. Leonard, Jr., dated April 15, 1988

Gentlemen:

The attachments to this letter constitute LILCO's response to the subject Request for Additional Information (RAI). Attachment 1 contains an item by item response that directly corresponds to each of your requests. Attachment 2 is the revised Procedures Generation Package (PGP). The PGP was revised to comply with Section 3 of the RAI and to be consistent with the responses contained in Attachment 1. Three appendices accompany Attachment 2. The first provides a copy of the SNPS Plant Specific Technical Guidelines which were derived from the BWROG Emergency Procedures Guidelines, Revision 4. The second consists of SNPS Station Procedure 21.009.02 entitled, "Technical Review of New or Revised Symptom Oriented Emergency Operating Procedures." The third appendix provides a copy of applicable Office of Training Procedures. Finally, Attachment 3 provides a sample of an Emergency Operating Procedure (SP 29.023.01, "RPV Control Emergency Procedure") and its associated verification documentation.

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Should you have any additional questions or require clarification, please do not hesitate to call my office.

Very truly yours,

John D. Leonard, Jr.
Vice President - Nuclear Operations

CJG:ck

Attachments

cc: W. T. Russell
S. Brown
F. Crescenzo

Responses to NRC's Request for Additional Information

SNPS Procedure Generation Package

A. Plant Specific Technical Guidelines

1. NRC Request

The license should describe how operator information and control needs will be derived and used to specify instrumentation and control requirements. The P-STG should be based on the identification of plant systems and functions and, be supported by an analysis of operator tasks to identify operator information and control requirements. This description may be in the PGP, or in the Detailed Control Room Design (DCRDR) Program Plan. If the licensee addressed this item as part of the DCRDR, the licensee should state this (cross-reference) in the P-STG portion of the PGP.

LILCO Response

The analysis of operator tasks, and the determination of information and control needs is described in the SNPS Detailed Control Room Design Review (DCRDR) Implementation Plan under Section 3.5.5, Methodology for Task Analysis. This plan has been submitted to the NRC under SNRC-1297, December 8, 1986.

2. NRC Request

The licensee should submit all deviations from the Owners Group's Generic Technical Guidelines that are potentially safety significant (e.g., related to systems, functions, or methods), with justification for each deviation. Examples of deviations may be found in SRP Section 13.5.2.

LILCO Response

As required by NUREG 0737, Supplement No. 1, LILCO included "a description of the planned method for developing plant specific EOPs from the generic guidelines" in the PGP. In order to satisfy this additional request for all deviations from the generic technical guidelines, LILCO has included with this submittal, a copy of the latest revision of the SNPS PSTG. The format of the PSTG includes a justification for any differences between the Emergency Procedure Guideline and the SNPS PSTG.

B. Writers Guide

1. NRC Request

Notes and cautions provide operators with important supplemental information concerning specific steps or sequences of steps in the EOPs. The information on cautions and notes in Figure 1-3 and in Section 1.4.10 should be expanded and revised with regard to the following:

a. Figure 1-3 implies that the same symbol is used for both a caution and a note. Because caution statements provide information used to prevent actions by control room operators that could injure personnel or endanger public health or safety, it is important that they be distin- guished from notes, which provide less critical infor- mation. Further, in Section 1.4.10 the symbol is used only for a caution and no symbol is designated for a note. This format discrepancy should be clarified; and some emphasis technique, such as a different symbol, should be used to distinguish cautions from notes to alert control room personnel to their more critical nature.

LILCO Response

The Writer's Guide has been significantly revised. Figure 1-3 now exists as Figure 6-3. The caution and note symbols now differ with the caution symbol being a yellow outlined hexagon and the note symbol being a circle. Section 1.4.10, now exists as Sections 6.12 and 6.13 of the revised Writer's Guide, and distinguishes the differences between cautions and notes.

1b. NRC Request

Section 1.4.10b describes the format and placement of the caution symbol but not for the note. This section should be expanded to include the format and the placement of a note symbol.

LILCO Response

Section 1.4.10b now exists as Sections 6.12, "Cautions" and 6.13, "Notes". Section 6.13 includes the format and placement of a note symbol.

1c. NRC Request

The Writer's Guide does not describe the format of the cautions and notes to be placed at the bottom of the flowchart or the numbering scheme to be used for each note and each caution. The Writer's Guide should be revised to specify the format for cautions and notes at the bottom of the flowcharts, how cautions and notes are to be numbered, and the emphasis techniques to be used.

LILCO Response

Writer's Guide Sections 6.12 and 6.13 explain the numbering schemes of cautions and notes, plus describe format for cautions and notes at the bottom of the flowcharts. Additionally, examples have been provided in each section.

1d. NRC Request

Section 1.4.10 states that it is acceptable to express conditional actions in a note or caution. Notes are intended to provide supplemental information and cautions are intended to attract attention to essential or critical information in procedures; neither is intended to include any instructions, directions, or operator actions. The Writer's Guide should be revised to indicate that actions of any kind are not acceptable in notes and cautions.

LILCO Response

Sections 6.12 and 6.13 state that actions are not acceptable in cautions or notes.

2. NRC Request

Conditional and logic statements should be used in EOPs to describe a set of conditions or a sequence of actions. Because of their importance and complexity, it is important to provide explicit guidance for their use. The guidance provided in Sections 1.5.5 and 1.5.6 should be revised with regard to the following:

a. The terms WHILE and BEFORE are not considered logic terms and are not in NUREG-0899. Statements can be worded to avoid the use of WHILE and BEFORE as pseudo-logic terms. The Writer's Guide should be revised to eliminate their use as logic terms.

LILCO Response

Writer's Guide Section 1.5.5, now Section 4.5 addresses logic terms. The term WHILE by itself is not to be used as a logic or psuedo-logic term and writers are instructed not to use WHILE by itself in Section 4.5d. WHILE is used in the adjunctive sense along with the logic term IF to qualify retainment override steps which specifically address sequence of action type steps that are required by the BWROG EPGs. Explicit guidance for the use of the IF WHILE term is addressed in Section 4.5d.

Section 1.5.6 now exists as Section 4.6 which contains the term BEFORE. The term BEFORE is used to define conditional statements specific to the BWROG EPGs which is interpreted by LILCO as a specific set of conditions relating to sequence and plant parameters requiring conservative action. BEFORE is defined in Appendix B of

Revision 4 EPGs as "Any time prior to. Utilized where an event-independent margin is not appropriate or cannot be defined." Explicit guidance for the use of BEFORE is addressed in Section 4.6d.

2b. NRC Request

Section 1.5.5c describes the use of the logic term OR. The logic term OR can be used in an inclusive sense and in an exclusive sense. This section should be revised to provide instructions for formatting logic statements that include OR used in either sense, and when to use or not to use either.

LILCO Response

Section 1.5.5c now exists as Section 4.5c which provides instructions for formatting logic statements that include OR used in the inclusive and exclusive sense, as well as directions when to use or not to use either.

2c. NRC Request

Section 1.5.11 states that logic terms are to be underlined for emphasis. It also allows other words to be underlined for emphasis. Logic terms should be uniquely emphasized so that they stand out in the text and are easy for operators to recognize. The Writer's Guide should be revised to exclude any other words to be underlined for emphasis.

LILCO Response

Section 1.5.11 now exists as Section 4.11 and still allows for both: 1) logic terms; and, 2) other types of information to be underlined, when appropriate for special emphasis. Besides being underlined, logic terms are further emphasized so that they stand out in the text of both prose and flowchart procedures.

In prose procedures, logic terms are further emphasized by being: 1) in boldface type, 2) in all capitals, and 3) placed either to the left margin or in the center of the page. Since flowchart type is in all capitals, logic terms are further emphasized by being placed either to the extreme left margin or in the center of the step symbol. Flowchart type is not boldfaced because the type size would conflict with readability guidelines addressed in Section 6.19. These additional emphasis techniques are unique to logic terms and were easy for operations to recognize during EOP Validation.

3. NRC Request

Section 1.5.7c discusses referencing and branching. It should state that the procedure title, and where applicable the entire step number, be included in a reference or branch; e.g., GO TO SP 29.023.05 "TITLE", STEP WP-3.

LILCO Response

Section 1.5.7c, now as Section 4.7c, discusses referencing and branching, which states details on procedure titles and procedure step numbers.

4. NRC Request

Instructions should be written for the various types of action steps that an operator may take to cope with different plant situations.

a. The Writer's Guide should define the following types of action steps: (1) steps that verify an action; and (2) steps which are performed continuously or periodically.

LILCO Response

Section 4.4 of the Writer's Guide, "Types of Steps", provides guidance for the various types of action steps. Section 4.4b defines steps that verify an action, and Sections 4.4c and 4.4d respectively define steps that are performed continuously or periodically.

4b. NRC Request

The Writer's Guide should define, describe the format of and provide examples of (1) steps for which a number of alternative actions are equally acceptable; (2) steps which diagnose a situation; and (3) steps which are time-dependent.

LILCO Response

Section 4.4 of the Writer's Guide defines, describes the format of, and provides examples for each of the following step types:

1) Steps for which a number of alternative actions are equally acceptable (Section 4.4e)

2) Steps which diagnose a situation (Section 4.4c Decison)

3) Steps which are time-dependent (Section 4.4b)

5. NRC Request

Procedure writers should be given sufficient information to produce procedures that are correctly and consistently formatted. In order to ensure consistency throughout EOPs, instructions and examples in the Writer's Guide should be revised as follows:

a. The Writer's Guide does state the size of the type for wording on the flowcharts, but not the size of the symbols used, line

width, and arrow size. The Writer's Guide should specify the size of symbols, line width, arrow size and any other aspect of the flowchart that would affect readability.

LILCO Response

"Readability Guidelines", Section 6.19, specifies the aspects of flowchart readability. Symbol size is addressed in Section 6.19b, and line widths and arrow sizes are located in 6.19c.

5b. NRC Request

Because of the complexity of flowcharts, it is recommended that an example of a properly formatted flowchart be included in the Writer's Guide.

LILCO Response

An example of a properly formatted flowchart is included in the Writer's Guide as Appendix B, "Sample Flowchart Procedure."

6. NRC Request

Section 1.5.10 provides guidance with respect to the verbs to use in the action steps. The number of verbs listed however is limited and there may be other acceptable verbs the writers will want to use. The Writer's Guide should provide an inclusive list of acceptable and defined verbs available for use by the writers.

LILCO Response

The Writer's Guide provides an inclusive list of acceptable and defined verbs in Appendix D, Recommended Action Verb List. Section 1.5.10, now Section 4.10, provides guidance to verb use.

7. NRC Request

Because operators will use EOPs in stressful conditions and under time constraints, the procedures must be easily accessible to operators and should be accurate and current at all times. The guidance provided in the PGP should address the following:

a. The location of the flowcharts in the control room for easy and quick access by the operators.

LILCO Response

Section 6.21 addresses the location and maintenance of flowcharts in the control room.

7b. NRC Request

The method by which the EOPs are easily distinguishable from other plant procedures.

LILCO Response

Section 7.13 addresses Text EOP designation. Text EOPs are bound in red plastic binders which separate them from other procedures bound in tan binders that are located in the control room procedure bookshelf.

8. NRC Request

To minimize confusion, delay, and errors in execution of EOP steps, the following concerns should be addressed in the Writer's Guide:

a. Action steps should be structured to be consistent with the roles and responsibilities of the operators.

LILCO Response

"Step Sequencing", Section 4.2 addresses action step structuring with respect to operators roles and responsibilities under Subsection e.

8b. NRC Request

Action steps should be structured to enable the control room supervisor to follow staff actions and monitor plant status.

LILCO Response

Step Sequencing, Section 4.2 addresses action step structuring with respect to the control room Watch Supervisor and/or Watch Engineer.

9. NRC Request

Section 1.4.2 of the Writer's Guide discusses the review and approval of the EOP flowcharts. This section should state who (by title) is authorized to review and approve the flowcharts. This information should also be indicated on the flowchart signature block.

LILCO Response

EOP Flow Charts are approved as an attachment to the corresponding Text EOP. The Text EOP signature heading is displayed on Figure 7-1. The Flow Chart signature heading for all future Flow Charts will include the title of the Operating Engineer as the final approver of the Flow Chart.

10. NRC Request

Section 1.4.13 "Text Procedure Step Numbering Scheme" applies to text preparation and therefore should be moved from the flowchart section to the text preparation section of the Writer's Guide.

LILCO Response

"Text Procedure Step Numbering Schemes" has been removed from the flowchart section of the Writer's Guide and now exists in Section 7.2 entitled "Section/Step Numbering".

11. NRC Request

Section 1.7.5 discusses the emphasis and placement of cautions and the definition and placement of notes, and states that notes should not contain instructions. However, there are other aspects of notes and cautions which need to be addressed.

a. The Writer's Guide should provide a definition of cautions, state that they must be complete on a page and do not contain instructions.

LILCO Response

Section 1.7.5, now Section 7.5, addresses cautions, provides a definition, and states relative requirements.

11b. NRC Request

The Writer's Guide should describe how notes are emphasized (differently than cautions) and state that notes are complete on a page.

LILCO Response

Section 7.6 addresses all requirements relative to notes within the text procedures.

11c. NRC Request

Examples of notes and cautions which are consistent with the text should be provided.

LILCO Response

Examples of cautions and notes that are consistent with the text are provided in Sections 7.5 and 7.6 respectively.

11d. NRC Request

The Writer's Guide states that cautions are placed adjacent to the step they refer to and notes should be placed as close as possible. However, both notes and cautions should be placed directly above the step they refer to, so they can be read before the step is read.

LILCO Response

Both cautions and notes in the text procedures are identified by a box which is placed above the relative step on the text (right hand) page of the procedure. Each box contains the caution/note number that references the caution/note located on the backside of the proceeding page, or the left hand page. This format allows for the operators to read the procedure and reference the cautions and notes simultaneously, i.e. both are in front of the reader together. Caution and note placements are addressed in Sections 7.5 and 7.6 respectively.

12. NRC Request

Logic statements are used in EOPs to describe a set of conditions or sequence of actions. Because of their importance and complexity, it is important to provide explicit guidance for their use. Section 1.7.4 of the Writer's Guide addresses certain aspects of logic statements including the use of the words IF, WHEN, THEN, IF NOT, and AND; the use of a list format and the exclusion of AND and OR in the same action. Examples are also provided However, there are other aspects of logic statements which need to be addressed.

a. The Writer's Guide should discuss the use of AND and OR as logic terms versus conjunctions, and how logic terms are to be emphasized. See NUREG-0899, Section 5.6.10 and Appendix B for further guidance.

LILCO Response

Section 4.5 discusses the use of AND and OR as logic terms versus conjunctions. Section 1.7.4 is now Section 7.4 which discusses the uses of AND and OR for text procedures. Emphasis techniques for logic terms are also addressed in this section, as well as in Section 4.11.

12b. NRC Request

The examples provided in Figure 1-13 are not consistent with the text. For example, the GOOD statements do not contain the word THEN and the logic terms used are not emphasized as they are in the text. Examples of all types of logic statements, and those to avoid, should be provided in the Writer's Guide and they should be consistent with the guidance in the text.

LILCO Response

Figure 1-13 has been deleted from the Writer's Guide and replaced by specific examples for each type of logic statement. Each example is consistent with the text and is located in Section 7.4 after descriptions of the logic statement types.

13. NRC Request

The Writer's Guide should state that vague verbs such as rapidly or slowly should be avoided, and should provide an inclusive list of verbs to be used in the EOPs.

LILCO Response

Sections 4.3e and 4.10 of the Writer's Guide address the avoidance of vague verbs and an inclusive list of recommended action verbs is provided in Appendix D. The terms rapidly and slowly are only stated when specifically used in the Emergency Procedure Guideline. When used, these terms are in an adverbial context with the specific action verb (for example, rapidly depressurize, slowly increase). For those procedure steps where these terms are located, the operator is trained to know the quantitative ranges associated with each parameter within the step.

14. NRC Request

During the execution of EOPs it is often necessary to refer operators to other procedures or sections of procedures. Such referencing and branching can be disruptive and cause unnecessary delays. To minimize disruptions and delays the Writer's Guide needs to address referencing and branching.

a. The Writer's Guide should include a statement of commitment to minimize referencing and branching by providing criteria to be used when deciding if the steps should be included in the text or cross-referenced.

LILCO Response

Section 4.7b, "Referencing and Branching Guidelines", includes a committed statement to minimize referencing and branching and provides guideline. for determining step inclusion or cross-referencing.

14b. NRC Request

The content and format of the reference/branch statement including step number, procedure/section title and number, and a consistent conventions such as GO TO and REFER TO should be specified.

LILCO Response

Section 4.7c, "Referencing and Branching Format", specifies the content and format for reference/branch statements. This section addresses each of the following:

- Step Number
- Procedure section/title and number
- Consistent convention specification

LILCO does not use GO TO, but instead uses EXIT/ENTER for reference/branch conventions.

14c. NRC Request

Examples of referencing and branching formats that are consistent with the text should be provided.

LILCO Response

Examples of referencing and branching formats consistent with the text are provided in Section 4.7c.

14d. NRC Request

Some method such as tabbing for easily identifying sections or subsections in the EOP should be specified.

LILCO Response

Tabbing is only used by LILCO for identifying specific procedures. Each text procedure is tabbed for easy identification. Sections and subsections of procedures presently are distinguished by the numbering format within each procedure. In most cases, major sections or subsections of procedures that are performed concurrently with other sections/subsections within the same text procedure begin on new pages. Therefore adding tabs to procedural sections and subsections would cause confusion with already existing procedure identification tabs and is consequently not addressed in the Writer's Guide.

15. NRC Request

The proper use of emphasis techniques makes the procedures easier to understand. The Writer's Guide needs to be revised to describe how various types of emphasis techniques such as capitalization, boxes, etc., are to be used.

LILCO Response

Section 4.11 of the Writer's Guide, "Methods of Emphasis" describes the various types of emphasis techniques used.

16. NRC Request

The Writer's Guide needs to include guidance for writing the various types of action steps that an operator may take to cope with different plant situations. The Writer's Guide should address the definition and format of the following types of action steps and should provide examples consistent with the text: verification steps, equally acceptable steps, recurrent steps, time-dependent steps, concurrent steps, and diagnostic steps. See NUREG-0899, Section 5.7 for further information.

LILCO Response

Section 4.4 of the Writer's Guide provides guidance for writing the various types of action steps. Definitions, formats, and examples consistent with the text are provided for the following types of action steps:

- Verification Steps - Section 4.4b
- Equally Acceptable Steps (Alternative Step) - Section 4.4e
- Recurrent Steps - Section 4.4d
- Time-Dependent Steps - Section 4.4h
- Concurrent Steps - Section 4.4f
- Diagnostic (Decision) Steps - Section 4.4i

17. NRC Request

Information should be presented so that interruption in the flow of information in an EOP is minimized.

a. Action steps should be presented completely on one page.

LILCO Response

Section 7.3, Instruction Step Length and Content, part e, requires that action steps should be presented completely on one page.

17b. NRC Request

Procedures and sections of a procedure should begin on a new page.

LILCO Response

Section 7.1 "Procedure Organization" identifies those procedure sections and subsections that are required to begin on a new page.

17c. NRC Request

A simple method for accessing attachments or appendices should be provided. Examples consistent with the text should be included.

LILCO Response

Methodology for accessing attachments or appendices is provided in Section 7.11. No examples are provided since none currently exist that are consistent with text. This section was included for guidance to future EOP revisions should attachments and/or appendices become necessary.

18. NRC Request

It is important that a consistent method of section heading and step numbering be used throughout EOPs. The manner in which the text is organized and divided should be evident through the use of headings and a numbering system so that operators can keep track of where they are in the procedure and know how to move easily and quickly to other parts of the procedure. The Writer's Guide does provide a list of headings and state that a SNPS station procedure is used for section numbering, but it should also address the following:

a. The methods of pagination should be specified. The total number of pages should be included in the pagination.

LILCO Response

Methods of pagination are specified in Section 7.1g, "Page Identification", which includes requirements for the total number of pages.

18b. NRC Request

Step and section numbering, as applied to the dual column procedure format, should be specified. If an existing station procedure is referenced, a copy of the station procedure should be provided to the NRC.

LILCO Response

Step and Section numbering are addressed in Section 7.2 which references procedure SP 12.006.01 "Station Procedures - Preparation,

Review, Approval, Change Review and Cancellation". A copy of this procedure is provided as an attachment to this submittal.

18c. NRC Request

Examples of the above topics, including section numbering, should be provided consistent with the text.

LILCO Response

Examples of Step and Section Numbering can be found in Section 7.2, and a pagination example is provided in Figure 7-1.

19. NRC Request

An inclusive list of acronyms and abbreviations and their definitions should be provided in the Writer's Guide so that they are used consistently by both procedure preparers and operators.

LILCO Response

Appendix E of the Writer's Guide provides an inclusive list of acronyms and abbreviations with definitions. This list is derived from procedure SP 11.011.01 "Standard Abbreviations."

20. NRC Request

Figures and tables assist operators to make decisions and to locate information. Section 1.7.7 discusses the identification of figures and tables, but should also address their other aspects.

a. The criteria for deciding when to use a figure or table should be provided.

LILCO Response

Section 1.7.7, now Section 7.8, addresses the guidelines for determining when to use a figure or table and differentiates between what each type is used for.

20b. NRC Request

The location of figures and tables within the EOP should be specified.

LILCO Response

The location of figures and tables within the EOP are specified in Section 7.8d, "Figure and Table Location."

21. NRC Request

It is important that the operators know where to find all of the instrumentation and controls that are referenced in the EOPs. The Writer's Guide should discuss the criteria for determining when the location of instruments and controls should be specified in the EOP, the format for this location information, and should provide an example consistent with the text.

LILCO Response

Section 7.3 discusses various criteria applicable to specifying instrumentation and controls in the EOPs including location information. Additionally, an example consistent with the text is provided. In many steps within the EOPs, instrumentation and control location is not referenced because there can be more than one method used to accomplish the same task. Each method used to accomplish a task could involve different instruments or controls (I&C) measuring the same parameters. Providing a list of all related I&C would be cumbersome and confusing to the operators and specifying particular I&C would be limiting for these circumstances.

22. NRC Request

Consistent, well-organized and well-labeled EOPs increase the ease with which operators understand and use the procedures. Section 1.7.1 of the Writer's Guide discusses procedure organization and lists the major section headings and general content of each. However, the Writer's Guide should address the following:

a. A cover page should be used and the identifying information on this page should be identified.

LILCO Response

Section 7.1a, originally Section 1.7.1, addresses identifying information on cover pages and provides an example consistent with the procedure in Figure 7-1.

22b. NRC Request

b. The format of entry conditions should be specified. See NUREG-0899, Section 5.4 for further information.

LILCO Response

Section 7.1d of the Writer's Guide specifies the format of entry conditions. Section 2.0 of all symptom oriented text EOPs contains a list of conditions under which each EOP is entered.

23. NRC Request

So that operators are always certain that they are using the correct procedure, the procedure should include identifying information in a consistent place on each page. The Writer's Guide should require that every page contain a block of information consistently placed on each page. This information should include a brief title or unique number, and revision number and/or date.

LILCO Response

All symptom oriented EOPs shall have the procedure number, revision number and page number on each page. This is addressed with an example in Section 7.1g of the Writer's Guide.

24. NRC Request

The Writer's Guide should discuss the use of placekeeping aids (checkoffs) for all steps and substeps not just for steps with multiple objects as stated in paragraph 1.7.3e. Placekeeping aids can assist operators in keeping track of their positions within a procedure. These aids are of particular importance when performing steps or procedures concurrently, and in situations where the operator's attention is diverted.

LILCO Response

Section 1.7.3, now Section 7.3 discusses the use of checkoffs (placekeeping aids) for all steps and substeps of the EOPs. Location of checkoffs is addressed and an example is given.

25. NRC Request

The Writer's Guide should address the use of punctuation, capitalization, margins, line spacing, units of measure, numerals, tolerances, and how titles/nomenclature of instruments and controls are to be referred to. See NUREG-0899, Sections 5.5.7 and 5.6.3-5.6.8 for further information.

LILCO Response

Various sections of the revised Writer's Guide addresses the specific concerns and guidelines addressed in NUREG-0899. Each area of concern and the related Writer's Guide section are listed below:

- Punctuation, Section 5.4
- Capitalization, Section 5.5
- Margins, Section 7.10

- Line Spacing, Section 7.10
- Units of Measure, Section 5.7
- Numerals, Section 5.7
- Tolerances, Section 5.6
- Titles/Nomenclature, Section 4.9

26. NRC Request

The PGP should address the issues of accessibility of procedures, their unique identification, and quality of reproduction as the procedures must be easily accessible and readable to operators and should be uniquely identified to distinguish them from other plant procedures.

LILCO Response

Writer's Guide Section 7.13 addresses the issues of text procedure accessibility and identification. Section 7.12, Typing and Reproduction addresses reproduction quality so that procedures are easily readable to the operator. Section 6.21 addresses EOP Flowchart location, and Sections 6.19 and 6.20 address readability guidelines for flowcharts.

27. NRC Request

To minimize confusion, delay, and errors in the execution of EOP steps, the following issues should be addressed by the Writer's Guide:

a. Action steps should be structured so that they can be executed by the minimum control room staffing required by the Technical Specifications.

LILCO Response

Section 4.2, "Step Sequencing," provides guidelines to minimize confusion, delay, and errors in EOP step execution. Action step structure execution related to control room staffing is addressed in 4.2a.

27b NRC Request

Action steps should be structured to be consistent with the roles and responsibilities of operators.

LILCO Response

Section 4.2e describes action step structuring requirements for operator roles and responsibilities.

27c. NRC Request

Action steps should be structured to minimize the physical interference of personnel in the control room (where technical guidelines permit).

LILCO Response

Sections 4.2b and c provide guidelines for action step structuring to minimize control room personnel physical interference.

27d. NRC Request

Action steps should be structured to avoid unintentional duplication of tasks.

LILCO Response

Guidance for action step structuring to avoid unintentional task duplication is found in Section 4.2d.

27e. NRC Request

Action steps should be structured to enable the control room supervisor to follow staff actions and monitor plant status.

LILCO Response

Section 4.2f describes step structure so that the Watch Supervisor and/or Watch Engineer can follow staff actions and monitor plant conditions.

C. Verification and Validation Program

1. NRC Request

The verification and validation programs should specify that, at a minimum, plant operators, subject matter experts, procedure writers, and human factors experts will be involved in verification and validation. Although the PGP states that independent reviewers and operating crews will be used, the use of a wider variety of verifiers and validators will help to ensure that all aspects of EOPs are completely and accurately verified and validated. The verification and validation program should also specify their roles and responsibilities.

LILCO Response

The Shoreham Station Procedure SP 21.009.02, "Technical Review of New or Revised Symptom Oriented Emergency Operating Procedures", includes the requirements for the staffing of the verification and validation team. The team is to be made up of Operations section personnel (plant operators, EOP writers, and subject matter experts), Training/Simulator personnel and Human Factors personnel. The roles and responsibilities of each team member are as follows:

The plant operators will respond to the simulated accidents and transients both in the control room simulator or during tabletop reviews and slow paced walk and talk throughs. They will provide comments to the other validation team members on potential problems with the EOPs.

The Operations EOP writers/subject matter experts will be familiar with the draft procedures and the design of the plant systems. They will be responsible to verify the EOPs are are in accordance with the SNPS PSTG and to determine the success of the procedures in guiding the operators to the correct response.

Training/Simulator personnel will be primarily responsible for the running of the simulator. They will understand the capabilities of the software and hardware, and assist in the evaluation of the EOPs success in mitigating accidents and transients.

The Human Factors Expert (HFE) will evaluate the EOPs for adherence to the SNPS Writers Guide and for usability during the validation runs. The HFE will determine whether the EOPs are compatible with the minimum number, qualification, training and experience of the operating staff, as well as whether the Instrumentation and Controls (I&C) called out in the EOP are compatible with the I&C in the Control Room. This response is included in section 8.2 of SP 21.009.02.

2. NRC Request

The validation program should include the criteria for the selection of scenarios that will be used to exercise EOPs. This criteria should ensure that the full set of EOPs are validated to their fullest extent and should ensure that a wide variety of scenarios, including multiple (simultaneous and sequential) failures are included. The validation program should also contain a commitment to apply these criteria in developing scenarios for validation of EOP revisions.

LILCO Response

[illegible] sequences selected for validation will exercise the EOPs to the fullest extent possible and will include multiple (simultaneous and sequential) failures that progress through the multiple paths of the EOPs.

Significant revision to EOPs (ie, revisions which alter: the sequence of operator actions, the amount of required operator response, or clearly alter the original intent of the step.) will require revalidation and reverification. This response has been included in section 8.3 of SP 21.009.02.

3. NRC Request

The validation program description states that the SNPS simulator will be used for the validation process. The description should state the method to be used to validate those parts of the EOPs where the simulator does not react like the plant or cannot be run on the simulator.

LILCO Response

In the event that the simulator is not capable of adequately modeling the Shoreham plant during certain portions of the validation scenarios, alternate methods of validation as required by SP 21.009.02 (ie, tabletop review, slow walk/talk through) will ensure the NUREG-0899 objectives are met.

4. NRC Request

The PGP should specifically address the manner in which feedback from the validation and verification process will be used to address the accuracy, readability, completeness, and usability of the EOPs. While a few of these points are noted on pages 9 and 10 of the validation plan, they should be specifically addressed in the verification and validation program descriptions.

LILCO Response

Feedback from the validation and verification process will be gathered by the validation team in the form of checklists and EOP Discrepancy Sheets. The team will ensure that any problems regarding the accuracy,

readability, completeness and usability discovered throughout the V&V process, are documented on an EOP discrepancy sheet.

Each EOP discrepancy sheet will be reviewed by the V&V team. The team will decide on the most appropriate solution for the discrepancy and if necessary will change the EOP in accordance with the EOP Writer's Guide. Significant revisions to the EOPs (as defined previously) will require revalidation and verification to insure that a new discrepancy has not been created through the resolution of the first.

The Operating Engineer shall assess the proposed resolution and determine whether or not revalidation is required. If satisfied, he will assign the originator to incorporate the proposed resolution and execute the revalidation and verification as required. This response has been included in section 8.3 of SP 21.009.02.

5. NRC Request

The verification and validation program should include the criteria or method that will be used to determine the need to reverify or revalidate any changes to the EOPs, resulting from either verification and validation programs or from subsequent EOP revisions.

LILCO Response

As stipulated in the response to NRC requests C.2, and C.4, significant revisions to the EOPs resulting from either V&V Discrepancy resolutions or subsequent EOP revisions will undergo verification and validation. The definition of "significant revisions" is a change which alters the sequence, or amount of required operator action or clearly alters the intent of the original step(s). This response has been included in section 8.3 of SP 21.009.02.

6. NRC Request

The EOPs will require a certain number of operators to carry out the various activities and steps as specified. The validation program should clearly indicate that the EOPs will be exercised during simulator exercises or control room walk throughs with the minimum control room staff required by SNPS Technical Specifications.

LILCO Response

The number of Operations personnel serving as the operating crew, during V&V walk throughs or simulator exercises, shall be limited to the Technical Specification minimum crew complement for Operational Condition 1, 2, or 3. This response has been included in section 6.2 of SP 21.009.02.

7. NRC Request

Particular attention should be paid during the validation program to deviations from and additions to the generic technical guidelines that

are of safety significance. These validation steps can be accomplished separately or as part of the validation program. The PGP should discuss how the deviations from and additions to the generic guidelines are to be validated.

LILCO Response

Deviations from and additions to the generic guidelines are validated in the same manner as steps which do not deviate from the EPG.

8. NRC Request

The verification and validation program descriptions refer to the use of documentation such as checklists, discrepancy forms, completion forms, and validation documentation. These checklists, forms, records, etc., should be included in the PGP.

LILCO Response

LILCO has included SP 21.009.02, Technical Review of new or revised Symptom Oriented Emergency Operating Procedures, as an appendix to the PGP. This procedure contains the checklists, forms and records discussed in the PGP.

D. Training Program

1. NRC Request

The PGP states that the SNPS simulator will be used for training. The EOP training program should address the following:

(a) Indicate the use of the simulator using SNPS technical specification minimum control room staffing.

(b) Indicate the use of a wide variety of scenarios, including multiple (simultaneous and sequential) failures, to fully exercise (to the extent possible) the EOPs on the simulator and thus expose the operators to a wide variety of EOP uses.

LILCO Response

Training in use of the EOPs will be conducted for all licensed operators on the Shoreham Control Room Simulator using multiple (simultaneous and sequential) failures. These scenarios will exercise the EOPs on a wide variety of EOP uses with operators in the simulator performing their normal control room functions. The EOPs will be exercised using both 5 and 4 man crews. The normal shift complement for SNPS is 5 licensed operators (one greater than the SNPS technical specification minimum control room staffing). At times, a 4 man crew will be used to exercise the EOPs to ensure crews are familiar with their usage with only the minimum number of licensed operators per the Shoreham Nuclear Power Station Technical Specifications. This response has been incorporated into a revision to the SNPS PGP.

2. NRC Request

The training program description should be expanded to include a discussion of the method used to train operators in the areas where the simulator does not react like the plant and in parts of the EOPs that can not be run on the simulator. These areas would include differences between the simulator and the control room.

LILCO Response

The simulator is a full scope simulator which simulates the Shoreham Nuclear Power Station transients as per the Shoreham USAR. Parts of the EOPs which can not be run on the simulator will be performed via walkthroughs at Shoreham Nuclear Power Station. This response has been incorporated into a revision to the SNPS PGP.

3. NRC Request

The training program should include a statement of commitment to train all operators on all EOPs, including revised EOPs, prior to implementing the EOPs in the control room.

LILCO Response

LILCO will train all operators on revised EOPs prior to implementing the EOPs in the control room. This training could take the form of Night Order Reading for insignificant changes to EOPs, or a complete training effort for significant changes.

SHOREHAM NUCLEAR POWER STATION

Procedure Generation Package

I. INTRODUCTION

The Shoreham Nuclear Power Station Procedures Generation Package (SNPS PGP) has been prepared in order to describe the process for upgrading the Emergency Operating Procedures (EOPs) at Shoreham.

The SNPS PGP consists of the following sections:

- Plant Specific Technical Guidelines
- Writers Guide for EOPs
- EOP Verification & Validation Program
- EOP Training Program

This section describes the approach which will be followed as part of the overall EOP Upgrade Plan required by Attachment 1 of the Shoreham Operating License. This PGP has been developed in accordance with NUREG 0737, Supplement 1, Item 7.2b.

II. PLANT SPECIFIC TECHNICAL GUIDELINES

The Plant Specific Technical Guidelines (PSTGs) will be developed by converting the Boiling Water Reactor Owners Group Emergency Procedure Guideline (BWROG EPG) into a Shoreham specific technical guidelines. The latest version of the BWROG EPG is currently Revision 4, which will be the source document for PSTG development. If subsequent revisions are published by the BWROG at a later time, LILCO will evaluate the need to revise the PSTGs to the new document.

The methodology employed in converting the EPG to a Shoreham PSTG is as follows:

- Collect plant-specific source documents
  - Shoreham Technical Specifications
  - Shoreham Safety Analysis Report
  - As-built plant drawings
  - Approved LILCO Nuclear Engineering Department Calculations
  - Shoreham Operating Procedures
  - Other special studies deemed appropriate

- Translate EPG steps to SNPS PSTG steps
  - Delete systems/components not applicable to SNPS
  - Add all plant specific parameters

- Justify all differences
  - Include a short written justification for each deviation from the EPG

- Include references from the source documents
  - all plant specific parameters
  - All justification for deviations

The format illustrated in Figure II-1 will be utilized for the PSTGs. The Guidelines will be maintained as a Quality Assurance document in accordance with Shoreham Station Procedure 21.009.01, "Preparation, Review, Approval and Control of Plant Specific Technical Guidelines". The current controlled version of the SNPS PSTG's are appended to this PGP.

The analysis of operator tasks, and the determination of information and control needs is described in the Detailed Control Room Design Review (DCRDR) Implementation Plan. This plan has been submitted to the NRC under SNRC-1297, December 8, 1986.

The Shoreham PSTGs will be converted into Emergency Operating Procedures in accordance with the EOP Writer's Guide. Figure II-2 represents a simplified flow diagram showing how the BWROG EPG will be converted into the Shoreham EOPs.

SHOREHAM NUCLEAR POWER STATION

Plant Specific Technical Guidelines

Primary Containment Control

EPG Step:

SP/T Monitor and control suppression pool temperature below [95°F (most limiting suppression pool temperature LCO)] using available suppression pool cooling.

When suppression pool temperature cannot be maintained below [95°F (most limiting suppression pool temperature LCO)]:

SP/T-1 Operate all available suppression pool cooling [using only those RHR pumps not required to assure adequate core cooling by continuous operation in the LPCI mode].

SP/T-2 Before suppression pool temperature reaches [the Boron Injection Initiation Temperature), (Figure N) enter [procedure developed from the RPV Control Guideline] at [Step RC-1] and execute it concurrently with this procedure.

SNPS PSTG Step:

SP/T Monitor and control suppression pool temperature below 90°F using available suppression pool cooling. [#6]

When suppression pool temperature cannot be maintained below 90°F,

SP/T-1 Operate all available suppression pool cooling using only those RHR pumps not required to assure adequate core cooling by continuous operation in the LPCI mode.

SP/T-2 Before suppression pool temperature reaches the 110° F, enter procedure developed from the RPV Control Guideline at Step RC-1 and execute it concurrently with this procedure. [1]

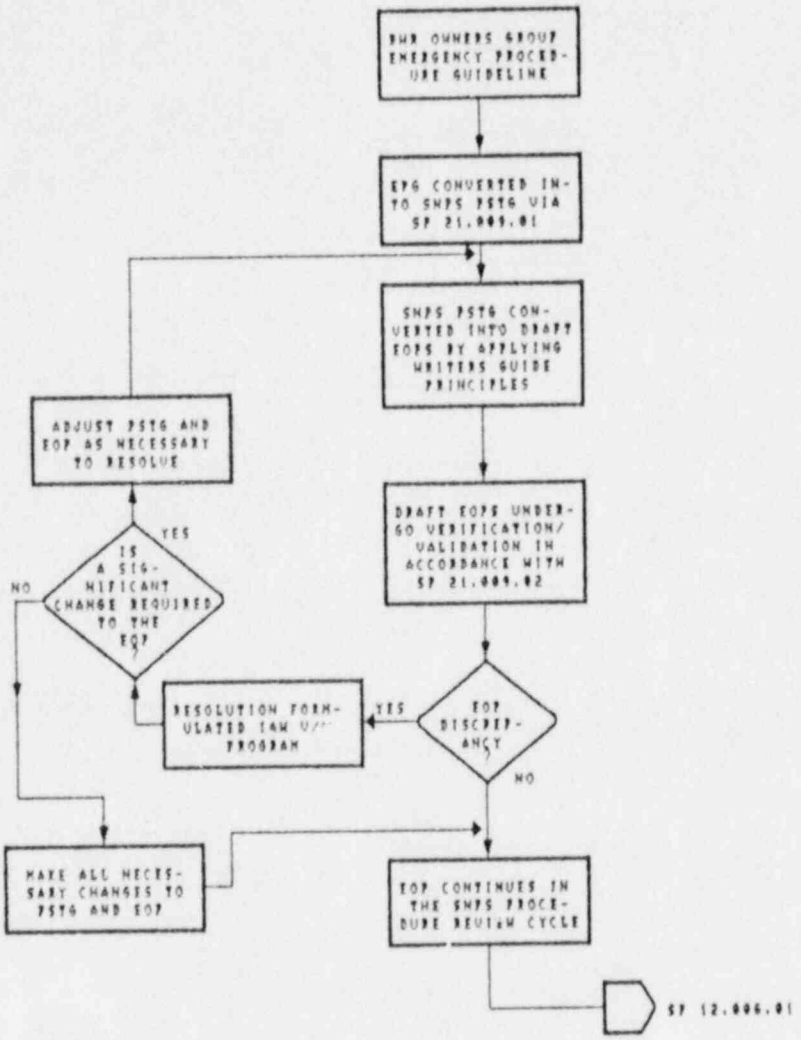
Justification for Differences/References:

Most limiting suppression pool temperature LCO - Tech Spec Section 3.6.2.1

Boron Injection Initiation Temperature - NED Appendix C Calculation No. C-NFD-276

In order to simplify this procedure the most conservative Boron Injection Initiation Temperature from the NED calculation was chosen. This eliminates the use of another graph while still maintaining the most conservative portion of it. [1]

Figure II-1



SIMPLIFIED FLOW PATH

EOP UPGRADE PROCESS

Figure II-2

III WRITER'S GUIDE FOR EOPs

The SNPS EOP Writer's Guide provides instruction on writing EOPs using good writing principles. The Writer's Guide promotes consistency among EOPs independent of the number of EOP writers.

Information on the following topics is included in the SNPS EOP Writer's Guide:

- EOP Text Preparation
  - Format
  - Instruction Step Length and Content
- Flowchart Preparation
  - Logic Symbols
  - Functional Flow and Branching
  - Step Construction
- Mechanics of Style
  - Punctuation
  - Abbreviations and Acronyms

The Writers Guide is controlled as an appendix to Shoreham Station Procedure SP 21.009.02, Technical Review of New or Revised Symptom Oriented Emergency Operating Procedures. This procedure is appended to the PGP as Appendix 2.

IV. EOP VERIFICATION AND VALIDATION PROGRAM

The SNPS Station Procedure SP 21.009.02, "Technical Review of New or Revised Symptom Oriented Emergency Operating Procedures" contains the specific procedural steps for performance of verification and validation of EOPs. An abbreviated overview of the program is described below.

Verification

EOP Verification will evaluate the written correctness and technical accuracy of the SNPS EOPs. The verification process will also ensure that the human factors aspects presented in the Writer's Guide have been correctly applied.

The SNPS verification process will address the following specific objectives:

- The EOPs are technically correct.
- The EOPs are written correctly.
- The language and level of information presented in the EOPs is compatible with the minimum number, qualification, training and experience of the operating staff.
- There is a correspondence between the control room/plant hardware and the EOP.
- The EOPs are usable.

The Verification plan is based on the guidance provided in NUREG 0899 and INPO 83-004, "Emergency Operating Procedure Verification Guideline", and will utilize a combination of table top review and slow walk- and talk- through the procedures by independent reviewers and operating crews. The review will consist of the following reviews:

- Comparison of EOPs with the requirements of the PSTGs.
- Comparison of the EOPs with the requirements of the SNPS EOP Writer's Guide
- Tabletop review of the EOPs by SNPS Operations personnel to initially assess usability and compatibility
- Comparison of control room Instrumentation and Controls (I&C) with the references to I&C made in the EOPs

The step-by-step comparison of the EOPs with the requirements of the SNPS PSTGs will ensure the completeness and technical accuracy of the EOPs. Comparison of the EOPs with the Writer's Guide will ensure written correctness and the incorporation of human factors engineering principles. The tabletop review by Operations personnel will identify early any potential problems that control room crews might have in accepting and adapting to the upgraded EOPs. The control room walkthrough of the EOPs will check each reference to I&C in the EOPs against the control room labels displayed on the equipment. Additionally, units of measurement used in the procedures will be checked to ensure that they are consistent with those displayed on instruments.

The verification process will be documented via checklists, discrepancy forms and a completion record, will provide traceable history of the Verification effort.

Validation

The SNPS EOP Validation Program will determine whether the actions specified in the EOPs can be performed by trained operators to manage emergency conditions successfully. The validation process will evaluate the EOPs against the following objectives:

- The EOPs are usable: i.e., they can be understood and followed without confusion, delays and errors.

- The presentation of language and level of information in the EOP is compatible with the minimum number, qualifications, training and experience of the operating staff.

- That there is a high level of assurance that the procedures will work: i.e., the procedures guide the operator in mitigating transients and accidents.

The SNPS validation process is modeled after INPO 83-006, "Emergency Operating Procedures Validation Guidelines". It includes the four phases of preparation, assessment, resolution, and documentation. The preparation phase will focus on the development of lists of expected operator actions and performance evaluation guidelines for the scenarios to be used in exercising the EOPs. During the assessment phase, the scenarios will be run on the SNPS simulator in real time and as a slow paced walk and talk through. The control room operating crew will use the EOPs to restore the plant to a safe condition. Based on a debriefing of the operators and an analysis of videotapes of the simulator runs, any procedure-related errors will be identified. The EOP discrepancies causing any errors will be listed, and resolutions will be developed during the resolution phase. Documentation produced during the process will be collected and organized during the documentation phase to provide a traceable history of the validation effort.

SHOREHAM NUCLEAR POWER STATION

Procedure Generation Package

	NUREG-0899 V&V Objectives	V&V Process Components: Verification	V&V Process Components: Validation
a.	Technically correct	• Comparison of PSTG and EOPs (TT)	
b.	Written correctly	• Comparison of EOP Writer's Guide (TT) • Evaluation Criteria Checklist (TT)	
c.	Compatible with minimum number, qualification, training and experience of operating staff	• Review by operating shift complement in conjunction with tabletop review for objective "d" (TT)	• Evaluation during slow-paced walk-throughs and real-time scenario exercises (WT & SIM)
d.	Usable	• Review by operating shift complement in evaluate readability, completeness, accuracy, and convenience (TT)	• Evaluation during slow-paced walk-throughs and "real-time" scenario exercises (WT & SIM)
e.	Correspondence exists between procedures and control room/ plant hardware	• Comparison of control room instrumentation and controls (I&C) and EOP references to I&C (WT)	
f.	Guide operators in mitigating transients and accidents		• Evaluation of "real-time" scenario exercises (SIM)

V&V Methods:

TT - Table Top - Individual or group evaluation
WT - Walk-through - Step-by-step enactment of scenario operator actions without carrying out actual control functions
SIM - Simulator - Control functions performed by operators in simulator

Figure IV-1 Correlation between V&V objectives and Process

V. EOP TRAINING PROGRAM

A formal EOP training program will be developed to support implementation of the upgraded EOPs. The EOP writer will interface with the Office of Training to ensure a supportive program. This description outlines the approach to be used to train licensed Shoreham operators on the upgraded EOPs and to ensure the operators are informed and knowleigeable of any future changes to the EOPs. Operator Training on the EOPs including revisions will be conducted prior to implementation in the main control room.

Training Program Goals

The initial, overall training goal to EOP training program are as follows:

- to enable the operators to understand the structure of the EOPs including the flowcharted version of the EOPs
- to enable the operators to understand the technical bases of the EOPs
- to enable the operators to have a working knowledge of the technical content of the EOPs
- to enable the operators to use the EOPs under operational conditions

In order to accomplish these goals, approved Office of Training procedures will be implemented to measure student performance and determine the need for remedial training. Pertinent Office of Training procedures are appended to this Procedure Generation Package for completeness.

Initial Training on Upgraded EOPs

The EOP training program will be established to instruct operators in the upgraded EOPs. It will consist of classroom instruction, simulator control room walk-throughs, and real time simulator exercises as follows:

- Classroom instruction sessions will be conducted. Included in the information to be presented during this section will be:
  - the logic behind the development of EOPs
  - the process used to develop the EOPs
  - the EOPs themselves, including supporting technical and human-factors information

- Simulator control room walk-throughs will be conducted. During this method of training, the team approach to using EOPs will be stressed. This walk-through training will also concentrate on information flow and interactions of the operators in the control room.

- Training on the EOPs will be conducted for all licensed operators using scenarios run on the Shoreham control room simulator. Training will be conducted with all operators performing their normal control room functions. This simulator training will utilize a wide variety of scenarios, including multiple (simultaneous and sequential) failures so as to exercise the EOPs to their fullest extent possible. The training exercises will utilize both five

and four man operating crews. The normal shift complement for the Shoreham control room is five licensed operators (one above the Technical Specification minimum). In this way, the operators will become familiar with their roles for casualties when both normal and Technical Specification minimum crew members are available.

Additional training will be conducted whereby the members of a crew alternate responsibilities. This additional training is important to promote understanding of the other operators' responsibilities in the overall conduct of the actions leading to enhanced communications within the control room. For those portions of the EOPs which cannot be run on the SNPS simulator, slow paced walk and talk throughs will be utilized to ensure the training goals are fulfilled.

Refresher Training

All licensed operators will conduct control room walk-throughs and real time simulator exercises using the EOPs during refresher training. The walk-throughs will be conducted on the Shoreham simulator.

Training on EOPs will be conducted in such a manner that each crew conducts the walk-throughs with each operator simulating the actions that he normally would be responsible for during an emergency incident. Licensed operators not assigned to a shift will participate in the walk-throughs as part of a control room crew.

The plant training and operations staffs will participate in the development and execution of refresher training. The training staff is responsible for developing the scenarios, observing and evaluating the walk-throughs, and critiquing the results. Any additional training needs will be determined from the performance of the operators.

The simulator exercises will be varied sufficiently to ensure the operators do not develop a set pattern of response to incidents but are able to respond to the symptoms as they develop.

Training on Revisions

Training on minor procedure revisions will be conducted through a program of required readings (self-taught), preshift briefings, or lectures in the requalification program. Training on significant revisions will be conducted by the use of classroom instruction and walk-throughs in the control room or on the Shoreham simulator.

Inputs Into Training Program Changes

Changes to supporting training material will be factored into updated lesson plans and student handouts. Operator feedback resulting from EOP verification, EOP validation, and training critique forms will be used to keep the training program and EOPs current and relevant.

SHOREHAM NUCLEAR POWER STATION

Procedure Generation Package

Appendix 12.1

Plant Specific Technical Guidelines