SOUTH CAROLINA ELECTRIC AND GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION

NUCLEAR OPERATIONS

STATION ADMINISTRATIVE PROCEDURE

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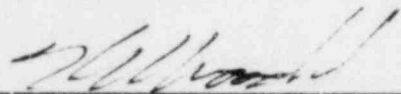
DEVELOPMENT OF EMERGENCY OPERATING PROCEDURE

REVISION 0

APRIL 2, 1984

FOR INFORMATION ONLY

SAFETY RELATED

_____   6/6/84
DISCIPLINE SUPERVISOR   Date

_____   _____
APPROVAL AUTHORITY   Date

_____
DATE ISSUED

RECORD OF CHANGES

CHANGE NO.	TYPE CHANGE	DATE APPROVED	DATE CANCELLED	CHANGE NO.	TYPE CHANGE	DATE APPROVED	DATE CANCELLED

LIST OF EFFECTIVE PAGES

ATTACHMENTS

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ATTACHMENTS

Attachment 1 - Cover Sheet Format

Attachment 2 - Table of Contents Format

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TABLE OF CONTENTS

1.0 PURPOSE

1.1 This procedure provides guidance for the development, verification, validation, training and implementation of Emergency Operating Procedures (EOP). This procedure has been developed in response to NRC Generic Letter 82-33.

2.0 SCOPE

This procedure describes:

2.1 Use of source documents for the development of plant specific Technical Guidelines which are used as a bases for the EOP's.

2.2 Use of an EOP Writer's Guide to ensure EOP's are formated and worded in a consistant manner, applying proper human factor guidelines.

2.3 Method of performing an EOP verification to confirm written correctness and that the Technical Guideline information has been properly incorporated into the procedures.

2.4 Method of performing an EOP validation to confirm that the actions specified in the procedure can be performed by the operator to manage the emergency conditions effectively.

2.5 Requirements for the Operator training program in regards to Emergency Operating Procedures.

2.6 Method of implementing EOP and subsequent revisions.

3.0 REFERENCES

3.1 Westinghouse Owners Group Emergency Response Guidelines, Revision 1, with Background Information.

3.2 NRC Generic Letter 82-33.

3.3 INPO 82-016, Emergency Operating Procedures Implementation Guideline (Preliminary).

3.4 INPO 82-017, Emergency Operating Procedures Writing Guideline (Preliminary).

3.5 INPO 83-004, Emergency Operating Procedures Verification Guidelines (Preliminary).

3.6 INPO 83-006, Emergency Operating Procedures Validation Guidelines (Preliminary).

3.7 INPO 83-007, Emergency Operating Procedures Generation Package Guideline (Preliminary).

4.0 DEFINITIONS

4.1 Verification - EOP verification is the evaluation performed to confirm the written correctness of the procedure and to ensure that applicable generic and plant specific technical information has been incorporated properly. This evaluation also checks that the human factors aspects presented in the writers guide have been applied.

4.2 Validation - EOP validation is the evaluation performed to determine that the actions specified in the procedure can be performed by the operator to manage the emergency condition effectively. The methodology for EOP validation utilizes present, available methods at the V.C. Summer Nuclear Station while recognizing and allowing for future improvements. It will validate that part of the EOP not covered by any technical validation of generic technical guidelines.

5.0 RESPONSIBILITIES

5.1 The Manager, Operations is responsible for the development of EOP's in conformance with this procedure.

5.2 The Manager, Technical Services, is responsible for development of plant specific setpoints as required for EOP preparation and which are beyond the scope of source documents such as Technical Specifications and the Westinghouse PLS document.

5.3 The Manager, Nuclear Operations Education and Training Group is responsible for:

    5.3.1 Development and implementation of the Operator EOP Training Program.

5.3.2 Providing operator feedback to Nuclear Operations Group in regards to procedure inadequacies revealed during the operator EOP training.

5.3.3 Assisting in the EOP Validation Program whenever the plant simulator is used by:

a. Developing test scenarios which adequately challenge the EOP's.

b. Providing simulator instructors.

6.0 TECHNICAL GUIDELINES

6.1 The following documents constitute the V. C. Summer Nuclear Station Emergency Operating Procedure Technical Guidelines:

6.1.1 Westinghouse Owners Group Emergency Response Guidelines (ERG) Revision 1, with Background Information.

6.1.2 V. C. Summer Nuclear Station Final Safety Analysis Report (FSAR).

6.1.3 V. C. Summer Nuclear Station Technical Specifications.

6.1.4 V. C. Summer Nuclear Station Evaluation Report (SER), NUREG 0717.

6.1.5 V. C. Summer Nuclear Station Precautions, Limitations and Setpoint (PLS) as supplied by Westinghouse Electric Corporation.

6.1.6 V. C. Summer Nuclear Station System Descriptions as supplied by Gilbert Associates Inc.

6.1.7 Westinghouse Letter CGE-83-822. This provides plant specific values for adverse instrument conditions to be used in the EOP's.

6.1.8 V. C. Summer Nuclear Station plant drawings and equipment manuals.

6.2 The ERGs constitute the primary Technical Guidelines for development of the plant specific EOP's. They provide:

    6.2.1 Generic Emergency Operating Procedures, indicating:

        A. Procedure breakdowns by type of events or conditions to be mitigated.

        B. Sequence of procedural steps.

    6.2.2 Background documentation to explain the procedure steps.

6.3 The Technical Guideline Supplements, Item 6.1.2 through 6.1.7, provide plant specific details required to adapt the ERGs to plant specific EOP's.

6.4 Use of the Technical Guidelines.

    6.4.1 The ERGs shall provide the nucleus of the plant specific Technical Guidelines for EOP development. Generally the EOP writer will follow the ERGs step-by-step.

    6.4.2 Deviations from the ERGs due to plant specific restraints will be justified on Attachment II, EOP Step Documentation.

    6.4.3 Use of non-ERG Technical Guidelines, Items 6.1.2 through 6.1.7, will be documented on Attachment II, EOP Step Documentation.

    6.4.4 Format and word changes to comply with the EOP Writers Guide does not constitute a deviation from the Technical Guidelines.

    6.4.5 Recognizing that the ERGs are a generic procedure set, the Manager, Operations Group, has the authority to modify the procedures by simplifing or consolidating to satisfy plant specific needs or human factor considerations provided the basic intent of the ERGs are not jeopardized. Such modifications will be documented.

7.0 EMERGENCY OPERATING PROCEDURE WRITER'S GUIDE

7.1 Emergency Operating procedures shall be written in compliance with the Emergency Operating Procedures Writers Guide, Attachment I.

8.0 EOP PREPARATION

8.1 EOP writers will familiarize themselves with the EOP Writers Guide and the Technical Guidelines for the procedures they have been assigned to develop.

8.2 Using the format contained in the Writers Guide, the writer prepares a 1st draft plant specific EOP based on the Technical Guidelines.

8.3 For each step in the EOP and EOP Step Documentation Form, Attachment II, will be completed. This form indicates:

8.3.1 EOP Number and Title.

8.3.2 EOP Step number and actual wording.

8.3.3 The related ERG Number, Step Number and wording.

8.3.4 Justification for any differences between the EOP and ERG step, if any.

8.3.5 The source of any numerical values used in the EOP step.

8.4 The draft EOP will be submitted for typing and review per SAP-139, Procedure Development, Review, Approval and Control.

8.5 Documents generated during the writing process include:

8.5.1 Proposed EOP in draft form.

8.5.2 Procedure Development form.

8.5.3 EOP Step Documentation.

9.0 EOP VERIFICATION

9.1 The originator will proofread the typed draft of the EOP for:

    9.1.1 Correctness - Does the procedure agree with the submitted handwritten version?

    9.1.2 Format - Does the procedure comply with the format specified in the Writer's Guide?

    9.1.3 Spelling Errors.

    9.1.4 Numbering - Are the procedure steps properly numbered in sequence?

    9.1.5 Spacing - Are the procedure steps properly spaced? Are the left and right hand columns properly aligned?

9.2 Corrections will be noted in red on the typed version of the procedure as they are identified. Unless the corrections are extensive, the procedure does not require retyping prior to Technical Review.

9.3 The originator will complete EOP Development Checklist, Attachment III, and submit it and the marked up typed version of the procedure to the Supervisor of Operations.

9.4 The Supervisor of Operations will select a qualified individual to perform a technical review of the procedure. Normally this will be an STA or other qualified engineer.

9.5 To perform a Technical Review the following documents must be available:

    9.5.1 The proposed EOP, as marked up by the originator.

    9.5.2 The applicable ERG.

    9.5.3 The applicable ERG Background Information.

    9.5.4 The EOP Step Documentation forms.

9.6 The Technical Reviewer will review the procedure for those items specified on Attachment IV, EOP Technical Review Checklist.

9.7   Comments can be noted in one of two ways:

    9.7.1   Making minor corrections on the procedure being reviewed.

    9.7.2   Completing Attachment V, Technical Review Discrepancy Form, when the discrepancy requires re-writing significant portions of the procedure.

9.8   The Technical Reviewer will review the EOP Step Documentation forms for the following:

    9.8.1   EOP/ERG step differences are adequately justified and does not have an adverse safety significance.

    9.8.2   The differences does not alter the intent of the procedure as described in the ERG background information.

    9.8.3   The proper source of numerical values was identified.

    9.8.4   The value used in the procedure step agrees with the source value.

    9.8.5   Discrepancies will be documented on Attachment V.

9.9   The Technical Reviewer will return the procedure package to the Supervisor of Operations.

9.10   The Supervisor of Operations shall ensure:

    9.10.1   Comments generated during the verification process are resolved.

    9.10.2   Procedures are re-typed with comments incorporated prior to the validation phase.

9.11   Documents generated during the verification process include:

    9.11.1   EOP Development Checklists.

    9.11.2   EOP Technical Review Checklists.

    9.11.3   Technical Review Discrepancy.

10.0 EOP VALIDATION

10.1 The ERG Validation Program, included as a part of the Technical Guidelines, constitute the basic validation that the ERG based EOPs will manage the emergency conditions effectively.

10.2 The EOPs to be validated use instruments and controls currently installed in the plant; therefore, this validation is independent of the Control Room Design Review validation to ensure the availability and adequacy of instrumentation and controls to meet the task analysis identified needs.

10.3 Plant specific EOPs may be validated by one or more of the following methods:

10.3.1 Table-Top Method - A validation method where by a qualified person(s) reviews the procedure and based on their knowledge of plant systems determines the adequacy of the procedure to manage the emergency conditions effectively. This method is effective only for minor revisions to previously validated procedures.

10.3.2 Walk-Through Method - A validation method whereby plant operators conduct a step-by-step enactment of their actions without actual control manipulation. This method is effective in identifing confusing procedure steps, compatability of instruments and controls to the procedure requirements, traffic flow required by the operators to complete the procedures in the required sequence.

10.3.3 Simulator Method - A validation method whereby Control Room operators perform the actual control functions on a simulator during a simulated emergency condition. This method is the most effective method of challenging and validating the Control Room portion of EOPs provided the operators have received adequate familiarization of the procedures to be validated.

10.4 The Supervisor of Operations will determine the method(s) of validation to be used. This determination will be based on the magnitude of the change or revision being made to the procedures. Selection of the validation method will be documented on Attachment VI, EOP Validation Requirements.

10.5 Table Top Validations.

10.5.1 The Supervisor of Operations will assign an SRO licensed individual to perform the validation.

10.5.2 This validation shall consist of an independant verification of the correctness and adequacy of the procedure as described in Section 9.0.

10.5.3 The validation will be documented on Attachment IV, EOP Technical Review Checklist.

10.6 Walk Through Validations.

10.6.1 The Supervisor of Operations will assign a qualified reviewer. This may be a Shift Supervisor, Shift Technical Advisor, or himself.

10.6.2 The designated reviewer will:

A. Review and familiarize himself with Section 3 of INPO 83-006, Emergency Operating Procedures Validation Guideline.

B. Review the scope of the validation designated by the Supervisor of Operations.

C. Review the procedure and develop scenarios to support the scope of validation.

NOTE: This scenario may be as simple as making marginal notes on a working copy of the draft procedure to verify alternative actions and branching.

D. Select operators to perform the walk-through. This should be coordinated with the Supervisor of Operations to ensure operator availability.

E. Select the location for the walk-through, either the Main Control Room or simulator for Control Room activities.

10.6.3 Validation process:

A. The reviewer will talk the operators through the procedure, step by step.

B. The operator will:

1) Go to the referenced instrument or control.

2) Verify the nomenclature is correct.

3) Verify referenced values can be monitored.

4) Verify the control action can be performed as stated in the procedure.

5) Notify the reviewer of any discrepancies or step omissions which would preclude taking the required step.

C. The reviewer will:

1) Observe the operators performing the step.

2) Observe movements of the operators around the Control Room to ensure smooth traffic patterns and lack of crowding.

3) Note parts of the procedure that can be accomplished concurrently and parts that must be accomplished in sequence. Ensure sequencial steps are listed in the proper order.

4) Record observations and operator comments.

D.   Perform a second walk-through of the
procedure. During this walk-through the
reviewer provides copies of the procedures
to the operators and only establishes various
conditions to be reacted to. During this
walk-through the reviewer will observe:

1)   Can the operators easily select the
proper procedure to implement for the
conditions.

2)   Can the operators progress through the
procedures and complete the alternatives
and branching without confusion.

E.   The reviewed will record discrepancies by:

1)   Preparing Attachment VII, Validation
Discrepancy Form

or

2)   Making corrections on the review copy of
the procedure for typographical errors.

10.7 Simulator Validations.

10.7.1 The Supervisor of Operations will coordinate with
the Nuclear Operations Education & Training Group
to perform simulator validations. This
coordination should include:

A.   Simulator availability.

B.   Selection of operators to perform the
validation.

C.   Training or familiarization the operators will
require to perform the validation.

D.   The scope of validation required or
recommended scenarios to use.

10.7.2 The Supervisor of Operations will assign an
evaluator to control and supervise the simulator
validation.

10.7.3 Nuclear Operations Education & Training will:

A. Provide instructor personnel to assist in the validation process. They will:

B. Familiarize themselves with the procedures to be validated and the scope of validation required by the Supervisor of Operations.

C. Provide adequate classroom instruction to prepare the designated operators for the validation of the procedures. This should include:

1) Background on the purpose and intent of the procedures.

2) Familiarization with the general content of the procedures.

3) Instruction on the validation process i.e. to perform the procedures exactly as written. The only deviations allowed will be because of procedure inadequacies that preclude doing the procedure step.

D. Prepare Attachment VIII, Simulator Scenario Form, for all Simulator scenarios to be used during the validation process.

10.7.4 The validation process.

A. The designated operators will be briefed as described in 10.7.3.C.

B. Sufficient observers will be assigned to verify the movements and actions of the operators. They will have copies of the procedures and scenarios to be used.

C. If available TV monitors should be used to record the actions of the operators for later use during the debriefing.

D. Using the developed simulator scenarios the operators will be subjected to plant conditions which require implementing the EOPs.

E. The observers will note the operators responses as described in step 10.6.4.

F. All deviations, either omissions or additional actions will be recorded on Attachment VII, Validation Discrepancy Form.

G. At the completion of the simulator exercise the operators will be debriefed:

  1) All discrepancies noted by the observers will be discussed.

  2) All comments by the operators as to problem areas or confusing steps will be discussed.

  3) If TV monitors were used, they will be replayed to determine if any other problem areas were overlooked.

H. The scenarios should be completed a sufficient number of times to determine if discrepancies and problem areas are caused by procedure inadequacies or non-compliance with the procedures.

G. The Evaluator will determine if the procedures were successful in managing the emergency conditions effectively.

10.8 The validation reviewers will submit all comments and documentation to the Supervisor of Operations for resolution.

10.9 The Supervisor of Operations will submit the draft procedures with all comments resolved for final typing.

10.10 Documents generated during the validation process includ :

  10.10.1 EOP Validation Forms.

  10.10.2 Validation Discrepancy Forms.

  10.10.3 Simulator Scenario Forms.

11.0 EOP TRAINING

11.1 The Nuclear Operations Education & Training Group is responsible for Operator Training in accordance with the Nuclear Education & Training Group Manual and approved Nuclear Training Center Instructions (NTCIs).

11.2 Operator EOP training will contain the following elements:

11.2.1 Classroom training:

A. Background and purpose of the EOPs.

B. Step-by-step review of the EOPs.

11.2.2 Simulator Training.

12.0 EOP IMPLEMENTATION

12.1 EOPs will be issued and implemented as follows:

12.1.1 Major revisions will be issued upon completion of the EOP Training Program. Whenever possible this should coincide with major outages so the training and transition can be completed while the plant is in cold shutdown.

12.1.2 Minor individual EOP revisions will be issued upon completion of the review and approval process. Operating shifts will be briefed on the nature and scope of the revision prior to assuming operator duties.

12.1.3 The Supervisor of Operations will maintain a copy of the Technical Guidelines for the EOPs in the vacinity of the Control Room for operators reference.

13.0 EOP REVISIONS

13.1 EOPs will be revised for the following reasons:

13.1.1 Changes to the Technical Guidelines identified by the WOG-ERG maintenance program.

13.1.2 Inadequacies observed during procedure implementation during actual plant emergencies.

13.1.3 Modifications to the plant such as new instrumentation and controls installed as a result of the Detailed Control Room Design Review.

13.2 EOP revisions will undergo the same review process as the basic procedures received.

14.0 RECORDS

14.1 The EOP Generation Package will be maintained in accordance with the Q.A. Records Accumulation and Retention Chart for plant procedures.

14.2 Each EOP Generation Package will contain as a minimum:

14.2.1 Procedure Development Forms, PDF-A & B.

14.2.2 Final Approved Master Copy of the procedure.

14.2.3 EOP Step Documentation.

14.2.4 EOP Development Checklists.

14.2.5 EOP Technical Review Checklist.

14.2.6 Technical Review Discrepancy Sheets.

14.2.7 EOP Validation Form.

14.2.8 Validation Discrepancy Forms.

14.2.9 Simulator Scenario Forms.

V. C. SUMMER NUCLEAR STATION

WRITER'S GUIDE

FOR

EMERGENCY OPERATING PROCEDURES

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1.0 <u>INTRODUCTION</u>

    1.1 PURPOSE

        This document provides administrative and technical
        guidance on the preparation of Emergency Operating
        Procedures (EOPs).

    1.2 SCOPE

        This writer's guide applies to the writing of all
        EOPs. The guidelines should be applied uniformly,
        with the exception of those circumstances where
        deviation is thought to result in a more readable
        document, or where deviation better conforms to
        accepted human factors principles.

2.0 <u>EOP ORGANIZATION AND IDENTIFICATION</u>

EOPs govern plant operation during emergency conditions and
specify operator actions for returning the plant to a
stable condition.

Each plant procedure is uniquely identified. This
identification permits easy administration of the process
of procedure preparation, review, revision, distribution,
and operator use. In addition, all EOPs follow a similar
pattern of organization to enhance operator use of the
EOPs.

    2.1 GENERAL ORGANIZATION OF EOPs

        Organize EOPs into the following general elements:

        a. Cover Sheet.

        b. Table of Contents.

        c. I. PURPOSE

        d. II. SYMPTOMS

        e. III. IMMEDIATE OPERATOR ACTIONS

        f. IV. FOLLOWUP OPERATOR ACTIONS

g. V. ATTACHMENTS

ATTACHMENT 1 - TITLE
ATTACHMENT 2 - TITLE

2.1.1 Conditions.

If necessary to divide a procedure to reflect
different situations, use conditions.

2.2 COVER SHEET

Every EOP has a cover sheet (see Attachment 1). The
primary purposes of the cover sheet is to:
(1) identify the procedure and (2) to identify the
authorized revision.

2.3 PROCEDURE TITLE

Use a concise and descriptive title to identify the
procedure and designate the scope of the procedure.

2.4 PROCEDURE DESIGNATION AND NUMBERING

Designate the emergency operating procedure as an EOP. A
sequential number follows the procedure designator.

Example: EOP-1.0
                         Sequence Number
                         Procedure Designator

2.5 REVISION DESIGNATION AND NUMBERING

Use sequential number after the word "revision" to
designate the revision level of the emergency operating
procedure.

Example: REVISION 1
                      Revision Level

3.0 PROCEDURE FORMAT

Apply the following format consistently for all EOPs.

3.1 TABLE OF CONTENTS

Prepare a Table of Contents identifying the title and page number of major sections within the procedure.

Number of pages of the Table of Contents with lower case roman numerals (i, ii). Locate the page identification information (See 3.2) and page number in the top right corner of the page, as shown in Attachment 2.

Identify the procedure by centering the procedure title on the Table of Contents page, and identify column headings as SECTION and PAGE. Section headings and page numbers are connected by a series of periods, as shown in Attachment 2.

3.2 PAGE IDENTIFICATION AND NUMBERING

Identify page of the procedure with (1) the procedure designator and number, (2) the revision number, and (3) the revision date. Place this information at the top right corner of each page, as shown in Attachment 3.

Identify each page of the procedure with the page number, specified as "PAGE ___ of ___." Center this information at the bottom of each page, as shown in Attachment 3.

3.3 PAGE FORMAT

Use dual-column format. Use the left-hand column for operator actions and label this ACTION. Use the right-hand column for contingency or alternative actions to be taken when the expected response is not obtained. Label this column ALTERNATIVE ACTION. A sample page format is presented in Attachment 3.

3.4 PROCEDURE ORGANIZATION

Use the following section headings for all EOPs.

a. PURPOSE -- The purpose provides a brief description of what the procedure is intended to accomplish. State the purpose for operator association with the symptoms.

b. SYMPTOMS -- Include as symptoms only those alarms, indications, operating conditions, automatic system actions, or other unique symptoms that the operator is to use in deciding to use the procedure.

c. IMMEDIATE OPERATOR ACTIONS -- The immediate operator actions are short, concise, identifiable instructions that the user should be able to perform without recourse to the procedure.

d. FOLLOWUP OPERATOR ACTIONS -- The followup operator actions are short, concise, identifiable instructions that give appropriate directions to the user.

3.5 CONDITIONS

Each EOP may contain several conditions, as deemed necessary.

a. Designate conditions with capital letters, e.g., Condition A, Condition B, etc.

b. Locate each condition on a new page.

c. Indicate the continuation of the condition by placing a continuation at the top of the page.

Example: (CONDITION A: continued)

If a procedure contains numerous conditions, include the condition title in the continuation to minimize confusion. Abbreviate only as necessary.

Example: CONDITION A: HIGH RADIATION GENERAL
AREA GAMMA (continued)

d. If appropriate, a single purpose statement
    reflecting the general purpose of the procedure
    may be used. More precision may be gained by
    using separate purpose statements for each
    condition.

e. Each condition should contain its own Symptoms,
    Immediate Operator Actions, and followup Operator
    Actions.

f. Any attachments are placed after the final
    condition.

3.6 NUMBERING WITHIN PROCEDURES

Use Roman numerals for numbering sections.

Number and indent ACTION and ALTERNATIVE ACTION steps
as follows:

1. Verify...

    a. Check...

        1) Position... (Not desirable)

Use every effort to avoid using the 1) level of
indenting. (See Figure 3, Page format).

Use continuous step numbering from SECTION III to
SECTION IV.

3.7 IN-TEXT REVISION IDENTIFICATION

To identify revisions to the text of an EOP, locate a
change bar in the margin alongside the text change.
Changes in the left column are marked by a change bar
in the left margin. Changes in the right column are
located by change bars in the right margin.

3.8 ATTACHMENT ORGANIZATION

Attachments include any materials which are neither included in the body of the procedure nor immediately available in the Control Room, but which are essential to carrying out the procedure. Attachments are to appear at the end of the procedure, arranged in numerical order. Use arabic numbers for numbering attachments.

a. Page identification for attachments is placed at the upper right corner of the page and is to follow one of two formats:

1) When the attachment consists of a figure, table, graph, flow chart, log, list, or questionnaire, the identification includes the following information:

a) Procedure number

b) Attachment number

c) Page number

d) Revision number

2) When the attachment consists of entry conditions and operator actions, the identification information and page numbering is the same as that for the body of the procedure (See Section 3.2).

b. Provide a concise and descriptive title for each attachment. Place the title at the top of each page of the attachment, centered, in all capital letters.

c. When attachments involve entry conditions and operator actions, use the following section headings and guidelines:

1) TITLE -- State the title for operator association with the entry conditions.

2) <u>ENTRY CONDITIONS</u> -- Include only those alarms, indications, operating conditions, automatic system actions, or other unique symptoms that the operator is to use in deciding to use the procedure.

3) <u>OPERATOR ACTIONS</u> -- State the operator actions as short, concise, identifiable instructions that give appropriate directions to the user.

4) Number and indent instruction steps as in the procedure body (See Section 3.6).

5) Use the two column format unless there are no alternative actions and a single column format provides a more readable, more concise attachment.

d. When attachments involve something other than entry conditions and operator actions (e.g., figures, logs, graphs, etc.), follow the appropriate guidelines presented elsewhere in this Writer's Guide.

4.0 <u>WRITING ACTION AND ALTERNATIVE ACTION STEPS</u>

4.1 STEP LENGTH AND CONTENT.

Instruction steps are to be concise and precise. Conciseness denotes brevity; preciseness means exactly defined. Thus, instructions should be brief and exact. This is easily stated, but not so easily achieved. General rules to follow to meet these objectives are as follows:

a. Write instructions to communicate clearly to the procedure user.

b. Use short, simple sentences rather than long, compound, or complex sentences.

c. Deal with only one idea per step.

d. Write steps using an action verb-object format.

e. Specifically state the objects of operator actions. Identify exactly what is to be done to what.

f. Use positive rather than negative sentences whenever possible.

g. Avoid long, obscure or abstract words.

h. Present complex evolutions in a series of steps, with each step made as simple as practicable.

i. If a step relates to three or more objects, give the objects in a list. If appropriate, provide space for operator check-off.

j. Completely identify components and parts. If appropriate, use exact nomenclature. Include component numbers whenever possible.

k. Express limits quantitatively whenever possible (see 5.7). Specify values such that computations are unnecessary.

l. Generally, expected results of routine tasks need not be stated.

m. If stating expected results would benefit the user, as in restoring or resetting an alarm or trip, list the expected results immediately after the required action.

n. When actions are required based upon receipt of an annunciated alarm, list the setpoint of the alarm for ease of verification.

o. When considered beneficial to the user for proper understanding and performance, describe the system response time associated with performance of the instruction.

p. When system response dictates a time frame within which the instruction must be accomplished, prescribe such time frame. If possible, however, avoid using time to initiate operator actions. Operator actions should be related to plant parameters.

q. When anticipated system response may adversely affect instrument indications, describe the conditions that will likely introduce instrument error and means of determining if instrument error has occurred by using a NOTE.

r. When additional confirmation of system response is
    considered necessary, prescribe the backup
    readings to be made.

s. When steps are to be performed in other than
    numberical order, provide clear instructions to
    the user regarding proper sequence (for example,
    use "go to..." or "refer to...").

4.1.1 Action Column

The left-hand column of the dual-column format
contains the operator action steps. In
addition to the general rules stated above, the
following rules apply:

a. Locate expected sequences in this column.
    The user normally will continue down the
    left hand column when the expected
    responses are obtained.

b. Provide appropriate operator actions for
    the expected sequences.

4.1.2 Alternative Action Column.

Present alternate actions in the right-hand
column of the dual-column format. Alternative
actions are operator actions that should be
taken in the event a stated condition, event,
or task does not represent or achieve the
expected result. The need for alternative
action occurs in conjunction with tasks
involving verification, observation,
confirmation, and monitoring.

Specify alternate actions for each circumstance
in which the expected results or actions might
not be achieved. The alternative actions
should identify, as appropriate, directions to
override automatic controls and to initiate
manually what is normally automatically
initiated.

4.2 USE OF LOGIC TERMS

The logic terms and, or, not, if, if not, when and unless are often necessary to describe precisely a set of conditions or sequence of actions. When logic statements are used, emphasize logic terms so all conditions are clear to the operator. Achieve emphasis by underlining all letters of the logic terms.

Avoid using and and or within the same action. When and and or are used together, the logic can be very ambiguous.

The dual-column format used equates to the logic, if not the action in the left-hand column, then follow the action specified in the right-hand column; for example: If Condensate Storage Tank level low, then switch to alternate Emergency Feedwater Supply.

Use other logic terms as follows:

a. When attention should be called to combinations of conditions, place the word and between the description of each condition. Do not use the word and to join more than three conditions. If four or more conditions need to be joined, use a list format.

b. Use the word or when calling attention to alternative combinations of conditions. The use of the word or shall always be in the inclusive sense. To specify the exclusive "or," the following may be used: "either A or B, but not both."

c. When action steps are contingent upon certain conditions or combinations of conditions, begin the step with the words if or when followed by a description of the condition or conditions (The antecedent), a comma, the word then, followed by the action to be taken (the consequent). Use when for an expected condition. Use if for an unexpected but possible condition.

d. Limit use of if not to those cases in which the operator must respond to the second of two possible conditions. Use if to specify the first condition.

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Do not use <u>then</u> at the end of an action step to
instruct the operator to perform the next step
because it runs actions together.

4.3 USE OF CAUTIONARY INFORMATION AND NOTES

Cautionary information can be considered in two
fundamental categories: that which applies to the
entire procedure and that which applies to a portion
or a specific step of the procedure. That which
applies to the entire procedure is called a
"PRECAUTION" and is covered in operator training.
That which applies to a portion of a procedure is
called "CAUTION" and is placed immediately before the
procedural step to which it applies.

Cautions attract attention to essential or critical
information in procedures. Use a caution to denote a
potential hazard to equipment or personnel associated
with or consequent to the subsequent instructional
step. Cautions are not meant to replace instructional
steps, and should not generally contain operator
actions. To ensure that the procedure user observes
the caution before performing the step, adhere to the
following:

a. Place the caution to extend across the entire
   page, immediately prior to the applicable step.

b. Follow the word "caution" with the number(s) of
   the step(s) to which it applies (i.e. CAUTION 6).

c. Center, capitalize, and underline the caution
   heading.

d. Highlight the caution in a box of asterisks.

e. Never break a caution statement between pages or
   place a caution at the bottom of a page separated
   from its associated step.

f. Example:

```
* * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                                                     *
*                     CAUTION 11                      *
*                                                     *
*     Automatic reinitiation of Safety Injection      *
*     will not occur with the Reactor Trip breakers   *
*     open.  If Safety Injection is needed, then it   *
*     must be reinitiated manually.                   *
*                                                     *
*                                                     *
* * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

Notes are used to present other important
supplemental information in procedures, such as
information necessary to support an instructional
step. Notes present information only, not
instructions. Adhere to the following guidelines
when using a note:

a. In general, locate the note in the right hand
    margin column immediately before the
    procedural step to which it applies. If a
    note applies to an entire section, place the
    note at the beginning of the section, centered
    on the page.

b. Follow the title NOTE by the appropriate step
    number.

c. Place the title information immediately over
    the note, centering, capitalizing and
    underlining as follows:

                                        NOTE b

                                    Injection from...

d. Locate the note on the same page as the step
    to which it applies.

4.4 CALCULATIONS

Avoid mathematical calculations in EOPs. If a calculation is required to perform a procedural step, keep the calculation as simple as possible, provide work space for the calculation, and use a chart or graph whenever possible.

4.5 USE OF UNDERLINING

Underlining is an effective means of emphasizing key terms. Use underlining for emphasis of the following:

a. Logic terms (and, or, not, if, if not, when, unless).

b. Negative terms (not).

c. Words denoting number (all, any, both, either, neither, nor, each).

d. Headlines or titles (PURPOSE, CAUTION, NOTE).

e. Other instances where the writer deems underlining to be essential for gaining needed emphasis.

4.6 REFERENCING AND BRANCHING TO OTHER PROCEDURES OR STEPS

Referencing and branching indicate that additional steps or an additional procedure are used to supplement the procedure presently in use. Avoid referencing either past or future steps within the procedure being used. When only a few steps are involved in the referencing, include the steps in the procedure at the point they are needed.

To minimize potential operator confusion, use branching when the operator is to leave one procedure or step and use another procedure or step. When branching is used, the following rules apply:

a. When the operator is to reference a future step within the procedure currently in use, the key words "go to".

b. When the user is to return to a completed step with that procedure, use the key words, "return to".

c. When the user is to leave the procedure in use and refer to another procedure, use the key words, "go to".

d. To emphasize the title of the branched procedure, capitalize all letters of the title, and place it in quotation marks, for example, go to EOP-1.0, "SAFETY INJECTION ACTUATION".

e. As indicated, the terms "go to" and "return to" direct the user to leave the current step and refer to the branched step or procedure. When referencing is an optional rather than a required operator action, use the key words "refer to".

4.7 COMPONENT IDENTIFICATION

With respect to identification of components, adhere to the following rules:

a. Identify equipment, controls, and displays in operator language (common usage terms). Do not abbreviate unless using exact nomenclature from panel placards and alarm windows.

b. When the engraved names and numbers on panel placards and alarm windows are specifically the item of concern in the procedure, quote the engraving verbatim (use exact nomenclature), and emphasize by using all capital letters.

c. When identifying components, list the component name first, and follow the name with the component number, placed in parentheses.

Example: RHR DISCHARGE FLOW (FI-605A)

d. When a component name involves a summary label, state the summary label first, followed by a parentheses, and the name of the specific component.

Example: PZR HEATER, BU GRP 1

e. Do not combine component names and/or numbers
    unless such a combination represents exact
    nomenclature.

    Example: Do not use:

    a. Reset SI RESET TRAIN A and TRAIN B.

    Do use:

    a. Reset both SI RESET TRAIN and SI RESET
        TRAIN B.

    Do not use:

    (MVB-3106A and B)

    Do use:

    (MVB-3106A and MVB-3106B)

f. If the component is seldom used or it is felt that
    the component would be difficult to find, give
    location information following the identification.
    In general, location information should be placed
    in parentheses.

g. Capitalize all letters of exact labeling of switch
    or component positions (FAST, START).

4.8 LEVEL OF DETAIL

Avoid too much detail in EOPs so that operators can
effectively execute the instructions in a timely
manner. Use the level of detail that a newly trained
and licensed operator would desire during an emergency
condition.

To assist in determining the level of EOP detail,
apply the following general rules:

a. For each control with a number engraved on the
    control panel placard, include the number in
    parentheses within the instructional step; for
    example, "Ensure SEAL WTR RTN ISOL (MVT-8100)
    open."

b. For control circuitry that executes an entire
    function upon actuation of the control switch, use
    the action verb appropriate to the component
    without further amplifying how to manipulate the
    control device; for example, "Close PZR PWR RELIEF
    (PCV-445A)." The following action verbs are
    recommended:

    1) For power-driven rotating equipment, use
       Start, Stop.

    2) For valves, use Open, Close, Throttle Open,
       Throttle Close, Throttle.

    3) For power distribution breakers, use
       Synchronize and Close, Trip.

c. For control switches with a positional placement
    that establishes a standby readiness condition,
    use the verb "Set," along with the engraved name
    of the desired position.

    Positional placements are generally associated
    with establishing readiness of automatic functions
    and are typically named AUTO or NORMAL; for
    example, "Set the GLAND SEAL AIR COMPRESSOR
    Control Switch (S15) in AUTO."

d. For multiposition control switches that have more
    than one position for a similar function specify
    the desired position placement; for example,
    "Place DIESEL FIRE pump SELECTOR switch to TEST
    No. 2."

e. Standard practices for observing for abnormal
    results need not be prescribed within procedural
    steps. For example, observation of noise,
    vibration, erratic flow, or discharge pressure
    need not be specified by steps that start pumps.

f. Attachment 1 contains a complete constrained
    language list.

4.9 PRINTED OPERATOR AIDS

When presenting information with graphs, charts, tables, and figures, verify that aids are self-explanatory, legible, and readable under the expected conditions of use and are within the reading precision of the operator.

4.9.1 Units of Measure

Give units of measure on figures, tables, and attachments in numerical values that represent observed measurement data or calculated results. Use a virgule (slant line) instead of "per";
examples: ft/sec, lbs/hr.

4.9.2 Titles and Headings

Capitalize all letters of table titles and all letters of column headings within the table. When referencing tables and figures within the text, initially capitalize the generic reference and capitalize all letters of the actual figure or table title.

Example: Complete Attachment 1, SHORT TERM PLANT STATUS LOG, or Refer to Table 2.

4.9.3 Figure, Table, and Attachment Numbering

Assign sequential arabic numbers to figures, tables, and attachments in separate series. The sequence should correspond with the order of their reference in the text. The symbol "#" and abbreviation "No." are unnecessary and should not be used. The number alone suffices.

Examples: Figure 1, Figure 2, etc.
           Table 1, Table 2, etc.
           Attachment 1, Attachment 2, etc.

5.0 MECHANICS OF STYLE

5.1 SPELLING

Keep spelling consistent with modern usage. When a choice of spelling is offerred by a dictionary, use the first spelling.

5.2 PUNCTUATION

Punctuation should be used as necessary to aid reading and prevent misunderstanding. Select word order to require a minimum of punctuation. When extensive punctuation is necessary for clarity, the sentence should be rewritten and possibly made into several sentences. Apply the following rules for punctuation:

5.2.1 Brackets

Use brackets only to enclose values for reference under adverse conditions.

5.2.2 Colon

Use a colon to indicate that a list of items is to follow, for example: Restore cooling flow as follows:

5.2.3 Comma

Use of many commas is a sign the instruction is too complex and needs to be rewritten. Therefore, evaluate the number of commas to ensure the instruction is not too complex.

Use a comma after conditional phrases for clarity. Example: WHEN level decreases to 60 inches, THEN start pump....

5.2.4 Parentheses

Use parentheses to indicate alternative items in a procedure, for instruction, for equipment numbers, and for indicating location.

5.2.5   Period

Use a period at the end of complete sentences and for indicating the decimal place in numbers.

5.3   CAPITALIZATION

Use capitalization to conform to standard American English usage, and also to emphasize words and phrases as follows:

a.   Center and capitalize all letters in the procedure title.

b.   Capitalize and underline all letters in section headings, column headings, caution headings, and note headings.

c.   Capitalize all letters contained in the page identification information.

d.   Capitalize all letters of exact nomenclature.

e.   Center and capitalize all letters of attachment, figure, and table titles.

f.   Capitalize all letters of column headings in attachments, figures, and tables.

g.   Emphasize the names of plant system titles by initial capitalization. When the word "system" is deleted from the title because of brevity and is understood because of the context, the title is still emphasized by initial capitalization.

5.4   HYPHENATION

Use hyphens between elements of a compound word when usage calls for it. Apply the following rules for hyphenation:

a.   When doubt exists, restructure the compound word to avoid hyphenation.

b.   Use hyphens in the following circumstances:

1)   in compound numerals from twenty-one to
     ninety-nine; example: one hundred
     thirty-four.

2)   in fractions; examples: one-half,
     two-thirds.

3)   in compounds with "self"; examples:
     self-contained, self-lubricated.

4)   when the last letter of the first word is the
     same vowel as the first letter of the second
     word--as an alternative, use two words;
     example: fire-escape or fire escape.

5)   when misleading or awkward consonants would
     result by joining the words; example:
     bell-like.

6)   to avoid confusion with another word;
     examples: re-cover to prevent confusion with
     recover, pre-position to avoid confusion with
     preposition.

7)   when a letter is linked with a noun;
     examples: X-ray, O-ring, U-bolt, I-beam.

8)   to separate chemical elements and their atomic
     weight; examples: Uranium-235, U-235.

5.5 VOCABULARY

Use words to convey precise understanding to the
trained person. The following rules apply:

a.   Use simple words. Simple words are usually short
     words of few syllables, and are generally common
     words.

b.   Use common usage if it makes the procedure easier
     to understand.

c.   Use words that are concrete rather than vague,
     specific rather than general, familiar rather than
     formal, precise rather than blanket.

d.   Define key words that may be understood in more than one sense.

e.   Use verbs with specific meaning. Examples are listed in Attachment 4.

f.   Denote equipment status as follows:

1)   Operable/operability--These words mean that a system, subsystem, train, component, or device is capable of performing its specified function(s) in the intended manner. Implicit in this definition is the assumption that all necessary attendant instrumentation, controls, normal and emergency electrical power sources, cooling or seal water, lubrication or other auxiliary equipment required for the system, subsystem, train, component, or device to perform its function(s) are also capable of performing related support function(s).

2)   Operating--This word means that a system, subsystem, train, component, or device is in operation and is performing its specified function(s), and that "Out of Service Cards" or other conditions do not prevent it from maintaining that service.

3)   Available--This word means that a system, subsystem, train, component, or device is operable and can be used as desired; however, it need not be operating.

5.6   SENTENCE STRUCTURE

Write sentences, clauses, and phrases in a manner which is short and directive. Use action verbs followed by the object of the verb. Use is, are, have, has, etc. when necessary. In general, these terms are unncessary.

5.7   NUMERICAL VALUES

Use numerical values in accordance with the following rules:

a.   Use arabic numberals. For brevity, use numerals rather than words when referring to quantities.

b. For numbers less than unity, precede decimal point by a zero; for example: 0.1.

c. The number of significant digits should be equal to the number of significant digits available from the display and the reading precision of the operator.

d. Specify acceptance values in such a way that addition and subtraction by the user is avoided if possible. This can generally be done by stating acceptance values as limits. Examples: 510°F maximum, 300 psig minimum, 580° to 600°F. For calibration points, stating the midpoint and its lower and upper limits for each data cell will accomplish the same purpose; for example, 10 milliamperes (9.5 to 10.5). Avoid using ±.

e. Always specify engineering units for numerical values of process variables. They should be the same as those used on the Control Room displays, for example: psig instead of psi.

f. When values for adverse Containment conditions must be given, place them in brackets following the value for normal Containment conditions.

   Example: a. Pressurizer pressure is greater than 20% [25%].

5.8 ABBREVIATIONS, LETTER SYMBOLS, AND ACRONYMS

Minimize the use of abbreviations and acronyms because they may be confusing to those who are not thoroughly familiar with them. Use abbreviations and acronyms only when their meaning is unquestionably clear to the intended reader, when using exact nomenclature, and when referring to quantities. Maintain consistent use of abbreviations and acronyms throughout the procedure.

Capitalize abbreviations uniformly. If the abbreviation is comprised of lowercase letters, use lower case letters when the abbreviation appears in titles or headings. Omit the period in abbreviations except in cases where the omission would result in confusion.

Use letter symbols, abbreviations, and acronyms to represent quantities, as appropriate. Examples of such use include: °F, 5%, T, gpm, psig, Tavg. do not use symbols for greater than, less than, or equal to, unless presenting a computational formula.

6.0 TYPING FORMAT

6.1 GENERAL REQUIREMENTS

Use 8 1/2 x 11 inch white, bond paper.

6.1.1 font

a. 10 pitch (10 characters per inch).

b. PICA 10 print wheel (unadorned font, with no serifs).

6.1.2 Margins

a. Set top of page at 1 1/2 inches, or line 8.

b. Set left margin at 1 1/4 inches, or space 12.

c. Set right margin at 1 1/8 inches, or space 74.

d. Set bottom of page at 1 inch, or line 60.

6.2 COVER SHEET

Type the cover sheet as shown in Attachment 1.

a. Beginning on line 8, center, capitalize, and double space the plant identification information.

b. Type in capital letters, center, and double space the following procedure specific information, beginning on line 20:

1. EMERGENCY OPERATING PROCEDURE
2. Procedure Number.
3. Procedure title.
4. Revision number.
5. Revision date.

c. At line 36, space 60, capitalize & type SAFETY RELATED.

d. Beginning on line 42, type the review and approval information at the left hand margin. Triple space this information.

e. On line 60, space 50, type the date identification line.

6.3 TABLE OF CONTENTS

a. Type the table of contents as shown in Attachment 2. Type all alphabet characters in capital letters.

b. Place the following page identification information in the upper right corner on line 3, beginning at space 64.

1. Procedure number.
2. Page number in lower case Roman numerals.
3. Revision number.
4. Numerical date.

c. Center and capitalize the procedure title on line 9.

d. Underline SECTION and PAGE headings and place on line 12 as follows:

1. Type SECTION at left margin.
2. Type PAGE at space 68.

e. Spacing for listing contents is as follows:

1. Triple space after the following:

a) Page identification.
b) Procedure title.
c) Section, page headers.

2. Double space after the following:

a) Section headings.
b) Attachment titles.

3. Single space after any continued lines.

f. Begin listing contents on line 16 as follows:

1. Section headings:

a) Use Roman numerals, left hand justified at margin.

b) Capitalize all letters in Section headings and begin at space 18. Do <u>NOT</u> underline.

2. Attachment titles:

a) Place the word "ATTACHMENT" at space 18.

b) Use Arabic numerals one space after "ATTACHMENT", and follow the number by a dash with one blank space before and after the dash.

c) Begin attachment titles after the space, and do not extend past space 74.

g. Connect section headings to page numbers by a series of periods, each separated by a space.

h. Type page numbers at space 70.

6.4 PROCEDURE BODY

Attachment 3 provides some examples for typing the procedure body. Type the procedure as follows:

6.4.1 Page Identification

Place the following page identification information in the upper right corner on line 3, beginning at space 64, single spaced, in capital letters:

a. Procedure number.
b. Revision number.
c. Numerical date.

6.4.2 Headings

Type headings throughout the text as follows:

a. Section headings are centered, underlined, and placed within the text page; for example, <u>I. PURPOSE.</u>

b. Attachment titles are centered, and each attachment begins on a new page.

c. Use two column headings under Sections <u>III. IMMEDIATE OPERATOR ACTIONS</u> and <u>IV. FOLLOWUP OPERATOR ACTIONS.</u> The left column under each section is entitled <u>ACTION</u>: the right column is <u>ALTERNATIVE ACTION</u>.

    1. Place the column header <u>ACTION</u> at space 16.

    2. Place the column header <u>ALTERNATIVE ACTION</u> at space 46.

6.4.3 Spacing

Space the text as follows:

a. Triple-space after the following:

    1) Page headers.
    2) Section headings.
    3) Text, when preceding Section headings.
    4) Two column headings.
    5) Upper and lower caution box lines.

b. Double space after the following:

    1) Caution and Note headings.
    2) Caution and Note text.
    3) Each Step.
    4) Each Substep.

c. Single space the following:

    1) Purpose statement.
    2) Subsequent lines of text.
    3) Subsequent lines of substeps.
    4) Text of Cautions and Notes.

6.4.4 Numbering Procedure Steps

Number procedure steps as follows:

1. Number steps consecutively (1,2,3...).

2. Designate substeps with lower case letters (a, b, c...).

3. Designate further substeps with a number followed by a parenthesis (1), 2), 3) ...).

6.4.5 Breaking procedure steps and breaking words.

a. To facilitate operator reading avoid breaking procedure steps. When breaking of steps is unavoidable, apply the following rules"

1. Do not separate a caution from its appropriate text.

2. Do not break substeps at the third level.

3. When a step begins on one page and ends on another, place a continuation in parentheses at the top of the next page, for example, (20. continued) or (20.a continued).

4. Where a step is continued on the next page in both the ACTION and ALTERNATIVE ACTION columns, place a continuation (as above) at the top of both columns.

b. Do not break words.

6.4.6 Tab Sets

Set tabs for steps and substeps at the following:

a. For left hand side, ACTION column:

1) Start Step number at margin and set text at space 16.

NOTE: Placekeeping line extends into left hand margin, in front of step number.

2) Start Substep number at 16 and set test at 20.

3) Do <u>not</u> extend text past space 43.

b. For right hand side, <u>ALTERNATIVE ACTION</u> column:

1) Begin Step number at 46 and set text at 50.

2) Begin Substep number at 50 and set text at 54.

3) Do <u>not</u> extend text past space 74.

6.4.7 Cautions

Type cautions as follows:

```
* * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                                                       *
*                    CAUTION 2                          *
*                                                       *
* Emergency feedwater flow should not be throttled      *
* until water level is above the top of the             *
* U-tubes.                                              *
*                                                       *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * *
```

a. Margins and spacing are as follows:

1) Left box margin at 16.
2) Right box margin at 70.
3) Center title.
4) Begin text at 20; do not go past 70.
5) Double space between upper row of asterisks and title.
6) Double space after title.
7) Double space after text.

b. Type the caution above its associated step.

c. The caution and step should be typed on the same page.

6.4.8 Notes

Type notes as follows:

a. Keep margins consistent with previous right column margins.

 1) A note referring to a step begins at space 50.

 2) A note referring to a substep begins at space 54.

 3) Do not type past space 74.

 4) Center the title over the text.

 5) Double space after the title.

b. The exception: Notes at III or IV level are centered on the page.

c. Type the note and the step or substep on the same page.

d. When the note applies to a step (e.g., NOTE 10), the note is placed as follows:

 1) If there is an alternative action in right column, place the note and text entirely prior to the step.

 2) If no alternative action, place the note so that the text of the note begins on the same line as the text of the step.

e. For substep (e.g., Note a):

 1) If there is an alternative action in right column, place entirety of NOTE a before substep, but after step.

Example:

_____25. Check for switchover to Cold Leg
recirculation:

Note a
_____
_____
_____

a. _____   a. _____
_____   _____
_____   _____

2) If <u>no</u> alternative action, place first
line of text on same line as first line
of substep.

Ex:
Note a

a._____   _____

6.4.9 Finishing

Do not extend the last line of text past
line 55.

Type footers as follows:

a. Capitalize PAGE, use lower case letters for
of, as shown: PAGE___of___

b. Place footers on line 60.

c. Start at space 34.

6.4.10 Capitalization

a. Type in all capital letters:

1) Title and procedure specific
information on title page.

2) Wording on Table of Contents page.

3) Headings.

      4) Annunciator legends.

      5) Engineering/equipment prefixes.

      6) Exact control board and plant nomenclature.

   b. Initially capitalize the following:

      1) First word in the sentence.

      2) Proper names.

      3) Major system names.

      4) Plant conditions.

6.4.11 Placekeeping aids.

Placekeeping aids are checkoff spaces used to remind the operator of his/her place in the procedure. The complexity of the step will influence placement of the placekeeping aids.

   a. Use placekeeping aids for each step in the followup Operator Actions.

   b. Place the aid in the ACTION column so that it extends into the left hand margin, in front of the step number.

   c. Use placekeeping aids in front of substep numbers as deemed necessary.

6.5 ROTATION OF PAGES

If pages need to be rotated, follow these rules:

a. The top of the page with rotated print is the normal left-hand edge.

b. The page margins do not rotate.

6.6 PRINTED OPERATOR AIDS

6.6.1 Figures

Figures include graphs, drawings, diagrams, and illustrations. The following rules are established:

a. Place the figure number and title three live spaces below the figure field.

b. The figure number and title should be in the same type style as the rest of the procedure.

c. Do not violate specified page margins to accommodate the figure field.

d. Use a figure field of sufficient size to offer good readability.

e. Use simple presentations such that the essential message is clear.

f. Place grid lines at least 1/8 inch apart. Make numbered grid lines bolder than unnumbered grid lines.

g. Accompany labels of items within the figure with arrows pointing to the item.

h. Orient items within the figures as naturally as possible. For example, place height on a graph along the vertical axis.

i. In general, items within the figures should be labeled using pica 10 pitch type. Exceptions may be in pitch 15, bold faced. Print handwritten labels using all capitals, with letters and numbers at least 1/8 inch high.

j. Be certain all lines in figures are reproducible.

6.6.2 Tables

Type tables according to the following rules:

a, Use type style and size consistent with that used for the rest of the procedure.

b. Locate table number and title three line spaces above the table field and three line spaces below preceding text. Capitalize all letters of the title.

c. Enter a heading for each column, and center that heading within the column. Capitalize all letters of column headings.

d. Place horizontal lines above and below the column headings; vertical lines, while desirable, are not necessary or required.

e. Align tabular headings as follows:

   1) horizontally by related entries.

   2) vertically by decimal point for numerical entries.

   3) vertically by first letter for word entries; however, run-over lines should be indented three spaces.

f. Double space between horizontal entries to segregate such entries. Horizontal lines may also be used if desired. If used, place double horizontal lines above and below the column headings.

g. There should be no vacant cells in the table. If no entry is necessary, enter "N.A." to indicate not applicable.

6.7 Attachments

When typing attachments, follow the margin guidelines as set in 6.1.2.

a. Place the page identification information in the upper right corner, beginning on line 3 at space 64.

b. Three line spaces below the page identification information, center and capitalize the attachment title, beginning each title on a new page.

c. When typing entry conditions and operator actions, the following guidelines apply:

1) Type the headings, ENTRY CONDITIONS and OPERATOR ACTIONS at the left margin, underlined, in all capital letters.

2) Type the two column headings as specified in section 6.4.2.c.

3) Follow other guidelines as established in Sections 6.4.3 through 6.4.11.

d. When typing operator aids, see Sections 4.9 and 6.6.

6.8 USE OF FOLDOUT PAGES

Use of foldout pages are optional. Foldout pages contain information or conditions that may apply throughout the procedure implementation.

6.9 USE OF OVERSIZED PAGES

Lo not use oversized pages. Reorganize or reduce the page to standard size.

6.10 USE OF REDUCED PAGES

Avoid using reduced pages whenever possible. Be certain reductions are readable.

7.0 REPRODUCTION

Reproduction will be done on a standard copier.

ATTACHMENT 1, COVER SHEET FORMAT
CENTERED

LINE 5 _____ SOUTH CAROLINA ELECTRIC AND GAS COMPANY

VIRGIL C. SUMMER NUCLEAR STATION   DOUBLE SPACE

NUCLEAR OPERATIONS

8 LINES

LINE 16   EMERGENCY OPERATING PROCEDURE

EOP-1.0

SAFETY INJECTION ACTUATION   DOUBLE SPACE

REVISION 1

JUNE 19, 1983

LINE 30   SAFETY RELATED

SPACE 60

LINE 36 _____   _____
DISCIPLINE SUPERVISOR   Date

TRIFLE SPACE

_____   _____
APPROVAL AUTHORITY   Date

LINE 47
                                                    _____
                                                    DATE ISSUED
                                                    SPACE 63

RECORD OF CHANGES

CHANGE NO.	TYPE CHANGE	DATE APPROVED	DATE CANCELLED	CHANGE NO.	TYPE CHANGE	DATE APPROVED	DATE CANCELLED

ATTACHMENT 2, TABLE OF CONTENTS FORMAT
CENTER
LINE 9_____ HIGH RADIATION OUTSIDE CONTAINMENT

SPACE 12   SPACE 68

LINE 12 <u>SECTION</u>   <u>PAGE</u>

EOP DEVELOPMENT CHECKLIST

EOP NUMBER: _____

TITLE: _____

This checklist is to be used for non-technical review by writers, editors, and proofreaders. Review the procedure for each of the following criteria. If the procedure meets a criterion, place a check on the line provided. If a criterion is not met, write "no" on the line. If the criterion does not apply, write "NA".

		YES	NO
A.	Cover Page		
1.	The cover page layout is consistent with Figure 1 of the Writers Guide.	___	___
2.	Upper and lower case lettering is used as shown in Figure 1 of the Writer's Guide.	___	___
3.	The title is brief and describes the purpose of the procedure.	___	___
B.	Table of Contents contains the following:		
1.	Header (4 lines - upper right).	___	___
2.	Procedure Title (centered).	___	___
3.	Column Headers.	___	___
4.	Entries.		
I.	PURPOSE	___	___
II.	SYMPTONS	___	___
III.	IMMEDIATE OPERATOR ACTIONS	___	___
IV.	FOLLOWUP OPERATOR ACTIONS	___	___
V.	ATTACHMENTS		
	ATTACHMENT 1 - TITLE	___	___
5.	Corresponding page numbers for above.	___	___
C.	Procedure Body		
1.	Header (each page - 3 lines upper right).	___	___
2.	PAGE ___ of ___ (each page - bottom)	___	___

ATTACHMENT 3, PAGE FORMAT

CENTERED   TRIPLE SPACE
|
I. PURPOSE

TRIPLE SPACE

This procedure provides...

TRIPLE SPACE

II. SYMPTOMS

III.   IMMEDIATE OPERATOR ACTIONS

SPACE 16   SPACE 46   TRIPLE
| | SPACE
ACTION   ALTERNATIVE ACTION

SPACE 12   SPACE 16   SPACE 50   TRIPLE
| | | SPACE
1.   _____   1.   _____
              SPACE 20   SPACE 54
              | |
a.   _____   a.   _____
                 SPACE 24   SPACE 58
                 | |
1)   _____   1)   _____

IV. FOLLOWUP OPERATOR ACTIONS

ACTION   ALTERNATIVE ACTION

_____2.

_____3.   3.
       a.
          1)   a.

                                 1)

PAGE   of

Align	Place valves or electrical devices in proper position for accomplishing specified function.
Check	Determine present status.
Close	Refers to valves. Generally involves completely stopping flow from entering or exiting an area, e.g., Close PCV-4458, PZR PWR RELIEF.
De-energize	Remove power supply by manual breaker operation.
Depress	Refers to pushbutton operation.
Determine	Infers technical knowledge. Make a decision based on operational knowledge.
Drive	Stepping in rods to specified point. Movement of reactor control rods, either in or out.
Energize	Supply power by manual breaker operation.
Ensure	Take necessary/appropriate actions to guarantee component, system, reading, etc. is as specified.
Establish	Perform actions necessary to meet stated condition.
Evaluate	Appraise the situation. Infers technical knowledge.
Faulted	The piece of equipment which has currently become inoperable.
Go To	Leave the present step or procedure and not return until directed.
Implement	Commence a required program or series of procedures, for example, "Implement the Emergency Plan".
Inspect	Examine or review present condition.
Load	Increase electrical output of a generator.

Maintain	Take appropriate actions to prevent fluctuation/changing.
Manually Initiate	Operator action which activates a safety function which is normally initiated automatically due to plant conditions.
Manually Trip	Operator action to activate a Reactor Trip or stop an operating piece of equipment such as a pump.
Modulate	Position a valve to a required position by use of controller to establish a required parameter.
Monitor	Periodically check status. Observe current trend.
Non-faulted	An operational component which is redundant to one which has malfunctioned.
Open	Refers to valve. Generally involves removing barrier to allow flow to enter an area, e.g., Open PCV-4458, PZR PWR RELIEF. Where instruction to partially open a valve is given, involves controlling or restricting the volume of flow across a barrier.
Per	As specified in or by name procedure. Infers referencing the document is optional.
Place	Physically position a switch to the specified location.
Rack in	Place an electrical breaker in place by physically connecting it to its associated power source.
Rack out	Remove an electrical breaker from service by physically disconnecting it from its associated power source.
Record	Document requested information on form provided.

CONSTRAINED LANGUAGE LIST

Refer
Use as a supplement. Perform applicable actions of cited procedure and return to the controlling procedure, for example, "Refer to Foldout page".

Regulate
Control or restrict rate.

Restore
Repair and/or return to service.

Rotate
Turn a rotary multi-position switch to the required position. In reference to pump, hand rotate before energizing.

Sample
Generally involves directing other personnel to obtain a representative part to be analyzed for content.

Secure
Remove from service. Take appropriate action to prevent return.

Set
Manually position a control switch to specified setting.

Shift
Specifies changing mode of operation, for example, "Shift SW Pump to FAST Speed".

Shutdown
Completely close down.

Stabilize
Maintain in a manner to reduce fluctuation.

Start
To originate motion of an electrical device, for example, "Start....Pump".

Startup
To set into motion the process of aligning valves, starting pumps, or any other auxiliary equipment necessary to place a system or systems into operation.

Stop
To terminate operation, for example, "Stop.....pump".

Survey
Inspect, examine. Complete survey form.

CONSTRAINED LANGUAGE LIST

Transfer   Specifies changing location or mode
                        of control, for example, "Transfer
                        SG Level to MANUAL".

Trip   Effect a complete and total
                        immediate shutdown.

Throttle   Place a valve in an intermediate
                        position to restrict flow to the
                        required amount. Infers that an
                        automatic controller has been
                        placed in a manual mode of
                        operation.

Verify   Determine if in proper
                        condition/status.

EOP STEP DOCUMENTATION

EOP NO_____ REV._____ TITLE_____

STEP NO._____

STEP:

ERG NO._____ TITLE_____

STEP:

JUSTIFICATION OF DIFFERENCES:_____
_____
_____
_____
_____

SOURCE OF NUMERICAL VALUE USED:_____

REVIEWED BY:_____

EOP DEVELOPMENT CHECKLIST

EOP NUMBER: _____

TITLE: _____

This checklist is to be used for non-technical review by writers, editors, and proofreaders. Review the procedure for each of the following criteria. If the procedure meets a criterion, place a check on the line provided. If a criterion is not met, write "no" on the line. If the criterion does not apply, write "NA".

	YES	NO
A. Cover Page		
1. The cover page layout is consistent with Figure 1 of the Writers Guide.	___	___
2. Upper and lower case lettering is used as shown in Figure 1 of the Writer's Guide.	___	___
3. The title is brief and describes the purpose of the procedure.	___	___
B. Table of Contents contains the following:		
1. Header (4 lines - upper right).	___	___
2. Procedure Title (centered).	___	___
3. Column Headers.	___	___
4. Entries.		
I. PURPOSE	___	___
II. SYMPTONS	___	___
III. IMMEDIATE OPERATOR ACTIONS	___	___
IV. FOLLOWUP OPERATOR ACTIONS	___	___
V. ATTACHMENTS		
ATTACHMENT 1 - TITLE	___	___
5. Corresponding page numbers for above.	___	___
C. Procedure Body		
1. Header (each page - 3 lines upper right).	___	___
2. PAGE ___ of ___ (each page - bottom)	___	___

YES   NO

3. I. PURPOSE

    a. Section Title is correct
        centered.   ——   ——

    b. Statement is brief, but clearly
        describes the function of the
        procedure.   ——   ——

4. II. SYMPTOMS

    a. Section Title is correct
        (centered).   ——   ——

    b. All necessary alarms, indications,
        operating conditions, and
        automatic system actions
        are included.   ——   ——

5. III. IMMEDIATE OPERATOR ACTIONS and
    IV. FOLLOWUP OPERATOR ACTIONS

    a. Section Titles are correct.   ——   ——

    b. Steps are brief, and under-
        standable.   ——   ——

    c. Grammer and punctuation is
        correct (periods at the end of
        all sentences).   ——   ——

    d. Spacing between lines is correct.   ——   ——

    e. Step numbering is correct.   ——   ——

    f. Steps are written as follows:
        Action verb - object.   ——   ——

    g. Long, obscure, or abstract words
        are avoided.   ——   ——

    h. Positive sentences are used
        rather than negatives, whenever
        possible.   ——   ——

    i. If there are three or more objects,
        they are given in a list.   ——   ——

    j. Exact nomenclature is in all caps.   ——   ——

YES   NO

k.   Component numbers are included whenever possible.

l.   Abbreviations are avoided, except in exact nomenclature.

m.   System names are in initial caps.

n.   Limits and tolerances are expressed quantitatively, EG. 935 psig (930-940).

o.   Only approved abbreviations and acronyms are used (see Writer's Guide).

p.   Greater than, less than, and equal to are spelled out (not symbols).

q.   The meaning of verbs is consistent.

r.   Check-off lines are used in Followup Operator Actions.

s.   Conditional statements are correctly written (If. . . then).

t.   Appropriate words are underlined (logic terms, negatives, words denoting number).

u.   Cautions and notes precede the applicable step and have same number as step.

v.   Cautions and notes are structured, and located as per the Writer's Guide.

w.   Cautions and notes do not contain operator actions.

x.   Values are specified wherever needed, computations are not required.

y.   Reference documents are identified by both titles (all caps - quotes) and number.

	YES	NO

z. Referencing is appropriately used:

    1) Does <u>not</u> route users past important information. ___ ___

    2) Uses "go to" for branching. ___ ___

    3) Uses "refer to" for referencing. ___ ___

D. Attachments.

1. Header is correct (4 lines - upper right). ___ ___

2. Title is in caps and centered. ___ ___

3. All action steps meet requirements b-z in previous checklist section. ___ ___

4. All graphs, charts, and tables are easily read and interpreted. ___ ___

5. Units of measurement are correctly given, Eg. ft/sec. ___ ___

6. Attachments, tables, and figures are correctly numbered, 1, 2, 3, etc. ___ ___

                  INITIALS: _____

EOP TECHNICAL REVIEW CHECKLIST

EOP NUMBER:_____

TITLE:_____

Review the procedure for each of the following criteria. If the
procedure meets a criterion, place a check on the line provided.
If the criterion is not met, write "no" on the line. Write "NA"
(not applicable), if the criterion does not apply.

1. The purpose statement briefly and clearly specifies
   the function of the procedure. _____

2. If appropriate, symptoms are listed by importance
   or order of probable appearance. _____

3. Sequence of steps is logical and accurate. _____

4. Text is compatible with operator's viewpoint. _____

5. Steps are brief, and easily understood. _____

6. All necessary steps are included. _____

7. There are no unnecessary steps or substeps. _____

8. Level of detail within steps is appropriate. _____

9. Within any given step, there is no uncertainty
   or confusion as to which step to go to next. _____

10. Specific instrument references match control
    room or local labeling (numbers are correct). _____

11. Control, displays, and other equipment mentioned
    are available and located as specified. _____

12. Descriptions given match actual units of measure-
    ment, engineering parameters, and function of
    control and displays. _____

13. Notes/Cautions do not contain operator actions
    (not active command steps). _____

14. Notes/Cautions are appropriately located and
    easily understood. _____

15. All necessary Notes/Cautions are included. _____

16. There are no unnecessary Notes/Cautions. _____

17. Branching (go to) and referencing (refer to) instructions are correct. _____

18. References to other procedures give correct numbers and titles. _____

19. Exit conditions are compatible with the entry conditions of the referenced procedure. _____

20. The use of referencing is minimized. _____

21. Quantitative values, including tolerance bands, comply with EOP source documents. _____

22. Appropriate and correct quantitative values, charts, or tables are provided, so that computations are not required. _____

23. Check-off blanks are appropriately located. _____

24. Licensing commitments applicable to EOPs have been addressed. _____

25. EOP/ERG differences have been documented and are justified. _____

26. Corrections marked on the procedure. _____

27. Discrepancies documented on Attachment V. _____

REVIEWER:_____

DATE:_____

TECHNICAL REVIEW DISCREPANCY

EOP NUMBER _____   STEP NUMBER_____

DESCRIPTION OF DISCREPANCY:_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

RECOMMENDED RESOLUTION:_____
_____
_____
_____
_____
_____
_____
_____
_____

TECHNICAL REVIEWER:_____ DATE_____

RESOLUTION:_____
_____
_____
_____

ORIGINATOR:_____ DATE_____

EOP VALIDATION FORM

Page____ of ____

EOP Title:_____

EOP Number:_____ Revision:_____

Scope of Validation:_____

_____

Validation Method or Methods to be Used:_____.

_____

Designated Observer/Reviewer(s):

_____

_____

_____

Preparation Completed on_____ By:_____

Assessment Completed on _____ By:_____

Operator(s) Involved: Qualification: (SRO, RO, Other)

_____   _____

_____   _____

_____   _____

_____   _____

_____   _____

_____   _____

Resolution Completed on_____ By:_____

Documentation Package Forwarded on _____
By:_____

VALIDATION DISCREPANCY FORM

EOP:_____ REV.:_____ STEP NUMBER:_____

DISCREPANCY:

_____
_____
_____
_____
_____

EVALUATOR:_____ DATE:_____

RESOLUTION:

_____
_____
_____
_____
_____

APPROVED: YES   NO   (circle one)

SUPERVISOR OF OPERATIONS:_____ DATE:_____

RESOLUTION INCORPORATED BY:_____ DATE:_____

SIMULATOR SCENARIO FORM

PROCEDURE NO.: _____   REVISION: _____

TITLE: _____

DATE: _____

PURPOSE: _____
_____
_____

SCENARIO DESCRIPTION: _____
_____
_____
_____

INITIAL PLANT CONDITIONS: _____
_____
_____
_____

SIMULATOR SEQUENCE (to be completed by the simulator
instructor):

EVENT NO.	TIME HR:MIN:SEC	I/O OVERRIDE	MALFUNCTION DESCRIPTION	INTENT