EMERGENCY OPERATING PROCEDURE GENERATION PACKAGE
VOGTLE ELECTRIC GENERATING PLANT
APRIL, 1984

INTRODUCTION

Supplement 1 to NUREG-0737, Section 7.2b requires that a Procedure Generation Package (PGP) be submitted to the NRC Staff for review. Georgia Power submits this volume in fulfillment of that requirement. The four major sections of the PGP are described below:

a. Method of Developing Plant Specific Emergency Operating Procedure from the Generic Guidelines

This document summarizes the method that will be used at the Vogtle Electric Generating Plant (VEGP), Units 1 & 2, to develop plant-specific emergency operating procedures from the Westinghouse Owners Group (WOG) Emergency Response Guidelines (ERGs), Revision 1, High Pressure version. It also presents plant-specific information, and discusses plant-specific differences between the generic reference plant and the VEGP design.

The outline for the mechanics of conversion is given in Procedure 10013-C, WRITING EMERGENCY OPERATING PROCEDURES FROM THE WESTINGHOUSE EMERGENCY RESPONSE GUIDELINES, wherein the preparation, generation, and documentation of the writing are described. This procedure is the administrative control for the instruction and direction of EOP writers.

b. Writers Guide

Procedure 10012-C, EOP AND AOP WRITERS GUIDE, provides administrative and technical guidance on the preparation of all emergency operating procedures (EOPs) and abnormal operating procedures (AOPs). The guide outlines methods of procedure designation and numbering, format, mechanics of style, writing instructional steps, and typing format; in addition, EOP numbering and listing, action verbs, and VEGP acronyms and abbreviations are tabulated. This procedure, along with references such as the Final Safety Analysis Report, system drawings and descriptions, technical specifications, etc., is a primary source document for the writing of EOPs and AOPs.

c. Validation Program

In NUREG 0899, Revision 1, section 2.0, paragraph 2.5, validation is defined as the process whereby the accuracy of information and/or instructions is established. The definition gives examples of validation methods and stipulates that both technical and human factors be considered. For VEGP Units 1 & 2, Georgia Power groups these tasks, as applied to the EOPs, into two separate but related processes. One is termed EOP verification, and the other is called EOP validation.

The first process is a detailed verification of the EOPs; essentially this is an administrative (written correctness) and technical review of the procedures by personnel other than those who wrote them. This review is carried out in accordance with Procedure 10014-C, VERIFICATION OF EMERGENCY OPERATING PROCEDURES, which describes the preparation, assessment and resolution of the verification, and establishes the verification criteria to be used. In addition, the procedure specifies how the findings will be documented.

The second process is a simulator run validation of the EOPs; this is performed by teams of observers and operators who will monitor and assess that the actions specified in each procedure can be effectively carried out by the operating crews to manage emergency conditions. These real time, simulator tests of the EOPs will be conducted in accordance with the EMERGENCY OPERATING PROCEDURE VALIDATION PROGRAM PLAN. This document gives the general goals and aims of validation, as well as the outline of the program which includes preparation, assessment, resolution and documentation.

d. Training Program Description

This document outlines the general areas from which the VEGP Training Department will develop curricula for the EOP training of license candidates. The two main phases of training are the Classroom Instruction Phase and the Simulator Instruction Phase. Detailed program development and subsequent training maintenance will also evolve from this document.

VOGTLE ELECTRIC GENERATING PLANT

UNITS 1 & 2

METHOD OF DEVELOPING PLANT SPECIFIC EMERGENCY OPERATING PROCEDURES FROM THE GENERIC GUIDELINES

1.0 INTRODUCTION

This document summarizes the method Vogtle Electric Generating Plant (VEGP) Units 1 & 2 will use to develop plant-specific EOPs from the Westinghouse Owners Group Emergency Response Guidelines (ERGs) Revision 1 High Pressure Version. Also included is a discussion of the plant-specific differences from the generic reference plant and the effect of these differences on the applicability of the ERGs to VEGP Units 1 & 2.

2.0 COMPARISON OF PLANT SYSTEMS

The high pressure (HP) reference plant is basically a 4-loop plant of current Westinghouse design. The HP reference plant is defined in terms of twenty-five plant systems. A comparison of these systems with VEGP Units 1 & 2 is made in table 1.

TABLE 1

COMPARISON OF SYSTEMS DESIGN

PLANT SYSTEMS	DESIGN DIFFERENCES
Control and Protection Actuation Systems	
Reactor Trip Actuation System	NONE
Engineered Safeguards Features Actuation System	SEE SECTION 3.1
Instrumentation Systems	
Nuclear Instrumentation System	NONE
Control Rod Instrumentation System	NONE
Radiation Instrumentation System	NONE
Containment Instrumentation System	NONE
Process Control Systems	
Reactor Coolant System	SEE SECTION 3.2
Safety Injection System	SEE SECTION 3.3
Residual Heat Removal System	NONE
Chemical and Volume Control System	SEE SECTION 3.4
Component Cooling Water System	SEE SECTION 3.5
Service Water System	SEE SECTION 3.5
Containment Spray System	NONE
Containment Atmosphere Control System	NONE
Main Steam System	SEE SECTION 3.6
Main Feedwater and Condensate System	SEE SECTION 3.7
Auxiliary Feedwater System	SEE SECTION 3.8
Steam Generator Blowdown System	NONE
Sampling System	NONE
Spent Fuel Storage and Cooling System	NONE
Control Rod Drive Mechanism Cooling System	NONE
Control Rod Control System	NONE
Turbine Control System	NONE
Support Systems	
Electrical Power System	SEE SECTION 3.9
Pneumatic Power System	SEE SECTION 3.10

3.0 DISCUSSION OF DIFFERENCES

The following sections describe the differences between the design of systems of the HP reference plant and those of VEGP Units 1 & 2.

3.1 ENGINEERED SAFEGUARDS FEATURES ACTUATION SYSTEM

The VEGP design differs from the HP reference plant in two cases. First, in the VEGP design, the Containment Isolation Phase B (CI-B) signal does not isolate cooling water lines into containment for Reactor Coolant Pump support. This is done by operator action only. Second, the VEGP design has an additional input for the Containment Isolation Phase A (CI-A) signal from the Containment Hi Range Area Radiation Monitors. A high radiation alarm on these monitors generates a CI-A signal. The operator has reset capability on this input as with all other CI-A input signals.

3.2 REACTOR COOLANT SYSTEM

The VEGP design differs from the HP reference plant in one case. The pressurizer PORVs are Class 1E solenoid-operated valves instead of air-operated valves. Each PORV is powered from a separate Class 1E 125 VDC electrical train.

3.3 SAFETY INJECTION SYSTEM

The VEGP design differs from the HP reference plant in the following three areas:

- Boron Injection Tank boron concentration
- Centrifugal Charging Pump alternate miniflows
- Accumulator vent valves

The VEGP design has a Boron Injection tank containing 2000 ppm boric acid solution as compared to 21000 ppm boric acid solution in the HP reference plant.

The VEGP design has an alternate miniflow path for the Centrifugal Charging Pumps that opens on an SI signal. This path contains a relief valve that relieves to the Refueling Water Storage Tank. The HP reference plant does not include this provision.

The VEGP design has two parallel solenoid-operated vent valves on each accumulator. The HP reference plant has a single air-operated valve shown on each accumulator. The VEGP design also has two parallel, solenoid-operated valves on the common vent line downstream of the accumulator vent valves for throttling vent flow. The HP reference plant has a single air-operated valve shown on the common vent line. All the aforementioned valves are powered from Class 1E 125 VDC power supplies.

3.4 CHEMICAL AND VOLUME CONTROL SYSTEM

The VEGP design differs from the HP reference plant in two cases. First, the charging flow indication in the VEGP design indicates total charging flow (the RCS charging flow and the RCP seal injection flow). The reference plant flow indication measures only the RCS charging flow. Second, the VEGP design has additional safety grade boration flowpaths. The valves in these flowpaths are either motor or solenoid-operated, and powered from Class 1E power supplies. The HP reference plant does not show these additional flowpaths.

3.5 COMPONENT COOLING WATER AND SERVICE WATER SYSTEMS

The VEGP design has three cooling water systems that provide the heat removal from all the components that are identified in the HP reference plant Component Cooling Water and Service Water Systems. These three systems are the Component Cooling Water (CCW) System, the Auxiliary Component Cooling Water (ACCW) System, and the Nuclear Service Cooling Water (NSCW) System.

In the VEGP design, the CCW system removes heat from the RHR heat exchangers. The other equipment listed by the HP reference plant as cooled by the CCW system is cooled by the other two systems.

In the VEGP design, the ACCW system removes heat from the seal water heat exchanger and the RCPs. The ACCW system is cooled by the NSCW system. The ACCW system is powered from the Class 1E 4160 VAC power supplies, but is load shed on an SI signal. The equipment cooled by the ACCW system is part of the equipment cooled by the CCW system of the HP reference plant.

In the VEGP design, the NSCW system performs the functions of the Service Water System in the HP reference plant with one additional feature. The containment fan coolers are cooled by NSCW. In the reference plant, they are cooled by the CCW system.

3.6 MAIN STEAM SYSTEM

The VEGP design differs from the HP reference plant in two cases. First, the power operated relief valves on each steamline are not air-operated. They are electo-hydraulic operated and powered (both actuation and control) from Class 1E power sources. Second, the VEGP design has two main steam isolation valves in series on each steamline. The reference plant shows only one valve per steamline.

3.7 MAIN FEEDWATER AND CONDENSATE SYSTEM

The VEGP design differs from the HP reference plant in one case. VEGP has two 50 percent capacity turbine-driven main feedwater pumps instead of the one motor-driven and two turbine-driven main feedwater pumps specified in the reference plant.

3.8 AUXILIARY FEEDWATER SYSTEM

The VEGP design differs from the HP reference plant in the following three areas:

- Motor-driven auxiliary feedwater (AFW) pump throttle valves
- Turbine-driven AFW pump throttle valves
- Auxiliary Feedwater nozzle

The VEGP design has motor-operated throttle valves in the steam generator feed lines from the motor-driven AFW pumps. These valves are powered from Class 1E 480 VAC power supplies. The HP reference plant diagram of the AFW system shows these valves as air-operated control valves.

The VEGP design has motor-operated throttle valves in the steam generator feed lines from the turbine-driven AFW pump. These valves are powered from Class 1E 125 VDC power supplies. The HP reference plant shows these valves as air-operated control valves.

The VEGP design includes a separate 6 inch AFW nozzle in each steam generator. The HP reference plant shows the AFW flow entering the steam generators through the main feedwater line.

3.9 ELECTRICAL POWER SYSTEM

The VEGP design differs from the HP reference plant in one case. The VEGP design has the ACCW pumps as additional major loads that are automatically sequenced on the diesel generator on a blackout signal, the ACCW pumps load shed but may be manually loaded on the diesel generators after completion of automatic sequencing. The HP reference plant has no analogous feature as all loads serviced by the VEGP ACCW system are part of the reference plant CCW system.

The VEGP design has an additional feature not discussed in the HP reference plant description. VEGP has two Non-Class 1E 480 VAC buses powered from the Class 1E 4160 VAC buses. These Non-Class 1E buses are automatically sequenced on the diesel generator on a blackout signal with no SI. On an SI signal, these buses are load shed, but may be manually loaded on the diesel generator under administrative control. These buses power equipment useful during EOP recovery actions.

3.10 PNEUMATIC POWER SYSTEM

The VEGP design differs from the HP reference plant design in that the pressurizer PORV's and the steam generator atmospheric relief valves are not air-operated. These differences are discussed in sections 3.2 and 3.6 respectively.

4.0 CONCLUSION

The differences given in the preceding sections do not preclude the use of the ERGs as bases for writing the VEGP EOPs.

These differences, however, may necessitiate some modification to certain ERG steps when they are converted to EOP steps during the procedure writing process. Such variances would be documented in accordance with procedure 10013-C, WRITING EMERGENCY OPERATING PROCEDURES FROM THE WESTINGHOUSE EMERGENCY RESPONSE GUIDELINES.

5.0 METHOD OF WRITING EOPS FROM ERGS

VEGP EOPs will be written based on Westinghouse Owners Group ERGs in accordance with procedure 10013-C, WRITING EMERGENCY OPERATING PROCEDURES FROM THE WESTINGHOUSE EMERGENCY RESPONSE GUIDELINES. This procedure is included as attachment A.

ATTACHMENT A

PROCEDURE 10013-C

WRITING EMERGENCY OPERATING PROCEDURES FROM WESTINGHOUSE EMERGENCY RESPONSE GUIDELINES

APPROVAL	Georgia Power	PROCEDURE NO.
W. F. Kitchens	POWER GENERATION DEPARTMENT	10013-C
DATE	VOGTLE ELECTRIC GENERATING PLANT	REVISION NO.
4/18/84	UNIT COMMON	0
		PAGE NO. 1 of 3

WRITING EMERGENCY OPERATING PROCEDURES FROM THE WESTINGHOUSE EMERGENCY RESPONSE GUIDELINES

1.0 PURPOSE

In conjunction with Procedure 10012-C, "EOP AND AOP WRITERS GUIDE", this procedure will be used to convert Westinghouse Emergency Response Guidelines (ERGs) into Vogtle Emergency Operating Procedures (EOPs).

Revision 1 of the ERGs will be used to generate Revision 0 of the EOPs. As changes to the ERGs are received or as plant operating experience dictates, the EOPs will be updated per this procedure.

2.0 MECHANICS OF CONVERSION

The ERG-to-EOP conversion process consists of the following phases:

a. Preparation Phase.

b. Generation Phase.

c. Documentation Phase.

The Generation and Documentation Phases procede concurrently.

In this procedure, the word "step" refers to high level action steps, notes, and cautions.

2.1 PREPARATION PHASE

Obtain and review the following information:

a. Westinghouse ERG-HP, Revision 1 Guidelines and Background Documents for the Revision 0 EOP generation. Thereafter use the latest ERG materials.

b. Procedure 10012-C,"EOP AND AOP WRITERS GUIDE".

CONTINUED

c. Final Safety Analysis Report.

d. Technical Specifications.

e. Plant Drawings.

f. Plant-specific setpoint/value documents.

g. Licensing Commitments.

This list is the minimum amount of information to be used; other pertinent sources of information should be consulted.

2.2 GENERATION PHASE

The ERGs list in generic terms the actions which optimize operator response to emergency conditions in the reference plant. To be used in an operating unit, the ERGs must be made plant-specific to that unit.

The writing of an EOP will be done per these guidelines:

a. Read the ERG to be converted, and its corresponding background document.

b. Convert ERG steps to EOP steps by inserting plant-specific information derived from sources as given in Section 2.1 of this procedure, and in accordance with Procedure 10012-C, "EOP AND AOP WRITERS GUIDE".

c. Alter the ERG steps only as necessary to generate EOP steps which conform to plant design; the intents and purposes of the ERG Background Documents should not be affected by these step modifications.

d. Delete ERG steps from the conversion only as necessary to conform the EOP to plant design.

e. Add steps to the EOP which do not have corresponding ERG steps only as necessary to conform the EOP to plant design.

CONTINUED

2.3 DOCUMENTATION PHASE

The Procedure 11894-C, "EOP STEP DOCUMENTATION FORM", will be filled out by the EOP writer to give a justification of how he arrived at a given EOP step from the corresponding ERG step.

2.3.1 The form will be used as follows except as noted in Section 2.3.2:

a. In "SECTION I: ERG STEP", enter the ERG step which is to be made plant-specific.

b. In "SECTION II: EOP STEP", enter the EOP step which was generated from the ERG step.

c. In "SECTION III: JUSTIFICATION", explain why there are differences (or why there are no differences) between the ERG and EOP steps. Also note the sources of the plant-specific information.

2.3.2 The form will be used for exceptional cases as follows:

a. If an ERG step is to be deleted, i.e., not converted to a corresponding EOP step, then enter the ERG step in Section I, enter "Not Applicable to this EOP" in Section II, and justify deletion of the ERG step in Section III, including plant-specific information sources.

b. If an EOP step is generated for which there is no ERG step, enter "No corresponding ERG step" in Section I, enter the EOP step in Section II, and provide justification in Section III,, including the plant-specific information sources.

2.3.3 The completed step documentation forms will be kept, and will be used as source documents to assist in the review, verification, validation, and approval processes.

When an EOP step must be revised, a new step documentation form will be completed and filed immediately preceding any other forms applicable to the step.

END OF PROCEDURE TEXT

APPROVAL	Georgia Power	PROCEDURE NO.
W. F. Kitchens	POWER GENERATION DEPARTMENT	11894-C
DATE	VOGTLE ELECTRIC GENERATING PLANT	REVISION NO.
4/18/84	UNIT COMMON	0
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EOP STEP DOCUMENTATION FORM

ERG # _____ REV _____ EOP # _____ REV _____

EOP WRITER _____ DATE _____

SECTION I: ERG STEP

SECTION II: EOP STEP

SECTION III: JUSTIFICATION _____

_____

_____

_____

_____

EOP AND AOP WRITERS GUIDE

1.0 INTRODUCTION

1.1 PURPOSE

This document provides administrative and technical guidance on the preparation of emergency operating procedures (EOPs) and abnormal operating procedures (AOPs).

1.2 SCOPE

This writers guide applies to the writing of all EOPs and AOPs.

2.0 PROCEDURE DESIGNATION AND NUMBERING

EOPs are procedures that govern the plant operation following reactor trip or SI initiation, and specific operator actions to be taken to return the plant to a stable condition.

AOPs are procedures that govern plant operation when important parameters or systems are in jeopardy, but a situation requiring reactor trip or SI initiation has not occurred. These procedures prescribe operator actions to be taken to return the plant to a normal status.

2.1 COVER SHEET

Each EOP and AOP shall have a cover sheet as described in paragraph 6.2.1. The cover sheet:

a. identifies the procedure

b. identifies the authorized revision

c. states the purpose of the procedure

d. provides the symptoms or entry conditions that require the use of the procedure.

CONTINUED

2.2 PROCEDURE NUMBERING

Procedure numbering follows the scheme set out in VEGP procedure 00050-C, Procedure Writers' Guide.

2.2.1 EOP Numbering and Listing

Example Numbering:

19 033 - 1

- 1 — Applicable Unit
- 033 — Individual identifier correlated to ERG as shown in Table 1
- 19 — Indicates EOP

2.2.2 AOP Numbering

Example Numbering:

18 033 - 1

- 1 — Applicable Unit
- 033 — Sequential Number
- 18 — Indicates AOP

2.3 REVISION NUMBERING AND DESIGNATION

Digit(s) following the abbreviation "Rev" will be used to designate the revision level of the EOP.

Example: Rev 1

- 1 — Revision Level
- Rev — Abbreviation

To identify revisions to the text of an EOP, a change bar located in the left margin alongside the text change will be used to indicate a change in the left column, and a bar in the right margin will indicate the text change in the right column.

CONTINUED

2.4 EOP STEP DOCUMENTATION

Each step, note and caution in an EOP will have 11894-1, EOP Step Documentation Form, completed for it. This will be done regardless of how much the corresponding ERG item was modified. If a step, note, or caution is added or deleted, this will also be documented.

3.0 FORMAT

3.1 PAGE IDENTIFICATION AND NUMBERING

Each page of the procedure will be identified by:

a. Procedure number

b. Revision number

c. Page number, specified as _____ of _____ (page number) of total number of pages in procedure).

This information will be placed in the appropriate blocks at the top of the preprinted procedure forms.

At the top of the first page, in addition to the above information, will be:

a. Approval Signature

b. Date (the final approval date)

c. Unit Number

d. Plant Name

e. The words "EMERGENCY OPERATING PROCEDURE" or "ABNORMAL OPERATING PROCEDURE", as appropriate.

On the first page the procedure title will be typed below item "e".

3.2 PROCEDURE ORGANIZATION

3.2.1 Purpose

Each procedure will contain a brief statement that describes what it is intended to accomplish.

The purpose section will be written on the first page with "PURPOSE" typed above the statement.

CONTINUED

3.2.2 Symptoms/Entry Conditions

Symptoms are process parameters used to identify and characterize a plant condition. Entry conditions are those procedure steps that direct entry into an EOP or AOP. A procedure can have either symptoms, entry conditions, or both.

a. The Symptoms/Entry Conditions section will be placed after the Purpose section.

1. If the procedure has symptoms only, use "SYMPTOMS" typed at the head of the section.

2. If the procedure has entry conditions only, use "ENTRY CONDITIONS" typed at the head of the section.

3. If the procedure has both symptoms and entry conditions, use "SYMPTOMS/ENTRY CONDITIONS" typed at the head of the section.

4. If the procedure contains either symptoms or entry conditions only, then list the symptoms under the heading with bullets (o) preceding each item, e.g.:

SYMPTOMS

- o Any reactor trip annunciator lit.
- o Rapid decrease in neutron level indicated by nuclear instrumentation.
- o All shutdown and control rods are fully inserted.

CONTINUED

5. If the procedure contains both symptoms and entry conditions, list the symptoms first with the phrase, "The symptoms are:" before the first item and then use the phrase, "The entry conditions are:" and list the entry conditions, e.g.:

   SYMPTOMS/ENTRY CONDITIONS

   The symptoms are:

   o All main and emergency AC buses are de-energized.

   The entry conditions are:

   o Procedure 19000-1, REACTOR TRIP OR SAFETY INJECTION, Step 3.

b. The order of symptoms is left to the discretion of the writer.

c. The entry conditions shall be ordered numerically first by procedure number then by step number.

3.2.3 Immediate Operator Actions

These are actions which can be performed from memory without reference to written procedure; typically this involves verification of automatic actions. These actions are listed starting on top of the next page after the symptoms section with "IMMEDIATE OPERATOR ACTIONS" typed above step 1.

3.2.4 Subsequent Operator Actions

If there are immediate operator actions, type "SUBSEQUENT OPERATOR ACTIONS" after the last immediate action step is listed.

If there are no immediate operator actions then omit the title "SUBSEQUENT OPERATOR ACTIONS".

CONTINUED

3.2.4 Sub-Procedures (AOPs Only)

Some AOPs may be more easily followed when developed as sub-procedures. This occurs when many similar abnormal conditions may have different causes. The response may follow one of several paths. In this event, the sub-procedures are designated by capital letters and their titles, and the steps by alphanumerics (e.g., A1, C3, etc.), with no decimal between the letter and number.

If alpha designated sub-procedures are to be used, they will be identified and referenced in the procedure "Purpose" paragraph. Only the symptoms applicable to all conditions covered will be listed on the title page. Each alpha designated sub-procedure will then start on a new page. Symptoms applicable to the specific condition will be listed next, in format as above the title page.

3.2.6 Critical Safety Function Status Trees

The CSFSTs will be of the box and branch format given in the ERGs, and will be printed separately.

3.3 PAGE LAYOUT

For ease of readability it is important that information be displayed with minimum clutter, sufficient distance between lines, and sufficient margins for reproduction and binding.

Interruptions to the flow of information should be minimal. Each action step should be wholly contained on a single page.

The pages on which the action steps are listed will be in a dual-column format. At the top of the page, the left-hand column will be designated "ACTION/EXPECTED RESPONSE (AER) and the right-hand column will be designated "RESPONSE NOT OBTAINED" (RNO). The right-hand column is for contingency actions to be taken when the specified action cannot be performed or the expected response is not obtained.

Write "CONTINUED" in the bottom right-hand corner of each page when the procedure continues on the next page.

Write "END OF PROCEDURE TEXT" after the last step.

CONTINUED

3.4 INSTRUCTION STEP NUMBERING

High level instruction steps will be sequentially numbered in Arabic numerals or Alpha-numerics. The number sequence is maintained throughout the procedure, regardless of when the Subsequent Operator Actions are started.

For EOPs and ACPs without sub-procedures, the Instruction Steps will be indented as follows:

```
1.  Verify ...                          1.  Verify
    a.  Check ...        or                 o   All
        (1) Position                        o   All
```

For AOPs with sub-procedures, the designation A, B, C, etc., as appropriate, will be added immediately to the left of the high level step number:

```
A1. Verify ...                          A1. Verify
    a.  Check                               o   All
        (1) Position                        o   All
```

The same step number sequence is to be used in both the right and left columns of the procedure.

Avoid using the (1) level of indenting.

3.5 LIST OF INCOMPLETE ITEMS (APPLICABLE ONLY TO GENERATION OF REV 0 PROCEDURES)

When procedures are initially prepared, certain information needed for the procedure may not be available. Also, initial content of procedures may be based on documents or data that are not finally approved. In such cases the affected portion of the procedure has "(Later)" typed in. In the cases where the "Later" is an ERG footnote value, it should be represented as "(Later-X)", where X is the footnote number.

"Later" items are generally setpoints and meter readings that may be subject to errors depending on plant conditions, or which must be determined by a study of the actual instruments installed. These laters, as far as possible, are to be resolved by a separate study. The values determined will be entered in procedures where appropriate prior to validation.

CONTINUED

The List of Incomplete Items provide a means of readily identifying such items until final resolution is obtained. The List of Incomplete Items will be on the page immediately following the last step. The purpose of the list will be made self-explanatory by a preprinted statement, as shown in Figure 1. Once all items are resolved, the list is deleted from the procedure.

The pages of the list will be numbered with lower case Roman numberals, i.e., i, ii, etc.

List Of Incomplete Items

At the time this procedure was written, information regarding the items listed below was incomplete. These items are either designated as "(Later)", "(Later-X)", or, if some information was available, an estimate or a description of the information was included.

Section or Step No.	Page	Item
Step No. 6	3	Charging Pump Suction Press
Step No. 8	4	ERG Footnote X

Figure 1 - Sample List Of Incomplete Items

4.0 MECHANICS OF STYLE

Action statements should be short and direct. Use only active, positive verbs. Avoid negative statements. Be precise and specific.

4.1 SPELLING

Spelling should be consistent with modern usage, as presented in the American Heritage Dictionary, Second Edition. When a choice of spelling is offered by a dictionary, the first spelling should be used.

CONTINUED

4.2 HYPHENATION

Hyphens are used between elements of a compound word when usage calls for it. The following rules should be followed for hyphenation.

- When doubt exists, the compound word should be restructured to avoid hyphenation.
- Hyphens should be used in the following circumstances:
  - a. in compound numerals from twenty-one to ninety-nine; e.g.: one hundred thirty-four
  - b. in fractions; e.g.: one-half, two-thirds
  - c. in compounds with "self"; e.g.: self-contained, self-lubricated
  - d. when the last letter of the first word is the same vowel as the first letter of the second word. As an alternative, two words may be used; e.g.: fire-escape or fire escape
  - e. when misleading or awkward consonants would result by joining the words; e.g.: bell-like
  - f. to avoid confusion with another word; e.g.: re-cover to prevent confusion with recover, pre-position to avoid confusion with preposition
  - g. when a letter is linked with a noun; e.g.: X-ray, O-ring, U-bolt, I-beam
  - h. to separate chemical elements and their atomic weight; e.g.: Uranium-235, U-235

4.3 PUNCTUATION

Punctuation should be used as necessary to aid reading and prevent misunderstanding. Word order should be selected to require a minimum of punctuation. Punctuation should be in accordance with the following rules:

CONTINUED

4.3.1 Brackets

In EOPs, use brackets only to denote setpoints and values for adverse containment conditions. Do not use brackets in AOPs.

4.3.2 Colon

Use a colon to indicate that a list of items is to follow, e.g.: Restore cooling flow as follows:

4.3.3 Comma

Overuse of commas is a sign that the instruction is too complex and needs to be rewritten.

Use a comma after conditional phrases for clarity and ease of reading; e.g.: WHEN level decreases to 60 inches, THEN start pump ....

4.3.4 Parentheses

Parentheses shall be used to indicate alternate items in a procedure, instruction, or equipment numbers.

4.3.5 Period

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

CONTINUED

4.4 VOCABULARY

Words used in procedures should convey precise understanding to the trained person. The following rules apply.

- o Use simple words.
- o Use words in their common usage.
- o Use words that are concrete rather than vague, specific rather than general, familiar rather than formal, precise rather than blanket.
- o Uniquely define key words that may be understood in more than one sense.
- o Use active, positive directions.
- o Verbs with specific meaning should be used. Examples are listed in Table 2.
- o Equipment status should be denoted as follows:

  a. 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).

  b. Operating--This word means that a system, subsystem, train, component, or device is in operation and is performing its specified function(s).

CONTINUED

4.5 NUMERICAL VALUES

The use of numerical values should be consistent with the following rules:

- o Arabic numerals should be used.
- o For numbers less than unity, the decimal point should be preceded by a zero, e.g.: 0.1.
- o The number of significant digits should be consistent with the accuracy available from the instrument and the reading ability of the operator.
- o Acceptance values should be specified 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, statement of the midpoint and its lower and upper limits for each data cell would accomplish the same purpose; e.g.: 9.5 to 10.5 milliamperes. Avoid using ±.
- o Engineering units should always be specified for numerical values of process variables. They should be the same as those used on the control room displays, e.g.: psig instead of psi.

4.6 ABBREVIATIONS, LETTER SYMBOLS, AND ACRONYMS

Common abbreviations and acronyms should be used where their meaning is unquestionably clear to the reader. Consistency should be maintained throughout the procedure. Table 3 is a list of common abbreviations as used in VEGP documents.

Capitalization of abbreviations should be uniform. If the abbreviation is comprised of lowercase letters, it should appear in a title or heading. The period should be omitted in abbreviations except in cases where the omission would result in confusion.

Letter symbols may be used to represent operations, quantities, elements relations, and qualities.

CONTINUED

Abbreviations, symbols, and acronyms should not be overused. Their use should be for the benefit of the reader. They can be beneficial by saving reading time, ensuring clarity when space is limited and communicating mathematical ideas.

5.0 WRITING INSTRUCTIONAL STEPS

This section presents guidance for use when preparing EOPs and AOPs, and is applicable to both unless otherwise specified.

5.1 INSTRUCTIONAL STEP LENGTH AND CONTENT

One of the most important factors to be considered when writing emergency/abnormal procedures is "when" the procedure will be utilized (i.e., during high stress conditions). Steps consisting of several actions result in a complex grouping of information which can increase reading time and reduce comprehension. It can also lead to the omission of actions. Steps that are short and concise can greatly assist the operator when using the procedure under stressful conditions. Therefore, procedural steps should be written consisting of a single sentence or sentence fragment.

Specify what is to be done, not what is to be avoided. Negative and passive statements are more likely to be misunderstood in a stressful situation.

The following guidance is applicable to step length and content, and shall be considered when writing a procedure.

- Operator actions should be presented in order of importance and use.
- The entire action step should be listed on the page on which it started.

CONTINUED

- If actions are functionally related (i.e., they must be performed together to accomplish a result) these actions may be directed in a single step. However, if the step consists of three or more actions, list each action separately rather than in a single sentence. For example:

  Shut seal water injection valves:

  - HV-8103A
  - HV-8103B
  - HV-8103C
  - HV-8103D
  - Minimize the number of action verbs and objects of actions in a single step.
  - Do not use footnotes.

5.1.1 Action/Expected Response Column (AER)

The left-hand column of the procedure is entitled "Action/Expected Response". This column contains the instructional action steps initiated by the operator. The steps should be arranged in a logical sequence with technical necessity being the overriding consideration.

For EOP AER columns only, when specifying the expected position, status, or value of an item or parameter, the expected response should be separated by hyphen from the item/parameter, and fully capitalized as follows:

- Check seal water injection valve HV-8103A - OPEN
- Check power to block valves - AVAILABLE
- Verify RCS pressure - GREATER THAN 2000 PSIG

CONTINUED

The AER Column is subdivided into two categories, Immediate Operator Actions and Subsequent Operator Actions. To determine whether a step is an immediate action or subsequent action, consider:

- Immediate Operator Actions are those actions which operators should take at once to stop further degradation of existing conditions, to mitigate their consequences, and to allow the operators to evaluate the situation. Normally, these actions include:

  1) verification of proper automatic protection system function following a reactor trip or safety injection,

  2) assessment of plant conditions,

  3) identification of appropriate recovery procedures.

- Subsequent Operator Actions are those actions used to return the plant to a normal, stable, or a safe steady-state condition, or to provide for a safe extended shutdown period. These steps shall contain those actions required to achieve the objectives (or purpose) of the procedure.

5.1.2 Response Not Obtained Column (RNO)

The right-hand column of the procedure is entitled "Response Not Obtained". This column will be formatted in the same way as the AER column (i.e., same categories and numbering scheme). Operator contingency actions which should be taken when a stated condition, event, or task does not represent or achieve the expected results, will be contained in the RNO column. The following guidance is applicable to this column:

- Provide supplemental information such as branching to, or referencing another procedure.

- Provide supplemental actions such as manually initiating automatic functions which have failed.

- RNO actions will be listed directly across from, and have the same step number as the applicable AER step.

CONTINUED

5.1.3 Step Sequencing

A written procedure presents steps in a sequence. Some steps can be performed concurrently or in a variety of sequences to accomplish the same result. When writing a procedure, order the actions using the following considerations:

- Determine if an action is an immediate operator action or a subsequent operator action.
- Order the action steps logically and according to technical necessity.
- Consider the physical layout and organization of the control room for optimal staff movement and monitoring.
- State when high level action steps do not have to be performed in the given sequence.
- Designate multiple action steps within a single step by letters (a, b, c, etc.) when sequencing is required. For example:

  1. Establish letdown flow

     a. Open letdown CNMT isolation valves

     b. Open letdown line isolation valves

     c. Open letdown orifice valve

- Designate multiple steps within a single step by bullets (o) when sequencing is not required. For example:

  c. Verify SG blowdown isolation valves - SHUT:

     - HV-7603A
     - HV-7603B
     - HV-7603C
     - HV-7603D

CONTINUED

5.2 CONDITIONAL STATEMENTS

5.2.1 Logic Terms

The terms AND, OR, IF, IF NOT, THEN, and WHEN should be used to logically construct conditional statements, and to express complex combinations of conditions and actions. These logic terms must be written into the procedure in a manner that will clearly identify the conditions that must be satisfied prior to taking the required action. It is important that these statements use the principles and techniques of formal logic so that they are correct, unambiguous, and complete.

5.2.2 Conjunctive Uses of "And", "Or", "Then"

a. When used to connect words or short phrases in a sentence, the words "and" and "or" shall not be emphasized by full capitalization and underlining, e.g.:

- Read and record core thermocouple temperatures
- Refer to SPDS or printed CSFSTs

b. When used as conjunctions connecting paragraphs or substeps, the words "and" and "or" shall be emphasized by full capitalization with hyphens placed immediately to the right and left of the word; also, the conjunction will be centered with respect to the items it is connecting, e.g.:

- 15. Check if ECCS Should Be Locked Out:

    a. Verify RCS pressure - LESS THAN 500 PSIG

    -AND-

    b. Verify RCS temperature - LESS THAN 392°F

CONTINUED

o b. Secondary heat sink:

o Total feed flow to intact SG - GREATER THAN 200 GPM

-OR-

o NR level in at least one SG - GREATER THAN 6%

c. The word "then" should not be used as a conjunction at the end of one action to instruct the operator to perform the next action, e.g.:

o Verify all SI accumulators isolated, then cooldown PRZR with auxiliary spray.

d. The word AND should not be used to join more than two conditions. If more than two conditions are required, a list should be used, e.g.:

IF all of the following conditions are met:

o RCS pressure above _____ psig,

o PZR level above _____%,

o CNMT pressure below _____ psig

.
.
.

o RCS temperature below _____°F,

THEN reset SI.

e. Most steps should be written using single action verbs and single direct objects. However, if combinations of two conditions are required, the word OR should be placed between the conditions, e.g.:

IF RCS pressure is rising,
OR PZR level is rising,
THEN go to step 7.

In this case, OR is to be taken in the inclusive sense, i.e., either one or both conditions will call for going to step 7.

CONTINUED

f. The word OR should not be used to join more than two conditions. If more than two conditions are required, a list should be used, e.g.:

IF one or more of the following conditions is met:

- o RCS pressure above _____ psig
- o PZR level above _____%
- o CNMT pressure below _____ psig

.
.
.

THEN DO NOT reset SI.

5.2.3 Structure and Use of Conditional Statements

Conditional statements should appear before the action statement. Logic terms and sequences will be emphasized so that the operator can clearly identify all conditions and actions contained in a given logic sequence.

a. Conditional statements shall begin with the words IF, IF NOT, or WHEN, followed by a description of the condition. The action statement which follows will begin with THEN. The logic terms IF IF NOT, WHEN, THEN, OR, AND will begin their sentences on separate lines. For example, a step would be written as:

WHEN PZR temperature reaches 480°F to 500°F, THEN stop charging pump

rather than:

WHEN PZR temperature reaches 480°F to 500°F, THEN stop charging pump.

(an exception to the left justified placement of THEN is given in paragraph "b" below)

CONTINUED

b. The use of IF NOT should be limited to those cases where the operator might have to respond to the second of two possible conditions. IF should be used to specify the first condition. The only time a conditional THEN does not start a separate line is when it follows IF NOT; e.g.:

IF pressure is rising,
THEN stop the injection pump.
IF NOT, THEN start an additional injection pump.

c. Most steps should be written using single action verbs and single direct objects. However, if combinations of two conditions are required, the word AND should be placed between the conditions, e.g.:

IF RCS pressure is rising,
AND PZR level is rising,
THEN go to step 7.

5.3 CAUTIONS AND NOTES

Cautions are a way to call attention to situations or actions that can result in personal injury or equipment damage. Notes provide supplemental information. Cautions and notes should not be overused to prevent diminishing their effectiveness as an attention-getter. Cautions and notes shall not direct actions.

5.3.1 Cautions

The term "caution" should be used to alert an operator to conditions that could result in health hazards, equipment damage, or plant damage.

a. The caution statement will be identified with the heading CAUTION fully capitalized and underlined.

b. The entire caution statement, including the heading, will be centered in the middle of the page and boxed. The statement should be short; not over 3 or 4 lines when typed.

c. Do not print the caution text in all capitals.

CONTINUED

d. Use short, concise sentences to describe the hazardous conditions.

e. Place a caution immediately before the first step to which it applies.

f. The entire caution test shall be on the same page as the first step to which it applies.

g. If two or more caution statements pertain to the same step, each statement will be indicated by a bullet and all will be placed in the same box.

5.3.2 Notes

Notes are a procedural means for providing important supplemental information to the operator.

a. The note statement will be identified with the heading NOTE fully capitalized and underlined.

b. The entire note statement, including the heading, will be centered in the middle of the page, and will not be boxed. The note should be brief.

c. Do not print the note text in all capitals.

d. Present information to the user in the order in which it is needed. If the information in the note is intended to aid in the performance of a step, place the note just ahead of the step to which it applies. If it pertains to the results of a step, place it just after the step.

e. A note should be located in the same page as the step to which it applies.

5.3.3 Examples

a. An example Caution:

CAUTION

The first eleven steps of 19001-1 NATURAL CIRCULATION COOLDOWN should be performed before continuing with this procedure

CONTINUED

b. An example note:

NOTE

- Foldout page should be open
- RCPs should be run in order of priority to provide normal pressurizer spray

5.4 CALCULATIONS

Required calculations in EOPs and AOPs should be avoided due to the elevated stress conditions. If calculations must be performed, enough space shall be provided in the procedure text for the operator to perform the calculations and record the results.

a. Calculations that must be performed repeatedly or displayed in graph form should be incorporated within the procedure using attachments.

b. Provide conversion factors or other information so that the operator can obtain the answer in the correct units.

5.5 METHODS OF EMPHASIS

Key instructions can be enhanced if certain types of words, phrases, or nomenclature are consistently emphasized. Capitalization, underlining and coloring are methods which can be used. Excessive use of these methods should be avoided to prevent loss of their effectiveness.

5.5.1 Generally, the following terminology applies:

- "Capitalize" means capitalizing only the first letter of the word.
- "Fully capitalize" means capitalizing the entire word.
- "Underline" means to underscore an entire word or phrase with a horizontal line.

CONTINUED

5.5.2 The following items are to be capitalized:

- o Organizations, Institutions, Companies and Associations, e.g.: Georgia Power
- o Titles of works and publications, e.g.: Final Safety Analysis Report
- o Titles of staff positions and personal titles, e.g.: Plant Manager
- o The high level steps on the AER of the procedure text, e.g.: Check IF RCS Is Isolated (other rules for AER capitalization are given in section 5.1.1; low level steps on both AER and RNO sides generally use normal capitalization.

5.5.3 The following items are to be fully capitalized:

- o Abbreviated titles of plant systems, e.g.: SI, RHR
- o System component and device identifiers, e.g.: HV-8103A
- o Verbatim equipment nameplates, e.g.: ROD BANK SELECTOR
- o Engraved switch position, e.g.: Place ROD BANK SELECTOR in MANUAL
- o Verbatim annunciator light wording, e.g.: ROD CONTROL URGENT FAILURE ALARM
- o Procedure titles, e.g.: REACTOR TRIP OR SAFETY INJECTION

5.5.4 The following items are to be fully capitalized and underlined:

- o Logic words, e.g.: <u>IF</u>, <u>WHEN</u>, <u>THEN</u>, <u>OR</u>, <u>AND</u>
- o <u>CAUTION</u> and <u>NOTE</u> headings
- o Undesirable actions or conditions, e.g.: <u>DO NOT</u> reset SI

(When used as conjunctions in other than "<u>IF</u>,...<u>THEN</u>" conditional statement, "or" and "and" will be treated as given in 5.5.2)

CONTINUED

5.6 REFERENCING AND BRANCHING

Proper "referencing" and "branching" techniques will minimize errors and delays in proceeding from one procedure to another.

5.6.1 General Guidelines

The terms "referencing" and "branching" are used to imply two distinctly different instructions. Referencing implies the cited procedure will be used as a supplement to, and that it will be performed concurrently with the one in effect. Branching implies the procedure in use shall be exited and a new procedure entered.

When deciding to branch to and reference other procedures, consider the following:

a. If the information can be included in a procedure without appreciably increasing its length, referencing and branching should be avoided.

b For AOPs only, if it is necessary to return to the original procedure, use branching. Direct the operator to return to the correct procedure and step; e.g.:

WHEN RCS temperature is above 108°F,
THEN Go to Procedure 13003-1, REACTOR COOLANT SYSTEM, to start one RCP

-AND-

Return to Step 7 of this procedure.

For EOPs, branching should be as specified by the ERGs.

CONTINUED

5.6.2 Referencing and Branching Terminology

To maintain consistency in referencing or branching to another procedure:

a. Use "Go to" when it is desired to branch to another procedure.

Example: IF the reactor trips,
THEN go to the Procedure 19000-1,
REACTOR TRIP OR SAFETY INJECTION

b. Use "INITIATE" when it is desired to reference another procedure.

Example: IF all rods NOT inserted
THEN initiate Procedure 18070-1,
EMERGENCY BORATION.

c. Other procedures will be identified by their number and full title. Examples are shown in a and b above.

5.7 COMPONENT IDENTIFICATION

Nomenclature that will assist the operator in accurately and quickly identifying equipment, controls, and displays should be used. Several methods to accomplish this are available and it is up to the discretion of the procedure writer to choose the method which best fits the situation. To make instructions as specific as possible without restricting the operator, a combination of these methods may be appropriate.

5.7.1 Methods of Identification

a. Verbatim nameplate identification - use when the operator should have no option but to use the equipment, control, or display identified. This is the most restrictive method and it could be confusing due to the abbreviations and long numbers that some equipment have. Not allowing an operator flexibility also implies that the equipment specified is operable when, in fact, it might not be.

Example of verbatim nameplate identification:

START CNDR VCM PP 1CAD1CA

CONTINUED

b. Word paraphrasing - use key identifying words to eliminate the potential confusion of the verbatim method. This method can be used to allow operator flexibility in choosing among alternate equipment by eliminating the number or letter designator.

Example of word paraphrasing with no operator flexibility:

Start Condenser Vacuum Pump A

Example of word paraphrasing with operator flexibility:

Start one Condenser Vacuum Pump

c. Common usage - although this method of identifying equipment can be the most concise and recognizable, the use of this method should be limited to those terms generally known industry-wide.

Example of common usage identification with no operator flexibility:

Start Hogger A

Example of common usage identification with operator flexibility:

Start one Hogger

5.7.2 Identification by Location

Because some procedures may involve relatively unfamiliar or infrequently performed tasks, the search for valves, switches, instruments or other items referred to in the procedure might be time consuming. The procedure writer should include location information in such cases.

5.8 LEVEL OF DETAIL

The degree of detail required for a step must be evaluated on a case-by-case basis. Always consider that the procedure is for emergency or abnormal conditions.

a. Details should be given for operators with the minimum expected skill level and experience.

CONTINUED

b. The operator should have all the information required for the task available to him.

c. Excessive detail may slow down the response.

d. Objects of actions must be identified adequately to prevent errors of identification or omission.

e. Any limits on the actions must be stated quantitatively whenever possible, e.g.:

The statement "Maintain SG levels above the low-low level trip"

should read "Maintain SG level above 21% NR"

f. Importance or complexity of the task may make greater detail necessary.

5.9 OPERATOR AIDS

Operator aid (figures, graphs, SPDS, etc.) can be used to assist the operator in making decisions. These aids can be an important asset to the operator and provide significant procedure support.

5.9.1 Printed Operator Aids

Printed operator aids (figures, charts, tables, graphs) can reduce operator error and increase speed of action.

a. Printed aids must be self-explanatory and legible.

b. Values used in printed aids must be in the same units as the operator reads on plant instrumentation and in the procedure.

c. Printed aids should not be included in the procedure text. They should be added, if appropriate, as attachments.

5.9.2 Computer-Driven Operator Aids

Computer-driven aids (Proteus, SPDS) display trends, perform calculations and provide guidance. Care must be exercised when specifying these aids in a procedure because they may not be available when needed. Therefore, a backup method for obtaining the same information must be included in the procedure.

CONTINUED

5.9.3 Units of Measure

Units of measure should be familiar to the operator. When presenting measured parameters, provide a band whenever possible e.g., 45 to 55%; NOT 50% ± 5.

Values should be presented in the same units as those displayed on the instrument i.e., do not require a flow rate in gallons per hour when the instrument reading is in gallons per minute.

Do not require the operator to make arithmetic conversions, e.g., 27 ft ± 1%.

5.9.4 Figures, Tables, and Attachment Numbering

The first letter of each of the words Figure, Table or Attachment will be capitalized. Sequential arabic numbers shall be assigned to each and shall correspond with the order of their reference in the procedure text. The symbol "#" and abbreviation "No." are unnecessary and should not be used.

Each figure, table, or attachment will have a title. The title will be capitalized and specified (in addition to figure, table, or attachment number) when referenced in the procedure text, e.g.: Refer to Figure 2, Capability Curve.

5.10 STAFFING AND TITLES OF STAFF PERSONNEL

5.10.1 Consideration of Staffing

The procedure should be written so that the number of operators required to perform the actions does not exceed the normal shift staffing required by Technical Specifications. In addition to technical specifications, the following should be considered when assigning sequential, concurrent and other responsibilities in a procedure:

a. Minimize physical conflicts between operators, i.e., performing actions at the same location at the same time, or crossing paths.

b. Avoid duplication of actions.

c. Ensure that the supervisor will be able to keep up with the operators and plant status.

CONTINUED

5.10.2 Titles of Staff Personnel

When it is required (or desired) to assign actions to specified personnel, the titles used will be those in the Plant Organizational Chart.

6.0 TYPING FORMAT

This section provides guidance which should be followed when typing EOPs and AOPs.

6.1 GENERAL INSTRUCTIONS

For EOPs and AOPs use the following general guidelines:

- Pre-printed Georgia Power Company forms shall be used (703101 and 703445).
- Two type elements are needed

  (1) Prestige, pitch 10
  (2) Rhetoric, pitch 10

  Prestige shall be used unless Rhetoric is specified.
- With the exception of spelling, do not edit the procedure text without the writer's approval.
- Typed procedures should be returned to the writer for proofing.
- Page numbering shall use the page "____ of ____" format, with the exception of "Later" pages, which continue to be numbered i, ii, ... and not "____ of _____".
- The word "CONTINUED" shall be placed in the lower right-hand corner of each page (except for the final page). It should be located in a manner to prevent interference with the procedure text and be fully capitalized.
- On the last page of the procedure text, the words "END OF PROCEDURE TEXT" shall be centered and fully capitalized. Allow six line spaces between the last line of text and the words END OF PROCEDURE TEXT. (Spacing may be reduced to prevent using a new page which would only contain this statement).

CONTINUED

- Page margins are defined by the pre-printed form borders.
- Procedure text shall be single-spaced.
- For EOPs the back of each page is to be blank and unnumbered.

6.2 PAGE ARRANGEMENT

Type each page as consistently as possible. The following gives the spacing recommendations and type style used for the title and instructional pages.

6.2.1 Title Page

- Each procedure shall have a title page.
- Georgia Power Company form 703101 shall be used.
- The pre-printed form information (i.e., UNIT, PROCEDURE NO., REVISION NO., and PAGE NO.) shall be entered.
- The heading "EMERGENCY OPERATING PROCEDURE" or "ABNORMAL OPERATING PROCEDURE" shall be 12 line spaces below the top of the paper and centered. All letters will be lower case using Rhetoric, pitch 10 type.
- The procedure title shall be triple-spaced below the procedure heading and centered. The title will be fully capitalized using Rhetoric, pitch 10 type.
- The "PURPOSE" heading shall be triple-spaced below the procedure title, indented five spaces, fully capitalized, and underlined.
- The PURPOSE text shall be double-spaced from its heading and indented five spaces. The text will use single line spacing and block form.
- The headings "SYMPTOMS", "ENTRY CONDITION", and "SYMPTOMS/ENTRY CONDITIONS" shall be triple-spaced below the last line of the PURPOSE text, indented five spaces, fully capitalized, and underlined.

CONTINUED

- The symptoms or entry conditions shall be double-spaced from the heading.

- Symptoms and entry conditions shall be double-spaced from each other, although the text is single-spaced.

- Each symptom shall be indicated by a bullet (o). Type style and spacing requirements are the same as those described for the PURPOSE text.

- If the symptoms must be continued on another page, use Georgia Power Company form 703445 and begin 12 line spaces below the top of the page. Spacing follows that previously described.

- If a breakout into sub-procedures is used (AOPs only), symptoms specific to the sub-procedure are triple-spaced below the sub-procedure title. The sub-procedure is centered on form 703445, 12 spaces below the top of the page.

- Cautions, notes and instructional steps shall <u>not</u> start on the same page as the title page information.

6.2.2 Instructional Pages

- Instructional pages shall be typed on Georgia Power Company form 703445 and start on a new page.

- Each page shall have two column headings: "ACTION/EXPECTED RESPONSE", and "RESPONSE NOT OBTAINED". These headings shall start 8 line spaces below the top of the paper, be fully capitalized, and underlined. Indentation will be 7 spaces for ACTION EXPECTED RESPONSE (AER) heading and 44 spaces for RESPONSE NOT OBTAINED (RNO) heading.

  These column headings will be triple-spaced between the symptoms on the initial page of each sub-procedure for AOPs.

CONTINUED

- For AOPs with sub-procedures, each sub-procedure will start on a new page with the condition title centered

- The headings "IMMEDIATE OPERATOR ACTIONS", and "SUBSEQUENT OPERATOR ACTIONS" shall be triple-spaced below any other typed line, indented 7 spaces, fully capitalized, and underlined.

- Numbered, high level instruction steps shall be trip spaced below any other typed line.

- Separate statements and a following list of valves, switches, components, etc., shall be double-spaced; the spacing within a list of valves, switches, components, etc., will be single.

- Corresponding steps under the AER and RNO columns must begin on the same line.

6.3 NOTES AND CAUTIONS

6.3.1

- The heading NOTE shall be fully capitalized, underlined, centered, and triple-spaced below the preceding text.

- The note text shall start not less than 10 spaces (1") from the left border and continue to not closer than 10 spaces (1") from the right border. The length of lines may vary in order to contain each statement in 3 or less lines. The text will be double-spaced from the note title.

- Multiple note statements shall be identified by bullets and be double-spaced from each other.

- The next printed line shall be triple-spaced from the last line of the last note's text.

- The entire note shall be contained on one page.

CONTINUED

6.3.2 Cautions

- CAUTION statements shall be further identified by boxing the heading and text. This is accomplished by double spacing a horizontal line (underline key) below the preceding text. This line starts 10 spaces from the left border and runs to 10 spaces from the right border.
- The heading CAUTION shall be fully capitalized and triple-spaced below the horizontal line, centered, and underlined.
- The first line of the first cautionary statement shall be double-spaced from the CAUTION heading.
- Multiple caution statements shall be identified by bullets and be double-spaced from each other.
- A second horizontal line shall be double-spaced from the last line of the last caution's text, of equal length and spacing with the first horizontal line.
- The next line of procedure text shall be triple-spaced below the lower horizontal line.
- The entire caution statement shall be on one page and it must be placed on the same page as the step to which it applies.

6.4 BREAKING OF WORDS

Breaking of words (i.e., hyphenation) should be avoided.

6.5 ROTATION OF PAGES

For a rotated page:

- The page margins do not rotate.
- Page identification and numbering should not be rotated.
- The unrotated heading shall be to the right end of the rotated print.

CONTINUED

6.6 ATTACHMENTS

6.6.1 General Instructions

- Attachments shall be placed on Georgia Power Company form 703445.
- All attachments shall be identified by the heading, "ATTACHMENT X", fully capitalized, centered, and underlined; X shall be A, B, C, etc.

6.6.2 Tables

- The ATTACHMENT X heading shall be eight spaces below the top of the paper.
- The title of the table shall be triple-spaced from the heading, fully capitalized, centered, and underlined.
- The column headings shall be triple-spaced from the title, fully capitalized, and underlined.
- When given, engineering units shall be single spaced from the column title, fully capitalized, enclosed in parentheses, and centered with respect to the column title.
- The first data entry line shall be double-spaced from the column heading.
- The layout of the remaining data shall be as specified by the writer.

6.6.3 Figures and Other Special Condition Listings

Except for the General Instructions, the layout of figures and special listings shall be as specified by the writer.

6.7 USE OF FOLDOUT PAGES

The format shall be as specified by the writer. When used, a foldout page is treated as a single page.

CONTINUED

6.8 USE OF OVERSIZED PAGES

With the exception of foldout pages, oversized pages should not be used. Text should be reorganized or reduced to a standard 8 1/2" X 11" page.

6.9 USE OF REDUCED PAGES

Reduced pages should be avoided whenever possible. Final size of reduced pages should be standard 8 1/2" X 11" page size. Reduced pages should be readable.

END OF PROCEDURE TEXT

Table 1. EOP Numbering and Listing

VEGP NUMBER	TITLE	WOG ERG NUMBER
19000-1	Reactor Trip or Safety Injection	E-0
19001-1	Reactor Trip Recovery	ES-0.1
19002-1	Natural Circulation Cooldown	ES-0.2
19003-1	Natural Circulation Cooldown With Steam Void in Vessel (With RVLIS)	ES-0.3
19004-1	Natural Circulation Cooldown With Steam Void in Vessel (Without RVLIS)	ES-0.4
19005-1	Rediagnosis	ES-0.0
19010-1	Loss of Reactor or Secondary Coolant	E-1
19011-1	SI Termination	ES-1.1
19012-1	Post-LOCA Cooldown and Depressurization	ES-1.2
19013-1	Transfer to Cold Leg Recirculation	ES-1.3
19014-1	Transfer to Hot Leg Recirculation	ES-1.4
19020-1	Faulted Steam Generator Isolation	E-2
19030-1	Steam Generator Tube Rupture	E-3
19031-1	Post-SGTR Cooldown Using Backfill	ES-3.1
19033-1	Post-SGTR Cooldown Using Steam Dump	ES-3.3
19100-1	Loss of All AC Power	ECA-0.0
19101-1	Loss of All AC Power Recovery Without SI Required	ECA-0.1
19102-1	Loss of All AC Power Recovery With SI Required	ECA-0.2
19111-1	Loss of Emergency Coolant Recirculation	ECA-1.1
19112-1	LOCA Outside Containment	ECA-1.2
19121-1	Uncontrolled Depressurization of All Steam Generators	ECA-2.1

Table 1. EOP Numbering and Listing (continued)

VEGP NUMBER	TITLE	WOG ERG NUMBER
19131-1	SGTR With Loss of Reactor Coolant-Subcooled Recovery Desired	ECA-3.1
19132-1	SGTR With Loss of Reactor Coolant-Saturated Recovery Desired	ECA-3.2
19133-1	SGTR Without Pressurizer Pressure Control	ECA-3.3
19201-1	Subcriticality CSFST	F-0.1
19202-1	Core Cooling ESFST	F-0.2
19203-1	Integrity CSFST	F-0.3
19204-1	Heat Sink CSFST	F-0.4
19205-1	Containment CSFST	F-0.5
19206-1	Inventory CSFST	F-0.6
19211-1	Response to Nuclear Power Generation/ ATWT	FR-S.1
19212-1	Response to Loss of Core Shutdown	FR-S.2
19221-1	Response to Inadequate Core Cooling	FR-C.1
19222-1	Response to Degraded Core Cooling	FR-C.2
19223-1	Response to Saturated Core Cooling	FR-C.3
19231-1	Response to Loss of Secondary Heat Sink	FR-H.1
19232-1	Response to Steam Generator Overpressure	FR-H.2
19233-1	Response to Steam Generator High Level	FR-H.3
19234-1	Response to Loss of Normal Steam Release Capabilities	FR-H.4

Table 1. EOP Numbering and Listing (continued)

VEGP NUMBER	TITLE	WOG ERG NUMBER
19235-1	Response to Steam Generator Low Level	FR-H.5
19241-1	Response to Imminent Pressurized Thermal Shock Conditions	FR-P.1
19242-1	Response to Anticipated Pressurized Thermal Shock Conditions	FR-P.2
19251-1	Response to High Containment Pressure	FR-Z.1
19252-1	Response to Co.. ainment Flooding	FR-Z.2
19253-1	Response to High Containment Radiation Level	FR-Z.3
19261-1	Response to High Pressurizer Level	FR-I.1
19262-1	Response to Low Pressurizer Level	FR-I.2
19263-1	Response to Voids in Reactor Vessel	FR-I.3

Table 2. Action Verbs

Verb	Application
Activate	To set an organization or plan into action. "Activate the TSC."
Actuate	To put into mechanical action or motion, typically an automatic function. "Actuate SI."
Adjust	To change to correspond to a given condition. "Adjust charging to maintain pressurizer level."
Align	Place systems or components in proper positions to allow performance of a specified function. "Align RHR for normal RCS cooldown."
Allow	To permit a stated condition to be achieved prior to proceeding. "Allow discharge pressure to stabilized."
Block	To prevent normal operation of an automatic system. "Block low pressurizer pressure SI."
Bypass	To prevent normal operation of a component of an automatic system while that automatic system remains operable. "Bypass N31 Source Range Hi Flux Rx Trip."
Calculate	To perform a mathematical process. "Calculate Shutdown Margin."
Check	To perform a comparison with a procedural requirement. "Check if SI can be terminated."

Table 2. Action Verbs

Verb	Application
Close	Do not use for valves (see Shut). To change the physical position of a breaker to allow passage of electrical current. "Close breaker ANB1002."
Continue	To go on with a particular action.
Complete	To accomplish specified procedural requirements. "Complete valve checklist A."
Control	To perform all necessary actions to establish and maintain a given condition. "Control AFW feed flow to maintain SG level greater than 69% WR."
Correct	To perform all necessary actions to remove, repair or counteract a malfunction. "Correct cause of Turbine Trip."
Declare	To state officially and formally. "Declare SI Pump A inoperable."
Decrease	Do not use because of verbal communication problems.
De-energize	To remove power supply. "De-energized Pressurizer Backup Heaters."
Depress	Used only with pushbutton operation. To exert a force to move the pushbutton to make or break electrical contacts. "Depress DG 1A START button."

Table 2. Action Verbs

Verb	Application
Direct	To require specific actions from an individual or department. "Direct Chemistry to sample all SGs."
Dispatch	To send to a specific location or on specific business. "Dispatch PEO to AFW Pumphouse to check MDAFW Pump A."
Drain	To take action to empty a component or system of fluid. "Drain ACCW Pump A to the CCDT."
Ensure	Take necessary actions to guarantee conditions are as specified. "Ensure all FWIVs Shut."
Energize	To establish power supply. "Energize Bus 1NA02.
Establish	To make arrangements for a stated condition. "Establish communication with the control room."
Fill	To add fluid to the greatest extent possible to a system or component. "Fill the CST."
Go To	Used to branch to another procedure. Specifies that the procedure in effect be exited and the named procedure performed. "Go to procedure 19000, REACTOR TRIP OR SAFETY INJECTION."

Table 2. Action Verbs

Verb	Application
Hold	Used with switches. To maintain a given condition or action. "Hold HS8149A in open position until valve is open."
Identify	To ascertain the condition by investigation. "Identify the faulted SG."
Increase	Do not use because of verbal communication problems.
Initiate	Used to reference another procedure. Specifies that the procedure in effect should be continued and the named procedure performed concurrently. "Initiate Procedure 18070-1, EMERGENCY BORATION."
Inspect	To measure, observe, or evaluate a feature or characteristic for comparison with specified limits; method of inspection should be included. "Inspect visually the Main Feedlines for leaks."
Isolate	To remove from service and prevent further electrical or fluid flow across the system or component boundaries. "Isolate the faulted SG."
Jog	To actuate components by a series of small changes or for short durations. "Jog AFW throttle valves to maintain SG levels at 33% NR."
Lower	To adjust a value towards a smaller magnitude. "Lower SG pressure to 900 psig.

Table 2. Action Verbs

Verb	Application
Limit	To take necessary actions to keep a parameter or condition below a given maximum. "Limit RCS cooldown to 60°F in any one hour."
Maintain	To take necessary actions to keep a parameter in a given existing condition. "Maintain SG levels at 33% NR."
Match	To take necessary actions to cause two or more indications to be the same. "Match PRZR level with PRZR level program setpoint."
Monitor	To periodically check status to detect current trends. "Monitor SG blowdown radiation."
Notify	To inform specified personnel to some action or occurrence. "Notify Operations Superintendent that a Rx trip has occurred."
Open	To change the physical position of a mechanical device such as a valve or door, to permit access or flow. "Open valve HV-182."
Place	Physically position a switch to a specified position. "Place steam dump controller in steam pressure mode.
Rack In	To physically connect an electrical breaker to its power source. "Rack in DG 1A output breaker.

Table 2. Action Verbs

Verb	Application
Rack out	To remove an electrical breaker from service by physically disconnecting it from its power source. "Rack out the accumulator isolation valve breakers."
Raise	To adjust a value towards a larger magnitude. "Raise SG level to 33% NR."
Record	To document a specified condition or characteristic. "Record discharge pressure."
Reset	To remove an active output signal from a retentive logic device even with the input signal still present. "Reset SI."
Restore	To return to service. "Restore power to AC emergency buses."
Secure	To remove from service, including actions to prevent automatic actuation. "Secure ECCS system."
Select	To choose from among several indications. "Select highest SR indication on NR-45."
Shift	To take necessary actions to change a systems mode of operation. "Shift RHR suction from RWST to Containment Sump."
Shut	For valves, to change physical position to prevent all flow. "Shut valve HV-182."

Table 2. Action Verbs

Verb	Application
Start	To originate motion of an electric or mechanical device directly or by remote control. "Start RCP 1."
Stop	To terminate operation. "Stop all RCPs."
Suspend	To terminate operation for a period of time. "Suspend all operations involving dilutions of RCS boron concentration until one train of RHR returns to operation."
Synchronize	To establish a coincidence in time, rate, phase angle, etc. "Synchronize the main generator to Bus 1."
Throttle	To operate a valve to a specified position to obtain a certain flow rate. "Throttle valve HV-182 to obtain 6-13 gpm seal injection flow per RCP."
Trip	To manually activate an automatic feature. "Trip Breaker 1AA0219."
Vent	To permit a gas or liquid confined under pressure to escape at a vent. "Vent all unisolated accumulators."

Table 3. VEGP Acronyms and Abbreviations

Item	Meaning
AC	Alternating Current
ACB	Air Circuit Breaker
ACCW	Auxiliary Component Cooling Water
AFW	Auxiliary Feedwater
AOV	Air Operated Valve
ARM	Area Radiation Monitor
ATWT	Anticipated Transient Without Trip
ATSI	Automated Turbine Supervisory Instrumentation
Aux	Auxiliary
Aux Bldg	Auxiliary Building
Aux Stm	Auxiliary Steam
BAST	Boric Acid Storage Tank
BFIV	Bypass Feed Isolation Valve
BIT	Boron Injection Tank
BOL	Beginning of Life
BOP	Balance of Plant
BRS	Boron Recycle Steam
BTRS	Boron Thermal Regeneration System
CB	Control Building
CCP	Centrifugal Charging Pump
CCW	Component Cooling Water
CI-A	Containment Isolation - Phase A
CI-B	Containment Isolation - Phase B

Table 3. VEGP Acronyms and Abbreviations (continued)

Item	Meaning
CNMT	Containment
CRDM	Control Rod Drive Mechanism
CRT	Cathode Ray Tube
CS	Containment Spray
CSFST	Critical Safety Function Status Tree
CST	Condensate Storage Tank
CVCS	Chemical and Volume Control System
CWS	Circulating Water System
DBA	Design Basis Accident
DG	Diesel Generator
DNB	Departure from Nucleate Boiling
DNBR	Departure from Nucleate Boiling Ratio
dP	Differential Pressure
DRPI	Digital Rod Position Indication
dT	Differential Temperature
DW	Demineralized Water
EAB	Electrical Auxiliary Board
ECCS	Emergency Core Cooling System
EHC	Electrohydraulic Control
EOC	End of Cycle
EOF	Emergency Operations Facility
EOL	End of Life

Table 3. VEGP Acronyms and Abbreviations (continued)

Item	Meaning
ERF	Emergency Response Facilities
ESF	Engineered Safety Features
ESFAS	Engineered Safety Features Actuation System
FW	Feedwater
GDT	Gas Decay Tank
GPM; gpm	Gallons Per Minute
HEPA	High Efficiency Particulate Air
HP	Health Physics Department
HV	High Voltage
HVAC	Heating, Ventilation, and Air Conditioning
I & C	Instrumentation and Control
IR	Intermediate Range NIS
ILRT	Integrated Leak Rate Test
LCO	Limiting Condition for Operation
LO	Lube Oil
LLRT	Local Leak Rate Test
LOCA	Loss of Coolant Accident
LOSP	Loss of Off Site Power
LP	Low Pressure
LV	Low Voltage
MCB	Main Control Board
MCC	Motor Control Center
MDAFW	Motor Driven Auxiliary Feedwater

Table 3. VEGP Acronyms and Abbreviations (continued)

Item	Meaning
MFIV	Main Feed Isolation Valve
MG	Motor Generator
MOV	Motor Operated Valve
MSIV	Main Steam Isolation Valve
MSLB	Main Steam Line Break
MSR	Moisture Separator Reheater
MWe	Megawatt Electric
MWt	Megawatt Thermal
NDT	Nil Ductility Transition (temperature)
NIS	Nuclear Instrumentation System
NPSH	Net Positive Suction Head
NR	Narrow Range
NSCW	Nuclear Service Cooling Water
NSCT	Nuclear Service Cooling Water Tower
NSSS	Nuclear Steam Supply System
OPdT	Overpower delta Temperature
OSC	Operations Support Center
OTdT	Overtemperature delta Temperature
PAMS	Post-Accident Monitoring System (Radiation)
PDP	Positive Displacement Pump
PERMS	Process and Effluent Radiation Monitoring System

Table 3. VEGP Acronyms and Abbreviations (continued)

Item	Meaning
PORV	Power Operated Relief Valve
P&ID	Process and Instrument Diagram
PR	Power Range NIS
PRT	Pressurizer Relief Tank
PRZR	Pressurizer
PSIA; psia	Pounds per Square Inch Absolute
PSID; psid	Pounds per Square Inch Differential
PSIG; psig	Pounds per Square Inch Gauge
Radwaste	Radioactive Waste
RAT	Reserve Auxiliary Transformer
RCCA	Rod Cluster Control Assembly
RCDT	Reactor Coolant Drain Tank
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RMWST	Reactor Makeup Water Storage Tank
RPS	Reactor Protection System
RTD	Resistance Temperature Detector
RV	Reactor Vessel
RVLIS	Reactor Vessel Level Instrumentation System
RWST	Refueling Water Storage Tank
Rx	Reactor

Table 3. VEGP Acronyms and Abbreviations (continued)

Item	Meaning
SG	Steam Generator
SG ARV	Steam Generator Atmospheric Relief Valve
SGBPS	Steam Generator Blowdown Processing System
SGFP	Steam Generator Feed Pump
SGTR	Steam Generator Tube Rupture
SI	Safety Injection
SIS	Safety Injection System
SJAE	Steam Jet Air Ejector
SLI	Steam Line Isolation
SLBA	Steam Line Break Accident
SPDS	Safety Parameter Display System
SR	Source Range NIS
SSPS	Solid State Protection System
SWGR	Switchgear
SWYD	Switchyard
Tavg	RCS average temperature
TB	Turbine Building
TC	Thermocouple
TDAFW	Turbine Driven Auxiliary Feedwater
TG	Turbine Generator
TPCCW	Turbine Plant Closed Cooling Water
TPCW	Turbine Plant Cooling Water

Table 3 VEGP Acronyms and Abbreviations (continued)

Item	Meaning
TPSS	Turbine Plant Sampling System
Tref	Turbine load reference temperature
Transfer	Transfer (do not use "Xfer")
TSC	Technical Support Center
UAT	Unit Auxiliary Transformer
VCT	Volume Control Tank
VRS	Volume Reduction and Solidification
WHT	Waste Holdup Tank
WMT	Waste Monitor Tank
WR	Wide Range
XFMR	Transformer

VERIFICATION OF EMERGENCY OPERATING PROCEDURES

1.0 PURPOSE

This procedure establishes the Emergency Operating Procedure (EOP) verification process. The basic objectives of verification are:

a. Ensure the procedures are written in a manner which is consistent with Procedure 10012-C, "EOP AND AOP WRITER'S GUIDE".

b. Ensure procedures are technically correct.

2.0 VERIFICATION PROCESS

The verification process consists of the following phases:

a. Preparation Phase,

b. Assessment Phase,

c. Resolution Phase.

2.1 PREPARATION PHASE

The preparation phase consists of the following activities:

a. Assignment of personnel to perform the verification.

b. The gathering and review of EOP source documents.

2.1.1 The Operation Procedures Coordinator shall designate personnel to verify EOPs.

CONTINUED

2.1.2 The verifier shall obtain and familiarize himself with the applicable parts of the following:

a. Final Safety Analysis Report (FSAR),

b. Procedure 10012-C, "EOP AND AOP WRITERS GUIDE",

c. Technical Specifications,

d. Plant drawings,

e. Instrument setpoint documents,

f. Emergency Response Guidelines (ERG-HP) Guidelines and Background Documents,

g. EOP Step Documentation Forms,

h. Licensing commitments,

i. Other sources of information, such as procedures from other plants and personal experience can be used.

2.2 ASSESSMENT PHASE

The assessment phase shall consist of:

a. General review,

b. Specific review,

c. Document compilation.

2.2.1 General Review

a. Perform a general review of the procedure using Checklist A and source documents. If a discrepancy is repeatedly noted throughout a procedure, record this fact on one Procedure 11890-C, "EOP DISCREPANCY FORM", indicating all the affected steps on the "STEP NUMBER or SECTION" line. In all other cases, fill out a separate Procedure 11890-C, "EOP DISCREPANCIES FORM", for each discrepancy.

b. Indicate on Procedure 11891-C, "EOP GENERAL VERIFICATION FORM", that the general review was performed, either by checking the acceptable column or by designating the appropriate discrepancy numbers for any discrepancies identified.

CONTINUED

2.2.2 Specific Review

a. Perform a detailed, item by item review of the procedure using Checklist B and source documents. Note additional discrepancies as given in 2.2.1.a of this procedure. If the existence of a discrepancy is doubtful, the verifier should note it as a discrepancy.

b. Indicate on Procedure 11892-C, "EOP SPECIFIC VERIFICATION FORM" that the specific review was performed, either by checking the acceptance column or by recording the appropriate discrepancy numbers. This will be done for the purpose, symptoms, and for each caution, note, and high level step.

2.2.3 Document Compilation

When both reviews are complete, fill out Section I of Procedure 11893-C, "EOP VERIFICATION DOCUMENTATION FORM" and forward the discrepancy forms and verification forms to the Operations Procedure Coordinator.

2.3 RESOLUTION PHASE

2.3.1. Operations Procedure Coordinator

The Operations Procedure Coordinator shall:

a. Check the verification package for completeness.

b. Include other comments in the verification package as appropriate.

c. Complete Section II of Procedure 11893-C, "EOP VERIFICATION DOCUMENTATION FORM".

He shall then forward the package to the procedure writer for resolution.

2.3.2 Procedure Writer and Verifier

The procedure writer shall review the verification package and address comments as follows:

a. Draft resolutions for those discrepancies he considers valid.

b. Confer with verifier to draft resolutions for those discrepancies the writer disagrees with or does not understand.

CONTINUED

c. Obtain verifier concurrence signature for all resolutions in the space provided on Procedure 11890-C, "EOP DISCREPANCY FORM".

d. Forward verification package to the Operations Superintendent, or his designee, when all changes to the EOP have been made.

2.3.3 Operations Superintendent or Designee

The Operations Superintendent, or designee, shall indicate final approval of the verification in Section III of Procedure 11893-C, "EOP VERIFICATION DOCUMENTATION FORM".

2.4 DOCUMENTATION

All documents which are generated during the verification of the procedures shall be retained.

END OF PROCEDURE TEXT

CHECKLIST A

EOP GENERAL VERIFICATION CRITERIA

The general review checks the consistency of a specific EOP with respect to the entire EOP set.

WRITTEN CORRECTNESS

A. Legibility

1. If the text centered on all pages of the procedure.

2. Are the text, tables, graphs, figures, and charts legible.

B. Format Consistency

1. Do the following exist in the procedure and are they consistent with the Writers Guide:

   a. TITLE

   b. PURPOSE

   c. SYMPTOMS/ENTRY CONDITIONS

   d. OPERATOR ACTIONS

2. Are the operator action steps presented in dual-column format?

C. Identification Information

1. Does the first page correctly provide the following:

   a. "EMERGENCY OPERATING PROCEDURE"

   b. Procedure Number and Title

   c. Unit Number

2. Does each page correctly provide the following:

   a. Procedure Number

   b. Revision Number

   c. Page _____ of ____ Numbers

3. Is "CONTINUED" typed at the bottom of each page, except the last which has "END OF PROCEDURE TEXT"?

4. Does the procedure have all its pages in the correct order?

CHECKLIST B

EOP SPECIFIC VERIFICATION EVALUATION CRITERIA

WRITTEN CORRECTNESS

A. Information Presentation

1. Are instruction steps numbered correctly?
2. Are instruction steps constructed to comply with the following:
   a. The entire step is listed on the page which it started.
   b. Steps are short, concise, and precise.
   c. If there are more than two actions or objects in a step, they are listed separately.
   d. The number of action verbs and objects of actions are minimized in a single step.
   e. Punctuation and capitalization are proper.
   f. Abbreviations are correct and approved.
3. Do instruction steps make proper use of logic structure?
4. Are cautions used and written properly?
5. Are notes used and written properly?
6. Are notes and cautions worded so they do not contain operator actions?
7. Are cautions listed immediately before the step to which they apply and on the same page as the applicable step?
8. Are notes placed before the step to which it applies if it aids in the performance of the step?

9. Are notes placed after the step to which it applies if it pertains to the results of the step(s)?

10. If calculations are required, do they comply with the instructions in the writers guide?

11. Are the units of measure in the procedure the same as those used on indicators?

12. Is the accuracy required by the procedure obtainable from installed indicators or instrumentation?

13. Are values specified in such a way that mathematical operations are not required of the user?

14. Is component identification correct?

15. If an action is assigned to an individual, is his correct title used?

16. Are proper methods of emphasis used?

B. Procedure Referercing and Branching

1. Do the referenced and branched procedures identified in the procedure exist for operator use?

2. Are referencing and branching instructions correctly worded?

   a. "Go To" (Branching)

   b. "Initiate" (Referencing, i.e., concurrent use)

3. Is the use of referencing minimized?

4. Do the instructions avoid routing user past important information such as cautions preceding steps.

5. Are the exit conditions compatible with the entry conditions of the referenced or branched procedure?

TECHNICAL ACCURACY

A. Symptoms Information

1. Are the symptoms of the ERG correctly listed in the EOP?

2. Are all the symptoms listed appropriate for the procedure to be used?

3. Should more symptoms be listed?

B. Instructions Step, Caution and Note Information

1. Are EOP/ERG differences:

   a. Documented

   b. Explained

2. Has the ERG strategy or intent been changed in the development of the EOP?

3. Are correct plant specific means incorporated?

4. Have applicable licensing commitments been addressed?

5. Are differences between the licensing commitments and the procedure documented?

C. Quantitative Information

Do the quantitative values, including tolerance bands, comply with the applicable source documents?

D. Plant Equipment Information

Is plant equipment specified in the procedure available for operator use?

APPROVAL	Georgia Power	PROCEDURE NO.
W 7 Kitchens	POWER GENERATION DEPARTMENT	11890-C
DATE	VOGTLE ELECTRIC GENERATING PLANT	REVISION NO.
4/18/84	UNIT COMMON	0
		PAGE NO. 1 OF 1

EOP DISCREPANCY FORM

PROCEDURE TITLE _____

PROCEDURE NUMBER _____ REVISION _____ DISCREPANCY NUMBER _____

DISCREPANCY LOCATION _____

DISCREPANCY: _____

VERIFIER _____ DATE _____

RESOLUTION: _____

PROCEDURE WRITER _____ DATE _____

VERIFIER CONCURRENCE _____ DATE _____

RESOLUTION INCORPORATED BY _____ DATE _____

APPROVAL	Georgia Power	PROCEDURE NO.
W 7 Kitchens	POWER GENERATION DEPARTMENT	11891-C
DATE	VOGTLE ELECTRIC GENERATING PLANT	REVISION NO.
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EOP GENERAL VERIFICATION FORM

PROCEDURE TITLE _____

PROCEDURE NUMBER _____ REVISION _____

WRITTEN CORRECTNESS

	ACCEPTABLE	DISCREPANCY NUMBERS
A. LEGIBILITY	_____	_____
B. FORMAT CONSISTENCY	_____	_____
C. IDENTIFICATION INFORMATION	_____	_____

VERIFIER _____ DATE _____

APPROVAL	Georgia Power	PROCEDURE NO.
W. F. Kitchens	POWER GENERATION DEPARTMENT	11892-C
DATE	VOGTLE ELECTRIC GENERATING PLANT	REVISION NO.
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		PAGE NO. 1 OF 1

EOP SPECIFIC VERIFICATION FORM

PROCEDURE TITLE _____

PROCEDURE NUMBER _____ REVISION _____ PAGE ____ OF ____

PURPOSE, SYMPTOM, STEP, CAUTION, NOTE-SPECIFIC VERIFICATION

ITEM	WRITTEN CORRECTNESS		TECHNICAL ACCURACY	
	OK	DISCREPANCY NUMBER(S)	OK	DISCREPANCY NUMBER(S)

VERIFIER _____ DATE _____

APPROVAL	Georgia Power	PROCEDURE NO.
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EOP VERIFICATION DOCUMENTATION FORM

PROCEDURE TITLE _____

PROCEDURE NUMBER _____ REVISION _____

SECTION I: ASSESSMENT PHASE

		NUMBER OF PAGES
1. ALL 11890-C, EOP DISCREPANCY FORMS INCLUDED	_____	_____
2. 11891-C, EOP GENERAL VERIFICATION FORM COMPLETE	_____	1
3. 11892-C, EOP SPECIFIC VERIFICATION FORM COMPLETE	_____	_____
4. EOP INCLUDED	_____	

5. ASSESSMENT PHASE COMPLETION DATE _____

VERIFIER(S): _____

_____

SECTION II: RESOLUTION PHASE (OPERATIONS PROCEDURE COORDINATOR)

	NUMBER OF PAGES
1. OTHER COMMENTS ADDED TO VERIFICATION PACKAGE YES___ NO___	_____
TOTAL PAGES (SECTION I-1, 2, 3 AND SECTION II-1)	_____
2. VERIFICATION PACKAGE READY FOR REVIEW _____	

SIGNATURE _____ DATE _____

SECTION III: RESOLUTION PHASE (OPERATIONS SUPERINTENDENT OR DESIGNEE)

1. VERIFICATION PACKAGE REVIEWED _____

2. ALL OUTSTANDING COMMENTS RESOLVED AND INCORPORATED INTO EOP AS APPLICABLE _____

FINAL APPROVAL _____ DATE _____

EMERGENCY OPERATING PROCEDURE VALIDATION PROGRAM PLAN

1.0 GENERAL

EOP validations will be performed on the VEGP simulator. The validation will be performed by teams of observers and operators who will monitor and assess that the actions specified in each procedure can be effectively carried out by the operating crews to manage the emergency conditions. Audio-visual aids and computer records may be used to assist the observers. Sufficient test scenarios will be developed to allow comprehensive validations of the EOP set.

The VEGP validation program is based on the Emergency Operating Procedures Validation Guideline (INPO 83-006), and the ERG Revision 1 validation program performed by the Westinghouse Owners Group (WOG) at the Seabrook station. The goal of the program will be to demonstrate that:

- EOPS are usable, i.e., they can be understood and followed without confusion, delays, and errors.
- A correspondence exists between the procedures and the control room and plant hardware.
- The instructions presented in the EOPs are compatible with the shift manpower, qualifications, training, and experience of the operating staff.
- A high level of assurance exists that the procedures will work, i.e., the procedures properly guide the operator in mitigating transients and accidents.

CONTINUED

2.0 PHASES

The program will consist of four phases:

a. Preparation

b. Assessment

c. Resolution

d. Documentation

3.0 PREPARATION PHASE

This phase includes indentification of resources, development of training plans and test scenarios, and determination of validation criteria.

3.1 A validation schedule will be developed based on the following preliminary milestones:

a.	Detailed validation schedule completed	4th Qtr 84
b.	Plant specific EOPs ready for validation	1st Qtr 85
c.	Operator training and observer training completed	1st Qtr 85
d.	Scenario test runs on simulator completed	2nd Qtr 85
e.	Resolution of discrepancies, including additional test runs if required, and completion of documentation	3rd Qtr 85

3.2 Validation Criteria

The purpose of all EOPs is to provide direction to place the plant in a safe, stable condition, regardless of the imposed structural and equipment failures. Safe implies that the reactor is brought to a shutdown, subcritical. cool condition. Stable implies either that conditions are in equilibrium, or are changing in response to operator control. This is the basis for all validation criteria.

CONTINUED

3.2.1 Criteria will be developed to assess the following interactions:

- EOPs - Operator
- EOPs - Control room
- EOPs - Training
- Training - Operator

Training-Control Room and Operator-Control Room interactions are not addressed in this program; however, major weaknesses found in these areas will be noted in the findings.

3.2.2 Special criteria will be developed for most of the individual procedures expected to be exercised on the simulator.

3.3 Test Scenarios

Scenarios will be developed which will test the EOPs on the VEGP simulator. Scenario development and selection will be based on industry experience. Those procedures which are not exercised on the simulator as part of a test scenario will be individually exercised on the simulator from pre-set conditions which would be expected to lead to use of the procedure.

Transition flow charts showing expected EOP usage during the scenarios will also be developed.

3.4 Administrative Materials

Documentation forms, flow charts, debriefing forms, etc. necessary for validation will be debeloped prior to validation. Audio-visual equipment will also be ready for use.

3.5 Operator and Observer Validation Training

3.5.1 Operator Training

Operating crews who will participate in the validation program will have received training on the EOPs.

Refresher training will be conducted just prior to the validation to place special emphasis on the following:

CONTINUED

- EOP review to discuss changes which have been incorporated since formal operator training
- Compliance with procedure
- Familiarization with validation principles and methods
- Familiarization with validation criteria

3.5.2 Observer Training

The observer team, as a whole, will be familiar with the following areas:

- ERG development
- VEGP EOP development
- Plant operations
- Human factors considerations
- Control room
- Simulator
- VEGP operator training programs

Observers are to be provided training during which they will be familiarized with the following:

- Validation objectives and criteria
- Forms and documentation used for the validation
- Anticipated operator and system responses
- Audio-visual aids
- Conduct of Debriefing

3.5.3 Validation Familiarization Runs

Each observation team and operating crew will participate in one practice run which does not involve multiple failures. The purpose of these runs is to ensure that all participants are throughly familiar with the validation process in real time.

CONTINUED

4.0 ASSESSMENT PHASE

This phase comprises the actual test scenario runs on the simulator, and the debriefings following the runs. Validation data will be recorded.

4.1 The preparation phase will be complete prior to starting this phase, and all necessary materials will be available. Only observers will be informed of the specific test scenarios for each run.

4.2 For each test scenario, the following sequence will be observed:

a. Simulator initialization

b. Operating crew briefing on plant status and operating instructions

c. Recording equipment synchronization

d. Test scenario activation

e. Operator response to plant condition

f. Scenario termination by observation team leader at appropriate time

g. Data assembly and debriefing session

4.3 Debriefing Sessions

Immediately after each test scenario, a debriefing session will be conducted for the operating crew and observation team. The debriefing should use the following sequence:

a. Operators present problems which they identified during the runs

b. Operators provide possible reasons for problems they identified

c. Observers present any other problems which they identified

d. Operators provide reasons for these other problems

e. Summarize the findings of the debriefing

The audio-visual recordings may be available for the debriefings. The observation team will record all pertinent problems and comments.

CONTINUED

5.0 RESOLUTION PHASE

This phase will involve review and resolution of all noted deviations. It will include analysis of plant transient data necessary to clarify the context of a deviation or to suggest a resolution. Out of this phase will come statements of EOP set validity, and validation results for individual procedures.

The resolution phase will be performed by the observation team and selected members of the operations staff.

6.0 DOCUMENTATION PHASE

Documentation for the Validation Program will include:

- Summary of the program
- Data taken during test runs
- Summary of test scenarios as run on the simulator
- Listing of deviations and resolutions
- Recommendations for improvements in training

A BRIEF DESCRIPTION OF THE EOP TRAINING PROGRAM

To ensure appropriate knowledge and proper application of VEGP's Emergency Operating Procedures (EOPs), the Training Department will develop a program of instruction for our license candidates. The course will consist of both classroom and simulator instruction phases:

A. Classroom Instruction Phase - Lectures or discussions on these topics:

1. Bases - the students will

   a. Learn the intent, and the philosophy and harmony of use of the Optimal Recovery Procedures (ORPs), and the Critical Safety Function Status Trees and Functional Restoration Procedures (FRPs). The event-oriented nature of the ORPs, and the symptom-oriented nature of the FRPs will be elucidated.

   b. Become acquainted with the method and material used to develop the EOPs from the generic Westinghouse Owner's Group (WOG) Emergency Response Guidelines (ERGs).

   c. Understand the rationale for the content and order of the steps of the EOPs as presented in the WOG ERG Background Documemts. (The depth to which this is presented, and the specific procedures to be used will be determined.)

2. Immediate Actions - the students will

   a. Understand the reasons for timely execution of immediate actions.

   b. Memorize the immediate action steps of all EOPs.

3. Subsequent Actions - the students will

   a. Learn how follow-up actions are used to either bring the plant to a stable condition or restore functional capacity.

   b. Be required to describe how the subsequent actions achieve these objectives, but will not have to memorize the steps.

4. Applicability - through study of the symptoms (and entry points from other procedures) the students will understand the circumstances under which a given procedure should be invoked.

B. Simulator Instruction Phase - There will be simulator walk-through and exercises to demonstrate ability in the following areas:

1. Symptom and Accident Identification

2. Immediacy of Response

3. Procedure Follow-up

4. Multiple Casualty Response

5. Critical Safety Function Status Tree review, and FRP use

As a minimum, the simulator phase will cover the major EOPs, and train the individual for the position for which he is a candidate.

In addition, the Training Department will implement a requalification program to ensure that license candidates maintain proficiency in their knowledge and use of EOPs, and update the candidates on any changes to the EOPs. This requalification program will ensure that each EOP is addressed at least every two years.

To demonstrate competency in this training program, a student must maintain an 80% average on classroom exams, with no single exam being less than 70%. In addition, each student must participate in and successfully complete a simulator examination. Failure to meet the above criteria will require the student to participate in a retraining program, of either formal or self-study, until satisfactory completion.

The described training program will be initially handled as a special course of instruction. It will eventually be incorporated as a part of the biannual requalification program.