ENCLOSURE (2)

EOP TRAINING PROGRAM

Emergency Operating Procedure (EOP) training for initial license candidates is conducted in conjunction with the classroom control panel lectures. Candidates are tested on their knowledge of EOPs at the conclusion of each lecture series. In addition, simulator training requires the demonstration of the proper sequence and execution of EOP steps in a team setting.

As part of the requalification training process, selected EOPs are reviewed on an annual basis. Routine simulator training strengthens the knowledge on proper use of the procedures with the actual Control Room teams as well as teams formed from staff license holders. All licensed personnel are examined annually on their ability to use procedures during the simulator exam. Team work, diagnostic abilities and procedure execution are tested.

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I. PURPOSE

The purpose of this instruction is to provide administrative guidance on the preparation and control of Operations' Procedures. This includes Operating Instructions (OI's), Operating Procedures (OP's), Abnormal Operating Procedures (AOP's), and Emergency Operating Procedures (EOP's). OP's and OI's are procedures which direct operator actions necessary for startup, normal operation, and shutdown of the plant and plant equipment. AOP's are procedures which give guidelines for operator actions necessary to mitigate the consequences of transients and emergencies that cause plant parameters to exceed their normal operating limits. EOP's are procedures which give guidelines for operator actions necessary to mitigate the consequences of transients and emergencies that cause plant parameters to exceed Reactor Protective System (RPS) setpoints or Engineering Safety Feature Actuation System (ESFAS) setpoints.

These procedures are d igned to give the operator a preplanned method of c ucting plant operations to minimize reliance on memory ar o enhance the efficiency and safety of plant operation.

Specifically, OI's and OP's are procedures written for normal plant operations to be used in a step by step manner and require verbatim compliance except those which are waived by the GSO Standing Instruction 85-1. AOP's are designed to provide the operator guidance in most cases, to prevent conditions from deteriorating to the point where a plant trip may be necessary. EOP's are designed to allow the operator to place and maintain the plant in a stable condition following a reactor trip by requiring:

A. An immediate assessment of critical safety functions;

B. The performance of immediate actions to restore these safety functions within satisfactory bounds;

C. An approach to event analysis; and

D. The use of an event-based procedure if diagnosis is successful or, failing event diagnosis, the use of a symptom-based functional recovery procedure that does not require knowledge of the specific event.

This administrative policy shall be used in conjunction with CCI-300 whenever a procedure is written or revised. All procedures shall be verified and validated whenever possible to ensure technical correctness and operational validity.

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Additionally, to provide adequate operator familiarity with changes to procedures, the Supervisor of Procedural Development shall make the determination whether or not the procedure or a summary sheet explaining the changes shall be routed via Required Reading.

II. GENERAL REQUIREMENTS

The following requirements shall be reviewed and incorporated as necessary, when writing or revising operations' procedures.

A. All Procedures:

1. Final Safety Analysis Report
2. Technical Specifications
3. Architect/Engineer Technical Documentation
4. Human factors consideration
5. Operating experience
6. Technical manual
7. POEAC recommendations
8. POSRC recommendations
9. Procedural Development request forms
10. CCOM Change Reports
11. Current and past revisions of OI's, OP's, AOP's, and EOP's

B. For Emergency Operating Procedures:

1. All of the requirements in Section A above, and

2. Combustion Engineering generic emergency procedure guidelines (CEN-152).

III. INTEGRATION OF TECHNICAL INFORMATION

A. Generic Emergency Procedure Guidelines (EPGs) prepared and validated by Combustion Engineering will be used as the basis for EOP development. These technical guidelines perform the following functions:

1. Identify the equipment or systems to be operated,

2. List the steps necessary to mitigate the consequences of transients and accidents, and

3. Restore the safety functions.

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They represent the translation of engineering data derived from transient and accident analysis into a sound engineering basis for the development of EOPs.

B. The EPGs will be implemented via the process described in section IV of this procedure. Information from plant documents, internal operating experience, industry operating experience, improved or new safety analysis calculations, as well as, revisions to the original EPGs shall be included where appropriate as an improvement in existing procedures or as an improvement in the basis for actions already required.

IV. TRANSLATION OF EMERGENCY PROCEDURE GUIDELINES TO PLANT SPECIFIC EMERGENCY OPERATING PROCEDURES

A. The following areas will be addressed in generating the Calvert Cliffs plant specific Emergency Operating Procedures:

1. Precautions
2. Entry Conditions
3. Immediate Actions
4. Recovery Actions
5. Alternate Actions
6. Scope

B. The source material described in Section II will be used to establish plant specific entry conditions and exit conditions (where appropriate) for each procedure. In addition, the source material will be used to classify the event with particular reference to initiating event and location (i.e., within or outside containment). Next, this plant specific information will be compared with the scope and initial conditions of the generic procedure to ensure a common starting point. Any discontinuities or deviations from the generic guidelines will be formally documented and resolved using bases or source documentation. It is possible that a few issues may require additional engineering analysis. The substantiated deviations will then be incorporated into the plant specific procedures. From the foregoing review the entry conditions for each Emergency Operating Procedure will be determined.

C. The ENTRY CONDITIONS contained in CEN 152 will be verified against plant specific indication and a list will be prepared using a combination of expert judgement and source documentation for inclusion in the EOP. This included list of indications will be limited to the most important and reliable parameters. The generic list of

initial indications will be reviewed and modified to include plant specific indications, alarms and equipment responses using source documentation to compile the list.

D. The generic guidelines will be reviewed to identify safety issues which, in turn, will be organized per Section VII.B.3 of this instruction. Specific PRECAUTIONS will be contained in the body of the EOP. Cautions relating to specific actions or the operation of specific equipment or components will appear immediately prior to the action to which they refer. The identification of plant specific safety concerns will be accomplished by review of the source material. Equipment and personnel safety concerns both nuclear and non-nuclear will be included in this process.

E. The IMMEDIATE ACTIONS of each EOP will be determined by the event definition which identifies the safety functions at greatest risk. Having identified the critical safety functions, the list will be prioritized and, in turn, the specific success criteria required to assess each safety function will be identified and documented. This work becomes a "Safety Function Status Check" which will then be compared against the plant specific accident analysis and specific issue limitations (for example, PTS, Natural Circulation). Deviations will be documented and resolved. This plant specific status check provides the operator directives to enter or exit the Functional Recovery Procedure. The Safety Function check whether initial, intermediate o final determines how the operator will deal with the incident.

F. Plant specific RECOVERY ACTIONS will be obtained by prioritizing the success paths provided in the generic guidelines in accordance with the previously accomplished Safety Functions prioritization. For each principal success path identified, the associated alternate and extraordinary success paths, where available, will be identified using source material. All bracketed data contained in the Emergency Guidelines will be replaced by plant specific data. The safety function checks together with the specific plant configurations expected to exist, will be identified and compared to ensure the correctness of detailed operator actions. The "SAFETY FUNCTION STATUS CHECKS" will be developed as described in Section E above.

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V. EOP SUPPORT DOCUMENTATION

Support documentation for the Emergency Operating Procedures (EOP) consists of the EOP guidelines, deviation sheets, special calculations, and any referenced technical literature which is used by the EOP writer during initial writing or subsequent revisions of the procedures. This material will be maintained by the Operations unit.

Superseded support documentation will be removed from the active file and placed in the EOP history file. The history file will be maintained by the Operations unit and as a minimum, will consist of:

a. one copy of each superseded revision,

b. superseded Emergency Procedure Guidelines,

c. deviation sheets,

d. superseded calculations, and

e. Calvert Cliffs Operating Manual change reports (Attachment (1) of CCI-300) after the changes are incorporated by revisions.

Records will be controlled in accordance with CCI-304.

VI. EOP SYSTEM STRUCTURE

The EOP System will consist of one function oriented procedure and selected event oriented procedures.

A. Function Oriented Procedure

The function oriented procedure entitled "FUNCTIONAL RECOVERY PROCEDURE" will be used when a plant condition causing a reactor trip cannot be quickly or easily diagnosed by the operator. It may also be used to mitigate accident symptoms for which the operator has initially selected an inappropriate event oriented procedure that does not adequately recover the plant as anticipated.

The "FUNCTIONAL RECOVERY PROCEDURE" will include recovery actions for restoring each of the following safety functions:

1) Reactivity Control
2) RCS Pressure and Inventory Control
3) CORE and RCS Heat Removal
4) Containment Isolation
5) Containment Environment
   a) Temperature and Pressure
   b) H_2 Gas Control
6) Radiation Control

These safety functions form the set of parameters which, if maintained within acceptable ranges, ensure plant and public safety. A "SAFETY FUNCTION STATUS CHECK" is the entry point for the "FUNCTIONAL RECOVERY PROCEDURE" and will provide acceptable values for each safety function and a method for detecting out of specification safety functions. The procedure itself will provide multiple recovery actions to restore these functions.

B. **Event Oriented Procedures**

Event oriented procedures will be designed to optimize accident recovery when an accurate diagnosis can be made, and when the initial assumptions used in procedure development are valid (i.e., no severe multiple failures or multiple accident scenarios). The following classes of events will be covered in these procedures.

1) Reactor Trip
2) Loss of Offsite Power
3) Total Loss of All Feedwater
4) Excess Steam Demand
5) Loss of Coolant Accident
6) Steam Generator Tube Rupture
7) Station Blackout

The entry point for these procedures will be via EOP 0, "POST-TRIP IMMEDIATE ACTIONS." EOP 0 will verify the reactor is shutdown if a trip condition exists, verify automatic post-trip actions occur, and will verify the safety functions meet the acceptance criteria of the "INITIAL SAFETY FUNCTION STATUS CHECK". The safety function criteria in this check will be chosen to be consistent with the plant conditions which prevail <u>only</u> in the short term after a simple and uncomplicated reactor trip. Thus, if there are other failures which require attention, the criteria in the status check will not be satisfied, signaling that more than a simple reactor trip has occurred. These initial actions will form the immediate actions for EOP system.

If the event symptoms can be diagnosed after the reactor trip actions are completed, the operator will implement the recovery actions from the appropriate event oriented procedure. One of the first of these recovery actions will be to assess the safety functions against specific criteria contained in an event specific "Safety Function Status Check." This check is to verify that all relevant safety functions are being fulfilled as anticipated by engineering analysis and to check on diagnostic accuracy. As such, it provides a summarized statement of PLANT SAFETY existing at the time of the status check.

One essential feature of the event oriented procedure is the provision for verifying that operator actions are restoring proper plant conditions and that the safety functions are being handled in the proper priority. This feedback on procedural effectiveness will be accomplished by periodic monitoring of the safety functions using the event specific "Safety Function Status Checks." If the treatment in use is adequately controlling the event, then the treatment is continued. If the treatment is inadequate, either because new information appears that is not covered in the procedure, or because the observed symptoms are not properly responding, then a transfer is made to a more appropriate treatment. In most cases, this more appropriate treatment will be the "FUNCTIONAL RECOVERY PROCEDURE." In this way the EOP system is designed to manage multiple, significant failures, or misdiagnosed or undiagnosed events.

VII. PROCEDURE FORMAT AND CONTENT

The purpose of this section is to ensure consistency in operations' procedures and to ensure that the information contained in operations' procedures is presented in a format and style that facilitates speed of reading and comprehension. These requirements incorporate human factor concerns and should be used as a checklist for revisions and during the initial drafting process of new procedures.

A. General Requirements

1. Procedure Titles and Numbering

   a. Each procedure shall have a title which describes the system or type of transient addressed. (Example: Service Water System, Loss of Instrument Air, Loss of Coolant Accident).

b. A list of procedures and their titles is presented in Attachment (4) of CCI-300.

2. Page Numbering and Identification

a. Each page of the procedure, including the cover sheet, list of effective pages, and table of contents, shall be identified by:

(1) The procedure number
(2) The revision number
(3) The applicable unit number
(4) The page number

b. The page identification shall be entered on three lines in the upper right-hand corner of each page, as shown in Attachment 1.

c. Each procedure shall contain a cover sheet and a list of effective pages. Each OI, OP, and AOP shall also contain a table of contents if the procedure is longer than ten pages in length.

3. Cover Sheet

a. Each procedure shall have a cover sheet similar to that shown in Attachment (2).

b. The cover sheet shall contain the following information:

(1) Procedure Number
(2) Procedure Title
(3) Revision Number
(4) POSRC meeting number
(5) Signature spaces for the preparer, verifier, and approver (Manager-Nuclear Operations or General Supervisor-Operations as required by CCI-300)

4. Procedure Organization

The follcwing section headings should be used in the procedures as appropriate.

a. Operating Instructions

1. General Precautions - General precautions describe safety issues relevant to the particular procedure. These are cautions

which pertain to several sections of the procedure. If a general precaution pertains to only one or two sections of the procedure, it should be moved to that section as a caution.

2. Procedure - Each procedure should begin with an initial conditions section which identifies all conditions which must be met before proceeding with the procedure. The procedure should include various sub-procedures which include system startup, normal operation, system shutdown, sub-system shutdown and startup, and any other abnormal system lineups and operation.

3. Attachments and Appendixes - Attachments generally include valve lineups for system startup. The responsibility for performing the valve lineups are as follows:

   Attachment 1 - Operations
   Attachment 2 - E & C
   Attachment 3 - Water Treatment/Chemistry/ Fire Protection

   Appendixes are used for special valve lineups or formula when calculations are necessary for determining volumes or concentrations.

b. Operating Procedures

1. General Precautions - General precautions describe safety issues relevant to the particular procedure. These are cautions which pertain to several sections of the procedure. If a general precaution pertains to only one or two sections of the procedure, it should be moved to that section as a caution.

2. Procedure - Each procedure should begin with an initial conditions section identifying all conditions which must be met prior to starting the procedure. The procedure should be written so as to flow smoothly from one mode to the next without backtracking in the procedure.

3. Attachments - This section can include special valve lineups or a special procedure which can be easily separated from the main body of the procedure to prevent confusion to the operator using the procedure, if these sections do not need to be used.

c. Abnormal Operating Procedures

1. Discussion - The purpose of the discussion section is to briefly explain the intent of the procedure which cannot be incorporated in either the notes or title.

2. Response - These are actions which are designed to mitigate the effects of the abnormal conditions and return the plant to a stable condition.

3. Attachments - This section can include special valve lineups or a special procedure which can be easily separated from the main body of the procedure to prevent confusion to the operator using the procedure, if these sections do not need to be used.

d. Emergency Operating Procedures

1. Precautions - Precautions describe safety issues relevant to the particular procedure. These are cautions which pertain to several sections of the procedure. If a precaution pertains to only one or two sections of the procedure, it should be moved to that section as a caution.

2. Entry Conditions - The initial indications should include only those alarms, indications, automatic system actions, or other unique symptoms that the operator should use to determine procedure applicability. Every alarm or possible indication need not be listed. Emphasis will be placed on determining specific sets of conditions which uniquely identify the event.

4. Immediate Actions - This section, which is located only in EOP-0, will include those actions required to verify the Reactor Trip, and to perform an initial "Safety Function Status Check."

5. Recovery Actions - These actions, located in EOP-1 through EOP-8, are designed to take the plant to a safe, stable condition following the completion of EOP-0.

6. Alternate Actions - All alternate actions provide an alternative method for achieving the desired goal. Alternate actions will be included in the event based procedure where appropriate but should specifically be available for equipment or lineups which are challenged by the event. Multiple alternate actions should be prioritized and presented in order of reliability.

7. Safety Function Status Check - This section provides acceptance criteria for each parameter used to verify proper safety function response.

8. Other General Requirements

   a. Each unit will have a separate set of procedures and will be maintained in binders. Each procedure will be tabbed so the procedure is easily accessed. Additionally, EOP-8 will be tabbed by each Safety Function.

   b. The procedures should be structured so that they can be executed by minimum shift and control room staffing.

B. Text Composition

1. General Requirements

   a. Mandatory sequence of steps through the third level of indentation is required unless otherwise justified.

   b. Limits should be expressed quantitatively whenever possible.

   c. For steps involving an action verb relating to three or more objects, the objects should be listed. If more than four items must be listed they should be displayed in subgroups not to exceed four items.

Example:

Shut the following valves:

1-SI-101
1-SI-202
1-SI-303

1-SI-404
1-SI-505

d. Evolutions involving a series of actions should be arranged as a series of individual steps.

e. When an automatic action occurs:

(1) List the setpoint.

(2) Request operator verification of automatic actions. If possible, this verification should use a positive indication that equipment has responded to a command rather than a check of the command signal. This verification shall include a manual initiation if the automatic response failed to actuate.

f. When system response dictates the speed of operator action, the limits or the time frame should be specified.

g. Instructions should be written in concise, numbered steps.

h. Whenever a specific step within a procedure has caused a reactor trip to occur, because it was performed incorrectly, that step shall be annotated with a footnote listing the LER, as shown on Attachment (14).

2. Logic Terms

a. Logic terms such as **AND**, **OR**, **IF**, **NOT**, **WHEN**, and **THEN** are used to describe a set of conditions or sequence of actions. Whenever these logic terms are used, all letters of the logic terms should be bolded, capitalized and underlined, when used in conditional statements required to be emphasized.

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b. The use of **AND** and **OR** within the same action should be avoided.

c. The word **AND** should be used to join a combination of two conditions only.

d. The word **OR** should be used when calling attention to alternative combinations of conditions in logic statements.

e. When action steps are contingent upon certain conditions or combinations of conditions, the step should begin with the words **IF** or **WHEN** followed by a description of the condition or conditions. The next line should begin with the word **THEN**, followed by the action to be taken. **WHEN** is used for an expected condition. **IF** is used for an unexpected, but possible condition.

f. Avoid the use of double negative wording.

poor example: **IF** loss of Component Cooling **NOT** verified,
THEN return to section XX.

good example: **IF** Component Cooling operability is verified,
THEN return to section XX.

g. The following examples illustrate proper use and formatting of the above guidelines.

(1) Ordering of information:

IF the feedwater header breaks,
THEN shut the S/G Feedwater Isolation Valve, 1-FW-4516-MOV.

(2) Listing conditionals:

IF any of the following parameters are abnormally high **OR** increasing:

a. containment pressure
b. containment radiation
c. containment sump level

THEN verify PORVs are shut.

(3) Use of the word **WHEN**:

WHEN pressurizer level increases to XXX inches,
THEN stop the Charging Pump.

h. The "Functional Recovery Procedure, EOP-8" is formatted per Attachment (13). The use of the word "OR" is a combination logic and placekeeping aid and may be boxed, underlined or provided with parentheses to allow easier operator comprehension and choosing alternate actions.

3. Cautions

a. Cautions describe safety issues relevant to a particular step within a procedure. These issues should include such areas as potential Technical Specification Violations, Inadvertent Safety System Actuation, restriction on the use of plant systems, and actions or situations which could result in injury or equipment damage.

b. Cautions should be inserted prior to the applicable step in the procedure and should not be split between pages.

c. Cautions shall not instruct the operator to perform an action.

4. Notes

a. Notes shall be used to denote additional information, which would be of benefit to operators during the procedure implementation.

b. Notes shall not instruct the operator to perform any action.

c. Notes should be inserted prior to the applicable step.

5. Branching to Other Procedures or Steps

When the term "referencing" is used in connection with another procedure, it implies that the referenced procedure will be used as a supplement to the procedure presently being used. This process should be minimized because it can require excessive movement between procedures and/or simultaneous application of several procedures.

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When the term "branching" is used in connection with another procedure, it signifies that the procedure being used is to be exited and the new procedure or major subsection of the procedure is to be used in its entirety. Branching is an acceptable method of entering another procedure and minimizes most of the problems associated with referencing.

The following guidelines should be used:

a. Referencing other procedures or operating instructions should be minimized.

b. If referencing instructions to perform a task, the operator should be instructed to complete the task "per OI-XX".

c. Branching to other procedures or operating instructions should be used when a complete procedure or independent section of a procedure supersedes the procedure currently in use. When branching, the operator should be instructed to "implement procedure (OI-XX)".If this occurs during the implementation of an Emergency Operating Procedure, the original procedure must be reentered from its beginning. Such a phenomena is expected if an incorrect accident diagnosis is made and the operator must return to the Functional Recovery Procedure.

6. Component Identification

a. Equipment, controls, and displays should be identified in common usage terms. These terms may not always match engraved names on panels, but will be sufficient for proper identification.

b. When a step in a procedure is contingent upon an alarm, the engraving should be quoted verbatim.

c. Valve designations, as listed in the Operating Instructions' valve list, should be used to identify valves.

d. The noun name should precede the number, if used when identifying valves. The number should precede the noun name when identifying pumps or valves called by an acronym (12 MSIV, 11 AFW Pump).

e. Location information for component should be provided only if items are seldom used or may be difficult to locate.

f. For handswitches which have standby positions, the verb "Place" should be used to denote the desired position. Positional placements are typically named REMOTE, AUTO, NORMAL, PULL-TO-LOCK. All switch positions should be capitalized.

g. For controllers with multiple modes of operation, the verb "shift" should be used when changing modes of operation. Example: Shift 1-HIC-100 to AUTO.

h. Standard practices for detecting abnormal conditions during equipment startup or operation (vibration, flow etc.,) need not be included in EOP's.

7. Operator Aids

a. When information is presented using figures, charts, or tables, these aids must be self-explanatory, and legible under the expected conditions of use and within the reading precision of the operator.

b. Units of measure on tables, figures, and charts, should be given for numerical values that represent observed data, measured data, or calculated results. A virgule (slant line) should be used instead of "per." (Examples: ft/s, lb/h)

c. Figures or tables referenced in the EOP text shall comprise the "ATTACHMENTS" section of the EOP publication. The attachments will be numbered consecutively and references in the text will refer to this number. Each attachment page should have the word "ATTACHMENTS", "Rev. #/Unit #", and "Page #" in the upper right corner.

8. Repetitious Steps

When using the EOP's, there are steps which will require repeated verification of parameters. This should be done once by the operator to establish a base line and further monitoring should be done in the Safety Function Status Check.

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C. Mechanics of Style

1. Hyphenation

a. Hyphens should be used in the following circumstances:

(1) In compound numerals from twenty-one to ninety-nine:
example: one hundred thirty-four

(2) In fractions: examples: one-half, two-thirds

(3) In compounds with "self"; examples: self-contained, self-lubricated

(4) When misleading or awkward consonants would result by joining the words; example: bell-like

(5) When a letter is linked with a noun; examples: X-ray, O-ring, U-bolt, I-beam

b. When doubt exists, the compound word should be restructured to avoid hyphenation.

2. Punctuation

a. Punctuation should be used only as necessary to aid comprehension. Word order should be selected to require a minimum of punctuation. If extensive punctuation is necessary for clarity, the sentence should be rewritten and possibly made into several sentences.

b. Brackets will normally not be used.

c. A colon should be used to indicate that a list of items is to follow, or if there is more than one step in the next level of indentation.

Example: Restore cooling flow as follows:

d. A comma should be inserted after conditional phrases for clarity and ease of reading.

Example: <u>WHEN</u> level decreases to 60 inches, <u>THEN</u> start pump....

e. Parentheses should be used to indicate alternative items in a procedure, instruction, or equipment or valve numbers. When an item could be singular or plural, "(s)" may be used. (i.e. Secure the sump pump(s). When parentheses are used, to identify identical equipment on opposite units or alternate equipment, a general statement should be included to describe what the parentheses mean.

Example: Parenthesis indicate valves for Unit 2. Start 11(21) Boric Acid Pump or Start 11(12) RCWRT Pump.

3. Vocabulary

a. Words used in procedures should convey precise understanding to the trained person.

b. Words should be used that are concrete rather than vague, specific rather than general, familiar rather than formal, precise rather than blanket.

c. Define key words which may be ambiguous.

d. Verbs with specific meaning should be used. Examples are listed in Attachment (3).

e. For consistency in the use of words which may have different spellings, Attachment (6) should be consulted.

f. Equipment status should be denoted as follows:

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

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

4. Numerical Values

a. For numbers less than unity, the decimal point should be preceded by a zero and subsequent numbers should be grouped in threes with a single space between each group of three numbers.

Example: 0.021 323

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

c. Acceptance values should be specified in such a way that addition and subtraction is not required. This can generally be done by stating acceptance values as limits.

Examples: 510°F maximum, 300 PSIG minimum, between 580 and 600°F, 525 to 535°F.

Negative and positive signs preceding numbers should be in parentheses.

Example: (-)170 to (+)30, between (-)170 and (+)30.

If addition or subtraction is required, then plus or minus signs should be spelled out.

Example: Thot minus Tcold.

d. Engineering units should always be specified for numerical values of process variables. They should be consistent with those read on the control room displays; for example: PSIA instead of PSI.

5. Abbreviations, Mathematical Symbols, and Acronyms

a. Abbreviations and acronyms listed in Attachment (4) may be used. All other words should be written in full. Consistency should be maintained throughout the procedure.

b. All abbreviations listed in Attachment (4) should be written per Attachment (4) when used. The period should be omitted in abbreviations except in cases where the omission would result in confusion.

c. Common mathematical symbols (i.e., greater than, less than, equal, etc.) should be spelled out, when used in text. The SFSC may use mathematical symbols for ease of use and because the SFSC is used repetitiously.

6. Capitalization

a. Capitalization may be used to provide emphasis or attract attention.

(1) Capitalize the first letter of the following:

First word in a sentence
First word in a list
Quoting titles of procedures within text
Unique plant equipment names
Each word in a major system
Plant condition descriptions
Titles of persons
Compass positions
Names of rooms

(2) Capitalize all letters in each of the following:

Switch positions; CLOSE, START, PULL-TO-LOCK
Logic terms
Some acronyms per Attachment (4)
Quoting alarm windows
The words NOTE and CAUTION
Section headings
Procedure titles

D. Procedure Format

1. Heading and Text Arrangement

a. Two column, block style is to be used, as shown in Attachment (1) for EOP's 0-7. The first column will provide the primary recovery action. The second column will provide alternate actions. Single column block style will be used for EOP-8 and all other procedures except where

a two column format would be beneficial for operators.

b. Three line spaces should be allowed between headings and preceding text.

c. Triple line spacing should be allowed between paragraphs.

d. Text should be typed using double spacing. EOPs should be typed single spaced with double spacing between steps.

e. EOP Arrangement

1. First level section headings should be typed bold face with capitals and underlined.

2. Second level indenting should be used to provide a general description of the action to be taken. If third level text is not required, specific guidance may be given at this level. Paragraph lettering at this level should be aligned with level 1 lettering to maximize space in the 2 column format. The general description will be capitalized and boxed to help serve as a place keeping aid and to emphasize general directions.

3. The third level should be used to provide specific guidance, for accomplishing the boxed statement. Care should be taken that all material in this section addresses the boxed statement it falls under.
Example:

III. RECOVERY ACTIONS

A. ENSURE SAFE TURBINE COASTDOWN:

---

1. Initiate and monitor printout of Turbine Bearing temperatures.

2. Start Turning Gear Oil Pump.

4. For numbering alternate action steps, the letter or number to the left of the decimal should be the same as its associated

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Immediate/Recovery action step. The sequential alternate action step number should appear to the right of the decimal.

Example:

E. MONITOR NORMAL CONTAINMENT ENVIRONMENT:

1.	Ensure containment pressure less than 0.7 PSIG.	1.1 IF containment pressure increases to 2.8 PSIG, THEN verify ESFAS actuation: a. SIAS. b. CIS AND trip all RCPs.
		1.2 IF containment pressure increases to 4.25 PSIG, THEN verify CSAS actuation.
2.	Ensure containment temperature less than 120°F.	
3.	Ensure containment radiation monitor alarms clear.	

---

5. Words should not be broken between lines or pages. If possible, action steps should be completed on the page they begin. This is particularly true, if the second page contains only 1 line of the action step.

2. Section and Instruction Step Numbering

a. Sections of the procedures shall be numbered using capital Roman numerals. Succeeding portions of each section shall be numbered as follows:

I.
A.
1.
a.
(1)

b. The use of the (1) level of indenting should be minimized. Lower level indenting should be used

for providing specific instructions for accomplishing the instruction of the next level up.

c. To avoid confusion, Safety Function Status Check sheets should use lower case letters to identify specific parameter checks.

3. Margins for EOP's

Margins will be designated by solid lines around the outside of each page containing operator actions, and attachments containing operating data. These solid lines must appear on any reproduced copy to ensure a complete copy has been made.

4. Cautions and Notes

a. The applicable heading -NOTE- and -CAUTION- should be capitalized, and centered. Both shall also be underlined and bolded.

b. The text of the note or caution should be block format, single space, and typed across the entire column in which it is located. The text of cautions shall be typed in bold print.

5. Figures

a. Figures used in the procedures should be accurate and easy to read.

b. Each figure has procedure number, figure number, and revision number in upper right hand corner.

VIII. PROCEDURE VERIFICATION/VALIDATION PLAN

A. Verification

1. The verification objective is to ensure written correctness and technical accuracy in each procedure.

2. Procedure verification can occur in two distinct phases. The first step consists of an individual review which shall occur on all procedures. The second step, which will occur for some AOP's and all EOP's is a group review.

a. Individual Review - The functions of writing and verification will be separated so that an independent check of each procedure is obtained in

the review process. Consistency between reviews will be achieved by using a verification checklist (Attachment 7). The objective of this step is to ensure written correctness and consistency in each procedure.

Group Review - The second objective of EOP verification is to ensure technical accuracy. This will be accomplished by bringing the procedure writers together as a group. Within this group the technical expertise will exist to compare each new and revised procedure against the various source documents (Generic Guidelines, Writer's Guide, FSAR, Technical Specifications, etc). The functions which will be incorporated in this comparison process are as follows:

1. Ensure no single individual's bias effects the procedure adversely.

2. Ensure procedure is technically consistent with the source documents.

3. Record any improvements in procedure writing methodology which should be provided as feedback to the writer's guide.

4. Complete deviation sheets for all verification findings in the EOP's, Attachment (5).

5. Document any additional information concerning bases for EOP actions obtained during the verification process.

6. The group review shall be documented with results on Attachment (8).

B. Validation

1. The validation program objective is to ensure the useability and operational correctness of each procedure.

2. The validation of Operations' Procedures will be accomplished by:

   a. Simulator performance using selected scenarios

   b. Feedback from actual performance of procedures

Simulator Validation - Simulator validation of the procedures should occur whenever possible to ensure:

(1) Useability of procedure

(2) Technical correctness

(3) User oriented

Feedback From Actual Performance - To provide for continual monitoring of procedure correctness and useability, the validation checklists developed for use in the validation above will be reviewed after a procedure is used in an actual plant transient and after use in simulator exercises run during operator requalification sessions.

3. The validation of a procedure should be documented on Attachment (9) and include initial conditions, and the scenario (i.e., 100 GPM tube leak). The results and/or any comments should also be noted and sent to the procedure writer's group.

C. Re-verification and Re-validation

Any changes made to the EOPs, which may change the intent of the procedure, made as a result from a verification or validation finding, shall be verified and validated per section VIII A and B of this Writers Guide.

D. Documentation

All comments made during the verification and validation processes for EOPs will be reviewed by the appropriate procedure writer for resolution. The procedure writer will determine he proper corrective action. If the corrective action deviates from the generic guidelines, the procedure writer shall document this response on an EOP Deviation Sheet, Attachment (5). All deviation sheets will become part of the EOP History File.

IX. PROCEDURE MAINTENANCE

An EOP Maintenance Checklist for Control Room copies, Attachment (12), should be performed for issuing revised EOPs.

OPERATIONS UNIT ADMINISTRATIVE POLICY 86-3

PROCEDURE WRITERS GUIDE

X. BIENNIAL REVIEW

Each procedure shall be reviewed at least once every two years. This review shall be documented by completing a Biennial Review Sheet and a Biennial Review Checklist, Attachments (10) & (11).

XI. RECORDS

All outdated procedures and their Biennial Review Sheets, if any, shall be maintained in the procedure history file which is maintained by the Supervisor of Procedural Development (S-PD). Supporting documentation used for the revision should also be included in the history file.

ATTACHMENT (1)

PAGE FORMAT

III. IMMEDIATE ACTIONS	ALTERNATE ACTIONS
A. MONITOR REACTIVITY CONTROL:	
1. Depress one set of Manual Reactor Trip Buttons.	
2. Ensure prompt drop in NI power.	2.1 IF reactor NOT tripped, THEN de-energize CEDM Motor Generator Sets: a. Open feeder breaker to 12A 480V Bus. b. Open feeder breaker to 13A 480V Bus. c. Open tie breakers to 12A and 13A 480V buses.
3. Ensure all CEAs fully inserted.	3.1 IF one CEA fails to fully insert, THEN borate 200 ppm: a. Open Boric Acid Direct Makeup Valve, 1-CVC-514-MOV. b. Start a Boric Acid Pump. c. Start all available Charging Pumps. 3.2 IF more than one CEA fails to fully insert, THEN borate the RCS to 2300 ppm.
B. MONITOR RCS PRESSURE AND INVENTORY CONTROL:	
1. Ensure pressurizer level stabilizes between 80 and 180 inches.	1.1 Operate charging and letdown to restore pressurizer level.

ATTACHMENT (2)

COVER SHEET

PROCEDURE
Rev. X/Unit X
Page 1

CALVERT CLIFFS NUCLEAR POWER PLANT

PROCEDURE TITLE

REVISION

	SIGNATURE	DATE
PREPARED BY;	_____	_____/_____
VERIFIED BY;	_____	_____/_____
POSRC;	Meeting # _____	_____/_____
APPROVED BY;	_____	_____/_____

ATTACHMENT (3), Page 1 of 6

VERB LIST

VERB	APPLICATION
ACTUATE	An automatic action which starts a series of sequential actions.
ADJUST	To regulate.
ALIGN	To arrange a system or component to produce a proper condition, for example, "Align 11 D/G to 21 4KV bus".
ALLOW	To permit a stated condition to be achieved prior to proceeding, for example, "allow discharge pressure to stabilize".
ASSIGN	To appoint a duty.
ATTEMPT	To make an effort to do.
BALANCE	Balance flow by throttling HPSI valves.
BORATE	The act of raising the concentration of boric acid.
BLOCK	To prevent from occurring, for example, "Block SIAS".
BLOW DOWN	Blow down the S/Gs to (-)30 inches.
CHARGE	To place in a position for use, or to furnish or fill to capacity, for example, "Charge the spring on 480V breaker 52-1102", or "Charge to the RCS using the Charging Pump".
CHECK	To perform a comparison with a procedural requirement "Check shut Letdown Isolation Valve, 1-CVC-515-CV."
CLOSE	To change the physical position of a device so that it permits passage of electrical current, for example, "Close the salt water pump breaker".
COMPARE	To examine to discover resemblances of differences.
COMPLETE	To accomplish specified procedural requirements, for example, "complete steps A through C of Section III".
CONFIRM	To support or establish validity of an action.

VERB LIST

VERB	APPLICATION
CONNECT	To join or fasten together.
CONSIDER	To think about with care or caution.
CONTINUE	To go on, for example, "Continue with step K".
COOL DOWN	Cool down the RCS.
COMMENCE	To begin.
CONTROL	Control steam flow using the HIC.
CYCLE	Cycle pressurizer heaters to maintain 2250 PSIA.
DECREASE	Use only when monitoring the results of an action or event. Use "LOWER" if directing an action.
DE-ENERGIZE	To remove electrical power.
DEPRESS	To push.
DETERMINE	To ascertain the quality, quantity, position, or nature of something, for example, "Determine the amount of Boric Acid to be added".
DILUTE	The act of lowering the concentration of Boric Acid.
DIRECT	Direct Chemistry personnel to draw Iodine sample.
DOCUMENT	To serve as evidence or proof.
DRAW	To form, for example, "Draw a bubble in the Pressurizer".
ELIMINATE	Eliminate voids as follows:
ENERGIZE	To apply electrical power.
ENSURE	To make certain, for example, "Ensure safe turbine Coastdown".
ENTER	To go into, for example, "Enter EOP-5".
ESTABLISH	To make arrangements for a stated condition, for example, "establish AFW flow...".

VERB LIST

VERB	APPLICATION
EVALUATE	To appraise or examine carefully, for example, "Evaluate the need for cooldown".
FEED	Feed the S/G using Main Feed.
GRAVITY FILL	The transfer of liquid from one tank or system to another caused by the difference in height of the two liquids.
HEAT UP	Heat up the RCS.
IDENTIFY	Identify affected S/G.
IMPLEMENT	To put into effect. Example, "Implement the RCP trip strategy".
INCREASE	Use only when monitoring the results of an action or event. Use "RAISE" if directing an action.
INHIBIT	If voids inhibit heat removal...
INITIATE	Operator or automatic action that starts a series of sequential actions.
INSERT	To put or thrust in, for example, "Insert CEAs".
INSPECT	To measure, observe or evaluate a feature or characteristic for comparison with specified limits; method of inspection should be included, for example, "visually inspect for leaks".
ISOLATE	Removed from service so as to make unavailable for operation.
LAY UP	Lay up S/Gs in preparation for extended outage.
LINE UP	Line up CVCS for normal...
LOWER	Reduction in the absolute value of a parameter, for example PZR pressure.
MAINTAIN	To keep in a desired condition, for example, "Maintain Tcold 525 to 535°F".
MAKE UP	Make up to VCT (to maintain level...)
MATCH	To position handswitches.

VERB LIST

VERB	APPLICATION
MAXIMIZE	Maximize S/G blowdown.
MINIMIZE	To reduce to minimum, for example, "Minimize heat loss".
MONITOR	To check or keep watch over, for example, "Monitor for proper operation of TBVs".
NOTE	To perceive or notice an action or parameter, for example, "Note position of CEAs after trip".
NOTIFY	To give notice to, for example, "Notify ESO of trip".
OBSERVE	To take notice.
OPEN	To change the physical position of a mechanical or electrical device, such as a valve or door to the unobstructed position that permits access or flow, for example, "open the AFW throttle valve, 1-AFW-4511-CV" or in the case of electrical breakers, to interrupt the flow of electrical current.
OPERATE	All manual actions available to the operator (manual control, setpoint adjustment, BIAS adjustment) are used to control the parameter of interest.
PARALLEL	The sequence of events performed to electrically connect alternating current in phase.
PER	"According to"
PERFORM	To begin and carry out an action, for example, "Perform EOP-1".
POSITION	Manually position TBVs.
PLACE	To change the physical position of a handswitch with positions for standby conditions, for example, "Place 23 AFW pump handswitch, 2-HS-4540, in AUTO".
PULL	To withdraw or to disconnect an electrical circuit board to cause an action, for example, "Pull CEAs to their UEL" or "Pull the High Pressurizer Pressure trip module".

VERB LIST

VERB	APPLICATION
PUSH	To depress as a button, for example, "Push the reset buttons".
RAISE	Increase in the absolute value of a parameter, for example, "Raise the level in 11 BAST".
RECALL	To collect, for example, "Recall post-trip review".
RECORD	To document specified condition or characteristic, for example, "record discharge pressure".
REDUCE	Reduce setpoint in back pressure controller.
REQUEST	To ask for or someone to do something, for example, "Request a Boron sample".
RESET	Reset the turbine.
RESTORE	To bring back to former or original condition, for example, "Restore pressurizer level".
RETURN	To bring back to former condition, for example, "Operate TBVs to return Tcold to 525°F".
SET	To physically adjust to a specified value an adjustable feature, for example, "set diesel speed to ....'RPM'".retaining availability.
SECURE	Place a system in a shutdown condition.
SHIFT	To change the condition of a piece of equipment, for example, "Shift HIC-100 to AUTO".
SHUT	To change the physical position of a mechanical device so that it prevents physical access or flow, for example, "shut the MSR steam source valves".
SHUT DOWN	Shut down the reactor.
START	To originate motion of an electric or mechanical device directly or by remote control, for example, "start ....pump." This includes a check of operating parameters to confirm proper operation of the equipment.
START UP	Start up reactor per...

VERB LIST

VERB	APPLICATION
STOP	To terminate operation, for example, "stop ....pump".
STABILIZE	Stabilize Tcold.
STRIP	To remove electrical loads from a power source by opening all individual breakers feeding individual equipment.
TAKE	To get possession of, for example, "Take manual control of pressurizer level".
THROTTLE	To operate a valve in an intermediate position to obtain a certain flow rate, for example, "throttle the AFW regulating valves...".
TRIP	To manually activate an automatic feature, for example, "Trip Unit 2 main turbine...".
VERIFY	To confirm an expected condition or characteristic, for example, "Verify that SIAS has actuated". If the expected condition or characteristic cannot be verified, due to a malfunction, the operator must take manual action to place the component or system in that expected condition.
WARM UP	Warm up turbine in preparation for...

ATTACHMENT (4), Page 1 of 5

ACCEPTABLE ACRONYMS AND ABBREVIATIONS

ACRONYM	TERM
AC	Alternating Current
AFAS	Auxiliary Feedwater Actuation System
AFW	Auxiliary Feedwater
AMPS	Amperes
AOP	Abnormal Operating Procedure
AUTO	Automatic
AUX	Auxiliary
BAST	Boric Acid Storage Tank
B/D	Blowdown
CC	Component Cooling
CCI	Calvert Cliffs Instruction
CEA	Control Element Assembly
CEDM	Control Element Drive Mechanism
CET	Core Exit Thermocouple
CIRC	Circulation/Circulating
CIS	Containment Isolation Signal
CNTMT	Containment
CO_2	Carbon Dioxide
cpm	Counts per Minute
CRS	Containment Radiation Signal
CSAS	Containment Spray Actuation Signal
CSF	Critical Safety Function
CST	Condensate Storage Tank
CVCIS	Chemical and Volume Control Isolation Signal
CVC/CVCS	Chemical and Volume Control System
CV	Control Valve
DEMIN	Demineralizer
DC	Direct Current
D/G	Diesel Generator
DI	Demineralized
DNB	Departure from Nucleate Boiling

ACCEPTABLE ACRONYMS AND ABBREVIATIONS

ACRONYM	TERM
DPM	Decades per Minute
DVM	Digital Voltmeter
ECCS	Emergency Core Cooling System
EHC	Electro Hydraulic Control
EOP	Emergency Operating Procedure
ERPIP	Emergency Response Plan Implementation Procedure
ESFAS	Engineered Safety Features Actuation System
ESO	Electric Systems Operator
ft	Feet
GPM	Gallon/Minute
GSO	General Supervisor Operations
h	Hour
H_2	Hydrogen
HI	High
HPSI	High Pressure Safety Injection
HS	Handswitch
HVAC	Heating Ventilation and Air Conditioning
HX	Heat Exchanger
IA	Instrument Air
i.e.	For example
INCA	Incore Calculation
IN Hg	Inches of mercury
KV	Kilovolts
KVAR	Kilo Volt Ampere Reactive
KW	Kilowatt
LER	Licensee Event Report
LOCA	Loss of Coolant Accident
LOCI	Loss of Coolant Incident
LPSI	Low Pressure Safety Injection
MAX	Maximum
m	Minute

ACCEPTABLE ACRONYMS AND ABBREVIATIONS

ACRONYM	TERM
MCC	Motor Control Center
Mini	Minimum
MOV	Motor Operated Valve
MPT	Minimum Pressurization Temperature
MSIV	Main Steam Isolation Valve
MSR	Moisture Separator Reheater
MVAR	Mega Volt Ampere Reactive
MWE	Megawatt Electric
MWMT	Miscellaneous Waste Monitor Tank
MWS	Miscellaneous Waste System
MWTH	Megawatt Thermal
MWRT	Miscellaneous Waste Receiver Tank
N_2	Nitrogen
N/A	Not Applicable
NEOG	Nuclear Engineering Operator Guide
NI	Nuclear Instrumentation
NPSH	Net Positive Suction Head
O_2	Oxygen
OI	Operating Instruction
OOS	Out of Service
OP	Operating Procedure
PPDIL	Pre-Power Dependent Insertion Limit
PDIL	Power Dependent Insertion Limit
PTL	Pull-to-Lock
PORV	Power Operated Relief Valve
POSRC	Plant Operation Safety Review Committee
ppb	Parts per billion
ppm	Parts per million
PRESS	Pressure
PSI	Pounds/square inch
PSIA	Pounds/square inch, absolute

ACCEPTABLE ACRONYMS AND ABBREVIATIONS

ACRONYM	TERM
PSID	Pounds/square inch, differential
PSIG	Pounds/square inch, gage
RAS	Recirculation Actuation Signal
RC	Reactor Coolant
RCDT	Reactor Coolant Drain Tank
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RCWE	Reactor Coolant Waste Evaporator
RCWMT	Reactor Coolant Waste Monitor Tank
RCWRT	Reactor Coolant Waste Receiver Tank
Rev.	Revision
RMS	Radiation Monitoring System
RPM	Revolutions per Minute
RPS	Reactor Protective System
RPSCIP	Reactor Protection System Calibration and Indication Panel
RTD	Resistance Temperature Detector
RV	Relief Valve
RVLMS	Reactor Vessel Level Monitoring System
RWT	Refueling Water Tank
s	Second
SDC	Shutdown Cooling
S/D	Shutdown
SEC	Site Emergency Coordinator
SFP	Spent Fuel Pool
SFSC	Safety Function Status Check
S/G	Steam Generator
SGFP	Steam Generator Feed Pump
SGIS	Steam Generator Isolation Signal
SI	Safety Injection
SIAS	Safety Injection Actuation Signal

ATTACHMENT (4), Page 5 of 5

ACCEPTABLE ACRONYMS AND ABBREVIATIONS

ACRONYM	TERM
SMECO	Southern Maryland Electric Cooperative
SPDS	Safety Parameter Display System
SRW	Service Water
SPEC	Specification
STA	Shift Technical Advisor
SUR	Start up Rate
SV	Solenoid Valve
SW	Saltwater
Tavg	Average RCS Temperature
Tcold	RCS Cold Leg Temperature
Temp	Temperature
Thot	RCS Hot Leg Temperature
TM/LP	Thermal Margin/Low Pressure
U/V	Undervoltage
V	Volts
VCT	Volume Control Tank
WBP	Water Box Priming
WR	Wide Range
^{o}F	Degrees Fahrenheit
^{o}C	Degrees Centigrade
#	Number
&	And
%	Percent

ATTACHMENT (5)

EOP DEVIATION SHEET

Sheet No. _____ Unit _____

EOP _____ REV _____ SECTION _____ STEP _____

Deviation from generic guidelines _____ Verification finding _____

Validation finding _____ Change from previous revision _____

Deviation/Finding description: _____

_____

_____

Recommended change: _____

_____

_____

_____

Signature: _____

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Actual resolution to problem if different from recommended change:

_____

_____

_____

Justification of change: _____

_____

_____

Signature: _____

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Additional Basis Information: _____

_____

_____

Source: _____

ATTACHMENT (6)

PROCEDURE WORD LIST

Backpressure
Backup (Noun) Back Up (Verb)
Bleedoff
Blowdown (Noun) Blow Down (Verb)
Breakdown
Buses
Checkoff
Circulating Water
Cooldown (Noun) Cool Down (Verb)
Counterclockwise
Cross Connect
De-energize
Ensure
Feed Pump
Feedwater gage
Flowpath
Handswitch
Heatup (Noun) Heat Up (Verb)
Hotwell
Inboard
Incore
Intercooler
Kilovolt-ampere
Layup (Noun) Lay Up (Verb)
Letdown
Lineup (Noun) Line Up (Verb)
Waterbox
Lockout
Makeup (Noun) Make Up (Verb)
Megavars
Megawatts
Non-Vital
Off-Gas
Override
Offsite
Onsite
Overpower
Pickup
Post-Trip
Pretreated
Re-energize
Reheat
Saltwater
Service Water
Setpoint
Shutdown (Noun) Shut Down (Verb)
Standby
Startup (Noun) Start Up (Verb)
Steam Generator
Subcooled
Subsystem
Switchgear
Warmup (Noun) Warm up (Verb)
Withdrawn

ATTACHMENT (7), Page 1 of 3

VERIFICATION/REVISION CHECKLIST

PROCEDURE _____ DATE _____

A. FOR OIs, OPs, AOPs, and EOPs:	Preparer (INIT.)	Verifier (INIT.)
1. The title reflects the procedures function.	_____	_____
2. Sections are titled correctly and arranged in proper sequence.	_____	_____
3. Steps are broken down and numbered correctly with proper indentation.	_____	_____
4. No action steps hidden in cautions or notes.	_____	_____
5. Notes are adequate, necessary and not lengthy.	_____	_____
6. Cautions immediately precede affected step and are indeed cautions, not notes and are in bold print.	_____	_____
7. Procedure is technically correct.	_____	_____
8. Adequate direction is provided from section to section or to another procedure.	_____	_____
9. Any reference to other documents is correct, accurate, and up to date.	_____	_____
10. Word list, Attachment (6), has been checked and words conform to acceptable format.	_____	_____
11. Verb list, Attachment (3), has been checked and verbs conform to acceptable format.	_____	_____
12. Instruction steps make proper use of logic structure.	_____	_____

ATTACHMENT (7), Page 2 of 3

VERIFICATION/REVISION CHECKLIST

	Preparer (INIT.)	Verifier (INIT.)
13. Acronyms and Abbreviations list, Attachment (4), has been checked and words conform to acceptable format.	_____	_____
14. Figures are accurate and easy to read.	_____	_____
15. Each figure has OI #, Figure #, and Revision # typed in upper right hand corner.	_____	_____
16. Attachments are complete, accurate, and easy to read.	_____	_____
17. All outstanding COMs and request forms have been incorporated.	_____	_____
18. Each page of the procedure has the procedure #, the revision #, the applicable unit #, and the page # in the upper right hand corner.	_____	_____
19. If OI, OP, and AOP is more than 10 pages, a Table of Contents is provided and it correctly identifies sections.	_____	_____
20. List of effective pages, correctly lists all pages, figures, and attachments.	_____	_____
21. All changes have been lined in the right hand margin.	_____	_____
22. A comparison has been made with the same procedure for the other unit and no unexplainable differences exist.	_____	_____
23. A review of general precautions has been made, and those applicable to a particular section have been moved to that section as a note or caution.	_____	_____

VERIFICATION/REVISION CHECKLIST

	Preparer (INIT.)	Verifier (INIT.)
24. The words used are precise, specific, and familiar to the operator.	_____	_____
25. Mathematical symbols are spelled out.	_____	_____
26. Sections or steps which have resulted in an inadvertant reactor trip, should be annotated per Attachment (14).	_____	_____

B. For EOPs Only:

1. Borders are visible on attachments and each page containing operator actions.	_____	_____
2. Appropriate actions are provided and prioritized by reliability under event conditions.	_____	_____
3. If possible, action steps are completed on the page they begin.	_____	_____
4. Procedure is written in two column format per Attachment (1), except EOP-8.	_____	_____
5. Deviations from generic guidelines, not previously documented, have been documented on an EOP Deviation Sheet.	_____	_____

C. This checklist is intended as a guide but your review should not be limited to this checklist when doing a revision. It should be an overall review for content and accuracy, with the goal of producing a useful and quality procedure.
For EOPs: Any comments made during the performance of this checklist should be noted on an EOP Deviation Sheet, Attachment (5), and sent to the appropriate procedure writer for resolution.

Preparer _____ Verifier _____

ATTACHMENT (8)

PROCEDURE VERIFICATION

GROUP REVIEW

DATE: _____

MEMBERS PRESENT:

_____ _____

_____ _____

_____ _____

PROCEDURE REVIEWED: _____

COMMENTS/RESULTS OF REVIEW: _____

ATTACHMENT (9) Page 1 of 3

PROCEDURE VALIDATION

Date: _____

Type of Validation:

_____ Simulator performance _____ Actual performance

Procedure Validated: _____

Validation performed by: _____
All members of validating team should be listed

Comments: (Include initial plant conditions and scenario/casualty and results). _____

_____

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Forward to Supervisor-Procedural Development

ATTACHMENT (9) Page 2 of 3

PROCEDURE VALIDATION

GUIDELINES

I. USABILITY

A. LEVEL OF DETAIL

1. Is there sufficient information to perform the specified actions at each step?
2. Are alternate actions written to perform the desired function?
3. Are the labeling, abbreviations, and location information as provided in the EOP sufficient to enable the operator to find the needed equipment?
4. Are the titles and numbers sufficiently descriptive to enable the operator to find referenced and branched procedures?

B. UNDERSTANDABILITY

1. Is the EOP easy to read?
2. Are the attachments easy to read with accuracy?
3. Can the values on attachments be easily determined?
4. Are caution and note statements readily understandable?
5. Are the EOP steps readily understandable?

II. OPERATIONAL CORRECTNESS

A. PLANT COMPATIBILITY

1. Can the actions specified in the procedure be performed in the designated sequence?
2. Are there alternate success paths that are not included in the EOP?
3. Can the information from the plant instrumentation be obtained, as specified by the EOP?
4. Are the plant indications specified by the EOP adequate to enable the operator to select the applicable EOP?
5. Are the initial conditions appropriate for the plant symptoms displayed to the operator?

ATTACHMENT (9) Page 3 of 3

PROCEDURE VALIDATION

GUIDELINES

6. Is information or equipment not specified in the EOP required to accomplish the task?
7. Are the instrument's units of measurement and tolerances, stated in the EOP, consistent with the instrument values displayed on the instruments?
8. Is the EOP physically compatible with the work situation (too bulky to hold, binding won't allow them to lay flat, no place to lay the EOPs down to use)?
9. Are the instrument's units of measurement and tolerances, stated in the EOP, for remotely located instruments, accurate?

B. OPERATOR COMPATIBILITY

1. Can the procedure action steps be performed by the minimum operating shift?
2. If specif. actions are assigned to individual shift personnel, does the EOP adequately aid in the coordination of actions among shift personnel where necessary?
3. Can the operating shift follow the designated action step sequences?
4. Can the particular steps or sets of steps be readily located when required?
5. Can procedure exit point be returned to without omitting steps when required?
6. Can procedure branches be entered at the correct point?
7. Are EOP exit points specified adequately?
8. Are action steps structured so as to minimize the movement of personnel around the control room while carrying out procedure steps?
9. Are action steps structured to avoid unintentional duplication of tasks?

ATTACHMENT (10)

BIENNIAL REVIEW SHEET

PROCEDURE NUMBER AND TITLE _____

UNIT _____

The Biennial Review shall be accomplished by completing Attachment (11). Changes shall be incorporated by use of CCOM Change Reports or Revisions.

CCOM Change Report # _____

Revision # _____

BIENNIAL REVIEW COMPLETED _____ / _____

(NAME) (DATE)

(ATTACH CHECKLIST TO THIS FORM)

APPROVED _____ / _____

(C-PD OR S-PD) (DATE)

THIS SHEET WILL BE RETAINED BY THE PROCEDURAL DEVELOPMENT GROUP.

C-PD COORDINATOR - PROCEDURAL DEVELOPMENT

S-PD SUPERVISOR - PROCEDURAL DEVELOPMENT

ATTACHMENT (11), Page 1 of 2

BIENNIAL REVIEW CHECKLIST

PROCEDURE _____ UNIT _____

A. FOR OIs, OPs, AOPs, and EOPs:	Reviewer (INIT.)
1. The title reflects the procedures function.	_____
2. No action steps hidden in cautions or notes.	_____
3. Procedure is technically correct.	_____
4. Adequate direction is provided from section to section or to another procedure.	_____
5. Figures are accurate and easy to read.	_____
6. Attachments are complete, accurate, and easy to read.	_____
7. A comparison has been made with the same procedure for the other unit and no unexplainable differences exist.	_____
8. All change reports are typewritten.	_____
9. Sections or steps which have resulted in an inadvertant reactor trip, should be annotated per Attachment (14).	_____
10. The List of Effective Pages have been checked and updated to reflect the current number of pages.	_____

B. For EOPs Only:

1. Borders are visible on attachments and each page containing operator actions.	_____

ATTACHMENT (11), Page 2 of 2

BIENNIAL REVIEW CHECKLIST

2. Appropriate actions are provided and prioritized by reliability under event conditions. _____
3. If possible, action steps are completed on the page they begin. _____
4. Procedure is written in two column format per Attachment (1), except EOP-8. _____
5. Deviations from generic guidelines, not previously documented, have been documented on an EOP Deviation Sheet. _____

C. This checklist is intended as a guide but your review should not be limited to this checklist when doing a review. It should be an overall review for content and accuracy, with the goal of producing a useful and quality procedure.

For EOPs: Any comments made during the performance of this checklist should be noted on an EOP Deviation Sheet, Attachment (5), and sent to the appropriate procedure writer for resolution.

D. Comments for future revisions

_____

_____

_____

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_____

Reviewer _____ Date _____

ATTACHMENT (12)

EOP MAINTENANCE CHECKLIST

CONTROL ROOM COPIES ONLY

INIT.

1. Xerox copies are legible, complete and are the latest revision. _____

2. Separate control room binders containing safety Function Status Check sheets have been updated. _____

3. Procedure contains all pages and are in numerical order. _____

4. Attachment section in the EOP binder has been updated, if necessary. _____

5. Margins exist around pages containing operator actions and attachments. _____

EOP NUMBER _____ TITLE _____

REVISION # _____ UNIT _____

REVISION ENTERED BY _____ / _____
(NAME) (DATE)

ATTACHMENT (13)

EOP-8 FORMAT

I. PRECAUTIONS

A.

B.

II. SAFETY FUNCTION ACCEPTANCE CRITERIA

A.

1.

2.

III. RECOVERY ACTIONS

A. SUCCESS PATH:

1. Substep Heading:

a.

OR

b.

(1)

(OR)

(2)

OR

2. Substep Heading:

OR

B. ANOTHER SUCCESS PATH:

IV. SAFETY FUNCTION STATUS CHECK

A.

ATTACHMENT (14)

LER FOOTNOTING

B. Procedure

1. Shut RWT/CVCS Manual Stop, 1(2)-CVC-256.
2. Open Blended Makeup to RWT Stop, 1(2)-CVC-254.
3. Open RWT to Charging Pump Stop, 1(2)-CVC-504-MOV and borate or dilute as desired.
4. When batch has been added, shut RWT to Charging Pump Stop, 1(2)-CVC-504-MOV.
5. When a direct lineup is no longer needed, shut 1(2)-CVC-254 and Lock Open 1(2)-CVC-256.

XIII. [1]FAST BORATION TO THE RCS

A. Initial Conditions

1. Charging and letdown are lined up for normal operation.
2. CVCS makeup system is in MANUAL.

B. Procedure

- NOTE -

This procedure can be used to stop a power increase or to reduce reactor power quickly.

1. Open Boric Acid Pumps to Charging Pump Suction Direct Feed Stop, CVC-514-MOV .

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[1]LER 87-11 (Unit 1)