(81)

INDIAN POINT STATION

UNIT NO. 2

OPERATIONS ADMINISTRATIVE DIRECTIVE 7 REV. 10

OPERATING PROCEDURE DEVELOPMENT AND CONTROL

Written by

Reviewed by

SNSC Review Mtg. No. / Date

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Effective Date

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OPERATING PROCEDURE DEVELOPMENT AND CONTROL

1 PURPOSE

The purpose of this directive is to specify the type, format, content, review, controls, and distribution for operating procedures. This OAD assures that operating procedures are prepared in a consistent manner.

2 APPLICABILITY

This OAD applies to all operating procedures and changes to procedures prepared after the effective date of this OAD. Prepare each proposed new procedure in accordance with this OAD. Sections nine, ten and eleven contain non-mandatory guidance. Change existing procedures to be in accordance with this procedure when they next undergo major revision for other reasons.

3 DEFINITIONS

Abnormal Operating Instructions (A): Procedure to cover off-normal conditions which require more action than can be described in an Alarm Response Procedure.

Alarm Response Procedure (ARP): Procedure which specifies operator actions for restoring an operating variable to its normal controlled value when it departs from its range, or to restore normal operating conditions following a transient. Such actions are invoked following an operator observation or an annunciator alarm indicating a condition which, if not corrected, could degenerate into a condition requiring action under an Abnormal Operating Instruction or the Emergency Procedure.

Checkoff List (COL): List which provides a written means of identifying specific conditions and the required status of components or system conditions. These are used to (1) assure prerequisites or conditions exist prior to the start up or status change of a system or component, (2) verify that procedural steps have been completed, (3) verify system or component lineup.

Daily Surveillance Requirements (DSR): Log sheets which specify those parameters which must be monitored to ensure compliance with the Technical Specifications or other safety related items.

Daily Check Sheets (DCS): Log sheets which specify those parameters which should be monitored to ensure compliance with vendor or other non safety related specifications.

Emergency Procedure (E): Procedure which specifies actions, including manipulation of plant controls, to reduce the consequence of a potentially hazardous condition or accident which has already occurred.

Graphs Book: The graphs book consists of curves, charts and/or tables that are useful to the operator in performing various plant operations and calculations.

Plant Operating Procedure (POP): Procedure which specifies operator actions for performing integrated plant functions (e.g. Plant Startup).

Procedure Checkoff List (PCO): Composite lists of all requirements necessary to change plant conditions (e.g. take the reactor critical). The PCO will not direct actions, but will refer to the POP step for completion of each requirement. The POP directs action to fulfill each requirement and will not allow changing plant conditions until the appropriate PCO's completed.

System Operating Procedure (SOP): Procedure which specifies operator actions for the normal startup, operation and shutdown of individual systems, or components within systems.

Temporary Operating Instruction (TOI): An instruction that relates to the performance of special tests or evolutions or to the performance of operations that are applicable for a short period of time.

4 ORGANIZATION OF OPERATING PROCEDURES

4.1 Categories of Procedures

The purpose of the operating procedures is to direct the operators through the tasks necessary to ensure the safe and efficient operation of the plant. To accomplish this purpose, procedures are provided for the following three general types of plant operation:

Type	Procedure Category
Normal Operation	POP, SOP, PCO, COL, DSR, DCS
Abnormal Operation	A, ARP
Emergency Operation	E

Procedures are supported by a book of graphs. Temporary Operating Instructions may be used to supplement procedures.

4.2 Hierarchy of Procedure Usage

4.2.1 GENERAL

During normal operation, the operator is directed by Plant Operating Procedures (POP), System Operating Procedures (SOP), Procedure Checkoff Lists (PCO), and Checkoff Lists (COL). Abnormal operations are directed by Alarm Response Procedures (ARP) and Abnormal Operating Instructions (A). Emergency Operations are directed by the Emergency Procedures (E). The flowchart of Figure 1 identifies the interrelationships between the procedure categories.

4.2.2 NORMAL OPERATION

During normal operation, primary direction is given by the POP, which guide the operator through startup, power operation and shutdown of the plant. Each POP directs the operator to COL and SOP which provide for alignment and operation of individual systems unless there are only a few steps in which case they will be in the POP.

4.2.3 ABNORMAL OPERATION

When off-normal conditions develop, the plant annunciators will alert the operator. Direction is provided by an ARP, which will then guide the operator to the best path for returning to normal operation. Plant administrative procedures allow the operator to elect to carry out the instructions of an ARP prior to receiving any alarm if the trend of conditions indicate the necessity.

To return from an ARP to a POP:

1 the operator actions outlined in the ARP may be sufficient to correct the condition and return the operator to the POP, or

2 the ARP may direct the operator to a SOP and an associated COL, after the completion of which, the operator may return to the POP.

Abnormal Operating Instructions are necessary when off normal conditions require more then the few steps that can be written in an ARP or where the necessary steps are not addressed by SOPs.

4.2.4 EMERGENCY OPERATION

The annunciation of any reactor trip signal will automatically direct the operator (by training and ARP) to the Emergency Procedure (E). The steps of this procedure require the operator to immediately verify the functional integrity and safety of the reactor core prior to any further diagnosis of symptoms or recovery from alarm conditions. Once core safety is ensured, the operator is guided through a recovery procedure which details all necessary supplemental actions before returning the operator to the POPs.

If symptoms following a reactor trip do not ensure core safety, the operator will continue through the E procedure. Decision statements will guide the operator to branches in the procedure which aid in the diagnosis of events, the prevention of further degradation of conditions, and provide for contingencies. Once the proper conditions for core safety are reached, the operator is guided to a recovery procedure.

Recovery procedures further direct the operator to perform a thorough diagnosis of conditions, followed by supplemental actions and implementation of the Emergency Plan, if necessary, including any required notifications.

5 PROCEDURE IDENTIFICATION

Use the following format for procedure identification.

5.1 Cover Sheet

Provide every procedure with a cover sheet. The cover sheet shall: 1) identify the procedure by title and number, 2) identify the authorized revision number, and 3) identify the effective date of the procedure. The cover sheet layout, capitalization and underlining should be consistent with Figure 2.

Cover sheets for PCO and COL have additional requirements and a different layout. See Section 7.2.1.

Cover sheets for A procedures have temporary additional requirements. See Section 7.4.1.

5.1.1 HEADING

The cover sheet should contain a heading which indicates that the procedure is applicable to the Indian Point Station, Unit No. 2.

5.1.2 PROCEDURE NUMBERING

Label and number procedures with the procedure type followed by identifying digits, followed by authorized revision number.

Example:	SYSTEM OPERATING PROCEDURE Type of Procedure	3.3 Sequence Number	REV. # Authorized Revision Level

5.1.3 TITLE

Provide each procedure with a title descriptive of the work, system, or unit to which it applies. The title designates the scope of the procedure.

5.1.4 SIGNOFF LINES

Provide the following labeled signoff lines. Provide one line for the author, one line for reviewer, one line for SNSC review, and a line for procedure approval.

5.1.5 EFFECTIVE DATE

Provide one labeled line for the effective date below the signoff lines.

5.2 Page Identification and Numbering

Identify each page of a procedure with (1) The procedure title, (2) the procedure designator and number, (3) the revision number, and (4) the page number; as directed below. This section does not apply to ARPs. See Section 7.3 for ARP requirements.

5.2.1 FIRST PAGE OF TEXT

Place the procedure designator, procedure number and revision number inside the upper right margin. Place the procedure title, capitalized and underlined, centered on the page and 5 lines below the upper margin. Page numbering should be "Page 1 of __," centered one line above the bottom margin.

5.2.2 REMAINDER OF TEXT

Place the procedure designator, procedure number and revision number inside the upper right margin. Place the procedure title, capitalized and underlined, inside the upper left margin. Page numbering should be "Page __ of __" centered one line above the bottom margin. Number all pages sequentially including those in figures, tables and attachments.

5.3 Revision Control

5.3.1 REVISION NUMBERING

Use one or two digits along with the abbreviation "Rev." to designate the revision number of the procedure on a separate line below the procedure designator.

5.3.2 REVISION TEXT IDENTIFICATION

Use a side bar to indicate a change. Place the bar vertically in the right margin alongside the change. Use the bar only to indicate the latest revision. Do not use a side bar when only the placement of text changes and not its content. Remove existing bars when preparing subsequent revisions. Do not use side bars on entire new procedures.

5.3.3 LIST OF EFFECTIVE PROCEDURES

Each procedure type shall have one list of effective procedures applicable to all procedures of that type. The list is placed as the first pages of a procedure volume. The format layout and content of the list of effective procedures should be consistent with Figure 3. The date in the upper right margin identifies the date of the latest revision. Deleted procedures are shown as such for at least one revision cycle.

6 GENERAL PROCEDURE FORMAT INSTRUCTIONS

6.1 Numbering of Paragraphs and Steps

Number paragraphs and steps with arabic numerals in the decimal format shown below and throughout this OAD. Refer to section 10.3 and Figure 4 for guidance on paragraph and step layout and spacing.

1 FIRST LEVEL PARAGRAPH NUMBER AND HEADING FORMAT
2 FIRST LEVEL PARAGRAPH NUMBER AND HEADING FORMAT
2.1 Second Level Paragraph or Step Number and Heading Format
2.2 Second Level Paragraph or Step Number and Heading Format
2.2.1 THIRD LEVEL PARAGRAPH OR STEP NUMBER AND HEADINGS FORMAT
2.2.2 THIRD LEVEL PARAGRAPH OR STEP NUMBER AND HEADINGS FORMAT
2.2.2.1 Fourth Level Paragraph or Step Number and Heading Format

6.2 Numbering of Lists

If a list occurs at the third or fourth level AND the list contains no sublist THEN the items of the list should be numbered 1, 2, 3, etc. as shown in Figure 5. Lists may consist of steps.

6.3 Table and Figure Numbering

Assign sequential Arabic numbers to tables and to figures, each in a separate series. Have the sequence correspond with the order of their reference in the text. Do not use the symbol "#" and abbreviation "No.". Number and identify table and figure pages in accordance with Section 5.2. See Section 9.8.8 for capitalization requirements.

EXAMPLES: Table 1, Table 2, etc.
Figure 1, Figure 2, etc.

6.4 Attachment Numbering

Number attachments sequentially by Arabic numeral. For example, Attachment 1, Attachment 2, etc. When the procedure is initially prepared, number attachments in the order of their reference in the text.

Page identification and numbering for attachments should be in accordance with Section 5.2, except add "Attachment" and its number directly under the revision number inside the upper right margin. Paragraph numbering should be in accordance with Section 6.1.

7 SPECIFIC PROCEDURE FORMAT INSTRUCTIONS

7.1 Plant Operating Procedure (POP) and System Operating Procedure (SOP)

7.1.1 COVER SHEET

Provide a cover sheet per Section 5.1 as directed below. Format both POP and SOP as shown in the example of Figure 6. (Only the first two pages are shown.)

1 Assign each POP a unique number. The first digit should be a 1, 2, or 3 according to the procedures content as a plant startup, plant operation, or plant shutdown procedure, respectively. Add a second subnumber in a logical sequence. Separate the numbers by periods e.g. POP 3.1.

2 Assign each SOP a unique number. The first and second part of the number shall correspond to the system number per the system descriptions. These numbers are then followed by another subnumber in a logical sequence, with each set of digits separated by periods e.g. SOP 27.1.1 is a Series 27.1 - AC Electrical procedure, first in the series.

7.1.2 SECTION HEADINGS AND CONTENTS

Use the following section headings and guidelines within a POP or SOP.

7.1.2.1 Purpose

Avoid having a statement of purpose unless the objective is not clear from the procedure title.

7.1.2.2 Precautions and Limitation (SOP only)

Include a list of the precautions to be taken before and during the performance of the procedure to provide for the safety of personnel and equipment. Identify setpoints and maximum or minimum safety limitations that may be approached.

When a precaution or limitation applies to a specific procedural step, it should be stated within the procedure immediately preceeding the applicable step.

POP will contain precaution and limitations in, or just prior, to the affected step(s). Due to this, there will be no Precaution and Limitations section in the POP.

7.1.2.3 Initial Conditions

State the plant conditions or the configuration of the component, system or subsystem assumed for the performance of the procedure. If applicable Technical Specifications have been verified by a COL or other procedure which is required prior to the performance of this procedure, include a statement similar to the following:

3.1 Requirements of Technical Specification 3.2.A, Chemical and Volume Control System, are met.

Describe in additional statements any required initial conditions of level, pressure, temperature and mode of control, and availability of cooling water and electrical power.

7.1.2.4 Procedure

1 If the procedure is divided into subsections, provide a title for each and number as first subdivisions (4.1, 4.2, etc.).

2 This section should include energizing, starting up, shutting down, changing modes of operation and other instructions appropriate for operations of plant systems, components or portions thereof.

3 Each procedure shall be sufficiently detailed for a qualified individual to perform the required function without direct supervision but need not provide a complete description of the system or plant process.

4 Reference will be included in the body of the procedure as necessary when the sequence of steps requires other tasks to be performed prior to or concurrent with a particular step of the procedure.

5 The main body of startup and shutdown procedures shall include the major steps of the startup or shutdown sequence. These major steps shall include or reference detailed instructions for their performance.

6 Shutdown procedures should include detailed instructions for performance of such actions as monitoring and controlling reactivity, load reduction and cooldown rates, sequence of activating or de-activating equipment, requirement for prompt analysis of causes of reactor trips or abnormal conditions requiring unplanned controlled shutdowns and provisions for decay heat removal. The administrative controls may be specified in other documents.

7 Procedures for steady state power operation and load changing will include provisions for use of control rods, boron addition or dilution or any other system available for long or short term control of reactivity, making deliberate load changes, responding to unanticipated load changes and adjusting operating parameters.

8 System procedures will include instructions for filling, venting, and draining safety related systems if separate procedures covering these operations are not provided.

9 Refueling procedures shall specify actions for core alterations and partial or complete refueling operations that include, for example, continuous monitoring of the neutron flux throughout core loading, periodic recording of data, audible annunciation of abnormal flux increases, and evaluation of core neutron multiplication to verify the safety of loading increments.

10 Refueling procedures should include instructions for controlling the status of the core, instructions for proper sequence, orientation, and seating of fuel and components, rules for minimum operable instrumentation, rules for periods when refueling is interrupted, verification of the shutdown margin and the frequency of determination, communications between control room and the fuel loading supervisor, and a containment evacuation plan and its associated safety measures.

7.2 Procedure Checkoff (PCO) and Checkoff List (COL)

7.2.1 COVER SHEET

Provide a cover sheet in accordance with Figure 7 which differs from the cover sheet in Section 5.1 in that there is provision for (1) verifying the date and time when the COL or PCO is completed; (2) full names (printed, not written) and corresponding initials of the operators performing the checkoff; (3) the Watch Supervisor to indicate the PCO or COL completion; and (4) any comments.

7.2.1.1 Assign each PCO a number using the procedure designation PCO followed by a sequential arabic number, e.g. PCO 3.

7.2.1.2 Assign each COL a unique number. The first and second part of the number shall correspond to the system description where possible. Where there is no corresponding system description number use a sequential number starting with 40. These numbers are then followed by another subnumber in a logical sequence, with each set of digits separated by periods e.g., COL 27.1.1 is a Electrical System checkoff list, first in a series.

7.2.1.3 The COL numbering system above is a substantial change from the previous COL numbering system. Therefore, for approximately one year from the date of implementation of the new numbering system, provide a reference to the prior COL procedure number. Center the reference on the cover sheet under the COL title.

7.2.1.4 Provide a cover sheet in accordance with Figure 7 which differs from the cover sheet in Section 5.1 in that there is provision for (1) full names (printed, not written) and corresponding initials of the operators performing the checkoff; (2) date that the operators completed the checkoff; (3) space for comments or exceptions to the checkoff; (4) space for the Watch Supervisor review signature with date and time of COL or PCO completion; (5) listings of reference drawings; and (6) instruction for completing the checkoff list.

7.2.2 PROCEDURE CHECKOFF LIST (PCO)

Plant startup and shutdown Procedure Checkoff Lists associated with POP provide for the verification of equipment operability or availability required for the applicable operating mode. Provide as many columns as necessary to verify TRIPPED, STARTUP, OPERATING, or other conditions as appropriate, with provisions for initials.

7.2.3 CHECKOFF LIST (COL)

Checkoff lists verify component status. They are written in a five or six column format per the example of Figure 8 as follows:

1 Provide one column listing the components to be verified.

2 Provide one column listing the required component status.

3 Provide one column for the initial of the operator performing the verification.

4 Provide a second operator initial column for all safety related items AND for all other checkoff list items designated by the Chief Operations Engineer.

5 Provide one column for the date of verification.

6 Provide a column for indication of missing name tags.

7 Checkoff lists may be typed in 12 pitch when necessary to provide adequate space.

7.3 Alarm Response Procedure (ARP)

7.3.1 COVER SHEET

Provide a cover sheet per Section 5.1. Assign each ARP a number using the procedure designator ARP followed by a sequential arabic number e.g. ARP 5.

7.3.2 PAGE IDENTIFICATION

Format the ARP as shown in the example of Figure 9. Only the first page is shown. Identify every ARP page by the following, which differs from the page identification requirements of Section 5.2.

1 For each window, provide the procedure on one page. In no case shall a second page be used. If procedural steps would require a second page, make the procedure an A and have the ARP direct the operator to that A.

2 Pages, corresponding to alarm windows, shall appear in the order of first column, then row as per location on the panel. Thus, alarms in the first column would appear sequentially, followed by the alarms in the second column, and so on.

3 Procedure Number and Revision Number

Center the revision number one line above the page number. Center the procedure designator and number one line above the revision number.

4 Panel Designation

Center the panel designation one line above the page number.

5 Window Number

Locate the annunciator window number in the upper right hand corner one line below the panel number. Assign window numbers based on the row-column position of the annunciator in the applicable panel in which they are located.

Example: Window 1-2 would be the alarm window in the first row, second column of the panel.

6 Alarm Title

Center the alarm title in a boxed outline described below. Make the alarm title an exact reproduction, line by line, of the wording on the alarm window. Include the breaking and arrangement of words as they appear on the alarm window.

The boxed outline (see Figure 9) should be nine line spaces high and wide. Align the box to the right margin and directly under the window number.

7.3.3 SECTION HEADINGS AND CONTENTS

Use the following section headings and guidelines within the ARP:

1 Setpoint

List the alarm setpoint in units consistent with the visual indication (see Figure 9). Use the spacing in Figure 9 for listing the setpoint and subsequent headings in the ARP.

2 Automatic Action

List any automatic actions that will occur as a result of the alarm. IF the alarm occurring in conjunction with another alarm will cause a new automatic action, THEN the coincident alarm and the resulting automatic action should be listed as a note.

3 Operator Action

List operator actions necessary to mitigate the consequences of the alarm, and stop the degradation of conditions. Direct the operator to A procedures, or other procedures by their number and section to prevent the use of excessive text in the ARP.

Further highlight the operator action by enclosing the text in a box as in Figure 9.

4 Technical Specification

List any Technical Specifications that apply as a consequence of the alarm.

5 Initiating Devices

List the initiating devices associated with the given alarm.

6 Reference Drawings

Provide a listing of those reference drawings which may provide guidance to the operator when performing maintenance on the associated instruments.

7.4 Abnormal Operating Instruction (A)

7.4.1 COVER SHEET

Provide a cover sheet per Section 5.1 and as directed below.

1 Assign each A procedure a unique number. The first and second part of the number shall correspond to the system description where possible. Where there is no corresponding system description number use a sequential number starting with 40. These numbers are then followed by another subnumber in a logical sequence, with each set of digits separated by periods e.g. A 28.1 is a Reactor Protection System series procedure, first in the series.

2 The A procedure numbering system above is a substantial change from the previous A procedure numbering system. Therefore, for approximately one year from the date of implementation of the new numbering system, provide a reference to the prior A procedure number. Center the reference on the cover sheet in parenthesis.

7.4.2 SECTION HEADING AND CONTENTS

1 Purpose

Avoid having a statement of purpose unless the objective is not clear from the procedure title.

2 Symptoms/Indications

List the entry indications or alarm conditions that direct the operator to the A. List the indications, operating conditions, and probable magnitudes of parameter changes.

3 Automatic Actions

List the expected automatic actions that should occur as a result of the abnormal conditions.

4 Operator Actions

List in generally sequential order the operator actions that are necessary to operate under the abnormal conditions. If appropriate, include actions necessary to return to normal plant conditions.

Steps which can be performed from memory that allow for continued plant operation, such as actions necessary to prevent turbine runback or instrument failure, shall be highlighted with an asterisk just to the left of the step number.

Actions for manipulations of controls to prevent accidents or lessen their consequences should be based on a general sequence of observations and actions. Emphasis should be placed on operator responses to observations and indications in the CCR.

7.5 Graphs

7.5.1 TITLE AND IDENTIFICATION

There is no specific format for the graphs.

7.5.2 CONTENTS

Graphs will normally be retained in the Graphs Book. The Graphs Book contains curves, tables, graphs and charts relating to tank capacities, pump or system flow characteristics, factors affecting reactivity or any other parameter that will aid the operator in operating the unit.

7.6 Emergency Procedure (E)

See Attachment 1.

7.7 Daily Surveillance Requirements (DSR) and Daily Check Sheets (DCS)

7.7.1 COVER SHEET

Provide a cover sheet in accordance with Section 5.1 as directed below.

1 Provide each DSR and each DCS with a unique sequential number.

2 For a DSR provide a approval signoff line for the Chief Operations Engineer and a signoff line for the required SNSC review.

3 For a DCS provide an approval signoff line for the Chief Operations Engineer. A SNSC review is not required.

7.7.2 PAGE IDENTIFICATION AND NUMBERING

Provide page identification and numbering per Section 5.

7.7.3 LOG SHEET FORMAT

There is no specific format for log sheets. Where possible provide minimum, maximum and expected values for plant parameter to be monitored and recorded.

7.8 Temporary Operating Instructions (TOI)

7.8.1 TITLE AND IDENTIFICATION

Assign a title descriptive of the system(s), component(s) or operation(s) to which it applies.

7.8.2 SECTIONS HEADINGS AND CONTENTS

1 Purpose

The purpose for which the TOI is intended will be clearly stated.

2 Instructions

There is no rigid format specified for the remainder of the TOI. The remaining sections will contain instructions in the degree of detail necessary for accomplishing its purpose.

Temporary Operating Instructions shall include a designation of the period of time during which they may be used.

8 WRITING INSTRUCTIONAL STEPS

8.1 Level of Detail

Write procedure steps with a level of detail consistent with the following principles, which are listed in order of precedence.

1 Consider the minimum level of training and experience of the intended user of the procedure. Consider the new employee who has recently completed the minimum qualification requirements for the position.

2 Consider the level of familiarity of the user with the evolution being performed. Seldom used procedure steps requiring the manipulation of seldom used controls should provide more detail about the control designation, its operation, and its location. See Section 8.12.

3 Consider the level of detail appropriate for the procedure type. In general, provide the most detail in SOPs, followed by A procedures and POPs. ARPs have a lesser degree of detail because of the intent of the procedure and space limitations.

8.2 Instruction Step Length and Content

Write concise, precise instruction steps. Use the following guidelines to support this objective:

8.2.1 For all action steps provide a right justified, six space underline for use as an operator checkoff.

8.2.2 For action steps which provide specific instructions for the positioning of multiple controls or valves, provide step checkoffs as follows:

1 IF the step positions a single control or valve, provide a right justified, six space underline for use as an operator checkoff.

2 IF the step positions more than one control or valve, list the controls or valves to be positioned, the required position, and provide a right justified six space underline for each valve or control.

3 For ARPs only: Multiple position listings need not be in a column format with right justified underlines. It is permissable to use a sentence structure listing with a checkoff underline after each valve or control position.

8.2.3 IF a step provides instructions to perform an equipment lineup, THEN the equipment lineup (valves, electrical, controller, etc.) must be explicit. Use step checkoffs per 8.2.1 above OR reference an appropriate COL or other procedure which provides the detailed lineup.

8.2.4 Write each instruction step so that it contains only one idea.

8.2.5 Use short, simple sentences in preference to long, compound or complex sentences.

8.2.6 Describe evolutions in a series of steps with each as simple as practicable.

8.2.7 State specifically objects of verbs to identify exactly what is to be done and to what.

8.2.8 State limits quantitatively.

8.2.9 State where the sequence of steps is mandatory.

8.2.10 Write all steps as mandatory actions, unless conditional compliance is intended. Use "shall", "will", "should", and "may" per paragraph 9.4.6.

8.2.11 Provide complete identification of components and parts.

8.2.12 Include instruction steps to obtain any required documentation, notification, reporting, independent verification, review or approval.

8.2.13 Eliminate unnecessary articles such as "the", "a", and "an".

9 Label items within the figure. If labels are typed, use Courier type, pitch 10. Avoid handwritten labels. If they are necessary, however, neatly use all capitals, with letters and numbers at least 1/8 inch high.

10 Make all lines in figures reproducible.

11 See Section 6.3 for figure numbering requirements.

10.8 Use of Foldout Pages

Avoid use of foldout pages if possible. Treat a foldout page as a single page. Follow the same format as for a standard page except that width is different. Fold the page such that a small margin exists between the fold and the right-hand edge of standard pages. Doing so will reduce wear of the fold.

10.9 Use of Oversized Pages

Do not use oversized pages. Reorganize or reduce the contents to fit a standard page. If this cannot be done, use a foldout page.

10.10 Use of Reduced Pages

Avoid using of reduced copy wherever possible. Make the final size of reduced pages the standard page size. Ensure reduced copy is readable.

10.11 Reproduction

Reproduce procedures single-sided only. Additionally, check every page for proper reproduction prior to issuing a procedure for use.

11 ARRANGEMENT OF PROCEDURE VOLUMES

Group each volume of operating procedures by procedure type (e.g. ARP, SOP, etc.). Use the following recommendations when revising procedure volumes.

11.1 Binding

Place procedures in a three-ring binder appropriately sized to accommodate the procedures without damage to pages during normal use.

11.2 Titling of Volumes

Title each procedure volume using block style lettering at least 1/2-inch in height. Place the lettering along the spine of book. Place lettering such that the volume can be read horizontally when normally stored on a bookshelf.

11.3 Identification

Identify the procedures enclosed in the given volume by placing a table of contents in the front of the volume. Include in the table of contents the following:

1 Procedure Designator and Number (e.g. SOP 27.1.1)
2 Title of Procedure
3 Current Revision Number of Procedure.

11.4 Tabbing

Use tabs to separate each procedure in the volume. 15 position tabs are recommended.

12 REVIEW AND APPROVAL OF PROCEDURES

Have proposed procedures or revisions reviewed by person or persons other than the one who drafted the procedure or procedure change. Personnel from other subsections shall be asked to perform a review when the procedure deals with a subject in their area. At a minimum the concurrence of at least one other Section Head or General Manager is required for a procedure/procedure revision. This requirement applies for all procedural actions except for emergency situations and for TPCs.

Each proposed procedure or procedure revision which involves safety-related components and/or their operation shall receive a pre-implementation review by the Station Nuclear Safety Committee (SNSC) except either in an emergency situation where time does not permit a SNSC pre-implementation review (SAO-102 paragraph 2.1) or for Temporary procedure changes in accordance with section 13.1.

Interpret "revision" to mean any modification to an approved procedure which alters the procedure's intent, or means for accomplishing this intent. Intent, as used here, is the objective to be accomplished or brought about. "Safety related components", as used herein are those which:

1 Form or are within the primary pressure boundary, or
2. Are accident preventing structures and/or systems, or
3. Are accident mitigating structures and/or systems, or
4. Contain radioactive materials.

IN CASE OF EMERGENCY, NUCLEAR POWER PERSONNEL ARE AUTHORIZED TO DEPART FROM THE INTENT OF APPROVED PROCEDURES WHERE NECESSARY TO PREVENT INJURY TO PERSONNEL, INCLUDING THE PUBLIC, OR DAMAGE TO THE FACILITY.

Each proposed procedure/procedure revision which renders or may render a Final Safety Analysis Report or subsequent safety analysis report inaccurate and those which involve or may involve potential unreviewed safety questions shall be approved by the SNSC prior to implementation.

Pre-implementation concurrence by the Nuclear Facilities Safety Committee shall be obtained if the Station Nuclear Safety Committee finds that a proposed procedure/procedure revision either involves an unreviewed safety question or is in doubt whether an unreviewed safety question is involved.

Assure that each procedure/procedure change which would make the Final Safety Analysis Report, or any later safety analysis report, inaccurate has a written justification by Nuclear Engineering of why an unreviewed safety question is not involved.

The Onsite Interdisciplinary Review Group (OIRG) will review all Plant Emergency Procedures, and changes thereto. This review will normally be conducted prior to implementation of the emergency procedure, and will consist of an evaluation of that procedure relative to its effect on the health and safety of the public.

13 TEMPORARY PROCEDURE CHANGES (TPC)

Temporary Procedure Changes are defined as changes which are needed to provide guidance in unusual situations not within the scope of the station operating procedures and to ensure orderly and uniform operations for short periods when the plant, a system, or a component of a system is performing in a manner not covered by existing procedures or has been modified or extended in such a manner that portions of existing procedures do not apply.

13.1 Approval of Temporary Procedure Changes

Temporary Procedure Changes should not be utilized to correct errors in procedures unless continued plant operation would not be feasible without the change. Temporary Procedure Changes should not be used to make procedure improvements. Errors or recommended changes should be documented using a form similar to Figure 11 (Drawing/Procedure/Computer Change Recommendations).

Before making a temporary change, a decision must be made as to whether or not it involves a change of intent or a means for accomplishing the intent. Intent, as it applies to a procedure, is what is intended to be done or brought about. "Means for accomplishing the intent" should be interpreted as the method used to reach the end objective. For example, if a procedure requires filling a tank from the RWST and the change desired is to fill the

tank from the Condensate Storage Tank, then that would be a change in the means for accomplishing the intent. If in doubt, the Senior Watch Supervisor should assume the change requires the Chief Operations Engineer approval.

Temporary changes which do not change the intent or the means for accomplishing the intent of the approved procedure shall be approved by two knowledgable persons, one of whom shall be the Senior Watch Supervisor. At a minimum the approval of any Technical Section Head (except for Security matters where the Security Administrator may also approve the change) or General Manager is required.

Temporary changes which involve a change of intent require the concurrence of the Chief Operations Engineer or his designated alternate. In addition, SNSC pre-implementation review is required for a TPC that changes the intent or changes the means of accomplishing the intent except in an emergency situation where time does not permit a SNSC pre-implementation review.

Assure that in emergency situations where personnel or plant safety are at risk, personnel understand their obligation to depart from approved procedures where this is considered necessary to prevent injury to personnel, including the public, or damage to the facility. Specifics regarding this type of procedure departure shall be documented and include the requirement to obtain approval of a Section Head or General Manager and the NRC Licensed Senior Watch Supervisor, prior to deviation from procedure, or, if time does not permit, as soon as possible afterwards.

Whenever a temporary procedure change is made a Temporary Procedure Change Form must be filled out. The TPC form will be similar to that included as Figure 12 to this directive.

NOTE: A Temporary Procedure Change Form is not required for documenting deviations from the desired position or condition of components on checkoff lists. However, such deviations shall be highlighted and annotated as to the reason for such deviation.

An index of Temporary Procedure Changes (similar to Figure 13) shall be maintained in the Control Room. The blue copy of the TPC form shall be placed in the book whenever one is issued.

The Chief Operations Engineer will designate, on the white and yellow TPC form, the date or condition which will cause the TPC to expire. He will either, for example, specify an expiration date, or in the case of a TPC which is to be included in the next revision to that procedure, the next revision number to the affected procedure.

The white and yellow copies are then forwarded to SNSC for review within seven days. The white copy is filed with the procedure and the yellow copy replaces the blue in the TPC book.

Copies of the TPC will be inserted into the appropriate procedure books. These books will be reviewed periodically to remove expired TPC forms. See Figure 14.

13.2 Distribution of Operations Procedure TPC

Copies of TPCs will be distributed to official copy holders as outlined in Section 15.

13.3 TPC for Test Procedures

TPCs on Test Procedures shall only be written by Operation personnel when the Test and Performance Engineer is off site. They require concurrence by the Test and Performance Engineer or his designee and expire when the test is completed. The Operation TPC index is also used for these TPCs. The blue copy is inserted in the TPC book and the number is recorded in index. The yellow copy is sent to the Test and Performance Engineer for his review. After the Test and Performance Engineer has reviewed the yellow copy, he shall return it to the COE with his comments. The white copy is sent to the COE for his review. The yellow and white copies shall then be sent to SNSC for review and approval. If the test is still in progress after SNSC review, the yellow copy replaces the blue in the TPC book. The remaining green and pink copies are attached to the test.

13.4 Distribution for Test Procedure TPC

Distribution is administered by the Test and Performance Section under TAD-O.

13.5 TPC for Station Administrative Orders

TPCs shall not be written for SAOs. Changes to SAOs require approval of the Vice President of Nuclear Power.

14 PERIODIC REVIEW

Review operating and emergency procedures at least every two years. Normally perform this review during the operator retraining program.

Additionally, review applicable procedures following an unusual event, such as an accident, an unexpected transient, significant operator error or equipment malfunction at Indian Point or any other nuclear power plant. Also, review applicable procedures following any modification to a system.

Suggested procedure revisions and temporary changes will be reviewed by the staff for incorporation as permanent changes. Control Room workbooks, as designated in Section 10 below, will be periodically reviewed for adequacy and currency.

A semi-annual review of all controlled procedures as listed in Section 15.1.1 will be performed by the Operations Staff to ensure that all controlled copies contain the latest procedure revisions. The findings of this review shall be documented via memo to the Chief Operations Engineer, the Operations Superintendent and the Operations Staff Manager.

15 DISTRIBUTION

The Operations Superintendent's clerk will be responsible for distribution and maintenance of procedures.

15.1 Locations

A controlled copy of the listed procedures will be maintained in each of the following locations:

15.1.1 Control Room (Normal and Emergency use copies) POPs, SOPs, COLs, Es, As, TOIs, ARPs and the Graphs Book.

In addition the following workbooks will be maintained:

1 Heat Balance Calculations (SOP 15.1)
2 Reactor Coolant System Leakage Calculations (SOP 1.7)
3 Jumper Log (SAO 126)
4 Waste Release Permits (SAO 107)

15.1.2 No. 2 Nuclear NPO Office
Selected Procedures

15.1.3 No. 2 Conventional NPO Office
Selected Procedures.

15.1.4 Operation Staff Office
POPs, SOPs, COLs, Es, As, TOIs, ARPs and the Graph Book.

15.1.5 Technical Support Center
POPs, SOPs, COLs, Es, As, TOIs, ARPs and the Graph Book.

15.1.6 Training Center
POPs, SOPs, COLs, Es, As, TOIs, ARPs and the Graph Book.

15.1.7 In addition to the above, copies for information will be sent to Sections and Departments as directed by the COE.

15.2 Marking of Copies

All controlled copies of procedures shall have stamped in RED ink the following:

CONTROLLED COPY

Controlled procedures will be laminated and stored in individual plastic binders at each location listed in Sections 15.1.4 and 15.1.5. Only the controlled copies will be used to conduct plant operations. Pen and ink changes shall not be made on controlled procedures.

15.3 Use of Controlled Copies

A laminated, controlled copy of the index for all controlled material shall be available at each location listed in Sections 15.1.4 and 15.1.5. Prior to using a procedure, an operator shall verify that the procedure revision agrees with the controlled index. Any discrepancies shall be brought to the attention of the Senior Watch Supervisor at once. Under no circumstances is a procedure to be used for plant operations that does not have the same revision number as shown in the controlled index.

Operators are responsible for returning controlled procedures to their storage locations when a plant evolution is completed. Missing or mutilated procedures shall be reported to the Senior Watch Supervisor who will inform the Operations Superintendent's Clerk.

15.4 Master Copies

Unstamped master copies of all procedures will be kept in locked storage files by the Operations Superintendent's Clerk. Controlled copies of these masters will be stamped and distributed by the Operations Superintendent's Clerk as needed.

16 RECORD RETENTION

Refer to OAD 8 for Record Retention requirements.

17 SUPERSEDES/CANCELS

OAD 7 Rev. 8 dated April 15, 1983.

TABLE 1
ACTION VERBS

Verb	Application
Adjust	To change a specified feature so that a specified parameter meets a specified value. Example: Adjust the voltage control so that the output is 18 to 22 volts as indicated on ...
Align	To arrange a series of components into a desired configuration. Example: Align the system for normal charging.
Allow	To permit a stated condition to be achieved prior to proceeding. Example: Allow discharge pressure to stabilize.
Begin	To start a process.
Block	To inhibit an automatic actuation. Example: Block SI actuation.
Check	To note a condition and compare with a specified procedure requirement. Example: Check pressurizer level - GREATER THAN 20%.
Close	To change the physical position of a mechanical device. Closing a valve prevents fluid flow. Closing a breaker allows electrical current flow.
Complete	To accomplish specified procedure requirements.
Control	To manually operate equipment as necessary to satisfy procedure requirements. Example: Control pressurizer level.
Ensure	To make certain that a piece of equipment or control is in a specified state. If it is not in the specified state, existing state will be changed to that specified. Examples: Ensure valve V-10 is open. Ensure Charging Pump 21 is running.
Establish	To make arrangements for a stated condition. Example: Establish normal pressurizer pressure and level control.
Hold	To retain a control in a specified position until a specified response occurs. Using hold requires that both control position and response allowing release be specified. Example: Press and hold the start switch until flow is established.

TABLE 1 (Cont'd)
ACTION VERBS

Verb	Application
Initiate	To begin a process (Begin is preferred).
Inspect	To measure, observe, or evaluate a feature or characteristic for comparison with specified limits; method of inspection should be included. Example: "Visually inspect for leaks".
Maintain	To control a given plant parameter to some guideline requirement continuously. Example: Maintain steam generator level in the narrow range.
Monitor	Similar to check, except it implies a repeated function.
Observe	1. To watch systematically a specified parameter. Example: Observe all steam generator level channel indicators. 2. To adhere to a specified limit. Example: Observe the following heatup limits.
Open	To change the physical position of a mechanical device to the unobstructed position. Opening a valve permits fluid flow. Opening an electrical breaker prevents current flow.
Place	To direct the movement of a control switch to a specified position. Example: Place the trip bistable switch to TRIP.
Press	To direct the movement of a control switch to the inward position. Example: Press the start switch.
Record	To document specified characteristic. Example: Record RCS average temperature.
Set	To put a specified feature to a specified value. Example: Set the voltage control at 20 volts.
Start	To originate motion of an electrical or mechanical device either directly or by remote control. Example: Start one RCP.
Stop	To terminate motion of an electrical or mechanical device. Example: Stop both diesels.

TABLE 1 (Cont'd)
ACTION VERBS

Verb	Application
Synchronize	To ensure that the phase rotation, frequency and voltage magnitude of two circuits are the same and then to connect the two circuits.
Throttle	To operate a valve in an intermediate position to obtain a certain flow rate. Example: Throttle AFW flow to maintain S/G level.
Transfer	To shift from one specified alignment or state to another. Examples: Transfer the pressure control from manual to auto. Transfer the bubble from nitrogen to steam. Transfer bus 5A from station service transformer to 21 D/G.
Trip	To manually activate a semi-automatic feature. Commonly, trip is used to refer to component de-activation. Examples: Trip the reactor; trip the turbine. Trip a breaker.
Vent	To permit a gas or liquid confined under pressure to escape at a vent. Example: Vent the pump.
Verify	To make certain that a piece of equipment, control or parameter is in a specified state. If it is not in the specified state, the change of the existing state will be dependent upon subsequent steps. Example: Verify flow in the Safety Injection headers. If no flow exits then ...

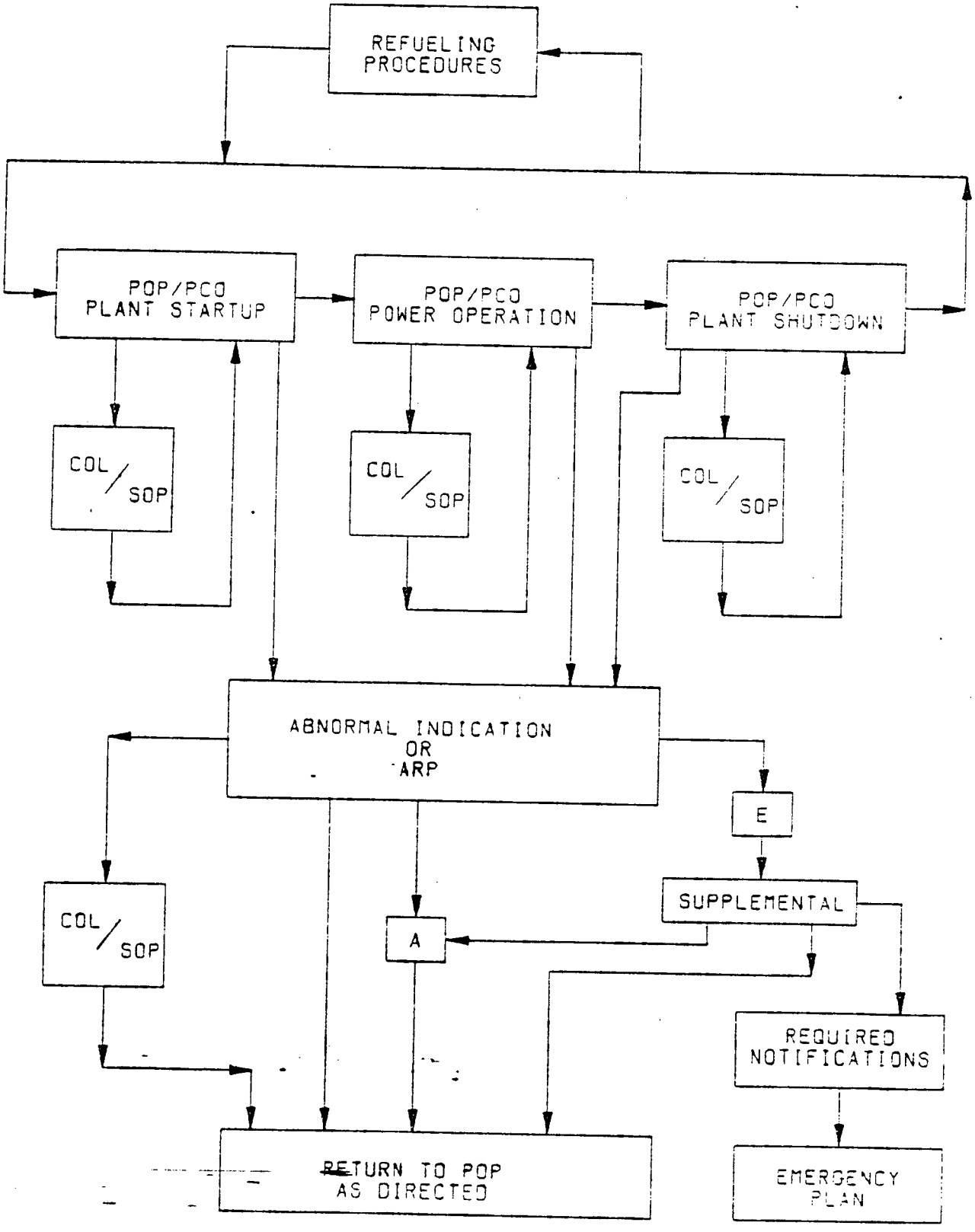


FIGURE 1
PROCEDURE STRUCTURE AND INTERFACING

INDIAN POINT STATION

UNIT NO. 2

PROCEDUPE TYPE NUMBER REV. #

PROCEDURE TITLE

Written by

Reviewed by

SNSC Peview Mtg. No. / Date

Approved by / Date

Effective Date

FIGURE 2
SAMPLE COVER SHEET
Page 48 of 61

April 1, 1983

PLANT OPERATING PROCEDURES

LIST OF EFFECTIVE PROCEDURES

POP Number	Procedure Name	Latest Revision	Effective Date
1.1	Plant Heatup From Cold Shutdown	14	12/21/82
1.2	Reactor Startup	5	12/21/82
1.3	Plant Startup From Zero Power Condition to Full Power Condition	8	1/14/83
2.1	Operation at Power (Base Load Steady State Operation)	13	12/21/82
2.2	Deleted	-	4/1/83
3.1	Plant Shutdown From Full Power Operation to Zero Power Condition	7	6/5/81
3.2	Plant Operation at Zero Power	7	12/21/82
3.3	Plant Cooldown From Zero Power Condition to Cold Shutdown Condition	12	12/21/82

Last Revision Entered by _____ _____
Signature Date

POP LOEP OPXXXW 07/29/83 ch

FIGURE 3
SAMPLE LIST OF EFFECTIVE PROCEDURES

1 FIRST LEVEL PARAGRAPH NUMBER AND HEADING

First level paragraph text.

1.1 Second Level Paragraph Number and Heading

Second level text, or

1.1 Second level step number and text.

1.1.1 THIRD LEVEL PARAGRAPH NUMBER AND HEADING

Third level text, or

1.1.1 Third level step number and text.

1.1.1.1 Fourth Level Paragraph Number and Heading

Fourth level text, or

1.1.1.1 Fourth level step number and text.

9 FIRST LEVEL PARAGRAPH NUMBER AND HEADING

9.10 Second Level Paragraph Number and Heading

9.10.10 THIRD LEVEL PARAGRAPH NUMBER AND HEADING

9.10.10.10 Fourth Level Paragraph Number and Heading

FIGURE 4
SAMPLE PARAGRAPH NUMBERING, HEADINGS AND SPACING

CORRECT

1 FIRST LEVEL STEP HEADING

1.1 Second Level Step Heading

1 First level list, item a

2 First level list, item b

1.2 Second Level Step Heading

1.2.1 First level list, item a

1.2.2 First level list, item b

1 Second level list, item a

2 Second level list, item b

9.10 Second Level Step Heading

1 First level list, item a

2 First level list, item b

INCORRECT

1.1 Second Level Step Heading

1 First level list, item a

2 First level list, item b

1 Second level list, item a

FIGURE 5
SAMPLE LIST NUMBERING, HEADINGS AND SPACING

SOP 10.1.3
Rev. X

RECIRCULATION AND/OR PURIFICATION OF REFUELING WATER STORAGE TANK

1 PRECAUTIONS AND LIMITATIONS

1.1 Differential pressure across Spent Fuel Pit Filter is limited to less than 20 psi (as determined from PI-654 and PI-655 indication).

1.2 Spent Fuel Pit Filter acitivity water should not exceed 100 gpm as indicated by PI-656.

1.3 Flow of refueling water should not exceed 100 gpm as indicated by FI-656.

1.4 Capacity of purification pump is 100 gpm.

2 INITIAL CONDITIONS

2.1 Requirements of Technical Specification 3.3.A.1.a (EFS) are met.

2.2 Power is available to purification pump from MCC-27.

2.3 Air hose is connected to Station Air supply.

2.4 Air hose is connected to sample connection.

2.5 COL 4.3 Section 3.0 is complete.

3 PROCEDURE

NOTE: It will take about 2-1/2 days to recirculate contents (350,000 gals) of RWST.

3.1 Tag close Spent Fuel Pit Purification Isolation valves 719A (Fuel Stor. Bldg.) and 719B (29' Elev. PAB). _____

Spent Fuel Pit Purification	719A	CLOSE	_____
Spent Fuel Pit Purification	719B	CLOSE	_____

3.2 Open following valves:

RWST Purification Pump Suction (Pipe Chase - West End)	- 845	OPEN	_____
RWST Purification Pump Return (Pipe Chase - West End)	- 841	OPEN	_____

3.3 IF RWST is to be recirculated, align valves as indicated below.

Demin. Bypass Valve	710	OPEN	_____
Filter Bypass Valve	716	OPEN	_____
Demin. Outlet Valve	709	OPEN	_____
Filter Inlet Valve	711	OPEN	_____

3.4 IF RWST is to be purified, align valves as indicated below:

Demin. Outlet Valve	709	OPEN	_____
Filter Inlet Valve	711	OPEN	_____
Demin. Bypass Valve	710	OPEN	_____
Filter Bypass Valve	716	OPEN	_____

3.5 Verify RWST Purification Pump breaker on MCC-27 is closed. CLOSE _____

3.6 Throttle open RWST Return Isolation valve (727B) to 1/2 turn.. THROTTLED _____

3.7 Start RWST Purification Pump. _____

* *
* CAUTION *
* *
* Exceeding 100 gpm as indicated on FI-656 *
* may cause damage to Spent Fuel Filter *
* and/or Demineralizer. *
* *

3.8 Adjust 727B to maintain 40-100 gpm as indicated on FI-656. _____

3.9 Open following valves:

Station Air Supply	999	OPEN	_____
RWST Sample	844	OPEN	_____

3.10 Continue agitation until chemical analysis shows agitation no longer necessary. _____

3.11 Continue recirculation flow until chemical analysis shows that it is no longer necessary. _____

3.12 To change from recirculation to purification OR purification to recirculation, perform the following:

1 Align valves per step 3.3 or 3.4 _____
2 Adjust flow as required per step 3.8 _____

FIGURE 6 (Part 2)
EXAMPLE SOP

INDIAN POINT STATION
UNIT NO. 2
CHECKOFF LIST 27.1 REV. XX
(Existing COL 24A)
6900V and 480V AC DISTRIBUTION

1st Operator	PRINT NAME	INITIALS	DATE COMPLETED
2nd Operator	PRINT NAME	INITIALS	DATE COMPLETED
3rd Operator	PRINT NAME	INITIALS	DATE COMPLETED
4th Operator	PRINT NAME	INITIALS	DATE COMPLETED

Comments/Exceptions: _____

_____

_____

SWS Review _____

_____
Date Time

Reference Drawings: UE & C 9321-F-3006, 3008, 3087

Circle in red any valves, switches, power supplies, etc. which are not in position indicated by checkoff list. If reason for non-compliance is an outstanding Operating Order or Work Permit, write the O.O. or W.P. number next to outstanding item. If there are any questions, contact CCR operator. Please check in NT column if name tag is missing. Checks in this column shall not be considered as unsatisfactory completion of this COL.

_____
Written by

_____
Reviewed

_____
SNSC Review / Date

_____
Approved / Date

_____
Effective Date

FIGURE 7
EXAMPLE COL COVER SHEET
Page 54 of 61

COL 3
Rev. XX

CHEMICAL AND VOLUME CONTROL SYSTEM

		Init.	Init.	Date	NT
1	INSIDE CONTAINMENT				
1.1	System and Equipment Valving (46' - Inside Ring Wall)				
1.1.1	REGENERATIVE HEAT EXCHANGER				
	342 Loop 21 Letdown Stop OPEN	____	____	____	__
	I.A. Supply to LCV 459 OPEN	____	____	____	__
	C-59 Letdown Inlet Vent Stop CLOSED	____	____	____	__
	PLUG INSTALLED	____	____	____	
	C-60 Letdown Inlet Drain Stop CLOSED	____	____	____	__
	PLUG INSTALLED	____	____	____	
	C-55 Aux Spray Vent Stop CLOSED	____	____	____	__
	PLUG INSTALLED	____	____	____	
	I.A. Supply to FCV 212 OPEN	____	____	____	__
	C-58 Charging Drain Stop CLOSED	____	____	____	__
	BLIND FLANGE INSTALLED	____	____	____	
	I.A. Supply to FCV 204A OPEN	____	____	____	__
	I.A. Supply to FCV 204B OPEN	____	____	____	__
	4055 Purification Pump Bypass OPEN	____	____	____	__
	4054 Pump Inlet Stop CLOSED	____	____	____	__
	4056 Pump Outlet Stop CLOSED	____	____	____	__
	4060 Purification Pump Vent				
	CLOSED	____	____	____	__
	CAPPED	____	____	____	
	4061 Purification Pump Vent				
	CLOSED	____	____	____	__
	CAPPED	____	____	____	
1.1.2	EXCESS LETDOWN HEAT EXCHANGER				
	344 Loop 21 Excess Letdown Stop OPEN	____	____	____	__
	IA Isolation Valve to FCV 213 OPEN	____	____	____	__
	C-56 Outlet Drain Stop CLOSED	____	____	____	__
	BLIND FLANGE INSTALLED	____	____	____	
	IA Supply to HCV 123 OPEN	____	____	____	__
	214 Pressure Instrument Stop OPEN	____	____	____	__
	IA Supply to FCV 215 OPEN	____	____	____	__
	C-57 Excess Letdown Drain Stop				
	CLOSED	____	____	____	__
	BLIND FLANGE INSTALLED	____	____	____	
	C-58 Excess Letdown Vent Stop CLOSED	____	____	____	__
	BLIND FLANGE INSTALLED	____	____	____	

FIGURE 8
EXAMPLE COL

SBF-2

Window 1-1, 2-1, 3-1, 4-1

STEAM GEN #2X
HIGH STEAM FLOW
MISMATCH TRIP

Setpoint

Steam Flow 1.15 x 10^6 lb/hr greater than Feed Flow

Automatic Action

Status lights trip

Note: Alarm occurring with LOW LEVEL MISMATCH CHANNEL TRIP, will trip reactor.

Cause

1/2 high steam flow in relation to feedwater flow associated steam generator.

Operator Action

1 Observe all steam flow, feed flow indicators trip status lights for affected steam generator. ____

2 IF alarm is valid AND steam generator level is 30% OR less, trip unit. ____

3 IF alarm is valid AND steam generator level is greater than 30%, transfer steam generator level control to manual. ____

4 Increase feedwater flow to maintain normal level.

5 IF steam flow channel failed high, refer to A 28.9. ____

Technical Specification
Table 3-2

Initiating Devices
S/G 21: FC-418D, FC-418F S/G 23: FC-438D, FC-438F
S/G 22: FC-428D, FC-428F S/G 24: FC-448D, FC-448F

Reference Drawings
B225249-0

A 28.3
Rev. XX

PRESSURIZER LEVEL CHANNEL FAILS LOW

1 SYMTOMS/INDICATIONS

1.1 Affected channel indicates low.

1.2 PRESSURIZER LOW LEVEL alarm (18% of span OR 5% below program level).

1.3 LOW CHARGING FLOW alarm (±10% error).

2 AUTOMATIC ACTIONS

2.1 IF failed channel is controlling pressurizer level, following will occur:

1 All pressurizer heaters will turn off.

2 IF charging pump speed control is in automatic, charging pump speed will increase.

3 Letdown Isolation Valve (LCV-459) will close.

2.2 IF failed channel is controlling auxiliary channel, following will occur:

1 All pressurizer heaters off.

2 Letdown Isolation Valve (LCV-459) will close.

3 OPERATOR ACTIONS

3.1 Place charging pump speed control in manual. _____

3.2 Control pressurizer level in normal band. _____

3.3 Place PRESSURIZER LEVEL DEFEAT switch (L/460A) to DEFEAT # for affected channel (Rack B6). _____

3.4 Open Letdown Isolation Valve (LCV-459). _____

3.5 Return charging pump speed control to automatic. _____

3.6 Return pressurizer heater controls to automatic. _____

Backup Heaters Group 1 AUTO _____
Backup Heaters Group 2 AUTO _____

FIGURE 10
EXAMPLE A PROCEDURE

DRAWING/PROCEDURE/COMPUTER CHANGE RECOMMENDATIONS

Change Affects: Procedure # & Rev. # _____ Computer Proteus / SAS _____ Drawing Number _____	Date: Staff Control Number (Leave Blank)
Description of Proposed Change:	
Reason for Proposed Change:	
Proposed change meets requirements of FASR, Tech. Specs., or Vendor Manuals. For Drawing Changes, the change has been verified in the field. Initiator: _____ Title: _____	
Operations Staff Recommendation/Resolution: Operations Staff Manager Concurrence: _____ Date: _____	

FIGURE 11
SAMPLE DRAWINGS/PROCEDURE
/COMPUTER CHANGE FORM

TEMPORARY PROCEDURE CHANGE FORM

T.P.C. No.:

DATE:

Procedure No. | Revision No. | Check One: Operations Procedure | Test Procedure

Procedure Title:

Description of Change:

Reason For Change:

Temporary procedure changes which involve a change of intent require a pre-implementation SNSC review, except when continued or safe plant operation is in jeopardy. For these exceptions, C.O.E. concurrence is required.

Change Of Intent | YES | NO | C.O.E. Concurrence:

Initiator: | Title: | S.W.S. Approval: | Date:

Incorporate as Permanent Change | YES | NO | Section head Approval:

S.N.S.C. Review | Signature: | Meeting No: | Date:

FIGURE 12
SAMPLE TEMPORARY PROCEDURES
CHANGE FORM

TEMPORARY PROCEDURE CHANGE INDEX

TPC No.	Proc. No.	Description	Copies Affected Changed	Date	SWS Initials

FIGURE 13
SAMPLE TPC INDEX

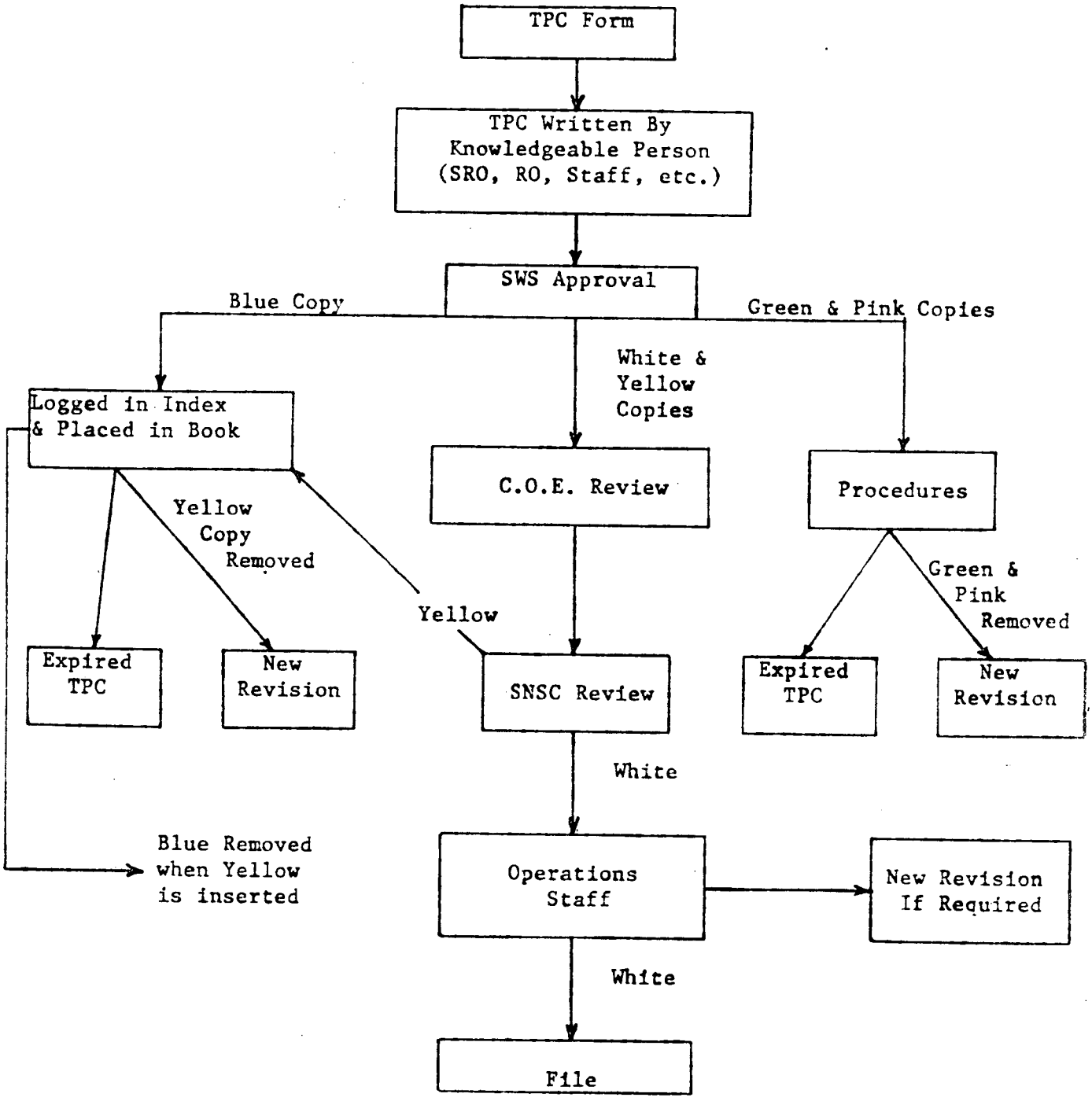


FIGURE 14
TYPICAL OPERATIONS TPC FORM FLOW

TABLE OF CONTENTS

OPERATING PROCEDURE DEVELOPMENT AND CONTROL
ERP WRITERS GUIDE

1 PURPOSE AND SCOPE

The purpose of this document is to provide administrative and technical guidance on the preparation of Emergency Response Procedures (ERP). This guide applies to Optimal Recovery Guidelines, Critical Safety Function Status Trees, Emergency Contingency Actions, and Function Restoration Guidelines.

1.1 Optimal Recovery Guidelines (ORG) provide the operator with guidance sufficient to effectively recover the plant from nominal emergency conditions and return it to a known safe state from which repair (if required) or return to power can be accomplished. The ORG set is composed of three basic types of procedures:

- Nominal Emergency/Upset Response (E-Series)
- Event-specific Subprocedures (ES-Series)
- Emergency Contingency Actions (ECA-Series)

1.2 Critical Safety Function Status Trees (CSF) provide the operator with a system and explicit means for determining the safety status of the plant for emergency situation. Continuous use of these status trees provide independent verification of the attainment and maintenance of safety plant conditions throughout the recovery.

1.3 Emergency Contingency Actions (ECA) are a subset of the Optimum Recovery Guidelines which provide contingency actions for emergencies such as Anticipated Transient Without Scram or Loss of All AC power.

1.4 Function Restoration Guidelines (FRG) provide guidance for maintaining the plant in a safe state without regard to initiating event or combinations of subsequent or consequential failures after event diagnosis. IRG's are used when a Critical Safety Function is challenged.

2 ERP DESIGNATION AND NUMBERING

Emergency Response Procedures specify operator actions to be taken during plant emergency situations to return the plant to a safe stable condition. Each procedure shall be uniquely identified to facilitate preparation, review, use and subsequent revision.

2.1 Procedure Title

Every separate procedure shall have its own descriptive name which summarizes the scope of that procedure, or states the event which it is intended to mitigate.

2.2 Procedure Numbering

Every separate procedure shall have its own alpha-numeric designation to supplement the descriptive title. Alpha designators are to be assigned according to the definitions provided in Table 1.

Numeric designators are assigned sequentially in order of procedure development. Each "ES" numeric shall consist of the number designator of the reference "E" procedure, plus a decimal integer, again assigned sequentially.

"ECA" procedures shall each have a number designator, and related sub-procedures shall be assigned additional decimal integers.

Alpha and numeric designators shall be separated by a hyphen.

Examples: E-0 (Zero designates the diagnostic procedure)
ES-1.1
ES-1.2
ES-1.3

ECA-1
ECA-1.1

Function Restoration Procedures shall all be designated by the letters FR plus an additional letter which corresponds to the respective Critical Safety Function. All the separate procedures related to a particular Safety Function are assigned decimal numbers in increasing order. Typically, the first (number .1) procedure for each safety function corresponds to the RED condition.

The procedure letter and decimal number are separated from the FR designator by a hyphen.

Examples: FR-S.1
FR-S.2

FR-0.1 (Zero designates the diagnostic, status tree procedure)

2.3 Revision Numbering

See OAD-7, Section 5.

2.4 Page Numbering and Identification

See OAD-7, Section 5.

3 FORMAT

The following format is to be applied consistently to all Emergency Response Procedures.

3.1 Procedure Organization

All Optimal Recovery Procedures (E, ES, ECA) will have three (3) sections. The Cover Sheet will summarize procedure intent and state either entry symptoms or means of entry. The Operator Actions will comprise the bulk of each procedure and present the actual stepwise guidance. A Foldout Page will summarize information which is continually required for operator guidance. A single Foldout Page will be used for each E-series and ECA-series.

The Function Restoration Procedures will have only the Cover Sheet and Operator Actions.

3.2 Page Formats

All pages of the Emergency Response Procedures will use the same page structure except the Foldout Page which is discussed below. This page structure employs a word processor and bordered page to assure all margins are correctly maintained and designator boxes and page cues to assure completeness and consistency. (See Figure 1).

The pages for presentation of operator action steps will use a two-column format within the pre-designated page border. The left-hand column is designated for operator actions, and the right-hand column is designated for contingency actions when the expected response is not obtained. These pages will use pre-designated title blocks above the separate columns (including the "step" column) for uniformity (see Figure 2).

The Foldout Page does not use the same page format. It is intended to summarize only that information which an operator should have continuously available, so page content will vary by procedure. Each Foldout Page shall be titled at the top in large bold type "FOLDOUT FOR E-X PROCEDURES".

3.3 Instruction Step Numbering

Procedure steps will be numbered as follows:

1. High-level step

    a. Substep

        Substeps are lettered sequentially according to expected order of performance. If the order of substep performance is not important, then the substeps are designated by bullets (o).

        This same numbering scheme is to be used in both the right and left columns of the procedures.

4 WRITING THE PROCEDURE

The following format is to be applied consistently when writing Emergency Response Procedures.

4.1 Cover Sheet

Each cover sheet will contain two explanatory sections in addition to procedure and page designators. The first will be titled "PURPOSE" and will briefly describe what the procedure is intended to do for the operator. The second section is a summary of those symptoms which require entry into the procedure. This section will be titled "SYMPTOMS OR ENTRY CONDITIONS". Certain procedures such as E-0 and ECA-2 can be entered purely based on symptoms; for these procedures, a symptom summary is sufficient (see Figure 3). For other procedures, which can only be entered by transition from previous procedures, a summary of the entry conditions (and procedure/step) should be provided (see Figure 4).

4.2 Operator Actions

Steps directing operator action should be written in short and precise language. The statement should present exactly the task which the operator is to perform. The equipment to be operated should be specifically identified, and only these plant parameters should be specified which are presented by instrumentation available in the control room. (If possible, use of qualified instruments is preferred). It is not necessary to state expected results of routine tasks.

All numbered steps are assumed to be performed in sequence unless stated otherwise in a preceding NOTE (see Section 4.2.4). To keep the individual steps limited to a single action, or a small number of related actions, any complex evolution should be broken down into composite parts.

Actions required in a particular step should not be expected to be complete before the next step is begun. If assigned tasks are short, then the expected action will probably be completed prior to continuing. However, if an assigned task is very lengthy, additional steps may be performed prior to completion. If a particular task must be completed prior to continuation, this condition must be stated clearly in that step or substep.

Refer to Figure 5 as an example of the format for presenting operator actions in the following sections.

4.2.1 INSTRUCTION STEPS, LEFT-HAND COLUMN

- The left-hand column of the two-column format will be used for operator instruction steps and expected responses. The following rules of construction apply:

- Expected responses to operator actions are shown in ALL CAPITAL LETTERS.

- If a step requires multiple substeps, then each substep will have its own expected response.

- If only a single task is required by the step, then the high level step contains is own EXPECTED RESPONSE.

- Left-hand column tasks should be specified in sequence as if they could be performed in that manner. The user would normally move down the left hand column when the expected response to a particular step is obtained.

- When the expected response is not obtained, the user is expected to move to the right-hand column for contingency instructions.

- All emergency procedures should end with a transition to either another emergency procedure or to some normal plant procedure.

4.2.2 INSTRUCTION STEPS, RIGHT-HAND COLUMN

The right-hand column is used to present contingency actions which are to be taken in the event that a stated condition, event, or task in the left-hand column does not represent or achieve the expected result. Contingency actions will be specified for all steps or substeps for which the task requirement might not be satisfied. The following rules apply to the right-hand column:

- Contingency actions should identify directions to override automatic controls and to initiate manually what is normally initiated automatically.

- Contingency actions should be numbered consistently with the expected response/action for substeps only. A contingency for a single-task high-level step will not be a separately numbered but will appear on the same line as its related step.

- The user is expected to proceed to the next numbered step or substep in the left-hand column after taking the contingency action in the right-hand column.

- As a general rule, all contingent transitions to other procedures take place out of the right-hand column. (Pre-planned transitions may be made from the left-hand column.)

- If a contingency action cannot be completed, the user is expected to proceed to the next step or substep in the left-hand column unless specifically instructed otherwise. When writing the procedure, this rule of usage should be considered in wording subsequent left-hand column instructions.

- If a contingency action must be completed prior to continuing, that instruction must appear explicitly in the right-hand column substep.

4.2.3 USE OF LOGIC TERMS

The logic terms AND, OR, NOT, IF, IF NOT, WHEN, and THEN, are to be used to describe precisely a set of conditions or a sequence of actions. Logic terms will be highlighted for emphasis by capitalizing and underlining. (See Figure 5.)

The two-column format equates to the following logic: IF NOT the expected response in the left-hand column, THEN perform the contingency action in the right-hand column. The logic terms should not be repeated in the right-hand column.

When action steps are contingent upon certain conditions, the step shall begin with the words IF or WHEN followed by a description of those conditions, a comma, the word THEN, and the action to be taken.

IF is used for an unexpected, but possible conditions.

WHEN is used for an expected condition.

AND calls attention to combinations of conditions and shall be placed between each condition. If more than three conditions are to be combined, a list format is preferred.

OR implies alternative combinations or conditions. OR means either one, or the other, or both (inclusive).

IF NOT should be used when an operator must respond to the second of two possible conditions. IF should always be used to specify the first condition. (The right-hand column of the two-column format contains an implicit IF NOT.)

4.2.4 NOTES AND CAUTIONS

Because the present action-step wording is reduced to the minimum essential, certain additional information is sometimes desired, or necessary, and cannot be merely included in a background document. This non-action information is presented as either a NOTE or a CAUTION. (See Figure 5.)

To distinguish this information from action steps, it will extend across the entire page and will immediately precede the step to which it applies. Each category (NOTE or CAUTION) will be preceded by its descriptor in large, bold letters. Multiple statements included under a single descriptor heading shall be separately identified by noting them with bullets (o).

CAUTION denotes some potential hazard to personnel or equipment associated with the following instructional step.

NOTE is used to present advisory or administrative information necessary to support the following action instruction.

As a general rule, neither a CAUTION or NOTE will be used to replace an instruction/operation action step. However, procedure transitions can be included as non-action information in a NOTE when absolutely necessary.

4.2.5 TRANSITIONS TO OTHER PROCEDURES OR STEPS

Certain conditions require use of a different procedure or step sequence. Transitions are specified by using the words "go to" followed by the procedure designator, title (in CAPITAL LETTERS) and step number.

Example: Go to ES-0.2, REACTOR TRIP RESPONSE, Step 1.

Transitions to a different step in the same procedure are specified in a similar manner.

Example: Go to Step 20.

4.2.6 COMPONENT IDENTIFICATION

Equipment, controls and displays will be identified in "operator language" terms. Standard abbreviations which may be used throughout the procedures are listed alphabetically in Table 2. Since similar components are used in both primary and secondary systems, it is always necessary to clarify the location, even if the wording appears redundant.

Example: PRZR PORV vs. SG PORV identifies the pressurizer power operated relief valve as distinct from a steam generator power operated relief valve.

4.2.7 LEVEL OF DETAIL

To allow an operator to efficiently execute the action steps in a procedure, all unnecessary detail must be removed. Any information which an operator is expected to know (based on his training and experience) should not be included. Many actuation devices (switches) in the control room are similar, even though the remotely performed functions are not, so certain action verbs listed here are recommended.

- Use "start/stop" for power-driven rotating equipment.
- Use "open/close/throttle" for valves.
- Use "trip/close" for electrical breakers. (LOCK OUT for breaker switches with a pull-to-lock feature.)
- Use "place in standby" to refer to equipment when actuation is to be controlled by automatic logic circuitry.

4.3 Foldout Page

Only a single foldout page will be supplied for each "E-series" and "ECA-series" of procedures. The sheet will be numbered as the final page of the last procedure in the series. (That procedure will still be captioned with "END" after the last instruction step.) The foldout page will be titled "FOLDOUT FOR E: SERIES PROCEDURES", (see Figure 6) and will use a single column format (vs. two-column).

Each set of operator information will be numbered sequentially and have an explanatory title. The title will be capitalized and underlined for emphasis.

Previously supplied guidance on writing instructional steps is applicable (Section 4.2), with the exception of right-hand column (contingency) instructions.

5 STATUS TREE FORMAT

Critical Safety Function Status Trees may be presented in either the "branch" or "block" versions (see Figure 7), but all trees in the set must use the same format. Similarly, the trees may be oriented either vertically or horizontally on a page, so long as the orientation is consistent over the set.

Color-coding and line-pattern coding shall both be used from the last branch points to the termini. (See Figure 8.)

All text on the Status Trees shall be at least as legible (type size and spacing) as the instruction steps in the procedures.

Each status tree shall have a designator block identical to that used in the standard procedure format, and containing the same information.

6 MECHANICS OF STYLE

See OAD-7, Section 9. The following additions and exceptions apply:

- Expected responses (left-hand column of instructions) are capitalized.
- Titles of guidelines will be completely capitalized whenever referenced within any guideline.
- Operator action steps may be completely capitalized FOR EMPHASIS.
- Section headings on foldout pages are capitalized and underlined.
- Certain other words are to be avoided simply because they are not adequately defined when used without modification. These include: stable, approximately, rapidly, slowly and normal. The same words become acceptable when some clarification is provided.

  Example: Rapidly (up to 200F/HR) cool down the RCS.

- Inequalities are to be expressed in words rather than symbols: i.e., "greater than" and "less than". These words are always appropriate for comparing pressures, temperatures, levels and flow rates. The words "above" and "below" should not be used in this context.
- Abbreviations and acronyms from Table 2 will be uniformly capitalized whenever they are used.

TABLE 1

DEFINITIONS OF LETTER DESIGNATORS FOR ERPs

E - a procedure for diagnosis or mitigation of design basis events.

ES - a procedure which supplements the actions of an "E" procedure.

ECA - a procedure containing tasks for mitigation of events significantly beyond the design basis that are not easily covered in the E's or ES's or which may complicate or reduce the effectiveness of the E procedures if included therein.

FR - a procedure to address or respond to a challenge to a Single Critical Safety Function (CSF).

S - designator for SUBCRITICALITY CSF

C - designator for CORE COOLING CSF

P - designator for INTEGRITY CSF

H - designator for HEAT SINK CSF

Z - designator for CONTAINMENT CSF

I - designator for INVENTORY CSF

TABLE 2

ABBREVIATIONS USED IN EMERGENCY PROCEDURES

ac	-	alternating current (electrical power)
AFW	-	auxiliary feedwater
ATWS	-	anticipated transient without scram
BAST	-	boric acid (storage) tank
BIT	-	boron injection tank
CCP	-	centrifugal charging pump
CCW	-	component cooling water
CRDM	-	control rod drive mechanism
CST	-	condensate storage tank
CVCS	-	chemical and volume control system
dc	-	direct current (electrical power and signals)
LOCA	-	loss of coolant accident
MD	-	motor driven (in reference to pumps)
MSIV	-	main steamline isolation valve
NR	-	narrow range (level indication)
PORV	-	power operated relief valve
PDP	-	positive displacement pump
PRT	-	pressurizer relief tank
PRZR	-	pressurizer
RCP	-	reactor coolant pump
RCS	-	reactor coolant system
RHR	-	residual heat removal
RPV	-	reactor pressure vessel
RTD	-	resistance temperature detector
RWST	-	refueling water storage tank
RVLIS	-	reactor vessel liquid inventory system
SI	-	safety injection
SG	-	steam generator
SGTR	-	steam generator tube rupture
SUR	-	startup rate
TC	-	thermocouple
TD	-	turbine driven (in reference to pumps)
VCT	-	volume control tank
WR	-	wide range (level indication)

Number:	Symptom/Title:	Revision No./Date

FIGURE 1
PAGE FORMAT

Number: Symptom/Title: Revision No./Date

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

FIGURE 2
PRE-PRINTED PAGE (2-COLUMN) FORMAT

Number:	Symptom/Title:	Revision No./Date
		LP - Basic
E-0	REACTOR TRIP OR SAFETY INJECTION	5 July, 1982

EMERGENCY INSTRUCTION E-0
REACTOR TRIP OR SAFETY INJECTION

A. PURPOSE

The purpose of this guideline is to verify proper response of the automatic protection systems following manual or automatic actuation of a REACTOR TRIP or SAFETY INJECTION, to assess plant conditions, and to identify the appropriate recovery guideline.

B. SYMPTOMS

I. Following are symptoms of a reactor trip:

a. Any reactor trip annunciator lit
b. Rapid decrease in neutron level indicated by nuclear instrumentation
c. All shutdown and control rods are fully inserted. Rod bottom lights are lit
d. Rapid decrease in unit load to zero power

II. Following are symptoms of reactor trip and safety injection:

a. Any SI annunciator lit
b. SI pumps in service
c. (Enter other plant specific symptoms)

FIGURE 3
COVER SHEET EXAMPLE FOR E-0

Number:	Symptom/Title:	Revision No./Date
		LP - Basic
ECA-3	SGTR CONTINGENCIES	1 Sept. 1981

A. PURPOSE

The purpose of this guideline is to provide recovery from transients for which E-3, Steam Generator Tube Rupture, and ES-3.3, SGTR With Secondary Depressurization are not applicable.

B. SYMPTOMS OR ENTRY CONDITIONS

The symptoms required for the use of this guideline may occur at many times during the E-3 and ES-3.3 recovery actions. The symptoms are included in steps 11, 13, 15 and 16 of E-3, Steam Generator Tube Rupture, and steps 11, 14, 16 and 17 of ES-3.3, SGTP With Secondary Depressurizations.

FIGURE 4
COVER SHEET EXAMPLE FOR ECA-3

Number:	Symptom/Title:	Revision No./Date
E-1	LOSS OF REACTOR COOLANT	LP - Basic 5 July, 1982

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	NOTE: Foldout page should be open.	
1	Check if RCPs Should be Stopped:	
	a. High-head SI pumps running - CHECK FOR FLOW OR PUMP BREAKER INDICATOR LIGHTS LIT	a. DO NOT STOP RCPs. Go to step 2.
	b. RCS pressure - EQUAL TO OR LESS THAN ___ PSIG	b. DO NOT STOP RCPs. Go to step 2.
2	Check RWST Levels - GREATER THAN __	Go to step 20.
3	Check Containment Sump Levels - INCREASING	Rediagnose event, go to E-0, REACTOR TRIP OR SAFETY INJECTION, STEP 32.
	CAUTION Alternate water sources for AFW pumps will be necessary if CST level is low.	
4	Check Steam Generator Levels:	
	a. Narrow range level - GREATER THAN __%	a. Maintain full AFW flow until narrow range level is greater than __%
	b. Throttle AFW flow to maintain narrow range level at __%	b. If narrow range level in one steam generator continues to increase, THEN go to E-3, STEAM GENERATOR TUBE RUPTURE, STEP 1.

FIGURE 5
INSTRUCTION STEPS EXAMPLE

FOLDOUT FOR E-2 SERIES GUIDELINES

1 RCP TRIP CRITERIA

. Trip any RCP if component cooling water to that pump is lost.

. Trip all RCPs if BOTH conditions listed below are met:

a. SI is ON.

b. RCS pressure - EQUAL TO OR LESS THAN ___ PSIG.

2 SI REINITIATION CRITERIA FOLLOWING LOSS OF SECONDARY COOLANT

a. Reinitiate SI if ANY ONE of the parameters listed below occurs:

(1) RCS Subcooling - LESS THAN ___ F

(2) Pressurizer level - greater than 20%

3 AFW SUPPLY SWITCHOVER CRITERION

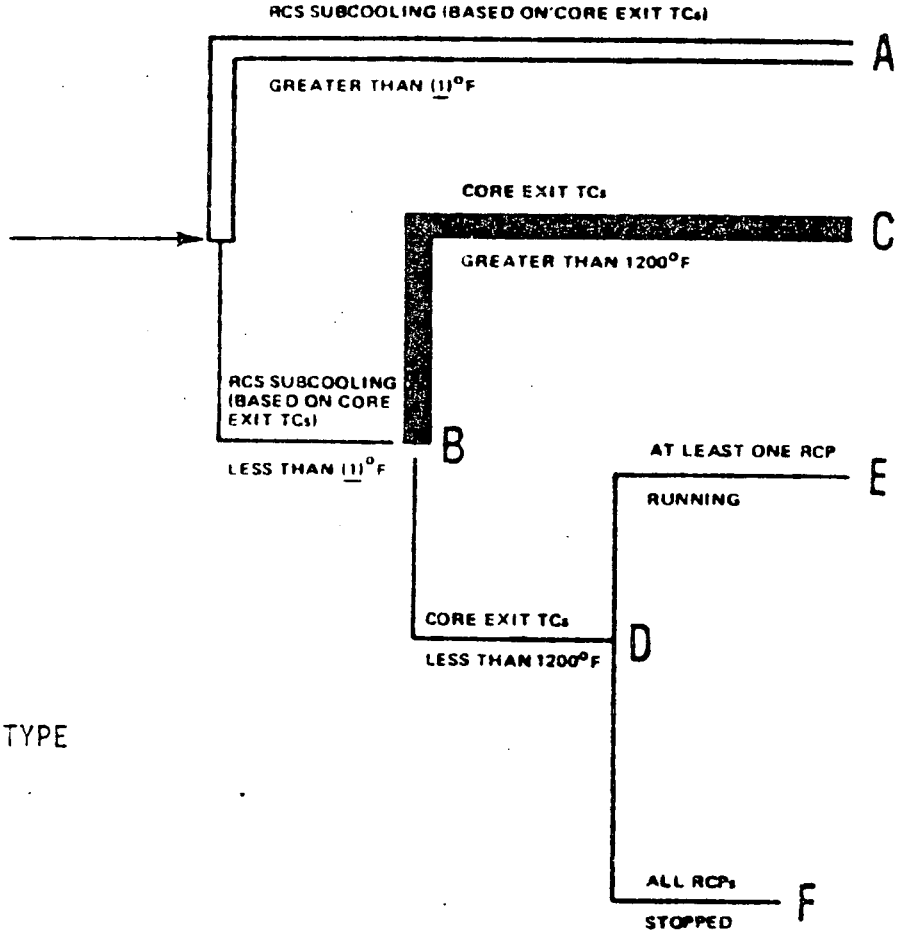
IF CST level less than ___%, THEN switch to alternate AFW water supply.

4 COLD LEG RECIRCULATION SWITCHOVER CRITERION

IF RWST level less than ___%, THEN align SI system for cold leg recirculation per ES-2.2, COLD LEG RECIRCULATION FOLLOWING LOSS OF SECONDARY COOLANT.

FIGURE 6
EXAMPLE FOLDOUT PAGE FORMAT

TREE TYPE



BLOCK TYPE

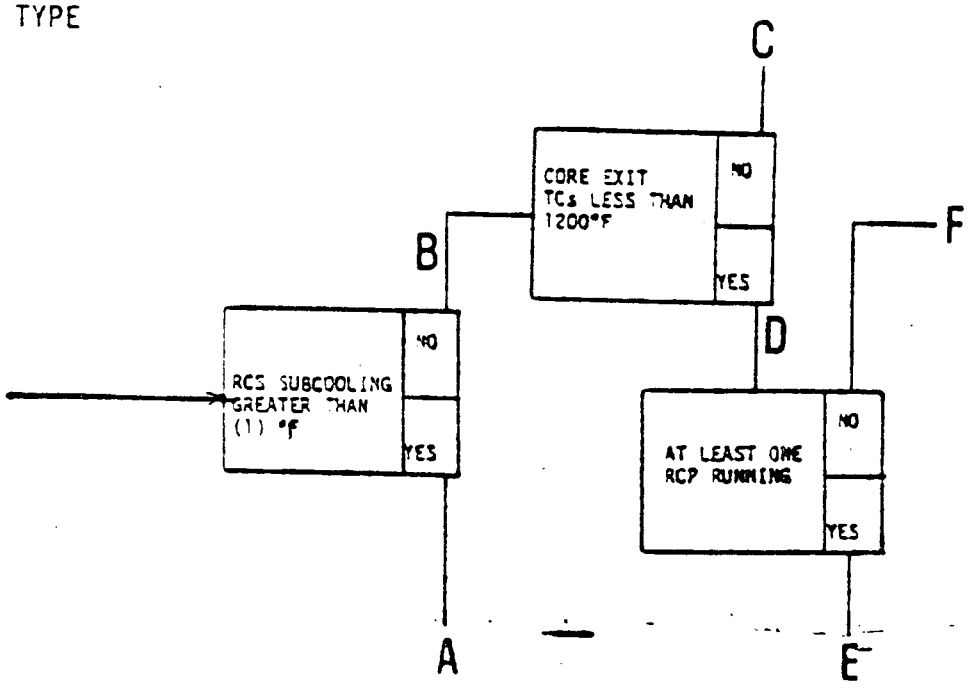


FIGURE 7
BRANCH AND BLOCK STATUS TREES

Number	Symptom/Title	Revision/Date
F-0.1	SUBCRITICALITY	BASIC 1 Sept. 1982

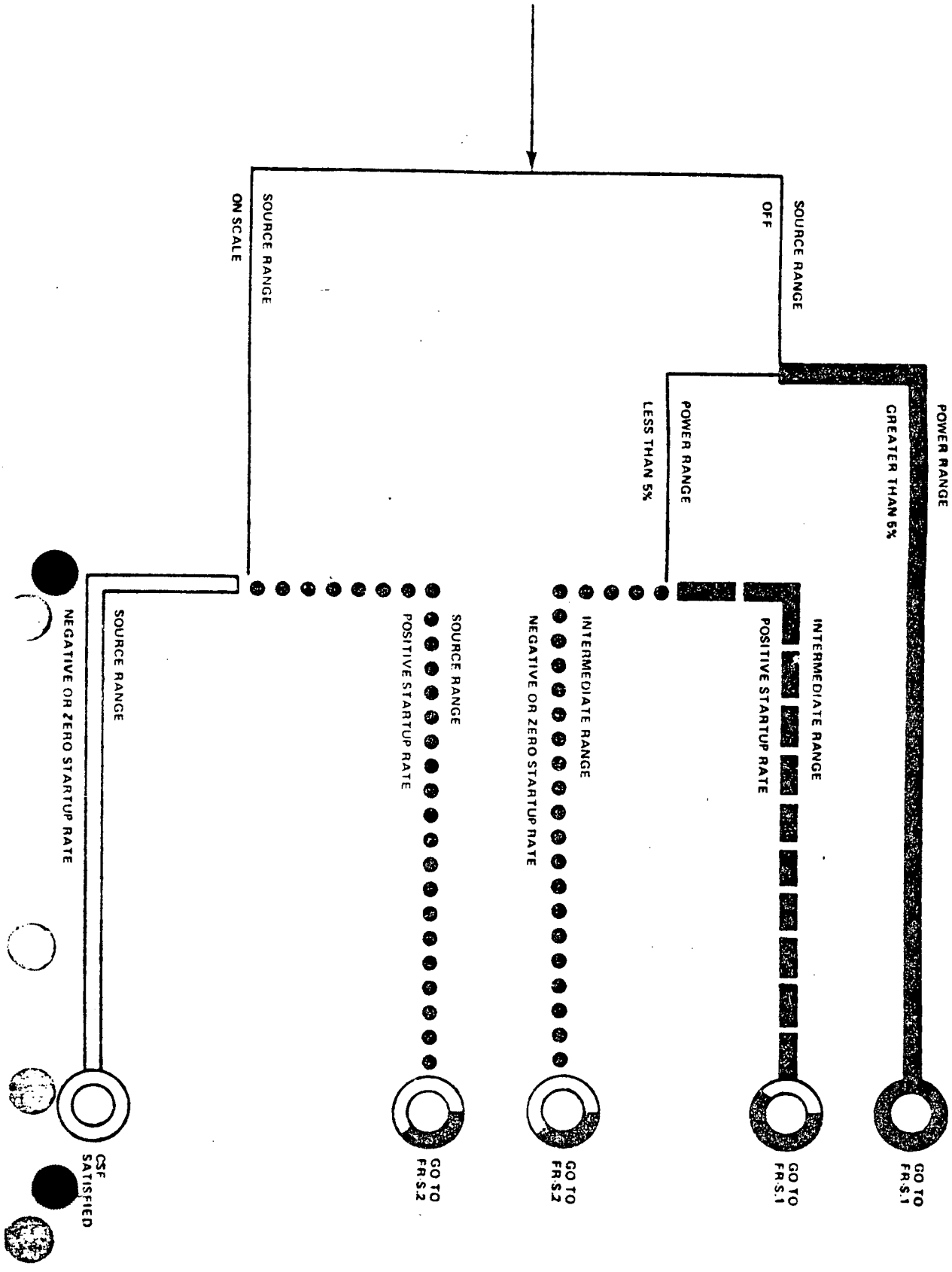


FIGURE 8
SCHEME OF LINE PATTERN CODING USED
TO IDENTIFY PRIORITIES