BOSTON EDISON

NUCLEAR OPERATIONS DEPARTMENT

PILGRIM NUCLEAR POWER STATION

Procedure 1.3.4-10

WRITERS' GUIDE

FOR

EMERGENCY OPERATING PROCEDURES

Total Pages: 36

FOR INFORMATION ONLY

Approved _____ 10/15/87
        Quality Assurance Manager   /Date

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I. **INTRODUCTION**

A. **Purpose**

This document specifies appropriate instructions, requirements, and conventions for writing PNPS Emergency Operating Procedures (EOPs) to assure the proper and consistent application of human factors principles addressing procedure organization, format, style, and content of the EOPs is established and effectively maintained.

B. **Scope**

· This Writers' Guide addresses the specifics of procedure identification, format, and content. The guidance provided herein is applicable to the initial preparation and subsequent revisions of all PNPS EOPs.

This document supplements existing BECo and PNPS administrative procedures governing procedure preparation, revision, and control, but does not supplant them.

C. **Use of Examples**

The examples provided are included solely to illustrate the graphics of the particular feature being discussed. The text within examples is not to be interpreted as providing accurate instructions for plant operations.

II. **PROCEDURE IDENTIFICATION**

Each EOP shall be clearly and uniquely identified. Identification shall consist of the procedure number, title, and revision number as described below.

A. **Procedure Numbering and Title**

Each EOP shall be assigned a unique identification number and a title which is descriptive of the procedure content. The procedure number and title shall be presented in large, boldfaced, underlined print located across the top of the EOP (Example 1).

Example 1: (EOP Title)

EOP-01
RPV CONTROL

B. Procedure Title Block

Each EOP shall have a title block (Example 2). The title block shall be located in the lower right-hand corner of the page, with the right and bottom sides adjoining the page border. If more than one procedure is located on a single page, each title block shall be located in the lower right-hand corner of the associated bordered area surrounding each EOP (refer to Section III.E.5).

The procedure title block shall contain the following:

1. Plant name

2. Approval signature(s)

3. Effective date

4. Procedure title

5. Procedure number

6. Revision number

Example 2: (EOP Title Block)

```
┌─────────────────────────────────────────────────┐
│         PILGRIM NUCLEAR POWER STATION            │
├─────────────────────────────────────────────────┤
│  Approved:_____│
│             QA Manager                  / Date   │
│                                                  │
│  Approved:_____│
│             Operations Section Manager  / Date   │
│                                                  │
│  Approved:_____│
│             Nuclear Operations Manager  / Date   │
│                                                  │
│  Effective Date:_____ │
├─────────────────────────────────────────────────┤
│                 Procedure Title                  │
├─────────────────────────────────────────────────┤
│                                                  │
│              RPV CONTROL                         │
│                                                  │
├──────────────────────────────────┬──────────────┤
│         Procedure Number         │   Revision   │
├──────────────────────────────────┼──────────────┤
│            EOP-01                │      0       │
└──────────────────────────────────┴──────────────┘
```

C. **Revision Identification**

Procedure revisions shall be distinguished by a sequential number.

If the content of a procedure is changed for any reason the entire procedure shall be reissued.

III. **PROCEDURE FORMAT**

The EOPs shall be structured as flowcharts and formatted in accordance with the conventions detailed below.

Unless otherwise specified, directional arrows entering and exiting flowchart elements shall be positioned along the element's vertical axis.

A. **Flowchart Elements**

1. **Entry conditions** shall be located at the top (i.e., beginning) of the procedure, enclosed in a heavy-bordered rectangle with rounded corners (Example 3). The parameters and the associated values or conditions shall be presented in a tabular format. Variances are permitted where a tabular presentation of values/conditions may be confusing.

Example 3: (Entry Conditions)

ENTRY CONDITIONS	
PARAMETER	**CONDITION**
RPV water level	Below +9 in.
RPV pressure	Above 1085 psig
Drywell pressure	Above 2.5 psig

Both of the following conditions exist:

o A scram is required

o Reactor power is above 3% or cannot be determined
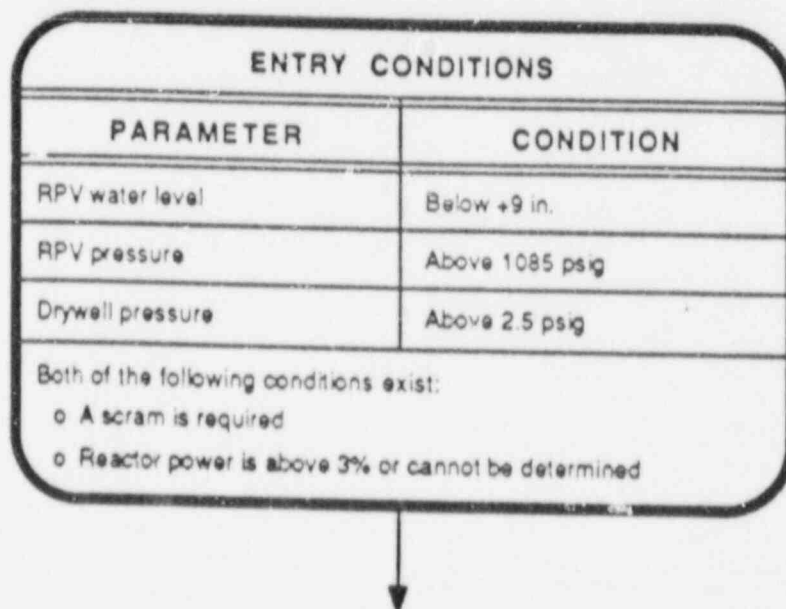
A.   Flowchart Elements (continued)

Entry points for EOPs entered only from other EOPs shall be indicated by the word "START" printed in boldfaced uppercase letters centered in a heavy-bordered rectangle with rounded corners (Example 4). This element shall be located at the top (i.e., beginning) of the procedure.

Example 4: (Entry Point)

START

2.   Concurrent execution statements shall be enclosed within a shaded elongated rectangle (Example 5). The instruction directing concurrent performance of multiple sections or steps of a procedure shall be centered beneath the directional entrance arrow within the rectangle. The subsequent procedure sections, paths, or steps which are to be executed concurrently shall be arranged along parallel axes directly below the concurrent execution element, appropriately spaced so as to achieve a balanced presentation.

Example 5:   (Concurrent Execution Statement)

Monitor and control RPV water level, RPV pressure and reactor power concurrently

RPV WATER LEVEL ❶   RPV PRESSURE   REACTOR POWER
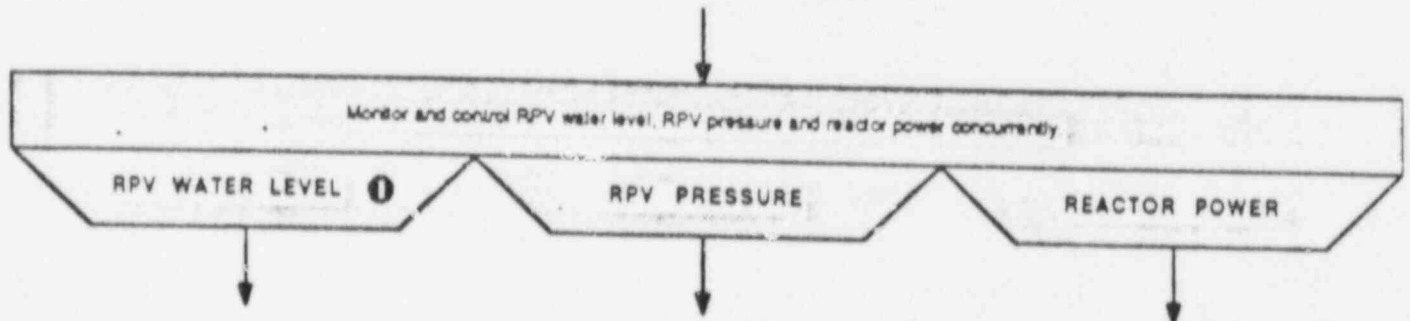
3.   Section designators shall be printed in boldfaced uppercase letters centered within a shaded trapezoid. This element shall only be used in conjunction with a concurrent execution element (Example 5).

A.   Flowchart Elements (continued)

    4.   Instructional steps shall be formatted as complete sentences and enclosed in rectangles (Example 6).

       Example 6:   (Instructional Step)

```
          │
          ▼
┌──────────────────────────────────┐
│ Terminate drywell sprays.        │
└──────────────────────────────────┘
          │
          ▼
```

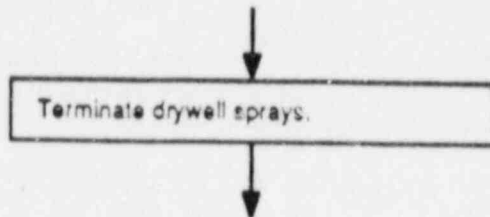   5.   Individual decisions constituting major branch points within a procedure shall be phrased as "yes/no" questions enclosed in diamonds (Example 7). Arrows extending from the points of the diamond shall be used to depict the "yes" and "no" response paths. The "yes" response path should exit from the right and the "no" response should exit from the bottom. Variances from this convention are permitted if necessary to accommodate proper phrasing of the "yes/no" question. "Yes" and "No" response path labels shall be capitalized and placed adjacent to the respective exit points.

       Example 7:   (Individual Decision)

```
                    │
                    ▼
                  ╱   ╲
                ╱  Has  ╲
              ╱  it been  ╲
            ╱  determined   ╲
          ╱  that the reactor ╲
          ╲ will remain shutdown ╱──── Yes ──►
            ╲ under all conditions ╱
              ╲   without   ╱
                ╲  boron  ╱
                  ╲  ?  ╱
                    │
                    No
                    │
                    ▼
```
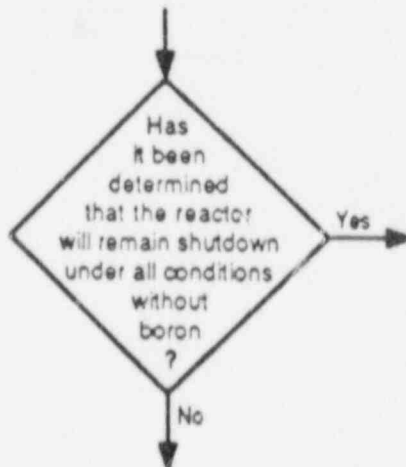
    6.   Individual decisions not constituting major procedure branches shall be presented in one of the formats described below. Consistent use of the format selected for a particular application should be maintained.

       a.   A "Yes/No" decision diamond (as described in Section III.A.5) with one of the response paths containing an instructional step (Example 8).

A. <u>Flowchart Elements</u> (continued)

Example 8: (Yes/No" Decision Diamond with an Instructional
Step in One of the Response Paths)
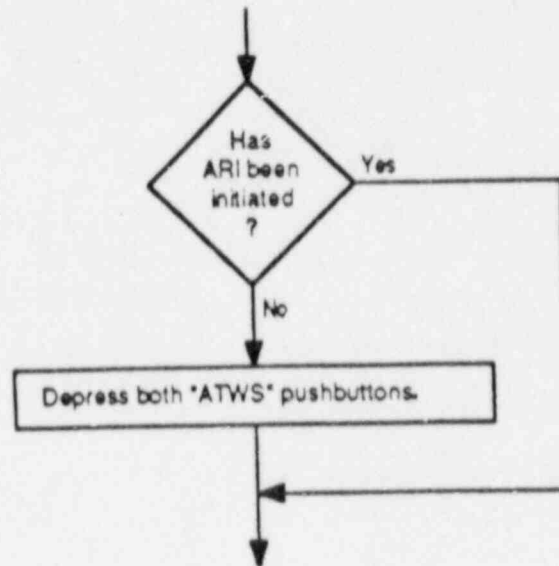
b. A "Yes/No" decision diamond (as described in Section III.A.5)
with one or more instructional steps in each response path.

Variances from the above guidelines are permitted where
necessary to clarify the procedure flowpath or enhance the
usability of the flowcharts.

7. <u>Conditional statements</u> which modify instructional steps shall be
presented in a format which clearly distinguishes between
conditions and actions. Highlighted logic terms shall be used to
emphasize distinction. The following format conventions shall
apply:

a. The conditional part of the instruction shall be stated
first, followed by the contingent action (Example 9).

This formatting requirement does not apply to conditional
clauses that begin with "UNTIL" (see Part c below) or
"EXCEPT" (See Part d below).

b. Logic terms shall be printed in uppercase letters physically
separated from the remainder of their respective clauses
(Example 9).

A. <u>Flowchart Elements</u> (continued)

    7. <u>Conditional statements</u> (continued)

        Example 9: (Conditional Statement)

```
                          ↓
┌──────────────────────────────────────────────────────────┐
│                                                            │
│    ╱‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾╲    THEN   ┌────────────────────┐   │
│   ╱         IF         ╲ ───────► │ Open SRVs in the   │   │
│   ╲ SRVs are used to   ╱          │ following sequence,│   │
│    ╲ stabilize RPV    ╱           │ if possible: B,C,D,A│  │
│     ╲  pressure,     ╱            └────────────────────┘   │
│      ╲‾‾‾‾‾‾‾‾‾‾‾‾‾‾╱                                       │
│                                                            │
│   ╱‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾╲                                        │
│  ╱        IF        ╲                                       │
│ ╱ SRVs are used to   ╲                                      │
│ ╲  stabilize RPV     ╱   THEN   ┌────────────────────┐     │
│  ╲ pressure,         ╱ ───────► │ Place all SRV      │     │
│  ╱ AND               ╲          │ control switches   │     │
│  ╲ The continuous SRV ╱         │ in the "AUTO" position. │ │
│   ╲pneumatic supply  ╱          └────────────────────┘     │
│   ╱(Nitrogen and     ╲                                     │
│   ╲Instrument Air)   ╱                                     │
│    ╲is or becomes    ╱                                     │
│     ╲unavailable,   ╱                                      │
│      ╲‾‾‾‾‾‾‾‾‾‾‾‾╱                                         │
│                                                            │
└──────────────────────────────────────────────────────────┘
                          ↓
```
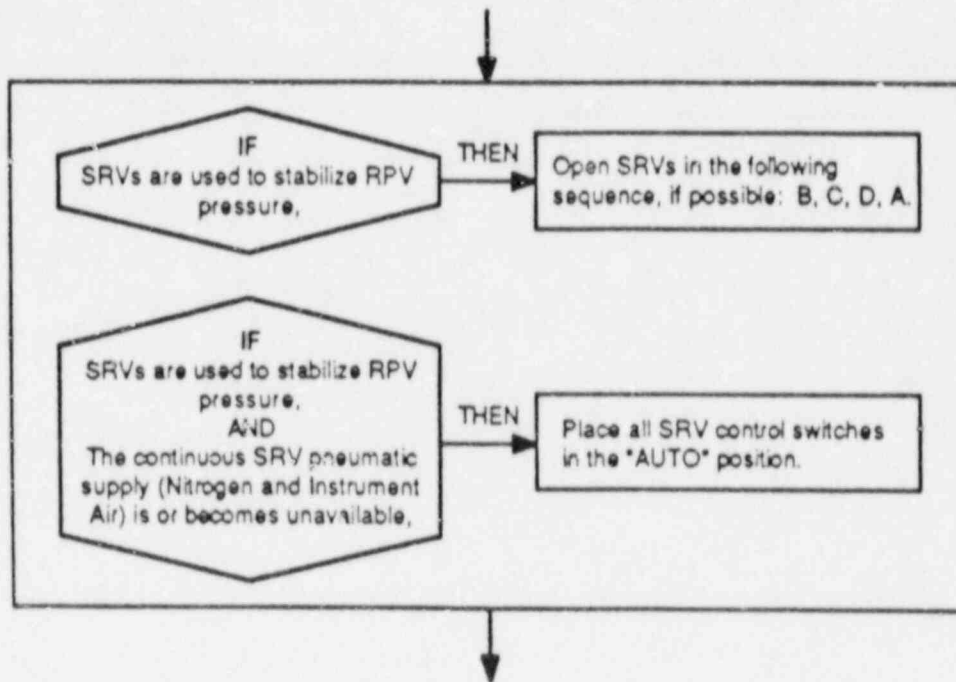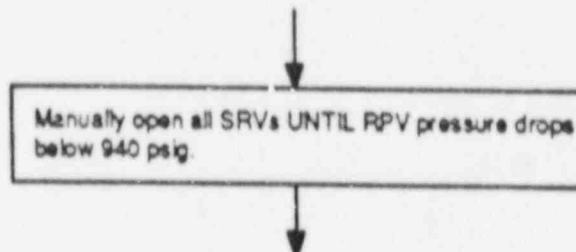
        c. When a prescribed action is to be performed until certain
specified conditions occur, the conditions shall be prefaced
by the word "UNTIL" printed in uppercase letters
(Example 10). Separation of "UNTIL" from the preceding and
following text is not required.

        Example 10: (Use of the word "UNTIL")

```
                    ↓
       ┌──────────────────────────────────────────────┐
       │ Manually open all SRVs UNTIL RPV pressure drops│
       │ below 940 psig.                                │
       └──────────────────────────────────────────────┘
                    ↓
```
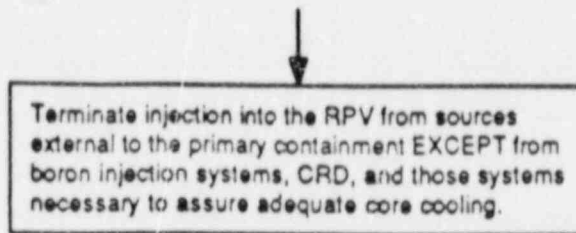
        d. When a prescribed action is to be performed with certain
specified exceptions, the exceptions shall be prefaced by the
word "EXCEPT" printed in uppercase letters (Example 11).
Separation of "EXCEPT" from the preceding and following text
is not required.
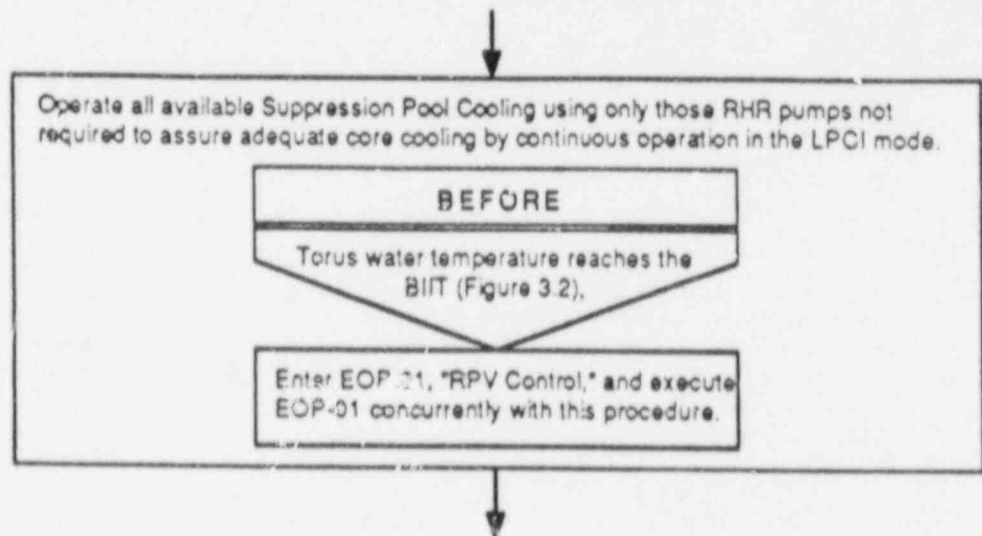
A. **Flowchart Elements** (continued)

7. **Conditional statements** (continued)

Example 11: (Use of the word "EXCEPT")

```
Terminate injection into the RPV from sources
external to the primary containment EXCEPT from
boron injection systems, CRD, and those systems
necessary to assure adequate core cooling.
```

e. When a prescribed action may be performed any time before a specified condition occurs, the condition shall be prefaced by the word "BEFORE" printed in boldfaced uppercase letters. "BEFORE" shall be separated from the text which defines the condition and formatted as shown (Example 12).

Example 12: (Use of the word "BEFORE")

```
Operate all available Suppression Pool Cooling using only those RHR pumps not
required to assure adequate core cooling by continuous operation in the LPCI mode.

                        BEFORE
              Torus water temperature reaches the
                       BIIT (Figure 3.2),

              Enter EOP-01, "RPV Control," and execute
              EOP-01 concurrently with this procedure.
```

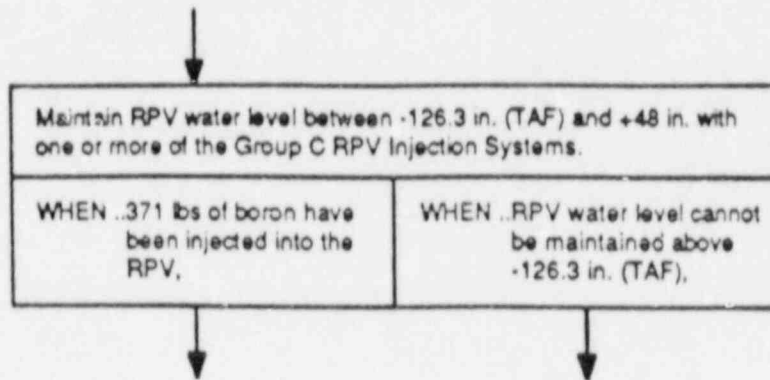f. The intermixing of clauses beginning with "and" with those beginning with "or" within an individual step or decision should be avoided whenever possible. If use of an "and/or" logic structure is required, a decision table, an appropriately structured series of connected decision diamonds, or a acceptable alternate format shall be used to clearly depict the relationship between the conditional clauses.
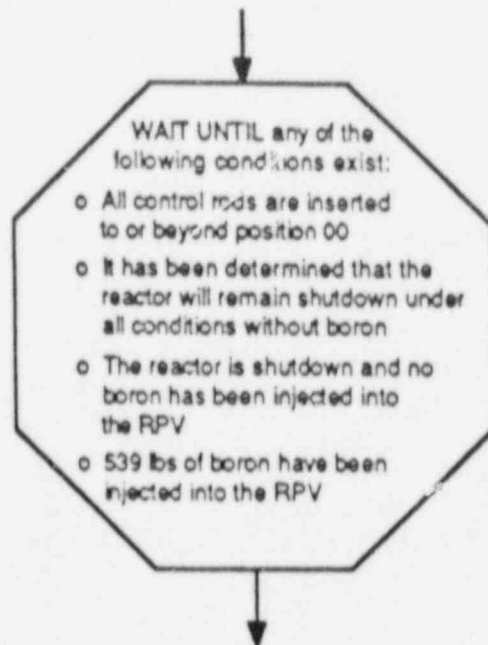
A. <u>Flowchart Elements</u> (continued)

8. <u>Continuation conditions</u> are plant conditions that cause procedure execution to immediately proceed from one instructional step to a subsequent element in the flowchart path. Continuation conditions shall be prefaced by the word "WHEN" printed in uppercase letters formatted as shown (Example 13). Note that more than one plant condition may apply to execution of an instructional step, and each separate condition may (or may not) proceed to a different flowchart element.

Example 13: (Continuation Conditions)

Maintain RPV water level between -126.3 in. (TAF) and +48 in. with one or more of the Group C RPV Injection Systems.	
WHEN ..371 lbs of boron have been injected into the RPV.	WHEN ..RPV water level cannot be maintained above -126.3 in. (TAF).

9. <u>Hold points</u> shall be formatted as instructions beginning with "WAIT UNTIL..." enclosed in octagons (Example 14). The words "WAIT UNTIL" shall be printed in uppercase letters.

Example 14: (Hold point)

WAIT UNTIL any of the following conditions exist:

o All control rods are inserted to or beyond position 00

o It has been determined that the reactor will remain shutdown under all conditions without boron

o The reactor is shutdown and no boron has been injected into the RPV

o 539 lbs of boron have been injected into the RPV
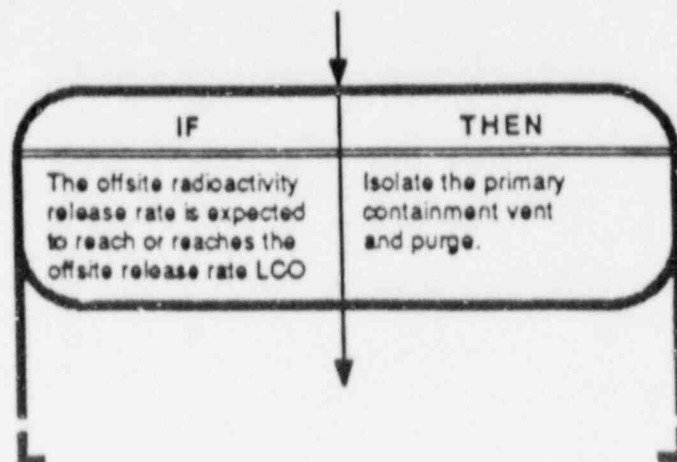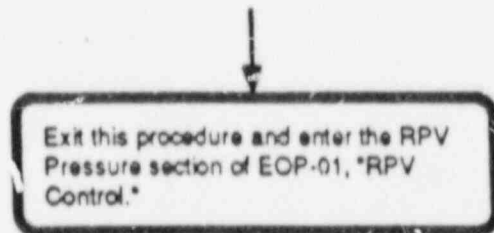
A. Flowchart Elements (continued)

10. Override statements are those conditional instructions which
apply while executing one or more steps. Override statements
shall be formatted as decision tables enclosed in shaded heavy
bordered rectangles (Example 15). Conditional statements and
contingent actions are presented in separate columns, each column
headed by the respective logic term. Logic terms shall be printed
in boldfaced uppercase letters centered over the respective
column. Shaded lines extending downward from the left and right
sides of the enclosing rounded-corner rectangle shall be used to
indicate the steps to which an override statement applies.
(Extension lines need not be used where an override statement
applies to an entire procedure.)

Example 15: (Override Statement)

IF	THEN
The offsite radioactivity release rate is expected to reach or reaches the offsite release rate LCO	Isolate the primary containment vent and purge.

11. Procedure Exit statements and end points shall be enclosed in
heavy-bordered rectangles with rounded corners (Example 16).
Variances to this convention are permitted when exit statements
are an integral part of override statements; when this situation
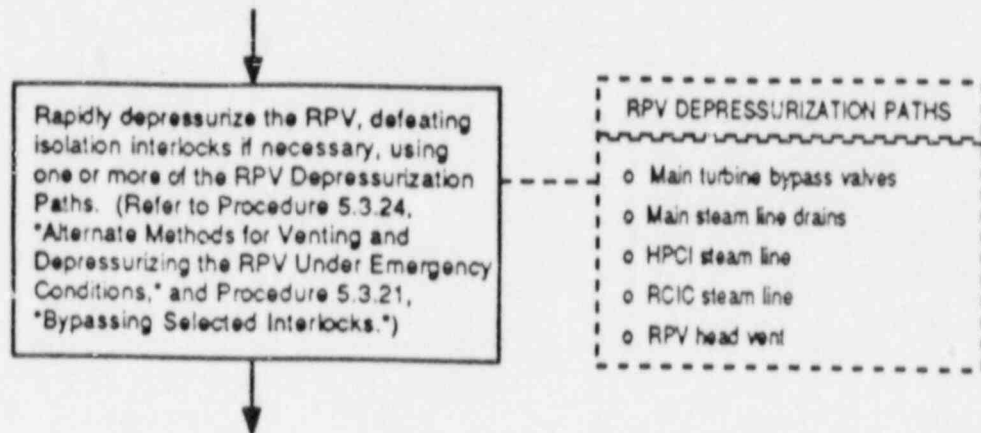occurs, the override statement formatting conventions apply.

Example 16: (Exit Statement)

Exit this procedure and enter the RPV
Pressure section of EOP-01, "RPV
Control."

A.   Flowchart Elements (continued)

12.   Supplemental Information that applies to the performance of a step may be placed outside of the procedure flow path, with dashed lines used to indicate step association (Example 17).

Example 17:   (Supplemental Information)

```
                              │
                              ▼
┌─────────────────────────────────────────┐        ┌─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┐
│ Rapidly depressurize the RPV, defeating  │        │   RPV DEPRESSURIZATION PATHS     │
│ isolation interlocks if necessary, using │        │                                 │
│ one or more of the RPV Depressurization  │ ─ ─ ─ ─┤  o  Main turbine bypass valves  │
│ Paths. (Refer to Procedure 5.3.24,       │        │  o  Main steam line drains       │
│ "Alternate Methods for Venting and       │        │  o  HPCI steam line              │
│ Depressurizing the RPV Under Emergency   │        │  o  RCIC steam line              │
│ Conditions," and Procedure 5.3.21,       │        │  o  RPV head vent                │
│ "Bypassing Selected Interlocks.")        │        └─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘
└─────────────────────────────────────────┘
                              │
                              ▼
```

13.   Notes shall be printed in italics and placed within the respective flowchart element, located immediately preceding or following the associated text (as is most appropriate considering the information content of the notes). The word "NOTE" printed in uppercase letters and punctuated with a colon shall preface the text of the note.

14.   Cautions shall be numbered consistent with the numbering scheme employed in the Plant-Specific Technical Guidelines. The applicability of a caution at a point in a procedure shall be indicated by a circle with a black background enclosing the caution number (Example 18). The full text of each referenced caution shall be enclosed in a rectangle and arranged around the periphery of the flowchart in numerical sequence, located to the left or above any figures present (Refer to Section III.E.6).

Example 18:   (Caution)

```
┌──────────────────────────────────────────────────────────────┐
│  ④   A rapid increase in injection into the RPV may induce a  │
│      large power excursion and result in substantial core     │
│      damage.                                                   │
└──────────────────────────────────────────────────────────────┘
```

A. Flowchart Elements (continued)

15. Figures shall be used to present graphical plots of limits expressed as a function of two or more plant parameters (Example 19).

Figures shall be numbered sequentially, in the order referenced within the procedure (top to bottom and left to right in the procedure flow path), using a prefix corresponding to the number of the applicable procedure followed by a decimal numeral. (For example: Figure 1.2 would be the second figure referenced in EOP-1.) The symbol "#" and the abbreviation "No." shall not be used. Figure references shall be enclosed within parentheses.
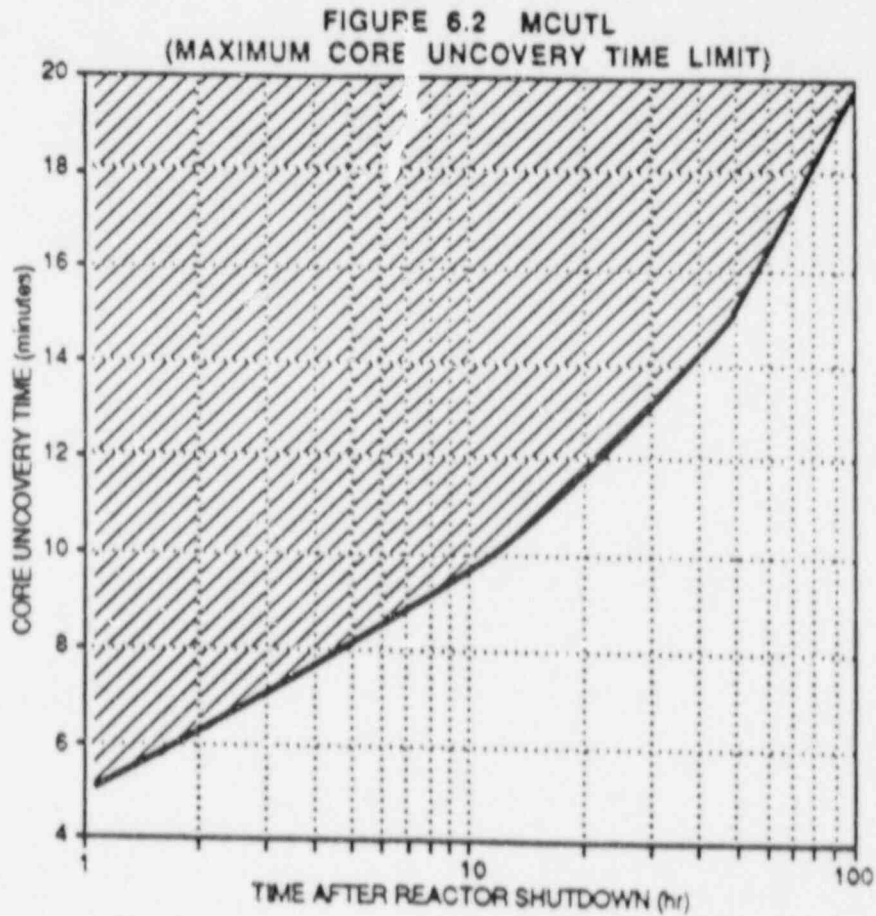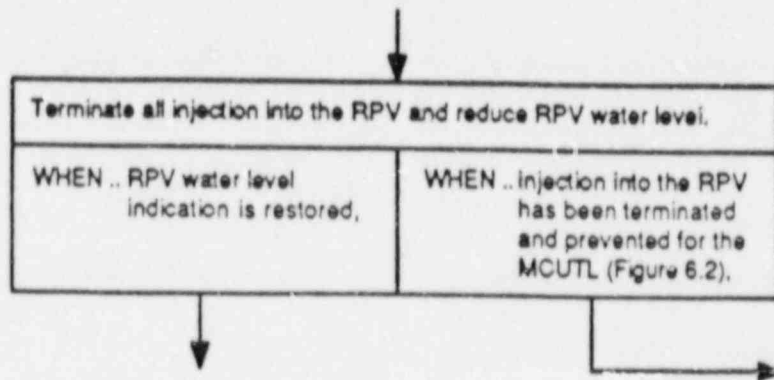
Each figure shall have a label comprised of the figure number and a descriptive title.

Figures shall be grouped or stacked in sequence (top to bottom, left to right) around the periphery of the flowchart (refer to Section III.E.6).

Figures shall be constructed and presented in accordance with the following conventions:

a. All text and graphics should be clear, simple, and easily readable.

b. Figure titles shall be printed in boldfaced uppercase letters and, together with the figure number, centered above the figure.

c. Axes of graphs shall be labeled with appropriate parameters, units, and numerical values. Axis numerical gradations and units shall correspond to those of associated control room instruments.

d. Grid lines shall be provided on graphs as appropriate to aid in interpolating plotted values to the required precision.

e. Operating regions beyond the action level defined by a graph shall be delineated through use of cross-hatching or background shading.

Example 19: (Figure)

Terminate all injection into the RPV and reduce RPV water level.

| WHEN .. RPV water level indication is restored, | WHEN .. Injection into the RPV has been terminated and prevented for the MCUTL (Figure 6.2), |

FIGURE 6.2   MCUTL
(MAXIMUM CORE UNCOVERY TIME LIMIT)

CORE UNCOVERY TIME (minutes)

TIME AFTER REACTOR SHUTDOWN (hr)

A. Flowchart Elements (continued)

16. Tables shall be used to effectively organize, correlate, or subdivide lists of systems, values, sensors, or other data (Example 20).

Tables shall be numbered sequentially, in the order referenced within the procedure (top to bottom and left to right in the procedure flow path), using a prefix corresponding to the number of the applicable procedure followed by a decimal numeral. (For example: Table 4.2 would be the second table referenced in EOP-4.) The symbol "#" and the abbreviation "No." shall not be used. Table number references shall be enclosed within parentheses.

Each table shall have a label comprised of the table number and a descriptive title.

Tables shall be grouped or stacked in sequence (top to bottom, left to right) around the periphery of the flowchart, to the right of any figures present (Refer to Section III.E.6). Small tables may be placed alongside the flowchart element in which they are referenced (Refer to Section III.A.12).

Tables shall be constructed and presented in accordance with the following conventions:

a. All text and graphics should be clear, simple, and easily readable.

b. Table titles shall be printed in boldfaced uppercase letters and, together with the table number, centered above the table.

c. A border shall enclose each table.

d. A heading shall be provided for each column. Headings shall be printed in uppercase letters and centered over the columns. Engineering units shall be included with column headings where applicable.

e. A double horizontal line shall be placed below the column headings.

f. Columns shall be divided by vertical lines.

g. Dashed horizontal lines or blank spacing may be used within tables to group (or divide) entries as appropriate to aid readability across the entries.

A. Flowchart Elements (continued)
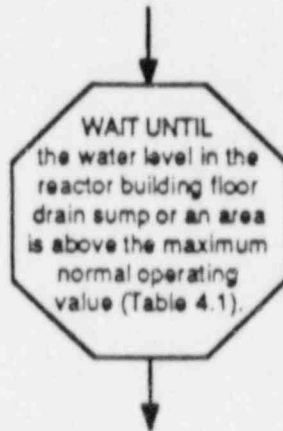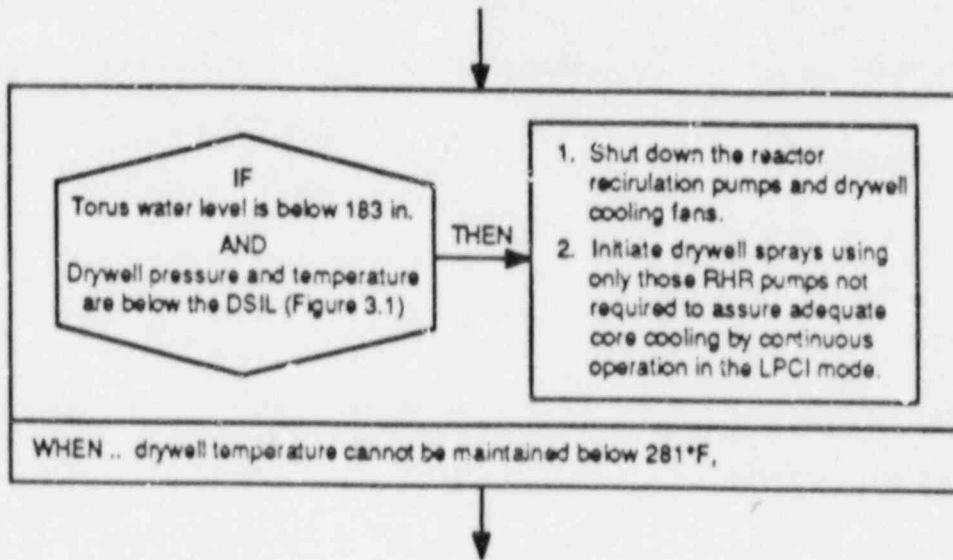
    Example 20: (Table)

```
           │
           ▼
      ╱──────────╲
     ╱  WAIT UNTIL ╲
    ╱ the water level in the╲
   │ reactor building floor │
   │ drain sump or an area  │
   │ is above the maximum   │
    ╲ normal operating     ╱
     ╲ value (Table 4.1). ╱
      ╲──────────╱
           │
           ▼
```

TABLE 4.1

SECONDARY CONTAINMENT SUMP/AREA MAXIMUM WATER LEVELS

SUMP/AREA	MAX NORMAL OPERATING VALUE (Inches above floor)	MAX SAFE OPERATING VALUE (Inches above floor)
SUMP Reactor building floor drain	1 inch on HPCI pump room floor	N/A
AREA N. W. quadrant	1	6
S. E. quadrant	1	6
HPCI compartment	1	6
̂. W. quadrant	1	6
CRD quadrant	1	6

B. Step Numbering

    Only those operator actions that must be executed sequentially and that
    are presented within the confines of one flowchart element shall have
    designated step numbers. Such steps shall be assigned sequential
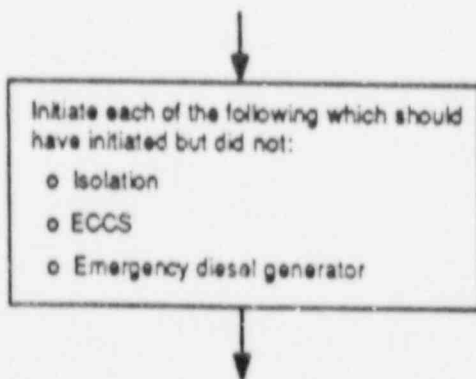   arabic numbers (Example 21).

Example 21:   (Step numbering)

```
                              │
                              ▼
┌─────────────────────────────────────────────────────────────┐
│  ┌──────────────────────┐        ┌─────────────────────────┐ │
│  │          IF          │        │ 1. Shut down the reactor│ │
│  │ Torus water level is │        │    recirulation pumps   │ │
│  │     below 183 in.    │  THEN  │    and drywell cooling  │ │
│  │         AND          │ ─────▶ │    fans.                │ │
│  │ Drywell pressure and │        │ 2. Initiate drywell     │ │
│  │ temperature are below│        │    sprays using only    │ │
│  │  the DSIL (Figure 3.1)│       │    those RHR pumps not  │ │
│  └──────────────────────┘        │    required to assure   │ │
│                                  │    adequate core cooling│ │
│                                  │    by continuous        │ │
│                                  │    operation in the     │ │
│                                  │    LPCI mode.           │ │
│                                  └─────────────────────────┘ │
│─────────────────────────────────────────────────────────────│
│ WHEN .. drywell temperature cannot be maintained below 281°F,│
└─────────────────────────────────────────────────────────────┘
                              │
                              ▼
```

C.   Listed Items

Multiple items (systems, plant conditions, etc.) for which there is no
unconditional pre-designated preference or priority shall be arranged
in a list format. Each entry in the list prefaced with a bullet (o).
Bullets shall be indented two spaces to the right of the left margin of
the immediately preceding text (Example 22). Variances to this
convention are permitted (Refer to Example 14) where listed items
appear in elements whose shap necessitates a centered text format
(i.e., octagons or diamonds).

Example 22:   (Listed Items)

```
                       │
                       ▼
┌──────────────────────────────────────┐
│ Initiate each of the following which │
│ should have initiated but did not:   │
│                                      │
│   o  Isolation                       │
│                                      │
│   o  ECCS                            │
│                                      │
│   o  Emergency diesel generator      │
│                                      │
└──────────────────────────────────────┘
                       │
                       ▼
```

D. <u>Use of Emphasis Techniques</u> (continued)

    i.   Text of instructional steps which may cause control of a parameter to transfer from one procedure (or section of a procedure) to another (e.g., "Primary Containment Flooding is Required")

    j.   Identification of as-labeled component designations, control switch positions, and annunciator engravings

    k.   The procedure title, number, revision number and plant name within title blocks

    l.   The word "BEFORE" (Refer to paragraph III.A.7.e)

3. Flowchart titles shall be underlined.

4. Italics shall be used for the text of notes.

5. Quotation marks shall enclose the as-labeled instrument and component designations, control switch positions, and annunciator engravings. This enhancement shall not be used if it is deemed to detract from the readability of the flowchart.

E. <u>Procedure Layout and Associated Conventions</u>
(Example 22)

1. More than one procedure may be placed on a page (page size restrictions permitting).

2. Maximum page size shall be restricted to that which can be accommodated by reprographics capabilities.

3. Page breaks in a procedure are not allowed.

4. A border approximately 1/2 inch from the edge of each side of the page shall be used to enclose the procedure(s) on the page. A line of medium thickness shall be used to form this border.

5. The procedure title block(s) shall be located in the lower right corner(s) of the bordered area(s) surrounding the EOP(s) (Example 23).

6. Cautions, figures, and tables shall be placed along the page periphery as described in Sections III.A.14, 15, and 16, respectively (Example 23).

7. Solid lines ending in arrows shall be used to connect flowchart elements and thereby indicate flowpaths through the procedure. Progression through a procedure shall generally be down and to the right.

8. Procedure titles and flowchart elements (including connecting lines and extension lines emanating from override statements) shall be located no closer than 1/2 inch to the page border.

CAUTIONS

PROCEDURE
(X)

FIGURES AND TABLES

TITLE
BLOCK
(X)

CAUTIONS

PROCEDURE
(Y)

FIGURES AND TABLES

TITLE
BLOCK
(Y)
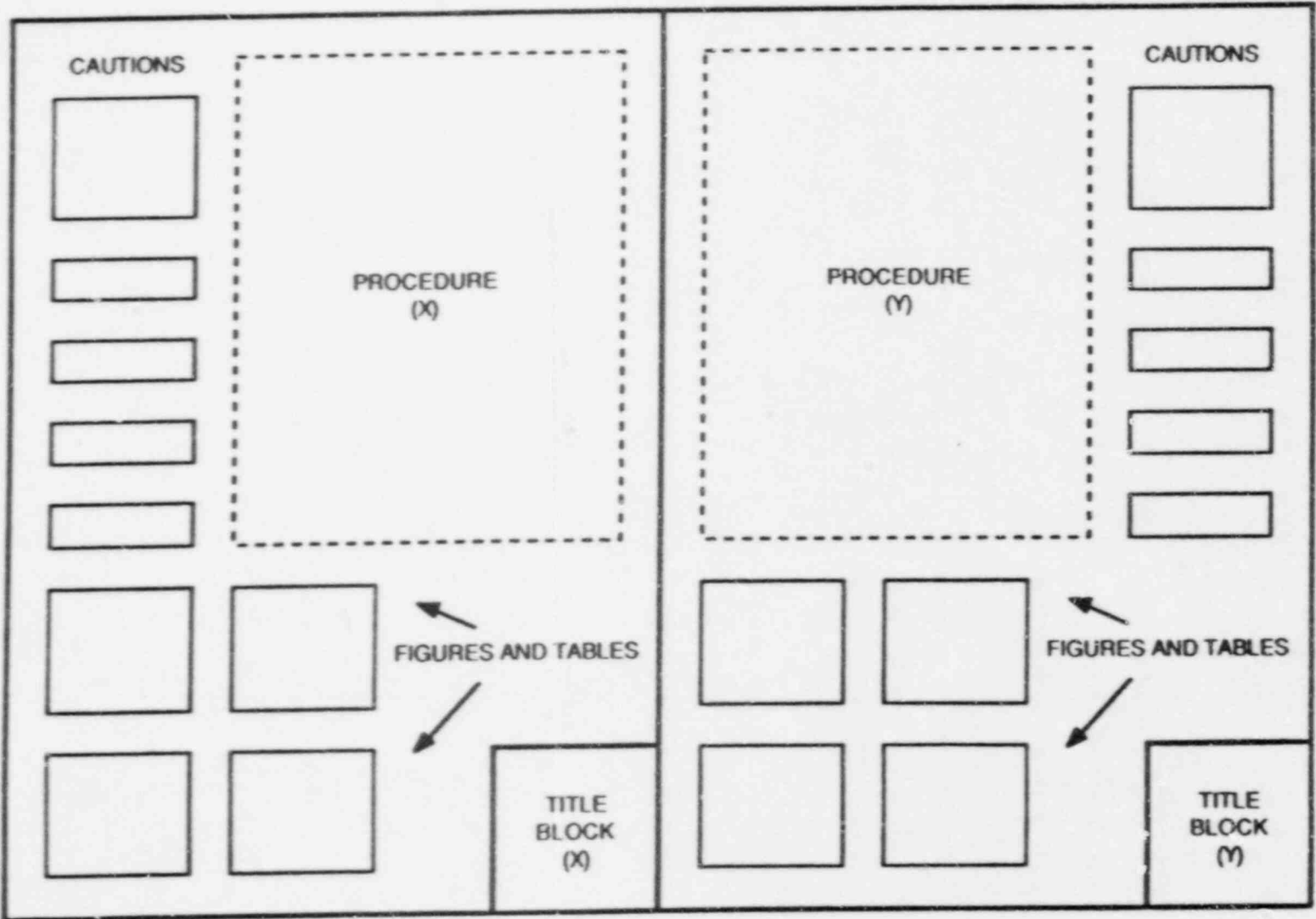
F. Instructions for Printing, Copying, and Storage

1. Text within flowchart elements shall be single-spaced, with one-and-a-half line spacing maintained between listed items and between multiple instructions or statements enclosed within one flowchart element.

2. Text within instructional steps, exit statements, and endpoints shall be left-aligned.

3. Text within the individual columns of entry conditions, override statements, and elements with decision table formats shall be left-aligned.

4. Text within hold points (octagons) and decision diamonds shall be centered.

5. Type size shall be no smaller than 9-point.

6. A simple, easy-to-read, type style shall be used. A type style which incorporates serifs or other character embellishments shall not be used.

7. Copies of the EOPs shall be legible, closely approximating the quality of the original.

8. Control room copies of EOPs shall be clearly distinguishable from other plant procedures, and shall be stored in a location where they are readily accessible to operators on shift.

IV. PROCEDURE CONTENT

A. Level of Detail

A level of detail shall be established in the EOPs that is consistent with the following guidelines:

1. The level of detail should be consistent with the knowledge and capabilities of a newly-licensed reactor operator. The relative complexity of and an operator's familiarity with the evolutions to be performed should be considered.

2. Excessive detail should be avoided. Expected results of routine actions need not be stated.

3. Where instructions are written in general terms, the user should be able to explain the execution of the associated tasks in detail.

4. Where appropriate, the following information shall be provided:

    - System response times

    - Equipment limitations

A.   Level of Detail (continued)

- Instrument inaccuracies

- Alternate or backup instrumentation

- Manual override instructions

- Methods of verifying correct plant response

5.   Instructions shall be brief and precise; however, technical
     accuracy takes precedence over brevity. Short, simple sentences
     shall be used. Any required verification of automatic plant
     response shall be included as a instruction.

B.   Writing Style

The EOPs shall be written in accordance with the following style
guidelines:

1.   The procedure shall be easily readable and interpretable.

2.   Directions shall be written in the second person imperative mood
     with an implicit subject.

3.   Each instructional step shall address only one idea (e.g., a
     series construction of multiple instructions each coupled with the
     word "and" to form one long sentence shall not be used).

4.   The objects of actions shall be specifically stated (i.e., it
     should be obvious exactly what is to be done to what). Multiple
     objects (3 or more) shall be listed individually, and separately
     from the preceding text.

5.   Actions which must be performed concurrently shall be explicitly
     identified as such.

6.   Limits shall be expressed quantitatively (Refer to Section IV.H).

7.   Instructions which require performance of arithmetical
     calculations should be avoided whenever possible.

C.   Cautions and Notes

Cautions shall be used to identify a potential hazard to personnel or
equipment.

Notes shall be used to provide supplementary information related to the
performance of a particular action.

Use of cautions and notes should be minimized. Neither shall be
contain instructional steps.

D.   Branching Instructions and Cross-References

Branching instructions shall be used to direct the operator to transfer
from one procedure (or section of a procedure) to another, or to
execute an additional procedure concurrently with the procedure(s)
presently being executed. These instructions shall be clear and
specific; wording shall be chosen so as to preclude ambiguity.

Branching instructions shall be presented as complete sentences in one
of the formats detailed below, as appropriate. Within the context of
branching instructions, the term "section" means that portion of an EOP
containing the instructions for controlling a particular plant
parameter (e.g., the RPV Water Level section of the RPV Control
Procedure).

Branching instruction formats:

1.   Exit this procedure and enter [Procedure X],
     "[Procedure Title]".

         Specifies that the operator shall exit the procedure
         containing the instruction (all sections if there are more
         than one), and enter the identified procedure.

2.   Exit the [Parameter] section of this procedure and enter
     [Procedure X], "[Procedure Title]".

         Specifies that the operator shall exit the section of the
         procedure containing the instruction and enter the identified
         procedure; execution of other sections of the procedure shall
         continue as appropriate (i.e., no exit is made from other
         sections of the procedure containing the instruction).

3.   Exit this procedure and enter the [Parameter] section of EOP-[X],
     "[EOP Title]".

         Specifies that the operator shall exit the procedure
         containing the instruction and enter the identified section
         of the identified procedure.

4.   Exit this procedure and enter the [Parameter] section and the
     [Parameter] section of EOP-[X] "[EOP Title]"; execute these
     sections of EOP-[X] concurrently.

         Specifies that the operator shall exit the procedure
         containing the instruction and enter the identified sections
         of the specified EOP; both sections of the EOP being entered
         shall be executed concurrently.

5.   Enter [Procedure X], "[Procedure Title]", and execute
     [Procedure X] concurrently with this procedure.

         Specifies that the operator shall enter and execute the
         identified procedure concurrently with the procedure
         containing the instruction.

D. <u>Branching Instructions and Cross-References</u> (continued)

    6.   Continue at [Y].

        Specifies that execution of the procedure (or section of the procedure) containing the instruction shall transfer from the step presently being executed to the location indicated. This format shall be used to branch "forward" in ar EOP.

    7.   Return to [Y].

        Specifies that execution of the procedure (or section of the procedure) containing the instruction shall transfer from the step presently being executed to the location indicated. This format shall be used to branch "backward" in the EOP.

    For branching formats 1, 2, and 5:

        The procedure to be entered shall be entered at the beginning.

    For branching formats 3 and 4:

        The proper entry point to an EOP section shall be indicated by the symbol shown below.

                ▷ EOP-07 ▷
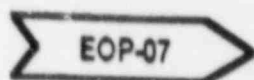
        The procedure number within the symbol shall be that of the procedure containing the exit branch instruction.

    For branching formats 6 and 7:
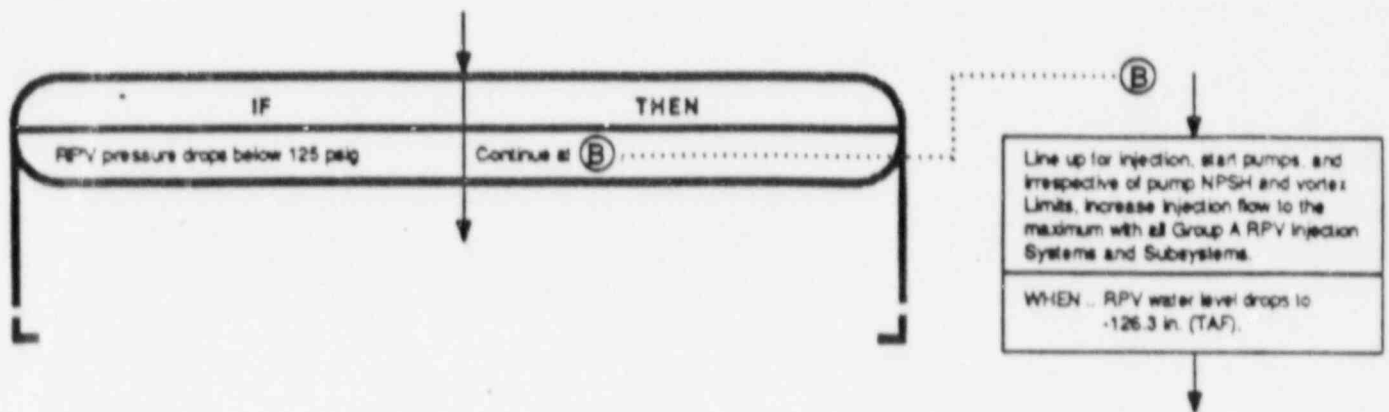
        The symbol "[Y]" shall be a capital letter placed within a circle as shown below:

            Ⓑ

        This symbol shall be repeated at the location where procedure execution is to be continued (or returned to). In each instance the letter designator shall be unique within the EOP. A dotted line connecting the pair of symbols may be used as an aid for proper execution of the procedure (Example 24). Forward and backward branching within a procedure should be minimized.

D. Branching Instructions and Cross-References (continued)

Example 24: (Intra-Procedure Branching)

IF	THEN
RPV pressure drops below 125 psig	Continue at Ⓑ

Ⓑ

Line up for injection, start pumps, and irrespective of pump NPSH and vortex Limits, increase injection flow to the maximum with all Group A RPV Injection Systems and Subsystems.

WHEN ... RPV water level drops to -126.3 in. (TAF).

Cross-references shall be specified where additional procedural instructions may be required to perform the specified task or evolution. The appropriateness of providing a procedure reference shall consider aspects such as complexity of and operator familiarity with the actions to be performed. Use of cross-references should be minimized; if only a few, relatively simple actions are involved, the referenced instructions shall be incorporated into the step itself.

References to supplemental procedures shall identify both the procedure number and title. The title shall be enclosed within quotation marks.

Figures and tables referenced within a procedure shall be identified by number; identification of the title is not required.

E. Component Identification

Components shall be clearly and completely identified. The following conventions shall apply:

1. If the procedure refers to a specific control switch or instrument, the as-labeled designation shall be used, typed in uppercase letters and enclosed within quotation marks. Otherwise, common-usage designations shall be used.

E.   Component Identification   (continued)

2.   System titles shall be capitalized.   The word "system" need not be included in the title.

3.   Component locations shall be specified if the components are infrequently used or if there would otherwise be a possibility of confusion.

F.   Spelling, Grammar, and Punctuation

Spelling, grammar, and punctuation shall be consistent with standard rules and modern usage.   The following conventions shall also apply:

1.   Excessive use of commas should be avoided.   Commas are not necessary in elements using a columnar format (e.g., override statements).

2.   Use of definite articles, pronouns, and adverbs should be minimized.   Personal pronouns shall not be used.

G.   Nomenclature, Vocabulary, and Abbreviations

Words and abbreviations shall have consistent meanings. The following conventions shall apply:

1.   Simple, common words shall be used.

2.   Words shall have specific, precise meanings.   Use of ambiguous terms should be avoided.

3.   Logic terms shall be used consistent with the applications defined in Table 1.

4.   The standard definitions listed in Table 2 shall be adopted.

5.   Use of acronyms and abbreviations should be minimized and only those immediately recognizable shall be used.   (A list of acceptable acronyms and abbreviations is provided in Table 3.)

H.   Numerical Values

Limits and values of operating parameters shall be expressed quantitatively.   The following conventions shall apply:

1.   Arabic numerals shall be used.

2.   Parameter values shall include the units of measurement.   Units shall be the same as those displayed on associated panel instrumentation.

3.   Parameter values shall be expressed to a precision consistent with the intent of the action(s) specified in the step.

H. <u>Numerical Values</u> (continued)

4. Acceptance values shall be expressed in terms of a range rather than a tolerance band to obviate the need for mental arithmetic (e.g., 20 in. to 30 in., rather than 25 in. ±5 in.).

5. A slash mark (/) shall be used in place of the word "per" (e.g., mR/hr).

6. Numbers between zero and one shall be expressed in decimal form with a zero preceding the decimal point (e.g., 0.12).

Table 1: Application of Logic Terms

Logic Term	Definition
AND	Designates a combination of two or more conditions. Identifies the second and subsequent elements of a set of conditions.
BEFORE	Indicates that the respective action is to be performed prior to the occurrence of a specified condition. Does not imply or require any specific margin be observed when a step states that action be taken "before" reaching a limit or value.
EXCEPT	Specifies an exception to or exclusion from taking a prescribed action.
IF	Indicates that performance of the associated action is contingent upon the existence of the identified condition(s). If the identified conditions do not exist, the prescribed action is not to be taken and execution of operator actions proceeds to the following step.
OR	Designates alternative combinations of conditions. Indicates that the associated action is to be performed if any one of the specified conditions occur. (Always used in the inclusive sense.)
THEN	Designates the action portion of an instruction.
WAIT UNTIL	Indicates that execution of subsequent operator actions is not permitted until the identified condition exists.
WHEN	Indicates that upon occurrence or existence of the identified condition(s), execution of the procedure should immediately proceed to the next identified flowchart element.
UNTIL	Indicates that the associated action is to be terminated when the specified condition occurs.

Table 2: Standard Nomenclature and Definitions

Available: The state or condition of being ready and able to be used (placed into operation) to accomplish the stated (or implied) action or function.

Cannot be determined: The value or status of the specified parameter relative to the procedure action level cannot be ascertained using available indications.

Cannot be maintained: The value of the specified parameter cannot be kept above or below (as applicable) the identified limit. Implies an evaluation based on system performance and availability considered in relation to parameter values and trends. Neither implies that the parameter must actually exceed the limit before the action is taken nor that the action must be taken before the limit is reached.

Cannot be restored: The value of the specified parameter cannot be returned to within the specified limit. Implies an evaluation based on system performance and availability considered in relation to parameter values and trends. Does not imply any specific time limit, but does not permit prolonged operation beyond the limit.

Close: To position a valve or damper so as to prevent flow of the process fluid.

Confirm: Use available indications and, as appropriate, physical observation to establish that the specified action has occurred, conditions are as stated, etc. Includes an implied requirement to take corrective action if the identified conditions do not exist.

Control: Take action, as necessary, to maintain the value of the specified parameter within applicable limits.

Enter: Commence performing, in sequence, the steps of the identified procedure.

Execute: Perform the actions prescribed in the identified step.

Exit: Cease performing the steps of the identified procedure.

Initiate: Operate the necessary controls so as to establish the specified system configuration or plant condition. Prolonged attempts to jumper interlocks, align alternate or backup power supplies, enter remote areas to manually operate valves, etc., are not intended by this term.

Table 2: Standard Nomenclature and Definitions (Continued)

Line up: Establish the prerequisites necessary for system
    operation. Does not encompass starting main system pumps.

Maintain: Take action, as necessary, to keep the value of the
    specified parameter within the applicable limits.

Monitor: Observe and evaluate at a frequency sufficient to remain
    apprised of the value, trend, and rate of change of the
    specified parameter.

Open: To position a valve or damper so as to allow flow of
    the process fluid.

Place: To align a switch to a specified position.

Prevent: Take action to forestall or avert the state,
    condition, or action addressed by the step.

Purge: Force flow through an enclosed volume. Includes
    establishing both an influent and effluent flowpath.

Restore: Take action, as necessary, to return the value of
    the specified parameter to within applicable limits.

Set: To position a control to a specified scale value.

Shut: To position a breaker so as to permit the flow of
    current in the associated circuit.

Slowly: Only as fast as can be accommodated and still maintain
    effective control of the associated parameter(s)
    within specified values or limits.

Start: To energize a pump or fan motor.

Terminate: Stop the stated action, process or evolution.
    The most direct action to stop the stated action/process/
    evolution is preferred, but a wide variety of actions may
    be employed.

Throttle: To position a valve or damper so as to partially
    restrict flow of the process fluid.

Trip: To deenergize a pump or fan motor; to position a breaker
    so as to interrupt or prevent the flow of current in the
    associated circuit.

Vent: Open an effluent (exhaust) flowpath from an enclosed volume.

Table 3: Standard Acronyms and Abbreviations

Abbreviation	Meaning
ADS	Automatic Depressurization System
APRM	Average Power Range Monitor
ARI	Alternate Rod Insertion
BIIT	Boron Injection Initiation Temp.
CAC	Containment Atmospheric Control
CAD	Containment Atmospheric Dilution
CPS	Counts Per Second
CRD	Control Rod Drive
CS	Core Spray
ECCS	Emergency Core Cooling Systems
CST	Condensate Storage Tank
Demin	Demineralizer
DSIL	Drywell Spray Initiation Limit
DW	Drywell
$^\circ F$	Degrees Fahrenheit
ft	Feet
FW	Feedwater
GPM	Gallons Per Minute
H&V	Heating and Ventilation
HCLL	Heat Capacity Level Limit
HCTL	Heat Capacity Temperature Limit
HCU	Hydraulic control unit
HPCI	High Pressure Coolant Injection
hr	Hour
HX	Heat exchanger
in.	Inch

Table 3: Standard Acronyms and Abbreviations (Continued)

Abbreviation	Meaning
lbs	Pounds
LCO	Limiting Condition for Operation
LI	Level Indicator
LOCA	Loss of Coolant Accident
LPCI	Low Pressure Coolant Injection
LR	Level Recorder
MARFP	Minimum Alternate RPV Flooding Pressure
MCFI	Minimum Core Flooding Interval
MCUTL	Maximum Core Uncovery Time Limit
min	Minimum
MPCWLL	Maximum Primary Containment Water Level Limit
mR	Milliroentgen/Millirem (as appropriate to the context and the units of associated instrumentation)
MSIV	Main Steam Isolation Valve
N/A	Not applicable
NPSH	Net positive suction head
NW	North West
PCPL	Primary Containment Pressure Limit
psig	Pounds per square inch (gauge)
PSP	Pressure Suppression Pressure
RB	Reactor Building
RBCCW	Reactor Building Closed Cooling Water
RCIC	Reactor Core Isolation Cooling
RHR	Residual Heat Removal

Table 3: Standard Acronyms and Abbreviations (Continued)

Abbreviation	Meaning
RPM	Revolutions per minute
RPV	Reactor Pressure Vessel
RWCU	Reactor Water Cleanup
SBGT	Standby Gas Treatment
SBLC	Standby Liquid Control
SE	South East
SRV	Safety Relief Valve
SRVTPLL	SRV Tail Pipe Level Limit
SSW	Salt Service Water
SW	South West
TAF	Top of the active fuel
TBCCW	Turbine Building Closed Cooling Water
TIP	Transverse In-Core Probe
&	Ampersand ("And")
'	Feet
"	Inches
%	Percent