

GUIDELINE FOR PREPARATION OF
EMERGENCY OPERATING PROCEDURES

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COOPER NUCLEAR STATION
NEBRASKA PUBLIC POWER DISTRICT

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1 PURPOSE AND SCOPE

This document is designed to provide specific administrative and technical guidelines for preparing Cooper Nuclear Station (CNS) Emergency Operating Procedures (EOPs). This Writer's Guide will ensure that each procedure is readily understood by the operator and is yet sufficiently comprehensive to be acceptable to the CNS Operations Department.

2 DESIGNATION AND NUMBERING

2.1 PROCEDURE DESIGNATION

Each EOP shall be uniquely identified by a number which identifies the type of procedure (i.e. EOP 2 identifies the procedure as Emergency Operating Procedure Number 2) and a descriptive title to designate the scope of the procedure (i.e. PRIMARY CONTAINMENT CONTROL).

2.2 APPROVAL SHEET AND REVISION SHEET

Each EOP shall have an Approval Sheet (see Appendix 5) and Revision Sheet (see Appendix 6). The purpose of the approval sheet is to identify the procedure and the authorized revision. The purpose of the revision sheet is to identify the effective revision of each page of the procedure. The approval sheet and revision sheets shall be the last two pages of the procedure. EOPs shall be reviewed and approved in accordance with CNS Administrative Procedure 1.3.

2.3 PROCEDURE NUMBERING

A sequential number shall follow the procedure designator.

Example

EOP-2

_____ Sequence Number

_____ Procedure Designator

3 FORMAT

The following format is to be applied consistently for all CNS Emergency Operating Procedures.

3.1 PAGE FORMAT

A dual-column format shall be used. The left hand column is designated for primary operator actions. The right hand column is designated for contingency actions (to be taken when the expected response is not obtained) and for supplemental information. A sample page format is presented in Appendix 7.

3.2 PROCEDURE ORGANIZATION

The following section headings will be used for all CNS Emergency Operating Procedures:

TITLE -- The title shall be centered at the top of the first page of the procedure. The title shall be in all capitals and shall be underscored. The title should be descriptive of the purpose of the procedure.

PURPOSE -- The purpose is a brief statement describing the objectives of the procedure.

ENTRY CONDITIONS -- The entry conditions shall include only those alarms, indications, operating conditions, automatic system actions, or other unique symptoms that the operator is to use in deciding to use the procedure.

OPERATOR ACTIONS -- The operator actions shall be short, concise, identifiable instructions. These instructions will give appropriate directions to the operator in order to mitigate further degradation of plant performance and restore plant operation to the point that normal operating procedures can be used.

3.3 SECTION DESIGNATION

a. Emergency Operating Procedures developed from the Emergency Procedure Guidelines (EPGs) will be identified by a letter prefix included in the Section Heading and step numbers as follows:

1. The first two letters indicate the area of control. The letters used and the area of control shall be:

RC = RPV Control
SP = Suppression Pool
DW = Drywell
PC = Primary Containment
SC = Secondary Containment

2. The third letter indicates the parameter which is controlled in the specified area. A virgule (slant line) should be used between the first two letters and the third letter; examples: SP/L-1, RC/Q-2. The letters used to denote the controlled parameters shall be:

L = Level
P = Pressure
Q = Power
T = Temperature
R = Radiation
H = Hydrogen

3. Attachments to the EOPs shall be designated as A1, A2, etc.

b. Section headings (e.g. RC/L, PC/H) shall be centered and in all capitals. The heading shall be underscored.

Procedures developed to support the EOPs (e.g. Alternate Methods for Injecting Boron into the RPV) shall be written in accordance with reference C.

3.4 INSTRUCTION STEP NUMBERING

Instruction steps in a section or subsection shall be numbered and indented as follows:

- RC/P-1. Confirm...
- a. Check...
- 1) If...

Due to the narrow width of the column for procedure steps in a dual column format, if possible avoid using the 1) level of indenting to eliminate wasted space.

4 PROCEDURE PREPARATION

4.1 INSTRUCTION STEP LENGTH AND CONTENT

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

- a. Instruction steps should deal with only one idea.
- b. Short, simple sentences or phrases should be used in preference to long, compound or complex sentences. As a rule, sentence length should not exceed 15 words.
- c. Complex evolutions should be prescribed in a series of steps, with each step made as simple as practicable.
- d. Objects of operator actions should be specifically stated. This includes identification of exactly what is to be done and to what.
- e. For instructional steps requiring operator actions, space will be provided on the left margin of each column for operator checkoff as an aid in keeping track of his place in the procedure (see Appendix 7 and Subsection 6.3, Item f).
- f. Limits should be expressed quantitatively whenever possible (refer to Subsection 5.5).
- g. Mandatory sequence of steps is assumed unless otherwise stated. Where necessary identify those procedures, or series of steps, which need not be followed in sequence or when concurrent operations are to be performed. When concurrent execution of steps is required it will be

identified using a special operator instruction (see sub-section 4.1.1).

- h. Identification of components and parts should be complete (see Subsection 4.8).
- i. User instructions should be written in the form of a command.
- j. Expected results of routine tasks or evolutions need not be stated.
- k. When actions are required based upon receipt of an annunciated alarm, list the setpoint of the alarm for ease of verification.
- l. When resetting or restoring an alarm or trip, list the expected results immediately following the reset or restoration if it would be beneficial to the operator.
- m. When considered beneficial to the user for proper understanding and performance, describe the system response time associated with performance of the instruction.
- n. When system response dictates a time frame within which the instruction must be accomplished, prescribe such time frame. If possible, however, avoid using time to initiate operator actions. Operator actions should be related to plant parameters.
- o. The basis or reason for an action should not be included in the instruction. If additional information is necessary to clarify an action, it shall be placed in the supplemental information column or on the facing page.
- p. When additional confirmation of system response is considered necessary, prescribe the backup reading to be made.

- q. If an operator will be required to perform actions in specified manner or observe the specific indications, a note should precede the step in order to advise the operator of those actions or observations which he will be required to perform following the initial action.

4.1.1 Special Operator Instructions

Special operator instructions are used to indicate changes in the expected flow of a procedure by indicating:

- a. A requirement for concurrent execution of multiple steps
- b. One or more contingent actions which remain applicable while executing a series of subsequent steps

Special operator instructions will be enclosed in a box formed using asterisks in order to differentiate them from Cautions. See sub-section 6.7 for an example.

4.1.2 Primary Action Column

The left-hand column of the dual column format will contain the operator instructional steps. The following rules are established in addition to the general rules in subsection 4.1.

- a. Expected indications should be presented in this column.
- b. Operator actions in this column should be appropriate for the expected indications.

4.1.3 Contingency Actions

Contingency steps will be placed in the right-hand column (see Appendix 7).

Contingency actions are operator actions that should be taken in the event a stated condition, event or task does not represent or achieve the expected results. The need for contingency action occurs in conjunction with tasks involving verification, observation, confirmation and monitoring.

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

Once an operator is directed to take action in the contingency action column, an instruction will be placed at the end of the contingency action to direct the operator where to proceed to in the EOP.

4.1.4 Supplemental Information

The right-hand column and the facing page shall be used to provide supplemental information such as setpoints, equipment and indicator locations, etc. not necessary to carry out the primary operator actions but may aid the operator. If the information is brief and there is room, the information should be placed in the right hand column.

The facing page shall be used when there is a lot of supplemental information (i.e. a list of items such as values that the operator must "check" or "verify").

The facing page shall also be used to provide a flowchart or logic diagram of operator actions, if needed to clarify operator actions.

4.2 USE OF LOGIC TERMS

The logic terms AND, OR, IF, IF NOT, WHEN, and THEN are often necessary to describe precisely a set of conditions or sequence of actions.

Emphasis shall be achieved by using capitalizations and underlining. All logic terms shall be underlined so that all the conditions are clear to the operator.

When these words are not used as logic terms they will not be capitalized or underlined. For example: (HPCI or RCIC) or two limit values (6 ft. and 10 ft.).

The use of AND and OR within the same action shall be avoided. When AND and OR are used together, the logic can be very ambiguous.

Use other logic terms as follows:

- a. When attention should be called to combinations of conditions, the word AND shall be placed between the description of each condition. The word AND shall not be used to join more than two conditions. If three or more conditions need to be joined, a list format shall be used.
- b. The word OR shall be used when calling attention to alternative combinations of conditions. The use of the word OR shall always be in the inclusive sense. To specify the exclusive "OR," the following shall be used: "either A OR B but not both." If three or more conditions need to be joined, a list format shall be used.
- c. When action steps are contingent upon certain conditions or combinations of conditions, the step shall begin with the word IF or WHEN followed by a description of the condition or conditions (the antecedent), a comma, the word THEN, followed by the action to be taken (the consequent).
- d. WHEN is used for an expected condition. IF implies a "monitoring" or "wait" function.
- e. IF is used for an unexpected but possible condition existing at the present time or at the time this step is reached. IF is not meant to include "at any time in the future."

- f. Use of IF NOT should be limited to those cases in which the operator must respond to the second of two possible conditions. IF should be used to specify the first condition.
- g. THEN shall not be used at the end of action step to instruct the operator to perform the next step because it runs actions together.

4.3 CONDITIONAL STATEMENTS

The following guidelines should be followed:

- a. Write conditional statements so that the description of the condition appears first, followed by the action instruction.
- b. If three or more conditions must be described before an action is directed, list the conditions separately from the action instruction.
- c. Emphasize the logic words by underlining, for example, IF...., THEN....
- d. See Subsection 6.8 for examples.

4.4 USE OF CAUTIONARY INFORMATION AND NOTES

Cautionary information can be considered in two fundamental categories: those that apply to the entire procedure and those that apply to a portion or a specific step of the procedure. Those that apply to the entire procedure are called "PRECAUTIONS" and are covered in operator training or included in a general procedure for ready reference. Those that apply to a portion of a procedure are called "CAUTIONS" and are placed in a box immediately before the procedural steps to which they apply.

In general, a CAUTION shall extend across the entire page and shall be highlighted as shown in the Example CAUTION (see Subsection 6.7). This placement of cautions helps ensure that the procedure user observes the caution before performing the step in either column. A caution shall not be used instead of an instructional step. It should be used to denote a potential hazard to equipment or personnel associated with a particular step. Each caution statement shall be wholly contained on a single page. A caution must appear on the same page as the step to which it applies.

A NOTE is used to present or remind the operator of explanatory or descriptive information that is intended to aid the operator to perform the instructional step. A note should present information only, not instructions, and should be located prior to the applicable action step.

It is permissible to separate the note from the applicable step to begin a new page as long as the note appears in sequence before the step.

In general, a note shall extend across the entire page and will be highlighted by indentation three spaces from the margins shown in the Example NOTE (see Subsection 6.7). Notes shall be further highlighted by centering three asterisks (with one space between asterisks) one-and-a-half line spaces above and below the note.

Caution and note statements should be short and concise. If a caution or note applies only to steps in the Primary Operator Action column or only to steps in the Contingency Action column the caution or note shall be placed in that column.

4.5 CALCULATIONS

Mathematical calculations should be avoided, especially in Emergency Operating Procedures (EOPs). If a value has to be determined in order to perform a procedural step, a chart or graph should be

used whenever possible (e.g. preparation of sodium pentaborate solution). The necessary space should be provided within the instruction or on attachments, along with the conversion factors to obtain the answer in correct units.

4.6 USE OF UNDERLINING

Underlining will be used for emphasis of logic terms, CAUTION and NOTE headings, and first level section headings.

The following examples illustrate what shall be underlined.

- a. Underline logic terms: IF WHEN
 AND OR
 BUT IF NOT

- b. Underline titles of first-level section headings.

RC/L RPV WATER LEVEL CONTROL

- c. Do not underline action which is all capitalized:

EMERGENCY RPV DEPRESSURIZATION IS REQUIRED

4.7 REFERENCING AND BRANCHING TO OTHER PROCEDURES OR STEPS

Referencing implies that an additional procedure or additional steps should be used as a supplement to the procedure presently being used. Referencing other steps within the procedure being used, either future steps or completed steps, should be minimized. When only a few steps are involved in the referencing, the steps should be restated in the procedure wherever they are needed.

To minimize potential operator confusion, branching shall be used when the operator is to leave one procedure or step and use another procedure or step. The words "exit" and "enter" will key the operator to leave the present step and not return until directed.

The words "proceed to" will be used to direct the operator to continue at the specified step within the same procedure. The words "Return to" will be used to direct the operator to return to a previous step in the same procedure.

Following the procedure number, the procedure title shall be enclosed in parentheses to emphasize the title of the referenced or branched procedure; example: Enter EOP-1 (RPV Control) at Step RC-1.

When the actions to be taken are located in a specific section of the branched procedure, the step where the operator should enter shall be stated rather than just the procedure number and title; example: Enter OP-2.2.9 (Core Spray) at Step C.2.

When sections of a procedure are executed concurrently, the referenced sections shall be tabbed to assist the operator in locating the material. Tabbing shall also be used when the operator is instructed to continue on or return to a step in the procedure which is several pages away from the instruction. The words "continue in this procedure at Step ... (TAB 6)" and "return to

Step ...(TAB 2)" shall be used for these instructions. Tabs will be numbered sequentially based on their physical location in the procedure.

4.8 COMPONENT IDENTIFICATION

For identification of components, the following rules apply:

- a. Equipment shall be identified in operator language (common usage) terms. These terms may not always match engraved or placarded names on equipment, but will be complete.
- b. When the engraved names and numbers on panel placards and alarm windows are specifically the item of concern in the procedure, the engraving should be quoted verbatim and emphasized by using all capitals. In addition, the location of the item shall be given by the panel number (and grid coordinates for annunciators) enclosed in parenthesis.
- c. The names of plant system titles are emphasized by capitalizing the first letter of each word in the title. The word "system" should be deleted from the title in the interest of brevity.
- d. If the component is seldom used or it is felt that the component would be difficult to find, location information should be given in parentheses following the identification.

4.9 LEVEL OF DETAIL

Too much detail in operating procedures, especially EOPs, should be avoided in the interest of being able to effectively execute the instructions in a timely manner. The level of detail required is the detail that a newly trained and licensed operator would desire, especially in an EOP, during an emergency condition. Instructions shall consist of a series of steps and, if desired, substeps.

These steps shall be written in the form of a command (i.e. tell the operator to do something). The substeps should consist of a more detailed procedure for accomplishing a major step.

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

- a. Action verbs are placed in instructional steps to denote a particular action that the operator must perform. Common action verbs and their application are provided in the Glossary (Appendix 1). Action verbs such as "Energize" or "Increase" will not be used in writing EOPs because they can cause oral communications problems.
- b. To standardize those applications for which specific terminology should be used, the following guidelines apply:
 1. For power-driven equipment use Start, Stop.
 2. For valves use Open, Close, Throttle Open, Throttle Close, Throttle Locked Open, Locked Closed and Locked Throttle.
 3. For power distribution breakers and electrical supply switches use Close and Open or On and Off, being consistent with the labeling used on the subject circuit breaker/switch.
 4. For indicating lights use On and Off.
 5. For annunciators use Alarm and Reset.
 6. For control circuitry that executes an entire function upon actuation of the control switch, the action verb appropriate to the component suffices without further amplification of how to manipulate the control device e.g. Close MO-4601 SUCTION VALVE (on Panel 1C04).

- c. For control switches with a positional placement that establishes a standby readiness condition, the verb "Place" should be used along with the engraved name of the desired position. Positional placements are typically associated with establishing readiness of automatic functions and are typically named AUTO or NORMAL: for example, "Place the core spray pump control switch in AUTO."
- d. For multiposition control switches that have more than one position for a similar function, placement to the desired position should be specified; for example, "Place DIESEL FIRE PUMP selector switch to TEST NO. 2."
- e. Standard practices for observing abnormal results need not be prescribed within procedural steps. For example, observation of noise, vibration, erratic flow or discharge pressure need not be specified by steps that start pumps.

4.10 PRINTED OPERATOR AIDS

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

Printed operator aids (graphs, etc.) applicable to a page of text should be presented on the backside of the preceding page (facing page) where it is available while reading the text. When this is not practical, printed operator aids should be presented as attachments; for example, when several graphs are applicable to a page and cannot be placed on the facing page. Reference to tables and figures should be by the figure or table number. For example: Maintain pump discharge flow in accordance with Figure 5.

4.10.1 Units of Measure

Units of measure on figures, tables and attachments should be given for numerical values that represent observed, measurement data or calculated results. A virgule (slant line) should be used instead of "per"; examples: ft/sec, lbs/hr.

4.10.2 Titles and Headings

Capitalization should be used for titles of tables and figures, titles of tables and figures within text material, and column headings within a table.

4.10.3 Figure, Table and Attachment Numbering

Sequential arabic numbers should be assigned to figures and tables in a separate series for each EOP. The sequence should correspond with the order in which they are first referenced in the text. If the same figure is used again later in the same EOP, it will retain the original figure number. The symbol "#" and abbreviation "No." are unnecessary and should not be used. The number alone suffices. Attachments will be numbered sequentially as A1, A2, etc.

Examples: Figure 1-1, Table 1-2, etc. (for EOP-1)
 Figure 2-1, Table 2-2, etc. (for EOP-2)
 Attachment A1, Attachment A2, etc.

Page identification for attachments should consist of information that identifies (1) procedure number, (2) attachment number, (3) page number and (4) revision number. Page numbering of attachments should meet the requirements of Subsection 2.5.

Section numbering for attachments should be in accordance with Subsection 3.3.

5 MECHANICS OF STYLE

5.1 SPELLING

Spelling should be consistent with modern usage. When a choice of spelling is offered by a dictionary, the first spelling should be used.

5.2 HYPHENATION

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

- a. When doubt exists, the compound word should be restructured to avoid hyphenation.
- b. Hyphens should be used in the following circumstances:
 1. in compound numerals from twenty-one to ninety-nine; example: one hundred thirty-four.
 2. in fractions; examples: one-half, two-thirds.
 3. in compounds with "self"; examples: self-contained, self-lubricated.
 4. when the last letter of the first word is the same vowel as the first letter of the second word -- as an alternative, two words can be used; example: fire-escape or fire escape.
 5. when misleading or awkward consonants would result by joining the words; example: bell-like.
 6. to avoid confusion with another word; examples: re-cover to prevent confusion with recover, pre-position to avoid confusion with preposition.

7. when a letter is linked with a noun; examples: X-ray, O-ring, U-bolt, I-beam.
8. to separate chemical elements and their atomic weight; examples: Uranium-235, U-235.

5.3 PUNCTUATION

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

- a. Do not use brackets.
- b. Use a colon to indicate that a list of items is to follow, for example: Restore cooling flow as follows:
- c. Use of many commas is a sign the instruction is too complex and needs to be rewritten. Therefore, evaluate the number of commas to ensure the instruction is not too complex.

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

- d. Parentheses shall be used to indicate alternative items in a procedure, equipment numbers, procedure titles and to set off referenced figures, tables, appendices, attachments, etc.
- e. Use a period at the end of complete sentences and for indicating the decimal place in numbers.

5.4 VOCABULARY

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

- a. Use simple words. Simple words are usually short words of few syllables. Simple words are generally common words.
- b. Use common usage if it makes the procedure easier to understand.
- c. Use words that are concrete rather than vague, specific rather than general, familiar rather than formal, precise rather than blanket. Avoid specialized or abstract words for which substitute words may be used.
- d. Define key words that may be understood in more than one sense.
- e. Minimize the use of articles (the, a, an) unless they are needed for clarity.
- f. Verbs with specific meaning should be used. Examples are listed in Appendix 1 (Glossary).
- g. Equipment status should be denoted as follows:
 1. Operable/Operability -- These words mean that a system, subsystem, train, component or device is capable of performing its intended function(s) in its required manner. Implicit in this definition is the assumption that all necessary attendant instrumentation, controls, normal and emergency electrical power sources, cooling or seal water, lubrication or other auxiliary equipment required for the system, subsystem, train, component or device to perform its function(s) are also capable of performing related support function(s).
 2. Operating -- This word means that a system, subsystem, train, component or device is in operation and is performing its intended function(s) in its required manner and that "Out of Service Cards" or other conditions do not prevent it from maintaining that service.

3. Available/Available for injection -- These words mean that a system, subsystem, train, component or device is operable and can be used on demand as desired; however, it need not be operating.
4. Line up for injection/Lined up for injection -- These words mean that a system or subsystem is operable with all valves (except possibly one injection valve) in position for introducing its process fluid in its intended flow path; however, it shall not be operating unless so stated.

5.5 NUMERICAL VALUES

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

- a. Arabic numerals should be used.
- b. For numbers less than unity, the decimal point should be preceded by a zero; for example: 0.1.
- c. The number of significant digits should be equal to the number of significant digits available from the display. The operator should not be required to read an indicator to an accuracy greater than one-half of the smallest graduation on the indicator.
- d. Acceptance values should be specified in such a way that addition and subtraction by the user is avoided if possible. This can generally be done by stating acceptance values as limits. Examples: above 95°F, below 150 psig; 580° to 600°F. For calibration points, statement of the midpoint and its lower and upper limits for each data cell would accomplish the same purpose; for example: 10 milliamperes (9.5 to 10.5). Avoid using \pm .

- e. Engineering units should always be specified for numerical values of process variables. They should be the same as those used on the control room displays; for example: psig instead of psi.
- f. For numbers less than zero, a minus sign should precede the number (e.g. -1.2).

5.6 ABBREVIATIONS, LETTER SYMBOLS AND ACRONYMS

The use of abbreviations should be minimized because they may be confusing to those who are not thoroughly familiar with them. Abbreviations may be used where necessary to save time and space and when their meaning is unquestionably clear to the intended reader. The full meaning of the abbreviation, other than the abbreviations listed in Appendix 2, should be written in before the first use of the abbreviation and whenever in doubt. Consistency should be maintained throughout the procedure.

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

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

An acronym is a type of symbol formed by the initial letter or letters of each of the successive parts or major parts of compound term. Acronyms may be used if they are defined or approved for use. Appendix 3 lists those acronyms approved for use at CNS.

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

5.7 CAPITALIZATION

Capitalize the first letter of each word of specific systems or system components, logic terms (see section 4.2), section headings (see section 3.3), titles of figures and tables (see subsection 4.10.2). Capitalization may also be used when special emphasis is required.

b. TYPING FORMAT

6.1 GENERAL TYPING INSTRUCTIONS

The following general requirements are to be followed:

- a. Paper size should be 8½ x 11 inches.
- b. White, bond paper.
- c. A Prestige Elite, 12 pitch, typewriter element is to be used.

6.2 PAGE ARRANGEMENT

- a. Page margins are specified in Appendix 7 (refer to Subsection 2.5).
- b. Page identification information is described in Subsection 2.5 and centered as shown in Appendix 7.
- c. The 8½ inch edges shall constitute top and bottom of pages and text. Tables and figures shall be readable with the page so arranged. Rotation of printed matter should be avoided. Refer to Subsection 6.5 if rotation is absolutely necessary.

6.3 HEADING AND TEXT ARRANGEMENT

Block style, as illustrated in Appendix 7, is to be used. First-level section headings shall be in full capitals with a full underscore, second-level section headings shall be in full capitals and third-level headings shall have the first letter of each word capitalized and the heading shall be underscored (refer to Subsection 3.3 for numbering).

- a. The title shall appear at the top margin, centered on the page, shall be in full capitals with an underscore. Three line spaces shall be allowed between the title and the first-level section heading.
- b. Three line spaces shall be allowed between headings and the respective text.
- c. Three line spaces shall be allowed between paragraphs and steps.
- d. Text will be typed using one-and-a-half line spacing.
- e. Start a page for the following conditions:
 1. At the start of a new section of the procedure; for example, DW/T MONITOR AND CONTROL DRYWELL TEMPERATURE.
 2. So that a CAUTION appears on the same page as the step to which it applies.
 3. So that an action step or substep is wholly contained on a single page.
- f. A line three spaces long shall be placed in the left margin adjacent to the step or substep number in each column to allow the operator to checkoff completed steps. Two line spaces shall be allowed between the checkoff line and the step number; for example, ___ PC/P-1.

6.4 BREAKING OF WORDS

Breaking of words shall be avoided to facilitate operator reading.

6.5 ROTATION OF PAGES

If pages need to be rotated, these rules shall be followed.

- a. The top of the page with rotated print is the normal left-hand edge.
- b. The page margins do not rotate.
- c. Page identification and numbering will not be rotated.

6.6 PRINTED OPERATOR AIDS

Operator Aid include graphs, drawings, diagrams, and illustrations. The following guidelines are established for typing figures which consist of graphs, drawings, diagrams and illustrations:

- a. The figure number and its title are placed three line spaces above the figure field (refer to Subsection 4.10).
- b. The figure number, title, and typed labels should be typed using the same typewriter element as is used for the text of the procedure (see 6.1.c).
- c. The figure field should be of sufficient size to offer good readability but should not violate specified page margins ($6\frac{1}{2}$ " x 9").
- d. The essential message should be clear; simple presentations are preferred.
- e. Grid lines of graphs should be no more than 10 lines per inch; numbered grid lines should be bolder than unnumbered grid lines.
- f. Labeling of items within the figure should be accomplished by arrows pointing to the item.
- g. The items within the figure should be oriented naturally insofar as possible. For example, height on a graph should be along the vertical axis.

- h. In general, items within the figure should be labeled. If handwritten labels are used, they should be printed using all capitals, with letters and numbers at least 1/8-inch high.
- i. All lines in figures should be reproducible.

Tables should be typed using the following rules:

- a. Type style and size should be the same as that for the rest of the procedure (see 6.1.c).
- b. The table number and title should be located above the table field and three line spaces below preceding text.
- c. A heading should be entered for each column and centered within the column; the first letter of words in the column headings should be capitalized.
- d. Horizontal lines should be placed above and below the column headings; vertical lines, while desirable, are not necessary or required.
- e. Tabular headings should be aligned as follows:
 - 1. horizontally by related entries
 - 2. vertically by decimal point for numerical entries
 - 3. vertically by first letter for word entries; however, run-over lines should be indented three spaces
- f. One and a half spaces between horizontal entries suffices to segregate such entries, although horizontal lines may also be used if desired. If used, double horizontal lines should be used above and below the column headings.

- g. There should not be a vacant cell in the table. If no entry is necessary, "N.A." should be entered to indicate not applicable.

6.7 SPECIAL OPERATOR INSTRUCTIONS, CAUTIONS AND NOTES

All special operator instructions, cautions, and notes should be distinguishable from the rest of the text by using the following format.

- a. If applicable, the heading ("NOTE" or "CAUTION") should be capitalized, centered and placed three line spaces below the preceding text.
- b. The text of the special operator instruction, caution, or note should be block format, line-and-a-half spaced. The Caution text shall begin three spaces from the left-hand margin of the step it applies so the vertical line of the box lines up with the step number and shall begin one-and-a-half line spaces below the heading. The text for Special Operator Instructions and Notes will begin five spaces from the left-hand printed margin.
- c. The right-hand margin of the text for a special operator instructions and a note should be five spaces to the left of the right-hand printed margin. The right-hand margin of the text of the caution should be three spaces to the left of the right-hand printed margin so the vertical line of the box appears at the right-hand printed margin.
- d. A special operator instruction and a caution shall be further highlighted by enclosing them in a box three spaces above the heading or text and one-and-a-half spaces below the last line of the text. Asterisks will be used to form the box by special operator instructions. Straight lines will be used to form the box for a caution.

6.8 USE OF FOLDOUT PAGES

When used, a foldout page is treated as a single page. It should follow the same format as a standard page except the width is different. The page should be folded so that a small margin exists between the fold and the right-hand edge of standard pages. This will reduce wear of the fold.

6.9 USE OF OVERSIZED PAGES

Oversize pages should not be used. They should be reorganized or reduced to a standard page. If this cannot be done, a foldout page should be used.

6.10 USE OF REDUCED PAGES

Reduced pages should be avoided whenever possible. Final size of reduced pages should be standard page size. Reduced pages should be readable.

7 REPRODUCTION

Reproduction will be done on a standard copier, single-sided copy only except when printed operator aids are presented on the back-side of the preceding page (facing page).

8 BINDING

For control room use each EOP, and the level, pressure, and power sections of EOP-1 (RPV Control) will be placed in separate binders and conspicuously marked so that they are readily identifiable as emergency procedures (e.g. placing them in red binders). Separate binders are necessary since these procedures will be used concurrently. Each binder will have a ribbon book marker attached for use as an aid in marking the operator's place in the procedure.

9 REFERENCES

- a. Updated Safety Analysis Report, Cooper Nuclear Station, Chapter 1.
- b. ANSI/ANS-32, American National Standard Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants, 1981.
- c. Administrative Procedures, Cooper Nuclear Station, No. 1.3.
- d. Emergency Operating Procedures Writing Guidelines, INPO, July 1982 (INPO 82-017).
- e. NUREG-0899, Guidelines for the Preparation of Emergency Operating Procedures, Rev. 5, June 4, 1982.

APPENDIX 1

GLOSSARY

Word	Application
Activate	Formally institute special activity/function. To place into operation.
Align	Place systems or components (e.g. valves and breakers) in proper positions for accomplishing specified function.
Allow	To permit a stated condition to be achieved prior to proceeding (e.g. "allow discharge pressure to stabilize").
Check	To determine the present status of a plant parameter or component and compare with a procedural requirement.
Close	<p>Mechanically: To change the physical position of a mechanical device so that it prevents physical access or fluid flow (e.g. "close HPCI-97").</p> <p>Electrically: To change the physical position of an electrical circuit breaker to permit passage of electrical current (e.g. "close circuit breaker SS1F").</p>
Complete	To accomplish specified procedural requirements (e.g. "complete valve checklist A", "complete data report QA-", "complete Steps 7 through 9 of OP 2.2.33").
Comparison	A comparing or being compared.

APPENDIX 1

GLOSSARY

(Continued)

Word	Application
Confirm	To observe an expected condition or characteristic without being specific as to the method (e.g. "confirm . . . pump operation").
Decrease	<u>Do not</u> use because of oral communication problems. Use "lower" in lieu of "decrease."
Deenergize	Remove power supply. Should <u>not</u> be used; use Open.
Depress	Refers to pushbutton operation.
Discrepancy	Disagreement or inconsistency.
Energize	Supply power. Should <u>not</u> be used; use Close.
Ensure	Take necessary/appropriate actions to guarantee proper component operation, instrument reading, etc., as specified.
Establish	To make arrangements for a stated condition (e.g. "established communication with control room").
Execute	To do or perform the instructed action or steps.
Implement	Commence a required program or series of procedures.
Increase	<u>Do not</u> use because of oral communication problems. Use "raise" in lieu of "increase."
Initiate	Take actions to begin a process.

APPENDIX 1

GLOSSARY

(Continued)

Word	Application
Inspect	To measure, observe or evaluate a feature or characteristic for comparison with specified limits; method of inspection should be included (e.g. "visually inspect for leaks").
Isolate	Remove from service by closing off the flow path.
Local	Take action outside the control room at equipment or local operating station.
Limitation	Specific parameter <u>not</u> to be exceeded (violated).
Maintain	Take appropriate actions to prevent fluctuation/changing.
Manual Initiation	Operator action which activates a function which is normally initiated automatically due to plant conditions.
Manual Trip	Operator action to activate a Reactor Trip or stop an operating piece of equipment such as a pump.
May	Possibility, permission or contingency.
Monitor	To observe a stated parameter or function for significant changes. This does not mean an operator continuously watches the parameter, but be aware of changes to keep the operation under control.
Notify	Inform specified personnel.

APPENDIX 1

GLOSSARY

(Continued)

Word	Application
Open	<p>Mechanically: To change the physical position of a mechanical device, such as a valve or door, to unobstructed position that permits a fluid flow or access.</p> <p>Electrically: To change the physical position of an electrical circuit breaker to prevent the passage of electrical current.</p>
Per	As specified in or by named procedure. Infers referencing the document is optional.
Place	Physically position a switch to the specified location.
Proceed	Go to specified area. In case of procedures, discontinue use of present procedure.
Qualified	Competent or fit. An operator is qualified when his qualification card is complete.
Rack In	Put an electrical circuit breaker in place by physically connecting it to its associated power source.
Rack Out	Remove an electrical breaker from its associated power source by physically disconnecting it.
Rack to Test	Position an electrical circuit breaker to the "TEST" position.
Record	To document specified condition or characteristic (e.g. "record discharge pressure").

APPENDIX 1

GLOSSARY

(Continued)

Word	Application
Refer	Use as a supplement. Perform applicable actions of cited procedure and return to the controlling procedure.
Regulate	Control or restrict.
Restore and Maintain	To bring a specified parameter back under control or within specified limits and keep it within those limits.
Rotate	Turn a rotary multi-position switch to the required position. In reference to pumps, hand rotate before energizing.
Secure	Remove from service. Take appropriate action to prevent return to service.
Set	To physically adjust to a specified value an adjustable feature (e.g. "set diesel speed to . . . rpm").
Shall	Infers mandatory requirement.
Shift	Specifies changing mode of operation.
Should	Denotes a recommendation (preferred or desired method).
Shut	To move so as to close, <u>Do not</u> use.
Stabilize	To bring a specified parameter under control with any fluctuations controlled.

APPENDIX 1

GLOSSARY

(Continued)

Word	Application
Start	To originate motion of an electric or mechanical device directly or by remote control (e.g. "start . . . pump").
Stop	To terminate operation (e.g. "stop . . . pump").
Terminate Injection	To stop flow to a specified location. This allows re-directing flow to another location without tripping the pump.
Throttle	To operate a valve in an intermediate position to obtain a certain flow rate (e.g. "throttle valve RHR-MO-38A to . . .").
Trip	Do not use except when the circuit breaker opens automatically. Use "open" in lieu of "trip" when possible.
Vent	To permit a gas or liquid confined under pressure to escape at a vent (e.g. "vent . . . pump").
Verify	To determine if in proper condition/status in a specified manner and place in proper condition/status if not found in proper condition/status.

APPENDIX 2
APPROVED ABBREVIATIONS

Abbreviation	Abbreviated Word or Phrase
AC	Alternating Current
Btu	British Thermal Unit
C	centigrade
cc	cubic centimeter
Ci	Curie
DC	Direct Current
dp	differential pressure
F	fahrenheit
ft	foot
gal	gallon
gpm	gallons per minute
Hg	mercury
hp	horse power
hr	hour
in.	inch
kW	kilowatt
lb	pound
min	minute
mrem	millirem
mr	milliroentgen
MW	megawatt
N ₂	nitrogen
psia	pounds per square inch (absolute)
psig	pounds per square inch (gauge)
R	roentgen
rem	roentgen equivalent man
rpm	revolutions per minute
sec	second
V	volt
W	watt

APPENDIX 3
APPROVED ACRONYMS

Acronym	Definition
ADS	Automatic Depressurization System
AOG	Augmented Off Gas
APRM	Average Power Range Monitor
ARM	Area Radiation Monitor
ATWS	Anticipated Transient Without Scram
BPV	Bypass Valve
CRD	Control Rod Drive
CS	Core Spray
CSCS	Core Standby Cooling System
DEH	Digital Electro-Hydraulic System
DG	Diesel Generator
EOP	Emergency Operating Procedure
EPG	Emergency Procedure Guidelines
FPC	Fuel Pool Cooling.
HCU	Hydraulic Control Unit
HPCI	High Pressure Coolant Injection
HVAC	Heating, Ventilating and Air Conditioning
HX	Heat Exchanger
IA	Instrument Air
IRM	Intermediate Range Monitor
LCO	Limiting Condition for Operation
LOCA	Loss-of-Coolant Accident
LPCI	Low Pressure Coolant Injection
LPRM	Local Power Range Monitor
MC	Main Condensate System
MCC	Motor Control Center
MSIV	Main Steamline Isolation Valve
NDTT	Nil-Ductility Transition Temperature

APPENDIX 3
APPROVED ACRONYMS

(Continued)

Acronym	Definition
NPSH	Net Positive Suction Head
OG	Off Gas
PCIS	Primary Containment Isolation System
RBM	Rod Block Monitor
RCIC	Reactor Core Isolation Cooling
REC	Reactor Building Equipment Cooling
RF	Reactor Feed
RFPT	Reactor Feed Pump Turbine
RHR	Residual Heat Removal
RMCS	Reactor Manual Control System
RPV	Reactor Pressure Vessel
RPIS	Rod Position Information System
RSCS	Rod Sequence Control System
RW	Radwaste
RWCU	Reactor Water Cleanup
RWM	Rod Worth Minimizer
SBDG	Standby Diesel Generator
SBFU	Standby Filter Unit
SBGT	Standby Gas Treatment
SDV	Scram Discharge Volume
SJAE	Steam Jet Air Ejectors
SLC	Standby Liquid Control
SORV	Stuck-Open Relief Valve
SRM	Source Range Monitor
SRV	Safety/Relief Valve
TAF	Top Active Fuel (352.56" above vessel bottom)
TB	Turbine Building
TEC	Turbine Building Equipment Cooling
TG	Turbine Generator
TIP	Traversing In-Core Probe

(See Burns and Roe Drawing No. 2001 for instrument identification acronyms.)

APPENDIX 4

NUMERICAL LISTING OF CNS EMERGENCY PROCEDURES

- EOP/C - Emergency Operating Procedures -- General Operator Precautions
- EOP-1 - Reactor Pressure Vessel (RPV) Control
- EOP-2 - Primary Containment Control
- EOP-3 - Secondary Containment Control
- EOP-4 - Radioactive Release Control

APPENDIX 5
APPROVAL SHEET

EMERGENCY OPERATING PROCEDURE NO. 1

REACTOR PRESSURE VESSEL (RPV) CONTROL

JULY 13, 1984

COOPER NUCLEAR STATION
NEBRASKA PUBLIC POWER DISTRICT

Reviewed by: _____ Date _____
Operations Manager

Approved by: _____ Date _____
Division Manager of Nuclear Operations

EOP-1
Page ___ of 20

Rev 0
Date

APPENDIX 6
REVISION SHEET

LIST OF EFFECTIVE PAGE REVISIONS

<u>Page</u>	<u>Rev. No.</u>	<u>Page</u>	<u>Rev. No.</u>	<u>Page</u>	<u>Rev. No.</u>	<u>Page</u>	<u>Rev. No.</u>
1	0						
2	0						
3	0						
4	0						
5	0						
6	0						
7	0						
8	0						
9	0						
10	0						
11	0						
12	0						
13	0						
14	0						
15	0						
16	0						
17	0						
18	0						
19	0						
20	0						

EOP-1
Page ___ of ___

Rev 0
Date

APPENDIX 7
PAGE FORMAT

SP/T SUPPRESSION POOL TEMPERATURE CONTROL

PURPOSE

This emergency instruction provides the direction necessary to restore and maintain suppression pool temperature below 95°F in order to maintain primary containment integrity and protect equipment in the primary containment.

Triple spaced (typical)

ENTRY CONDITIONS

Suppression pool temperature is greater than 95°F.

1 1/2 line
spacing
(typical)

OPERATOR ACTIONS

<u>Primary Operator Action</u>	<u>Contingency Action & Supplemental Information</u>
SP/T-1. Monitor and control suppression pool temperature. SP/T-2. Close any stuck open SRV. 2 spaces 3 spaces 8 sp. (minimum)	SP/T-1. None SP/T-2. <u>IF</u> any stuck open SRV cannot be closed within two minutes, <u>THEN</u> perform the following actions: a. Close both recirculation flow control valves until either an APRM UPSC ALARM is received <u>OR</u> the minimum valve position, OI, is attained.
1 space	

EOP-2

Rev 0

Page 1 of ___

Date