USE OF PROCEDURES FOR OPERATING DEPARTMENT..

A. STATEMENT OF APPLICABILITY

The purpose of this procedure is to provide operators with general information on how to use procedures and detailed information on how to use the Emergency/Abnormal procedures.

B. REFERENCE

1. ANSI 18.7 (1976), pp. 5.2.2.
2. NUREG 0899, 8/82.
3. Westinghouse Owner's Group Emergency Response Guidelines

C. MAIN BODY

1. General Information

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* NOTE *
* It is recognized that procedures *
* cannot (and should not) be specif- *
* ically written for every contingen- *
* cy. If an approved plant procedure *
* does not exist which applies to the *
* current situation, personnel are *
* instructed to take action so as to *
* minimize personnel injury, damage *
* to the facility, and to protect *
* health and safety. *
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a. Procedures shall be followed as written; however, they will be stopped if it is recognized that further action will jeopardize personnel and/or plant equipment. (Mechanisms to write and/or change procedures are covered by BAP 1310.)

b. Adequate distribution and availability of procedures is assured by BAP 1310.

c. Due to the large number of procedures, which vary widely in complexity and impact, it is recognized that their content must be retrieved on differing basis:

1) BEP, Immediate Operator Actions, must be committed to memory by all licensed operators.

2) BGP's must be immediately present as they are used, and the steps signed-off on the flow chart as the steps are performed.

3) Other procedures will be in-hand as the shift supervisor deems appropriate for the particular situation.

d. In the event that approved procedures conflict, further action will be taken at the discretion of the shift supervisor; however, the following actions shall subsequently occur:

1) Plant operation will remain inside the FSAR described design envelope.

2) Appropriate log entries describing the situation and resolution made.

3) Procedure changes will be made according to BAP 1310 (both long and short term, as appropriate).

2. Detailed Information (Emergency/Abnormal Procedures)

a. Definitions:

1) Emergency Operating Procedures (BEP)

BEP's are a four procedure set that initiate operator action based upon either a reactor trip or safety injection. They diagnose and mitigate the immediate consequences of a LOCA, SGTR, (Steam Generator Tube Rupture), LOSC (Loss of Secondary Coolant), and Reactor Trip.

2) Event Specific Subprocedures (BEP ES)

If certain conditions are met or exceeded in the BEP's, the BEP ES will direct actions to accomplish the given objective or supply new actions based on observed conditions.

3) Emergency Contingency Actions (BCA)

BCA's are procedures provided due to a direct NRC requirement without regard to their combined failure probability. These include, ATWS, Loss of All AC Power, SGTR contingencies, and others.

4) Abnormal Operating Procedures (BOA)

BOA's provide guidance to the operator when important parameters or systems are in jeopardy, but a reactor trip or SI have not actuated.

5) Status Trees (BST)

The BST's are a set of six decision trees that evaluate the six critical safety functions to determine if the function is intact or being challenged. If challenged it will reference the restoration procedure for restoring the function.

6) Functional Restoration Procedures (BFR)

The BFR's direct operators action to recover/restore the degraded safety function dependent on which CSF is challenged and the extent of degradation.

7) Critical Safety Function (CSF)

One of six functions necessary to ensure the integrity of the three "barriers" preventing the release of radiation. The six critical safety functions are monitored by the status trees and include subcriticality, core cooling, integrity, heat sink, containment, and inventory.

b. Two Column Format Use:

1) General

The left hand column contains the "action" the operator is to perform, or the "expected response" the operator should expect to see. This "action/expected response" column, contains both high level and low level actions. The high level step describes "what to do", whereas the low level substep presents the "how to do" information. When the action or expected response is satisfactorily obtained the user should continue down the left column completing all steps in order. If an action cannot be performed or an expected response is not obtained, the user should go to the "response not obtained" column (right side) to get the contingency response or action. After this contingency action is performed, the user should return to the next step in the left column, and continue with the steps in order, unless otherwise directed.

The low-level steps shall be indented and designated by letters (a, b, c, etc.) when their sequence of performance is important. When the sequence is not important, the low-level step shall be preceded by a bullet. "A closed bullet" requires all steps to be completed in any order (•). An "open bullet" preceeding multiple steps requires only the steps that apply to be completed in any order (•).

Most procedures may have a "kick-out", which direct the operator to go to another procedure as conditions require, or as a rediagnosis directs. The words "GO TO" will be used to direct the operator to leave one procedure and go to another. This same mechanism will be used to direct movement to different steps in the same procedure.

2) Word Usage

a) Key Words

The following words will be used in accordance with their definition below.

- Verify - confirm that an expected condition exists.
- Check - note the condition of
- Manually - operator action required at the main control board.
- Locally - operator action required in the plant, usually at the specific equipment location.
- Maintain - sustain or continue with at a relatively constant value, parameters or conditions as specified in the step.
- Monitor - Watch or observe a parameter at certain intervals, that are either designated or determined by the operator.

b) Logic Terms

The logic terms AND, OR, NOT, IF and THEN are used to precisely describe a set of conditions or sequence of actions. When logic terms are used they will be underlined and capitalized for emphasis.

When action steps are contingent upon certain conditions or combination of conditions, the step shall begin with the words IF or WHEN followed by a description of the condition, a comma, the word THEN, followed by the action to be taken. WHEN is used for an expected condition. IF is used for an unexpected but possible condition.

EXAMPLE: WHEN RCS pressure is below 1000 psi, THEN isolate all accumulators.

IF pressurizer level is still decreasing, THEN manually initiate SI and go to BEP-0 REACTOR TRIP OR SI.

3) Foldouts

Foldout pages contain information that must be monitored throughout the procedure. For example, RCP trip criteria, or inadequate core cooling criteria. The foldout is contained in the back of the procedure, and will be folded out upon entry into the procedure. Foldouts have tabs for each reference.

4) Convenience (Control Room, TSC, Remote Shutdown Panel)

Each procedure will have a tab on the outside edge identifying it for easy reference. Procedure pages will be laminated to facilitate place keeping, by marking steps with a grease pencil as they are completed. BEP's, BEP-ES and BCA's will be in red binders. BFR's and BST's will be in orange binders, while BOA's will be in yellow binders.

c. Critical Safety Functions:

1) Barrier Concept

In order to have procedures that address symptoms, instead of events, the critical safety functions were developed. The critical safety functions protect the integrity of the fuel, RCS, and containment (three barriers) to prevent the release of radiation. The six critical safety functions each have a status tree (BST), which determines if the function is satisfied, and restoration procedures (BFR's) which restore the function if it is challenged. The severity of the challenge will be indicated by color end points in the status tree.

2) Status Tree Priority

The prioritization of Critical Safety Functions is consistent with the defense-in-depth concept of multiple barriers to radiation release. It stresses the importance of maintaining as many barriers as possible at all times in order to insure the "health and safety" of the general public. Monitoring of Critical Safety Function status trees is always done in order of priority:

a) Subcriticality (S)

b) Core Cooling (C)

c) RCS Integrity (P)

d) Heat Sink (H)

e) Containment (Z)

f) Inventory (I)

The Status Trees will always be arranged and numbered in this order.

3) Color Definition and Priority

GREEN - The Critical Safety Function is satisfied - no operator action is called for

YELLOW - The Critical Safety Function is not fully satisfied - operator action may eventually be needed

ORANGE - The Critical Safety Function is under severe challenge - prompt operator action is necessary

RED - The Critical Safety Function is in jeopardy - immediate operator action is required

The six critical safety function status trees are arranged in order of priority. The importance of any non-green end point relative to any other end point of the same color is indicated by the order of the trees.

If a Red is encountered in working through the trees, immediately initiate the indicated BFR to defend or recover the jeopardized critical safety function. Continue or resume working through the trees when released from the BFR.

If an Orange is encountered, note the associated function restoration procedure to maintain the critical safety function and continue to work through the trees. As soon as the current pass through the trees is completed, initiate the indicated procedures, in the order of importance.

If a Yellow is encountered, note the nature of the deficiency in the critical safety function and continue to work through the trees. When practical, initiate the actions needed to fully restore the indicated critical safety function.

4) Usage Rules

The initial scan of the Status Trees is to be performed after departing the BEP-0 procedure unless specifically directed to do so within BEP-0.

The Status Trees are entered in succession in the sequence:

a) Subcriticality (S)

b) Core Cooling (C)

c) Primary Integrity (P)

d) Heat Sink (H)

e) Containment (Z)

f) Reactor Coolant Inventory (I)

- Entry into a tree is always at the point indicated by the arrow at the left side of the tree. The user then works through the tree, choosing at each branch point that branch which represents the actual condition existing in the plant and defining, by the path taken through the tree, the status of the plant in terms of the Critical Safety Function in question.

- Exit from the tree is always by way of a branch end point which shows either satisfaction of the Critical Safety Function or the failure that it currently exists. If a failure is indicated, the end point shows the color-coded priority of response to the failure to maintain the Critical Safety Function, and the Function Restoration procedure which should be activated to reestablish the faulted Critical Safety Function.

- The status of each Critical Safety Function should be logged during each scan of the trees using BAP 300-T23.

- Both Red and Orange conditions require departure from any other (non BFR) procedure. A Red condition requires implementation of the designated BFR immediately upon detection. Any other procedure remains in suspension until the BFR is complete. Generally the BFR requires actions which will clear a Red or Orange condition before returning the operator to whichever procedure was in effect.

- An Orange condition does not require immediate action. The current pass through the status trees is to be completed, with the status of each Critical Safety Function noted. If no Red condition is encountered during the scan, then the highest priority Orange is addressed first, requiring departure from the procedure in effect. Once the actions of the BFR are completed assuming no Red condition has appeared, the next highest priority Orange can be addressed.

- If, during the execution of any Red condition BFR, a Red-condition of higher priority arises, then the higher priority condition should be addressed first, and the lower-priority Red-BFR suspended.

- If, during the execution of any Orange BFR, any Red condition arises, the Red condition is to be addressed first, and the Orange BFR suspended.

- After completion of any Red-condition BFR, the status trees should be scanned again, if scanning was suspended by required operator actions.

- Tree scanning should be continuous if any condition coded higher than Yellow is found to exist. Operators should be familiar with those conditions associated with Red paths. If no condition coded higher than Yellow is encountered, the tree scanning frequency may be reduced to 10-20 minutes, unless some significant change in plant status occurs. Tree scanning <u>may</u> be terminated when deemed appropriate by the Station Director.

- A YELLOW end point does not require immediate operator action. Frequently, it is indicative of an off-normal or temporary condition which will be restored to normal status by actions already in progress. In these instances, the operator may choose to delay entry into the referenced BFR, and allow the function status to return to GREEN by itself. For example, following reactor trip, nuclear flux remains in the intermediate range with a negative startup rate for more than 15 minutes - a YELLOW condition. However, the flux normally continues to decay into the source range - a GREEN condition. Similarly following reactor trip, steam generator water levels typically shrink out of the narrow range of indication - a YELLOW condition. Normal AF flow will recover level to the no-load value over a period of time, thereby restoring a GREEN condition.

- Operator discretion is required in use of the status trees. It is possible that certain accidents might produce non-green status conditions which are not expected to be corrected. For example, the proper operator action for a ruptured steam line is to allow the ruptured generator to dry out, resulting in an unsatisfied heat sink condition. A loss-of-coolant accident will produce an unsatisfied RCS inventory condition, which may never be satisfied. The operator should realize, and the trees should reflect, that these concerns are of low priority as long as other safety functions are satisfied. In these instances, repeated attempts to restore the affected safety function are not necessary. It is sufficient to note the status condition on each pass through the trees.

- Actions which are required by a red-path BFR take precedence over possibly contradictory actions in any subsequent BEP, BEP ES, BCA procedure.

5) Summary of BFR's, BST Rules

In summary, the priority of operator action is fixed by the physical arrangement of the trees. Both the ordering of the trees and color coding of the end points serve to define priorities. For the entire set of trees, priority of operator action is given to:

RED paths, in tree order
ORANGE paths, in tree order
YELLOW paths, in tree order

As a example, a RED in Core Cooling is more important than a RED in Heat Sink (order of the trees). However, the RED in Heat Sink is more important than any ORANGE (order of the colors).

d. Procedure Interface:

BEP-0 must be entered on either a reactor trip or SI. There are no provisions for entering BEP-0 unless there is a reactor trip or SI. The LOCA, LOSC, and SGTR procedures (BEP-1, BEP-2, BEP-3) are all entered from BEP-0. It is not possible to go directly to BEP 1, 2, or 3 without a reactor trip or SI even though a LOCA, LOSC, or SGTR may be suspected. In the event of a small primary leak, without a reactor trip or SI, proper action would be to go to BOA PRI-1 EXCESSIVE PRIMARY PLANT LEAKAGE which may lead to BEP-0 if the condition is serious enough. It should be noted that if the primary leakage is small enough normal shutdown procedures may be adequate even though it would be classified as an actual LOCA.

Status trees are normally used only after a reactor trip or SI, however, this does not preclude the monitoring of these trees during a normal cooldown, or at any other point where the operator deems necessary. It should be recognized that if the trees were monitored at a point other than after a reactor trip or SI, some trees may not be satisfied and are not expected to be. For example, subcriticality would never be satisfied during normal power operations, if the tree were monitored.

3. Detailed Information (General Operating Procedures, BGP-100 series)

a. The BGP-100 series contains:

1) Operating procedures, BGP 100-1 through 5.

2) Operating flowcharts which correspond to each procedure BGP 100-T1 through T5.

3) Operating appendices, BGP 100-A1 through A12.

4) Operating tables, BGP 100-T6 through T40.

b. The operating procedures are used to describe the steps necessary for plant operation:

1) The procedures will be visible and followed during those evolutions described within.

2) The procedures are used in conjunction with the flowcharts and are not permanent records. The flowcharts are the permanent records as described below.

3) The procedures will contain all sections as described in BAP 1310-T15 and BAP 1310-6.

4) The procedures will follow the format as described in BAP 1310-T2.

5) The procedures will be used in conjunction with other procedures as referenced (BOP, BGP-A1 through A12, BGP 100-T1 through T40).

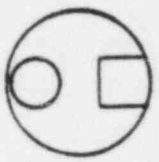
c. The BGP flowcharts (T1 through T) are referenced in the applicable procedures.

1) The flowcharts are to be followed from left to right as described by the black arrows.

2) The flowchart will be initiated by the Shift Engineer and he will place his initials, time and date at the enter arrow (upper left, sheet 1).

3) The Shift Engineer will note in the Exception box all exceptions by step and reason.

4) The flowchart will contain three basic step designations:

-  The large circle signifies major steps in the procedure and will contain within it either a small circle or a box for initials.
-  The circle signifies a step to be completed and initialled by the NSO.
-  The box signifies a step that is to be approved prior to starting and initialled after completion by an SRO.

5) The Prerequisite, Precaution, and Limitations and Actions section (C, D, E) will be read by the NSO and any subsequent relief NSO prior to continuing the procedure. All NSO's will signify this by initialling the circles (C, D, E).

6) Dotted lines around a step signify an option to either do the step or bypass the step.

7) The procedure will be done in accordance with the flowchart. It will more from the left to right of the flowchart. The steps are placed on the flowchart to show approximate times to do the step. Steps that have no line before them may be started at the discretion of the RO/SRO.

8) The flowcharts that contain more than 1 sheet will have black arrows for leaving that sheet and black arrows for entering the following sheet.

9) Included on the flowcharts will be pertinent information:

- Data tables for noting specific parameters.
- Plant conditions.
- Information pertinent to operation that may not be included in the procedures.

10) The Shift Engineer will initial completion of each flowchart and the Exit time and date.

d. The BGP Appendices will cover necessary checklists and information sheets for proper use and completion of the applicable procedure.

1) The appendices are referenced in the procedures.

2) The appendices contain the MODE CHECKLISTS which ensure all Tech Spec requirements are met prior to changing modes.

3) The Control Board Lineup Appendix (BGP 100-A2) will be generated by the appropriate Operating Engineer signifying which Control Boards he requests lineups on.

4) The System Lineup Checklist Appendix (BGP 100-A4) will be generated by the appropriate Operating Engineer signifying which systems he requests lineups on (M and E Lineups).

5) Contained within the appendices are the ECC, RRD, SDM, and Calorimetric forms.

e. The operating Tables T-6 through T-40 are the Main Control Board lineup lists and each contains an explanation for completion.

4. Procedure Changes

BEP's, BEP ES's, BCA's, BST's, BFR's, BOA's and BGP's will be changed or updated in accordance with station admin procedures. It is expected that if the user finds errors or problems during study, simulator exercise, or actual use, that such problems will be noted and relayed to a Shift Engineer or Operating Engineer for review.