

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

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EMERGENCY AND ABNORMAL OPERATING PROCEDURES USERS GUIDE

TECHNICAL REVIEW

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THIS PROCEDURE CONTAINS 19 PAGES

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A-503.1EMERGENCY AND ABNORMAL PROCEDURES USERS GUIDE

- 1.0 INTRODUCTION
- 1.1 PURPOSE - to give guidance in the use of Emergency Operating Procedures (EOPs) and Abnormal Procedures (APs) and to clarify the logic used in these procedures.
- 1.2 SCOPE OF APPLICABILITY - this procedure is applicable to all EOPs and APs.
- 1.3 REFERENCES - applicable to this procedure are;
 - 1.3.1 WOG-ERG, Revision 1, LP Version, Executive Volume Users Guide.
 - 1.3.2 Ginna Station EOP/AP Writers Guide, A-502.1.
 - 1.3.3 Ginna Station EOP/AP Series.
- 1.4 DEFINITIONS
 - 1.4.1 Emergency Operating Procedure (EOP) - A procedure which provides actions necessary to return the plant to a safe, stable condition following a transient/accident which has caused plant parameters to challenge reactor protection system set points, engineered safeguards system set points, challenge the ability to cool the reactor core or a radiation release boundary.
 - 1.4.2 Abnormal Operating Procedure (AP) - APs govern the plant operations during abnormal conditions and specify operator actions that will prevent the condition from degrading into an emergency.
 - 1.4.3 Critical Safety Function (CSF) - CSFs are those functions necessary to protect the fuel/cladding, RCS pressure boundary and the containment vessel from degradation. A prioritized list of these six functions is as follows:
 - 1.4.3.1 Maintenance of Subcriticality
 - 1.4.3.2 Maintenance of Core Cooling
 - 1.4.3.3 Maintenance of Heat Sink
 - 1.4.3.4 Maintenance of RCS Integrity



- 1.4.3.5 Maintenance of Containment Integrity
- 1.4.3.6 Control of Reactor Coolant Inventory
- 1.5 TEXT REVISIONS - are identified by a change bar. The change bar is located in the right hand margin to indicate changes to the text of that line. The change bar for the current revision will not be carried forward to the next revision.
- 2.0 EOP/AP Section Organization - in order to facilitate rapid location of specific sections and subsections of the EOP/AP, the control room copy is arranged per FIGURE 3 as follows:
 - 2.1 COVER SHEET - which is used for administrative purposes and does not provide any active function in the EOP/AP to be used. The Cover Sheet of the Control Room copy is the first page seen in the binder.
 - 2.2 PURPOSE and ENTRY CONDITIONS/SYMPTOMS PAGE - in the Control Room copy is immediately following the cover sheet.
 - 2.2.1 A Purpose Statement which specifically describes the intent of the procedure.
 - 2.2.2 Entry conditions and/or Symptoms sections which specify the conditions, transitions and/or symptoms which dictate or direct entry into the procedure. The symptoms used should be unique to the procedure.
 - 2.3 OPERATOR ACTION STEP PAGES- which may be subdivided into Immediate Operator Action pages, followed by subsequent operator action pages. Operator action step pages may contain;
 - 2.3.1 CAUTION STATEMENTS - which provide information about hazards to personnel or equipment and advice on actions or transitions which may become necessary depending on changes in plant conditions.
 - 2.3.2 NOTE STATEMENTS - which provide administrative or advisory information which supports operator actions.
 - 2.3.3 OPERATOR ACTION STEPS - presented in a two column format, direct the operator through specific step by step tasks, give the expected results from those tasks and provide contingency actions to be taken should an expected task method not be available or an expected result not be obtained.

- 2.3.3.1 Immediate Operator Actions - actions which the operator should be able to perform before opening and reading his emergency procedures. In general, immediate actions are limited to the verification of automatic protection features of the plant. Although the immediate actions should be memorized by the operator, they need not be memorized verbatim. The operator should know them well enough to complete the intent of each step, which is to verify that the automatic actions have occurred. The order in which they should be performed should also be consistent with the step sequence requirements.
- 2.3.3.2 Subsequent Operator Actions - actions not defined as immediate.
- 2.3.3.3 An Action/Expected Response column contains the primary operator action and the expected response or results of those actions. Expected response or results of the operator action tasks are given in CAPITAL LETTERS, separated from the action by a dash (-).
- 2.3.3.4 The Response Not Obtained (RNO) column presents contingency actions to be taken when an action in the left-hand column cannot be performed or does not satisfy the expected response condition. RNO column actions are specified for steps and substeps for which useful alternatives are available. Contingency actions may include directions to override automatic controls, to manually or locally initiate normally automatic actions, or to use alternative systems, evaluations, or procedures.
- 2.4 OTHER EOP/AP CONTENTS- may include:
 - 2.4.1 AUTOMATIC ACTION PAGE - which provides information on systems or components which should activate or realign automatically, without operator intervention.
 - 2.4.2 FOLDOUT PAGE - which provides a summary of information and conditions to be monitored throughout the EOP/AP. This page provides actions and transitions based on plant conditions which may occur outside the normal flow of the EOP/AP.
 - 2.4.3 FIGURES - may be drawings, graphs or diagrams which will provide additional information to the operator.



2.4.4

ATTACHMENT PAGES - which may be used to provide additional information to the operator. They provide information concerning a particular step or evolution addressed in the procedure. The information presented is of importance to the action or decision where referenced, but is of a length or format which precludes incorporation into the procedure step.

3.0

INSTRUCTIONS

NOTE: See attachment 1, Example of EOP Use, which describes the process of working through a dual column formatted EOP and implements the instructions described herein.

NOTE: Refer to A-502.1 EOP/AP Writer Guide (Reference 1.3.2) for actual format and content requirements.

3.1

ENTRY INTO EOP/AP - entry into an EOP/AP normally begins at the PURPOSE AND ENTRY CONDITIONS/SYMPTOMS page and sequentially progresses through the Operator Action pages unless specifically directed outside the normal operating or abnormal procedure, by a Foldout page concern or by a CSFST condition. Direct entry into the EOP set is normally through E-O, but procedure FR-S.1 or ECA-0.0 may be entered directly if the entry conditions are observed.

3.2

PURPOSE and ENTRY CONDITIONS/SYMPTOMS PAGE

3.2.1

Verify that the procedure purpose satisfies the specific goal desired.

3.2.2

Verify that the stated entry conditions are consistent with current plant conditions or that the correct transitions have been made.

3.2.3

Verify that current plant symptoms meet the symptoms associated with the procedure in hand.

3.3

OPERATOR ACTION STEP PAGES

3.3.1

NOTES and CAUTIONS

3.3.1.1

Observe all applicable NOTES and CAUTIONS prior to performing any step.

3.3.1.2

NOTES and CAUTIONS immediately proceed the applicable step(s) to which they apply. Those applicable to the entire procedure are shown prior to any Operator Action step.

- 3.3.1.3 Cautions are differentiated from notes by inclusion of asterisks across the EOP Page (See Reference 1.3.2).
- 3.3.2 DUAL COLUMN FORMAT USAGE
 - 3.3.2.1 Perform all Immediate actions prior to performing Subsequent action steps.
 - 3.3.2.2 Perform actions in the left-hand column first.
 - 3.3.2.3 Move to the next step and perform actions in the left-hand column if the actions in the previous left-hand column were performed successfully.
 - 3.3.2.4 Perform actions in the right-hand column only if the action performed in the left-hand column does not achieve the expected response or the action in the left-hand column cannot be performed.
 - 3.3.2.5 Move to the next step or substep and perform actions in the left-hand column if the actions in the previous right-hand column are performed successfully or if the actions in the previous right-hand column fail to bring about the required response or no entry exists in the right-hand column unless specifically directed not to continue.
 - 3.3.2.6 Perform all numerically or alphabetically identified steps in sequential order. Those substeps identified by bullets (o) may be performed in any order or preference.
 - 3.3.2.7 Beginning an action step or substep and being assured that it is progressing successfully is sufficient action to proceed to a subsequent step unless;
 - 3.3.2.7.1 A NOTE states otherwise or;
 - 3.3.2.7.2 The step specifies otherwise or;
 - 3.3.2.7.3 The operator deems it hazardous to personnel or equipment to proceed.
- 3.3.3 TEXT CONTINUITY - the text of operator action steps; with applicable substeps, cautions, notes; will normally be wholly contained on the same page. Where physical constraints preclude this the following guidelines are used:
 - 3.3.3.1 Cautions and/or notes are placed on the immediately preceding page.



3.3.3.2 If a step is continued on to another page, then:

3.3.3.2.1 The initial page is annotated at the bottom of the action step field portion of the page to indicate that the step is continued on the next page. (ie, THIS STEP CONTINUED ON FOLLOWING PAGE)

3.3.3.2.2 The follower page will have the initial action step heading repeated with a statement to indicate that the step is being continued from a previous page.

example: Establish letdown -

3.3.4 THIS STEP CONTINUED FROM PREVIOUS PAGE
USE OF LOGIC TERMS AND CONDITIONAL STATEMENTS:

3.3.4.1 The word AND is placed between a description of conditions for no more than combination of three conditions. A list format shall be used for four or more conditions. There is an implied and condition between each list item if no logic term is specified if substeps are proceeded with bullets (o).

3.3.4.2 The word OR is used between alternative conditions. Use of the word OR implies the inclusive sense. The exclusive sense of the word OR is denoted by using the form; either A OR B but not both.

3.3.4.2.1 When the inclusive or is used for a set of conditions, the satisfaction of any one condition allows progression to the next step or substep. When two or more actions are separated by an or condition, only one action needs to be successfully taken to allow progression to the next step or substep.

3.3.4.3 Action steps contingent upon certain conditions or combinations of conditions, begin with the logic terms IF or WHEN followed by a description of the condition(s), a comma, the logic term THEN and the action to be taken. IF is used for unexpected or possible conditions, THEN is only used in conditional statements and WHEN is used for expected or probable conditions.

3.3.4.4 The logic term IF NOT is limited to cases in which the operator must respond to the second of any two possible conditions. The term IF is used to specify operator response to the first of any two possible conditions.

3.3.5 USE OF REFERENCE TERMS



- 3.3.5.1 The words GO TO followed by only a step number directs transition to a subsequent step within the procedure being used.
- 3.3.5.2 The words RETURN TO followed by only a step number directs transition to a previous step within the procedure being used.
- 3.3.5.3 The words GO TO followed by a procedure designator, and title and/or a step number direct a transition to the specified EOP/AP. If no step number is specified, then the transition is to the beginning of the specified procedure.

Example: GO TO ES-0.1, REACTOR TRIP RESPONSE, Step 20.

- 3.3.5.4 The words REFER TO followed by a procedure designator and title are used to denote a procedure which may provide necessary or useful information during the execution of an EOP/AP. In general, those procedures referenced cover low probability occurrences, or plant evaluations with their own procedures whose inclusion in the EOP/AP would cause excessive complication of and reduced effectiveness of the EOP/AP. Referencing another procedure does not constitute leaving the EOP/AP in effect.

Example: REFER TO ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS.

- 3.3.5.5 Procedures entered for supplemental guidance or from CSFST direction may contain a RETURN TO statement. A procedure with multiple entry conditions may state RETURN TO PROCEDURE AND STEP IN EFFECT, this denotes a return to the last previous EOP and step in use.

3.3.6 ACTION VERBS AND ABBREVIATIONS USAGE

- 3.3.6.1 Operator action steps are normally written in a command form and begin with an action verb which has a precise meaning. Refer to A-502.1, WOP/AP Writers Guide (Reference 1.3.2) for listing.
- 3.3.6.2 Certain abbreviations are used throughout the EOPs and APs to improve readability. Refer to A-502.1, EOP/AP Writers Guide for proper abbreviations.



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3.4 FOLDOUT PAGES

- 3.4.1 Direction to use a foldout page is provided by a NOTE within the procedure, generally at the beginning. Once its use is directed the Foldout page is to be monitored throughout the time the EOP is in use.
- 3.4.2 One section of each foldout page is a RED PATH SUMMARY which promotes a periodic check of the Critical Safety Functions. Upon meeting one or more Red path conditions, transition to the appropriate Functional Restoration procedure is made as described in section 3.6.
- 3.4.3 Other sections of the Foldout page contain plant conditions which may arise at any time during the execution of the procedure or outside of the normal flow of the procedure. These sections provide actions or guidance for operations if these conditions occur.

3.5 USE OF CRITICAL SAFETY FUNCTION STATUS TREES (CSFST)

- 3.5.1 CSFSTs are entered from and monitored in conjunction with the recovery actions of the other EOP series procedures.
- 3.5.2 FR procedures are entered from the CSFST or the EOPs and are intended to restore a degraded safety function to satisfied condition.
- 3.5.3 A CSFST, as shown in Figure 1, is entered on the left side of the page as indicated by the arrow. Questions are asked and answered in turn which then direct the user to the next question.
- 3.5.4 When all questions are answered in a particular path the user will have reached an endpoint or terminus.
- 3.5.5 Each final path segment and each terminus circle is coded by a symbol scheme. The control room copy also utilizes a color code. The symbols and color coding used are described below.
 - 3.5.5.1 Color code - GREEN, final path segment and terminus circle are out-lined only: The CSF is satisfied. No operator action is required.
 - 3.5.5.2 Color code - YELLOW, the final path segment is a series of solid dots and the terminus circle is one third filled in: The CSF is off-normal. Operator action may be taken.



- 3.5.5.3 Color code - ORANGE, the final path segment is a broken line, the terminus circle is two thirds filled in: The CSF is under severe challenge. Prompt operator action is required.
- 3.5.5.4 Color code - RED, the final path segment is a solid line, the terminus circle is totally filled in: The CSF is under extreme challenge. Immediate operator action is required.
- 3.5.6 For Yellow, Orange and Red paths a procedure designator will be included to direct the operator to the correct Function Restoration (FR) procedure. These procedures are intended to return the CSF to the satisfied condition.
- 3.6 PRIORITIZATION OF FUNCTION RESTORATION PROCEDURES
- 3.6.1 Red or Orange challenges to a Critical Safety function take priority over all E, ES, ER and ECA procedures except ECA-0.0, Loss of All AC Power and the immediate action steps of E-0, Reactor Trip or Safety Injection.
- 3.6.2 The six CSFSTs are ordered in the control room book by the following priority list. This listing establishes the priority in which conditions are to be addressed in conjunction with the color code priority as described in 3.6.3.
 - 3.6.2.1 Subcriticality (S)
 - 3.6.2.2 Core Cooling (C)
 - 3.6.2.3 Heat Sink (H)
 - 3.6.2.4 Integrity (P)
 - 3.6.2.5 Containment (Z)
 - 3.6.2.6 Inventory (I)
- 3.6.3 Once entered the CSFSTs should be monitored in the priority order. Each CSFST is followed to a terminus based on plant conditions at that time. An example of status tree use is included as Attachment 2. The rules of use based on the color code/symbol system are as follows:
 - 3.6.3.1 If a RED path/solid circle terminus is reached, any procedure in effect other than those noted in step 3.6.1 is suspended and transition is made to the FR procedure designated on the CSFST.



- 3.6.3.2 If during the performance of an FR procedure from a RED path condition a higher priority RED path is determined, the FR procedure in use is suspended and the higher priority condition procedure is addressed. Once the higher priority procedure is complete, the suspended procedure for the lower priority condition is to be completed.
- 3.6.3.3 If an ORANGE path/2/3 filled circle terminus, is reached, the remaining trees are checked. If no RED path exists, procedures in effect other than those noted in step 3.6.1 are suspended and the FR procedure indicated for the highest priority ORANGE path condition identified is entered.
- 3.6.3.4 If during the performance of an ORANGE terminus directed FR procedure, a RED path or higher priority ORANGE path condition arises, then the original ORANGE path FR is suspended and the RED or higher priority ORANGE condition is addressed. Once the higher priority condition procedure is completed, the suspended procedure for the next lower priority condition is to be completed.
- 3.6.3.5 While it is expected that the actions in the FR procedure will clear the RED and ORANGE conditions before all operator actions are completed, the procedure is performed to the point of a procedure driven transition. However, FR-S.1, Reactor Restart-/ATWS requires completion when entered.
- 3.6.3.6 A YELLOW path/1/3 filled circle terminus is an indication of an off-normal condition. These do not take priority over other procedures. The operator is allowed to decide if an FR procedure noted at a YELLOW terminus is to be implemented based on the plant status and system trends at the time the condition is noted.
- 3.7 CONTROL ROOM PROCEDURE LAYOUT AND PLACEKEEPING TECHNIQUES
- 3.7.1 The Control Room copy of the EOP/AP procedures are organized in individual binders with layout per FIGURE 1. This layout provides for easy access, visibility of ATTACHMENTS and FOLDOUT Pages, and ensures placekeeping.
- 3.7.2 Each EOP/AP binder is located for easy access with the Control Room. Each binder is identified by letter designation, number, and title.

Example: E-0, Reactor Trip or Safety Injection

- 3.7.3 Placekeeping in the responsibility of the EOP User, normally the Control Room Foreman. In order to ensure proper placekeeping, the EOP User may checkoff or annotate steps by using pen/pencil markings to the immediate right of the Action Step or RNO performed. Also available to him, are stick-on pads or note pads which may be affixed to pages where transition or looping are necessary.
- 3.7.4 In addition to the Control Room Controlled Copy, additional controlled hard copies of the EOP/APS are available to the control room operators in the copy #4 files within the control room.
- 3.8 GENERIC ISSUES OF CONCERN
- 3.8.1 Adverse containment process parameter values:
- 3.8.1.1 If either containment pressure exceeds 4 psig or the containment radiation exceeds 10^5 R/hr, the operator should use adverse containment values.
- 3.8.1.2 If Adverse CNMT values are being used AND both of the following conditions are met, THEN the operator may revert to use of normal containment values:
- 3.8.1.2.1 CNMT pressure decreases below the pressure setpoint (4 psig) and,
- 3.8.1.2.2 If CNMT radiation exceeded 10^5 R/hr, Health Physics should assess the integrated radiation dose. If the integrated radiation dose is verified to be less than 10^6 Rads with dose rate less than 10^5 R/hr, the operator may again use normal CNMT values.
- 3.8.2 Technical Specification Violations during EOP use:
- 3.8.2.1 The EOPs contain actions which will lead to Technical Specification violations in order to maintain plant safety. Although it is desirable to remain within Technical Specification limits at all times, one must keep in mind that the overall objective is to protect the health and safety of the public. This may require violating a particular Technical Specification in response to an accident, although the EOP provide strategy that allows Technical Specification limits to be adhered to whenever possible.



ATTACHMENT 1

EXAMPLE OF EOP USE

The actual process of working through a dual column formatted EOP is illustrated by using E-2, Faulted Steam Generator Isolation. It is assumed the user was directed to the beginning of this procedure by another EOP.

The cover page provides the procedure designator and title to assure the correct procedure has been obtained. The PURPOSE section tells the user that this procedure is written to identify and isolate a faulted Steam Generator. The ENTRY CONDITIONS/SYMP-TOMS section list should show the procedure from which transition has been made.

The first action step of the procedure is preceded by two caution statements and one note statement. The cautions are distinguished by a line of asterisks above and below them and the word CAUTION. The word NOTE distinguishes the note's existence. Both types of entries are also made more visible by the use of the entire width of the page in contrast to the dual column format of the action steps.

The first caution tells the operator that at least one S/G must be maintained available for RCS cooldown. The second caution tells the operator that any faulted S/G or secondary break which becomes isolated should remain isolated during subsequent recovery actions unless needed for RCS cooldown. Both of these cautions are placed at this point due to the isolation process begun in the next step. The operator is presumed to know that "faulted" means a failure of the secondary pressure boundary, and "isolated" refers to closure of steam and/or feed paths. The cautions have provided a specific criteria of RCS cooldown concerns for not isolating, or unisolating a faulted S/G. In addition, the second caution reminds the operator that the concerns for maintaining a faulted S/G isolated continue to exist after a transition from this procedure to another.

The note reminds the operator that status tree monitoring should be occurring.

The first action, Step 1, is a check for main steam line isolation on any affected (faulted) S/G. The expected condition is that the MSIV and bypass valve on any affected S/G is CLOSED. If the operators determine they are closed, they proceed to Step 2. If any valve is not closed on an affected S/G, then a transfer to the right-hand or RESPONSE NOT OBTAINED (RNO) column. This column instructs manual closure of the valves. After the performance of this action the operator proceeds to the next task in the left-hand column. If any valve cannot be closed, the operator still proceeds to the next task in the left-hand column.



Step 2 contains a high level action step to "Check If Either S/G Is Not Faulted" with a substep "a." task providing more detail on how to complete this task. The substep instructs the checking of pressures in both S/G's. The expected response of "EITHER S/G STABLE OR INCREASING" is satisfied if the pressure in one S/G, or both, is stable or increasing and the user proceeds to Step 3. If pressure is decreasing in both S/G's, then the left-hand column is not satisfied and a move to the RNO column is made. The RNO column directs a transition to ECA-2.1 if both S/G's pressure are decreasing in an uncontrolled manner. At this point the operators must determine if the decreasing pressure is controlled or uncontrolled. If it is in fact uncontrolled by the operators, then the transition is made. If the depressurization in at least one S/G is under control, then they proceed to the left-hand column and into Step 3.

Step 3 directs the user to "IDENTIFY FAULTED S/G(s)" and again uses a substep for detailed task description. Two indications are used to determine if a S/G is faulted. If a S/G is depressurizing in an uncontrolled manner or is completely depressurized it is identified as being faulted and the operator moves on to Step 4. The use of the word OR between the two bullet marked conditions signifies that only one of the conditions need be satisfied to identify a faulted S/G. If no S/G satisfies either listed condition, then the operator moves to the RNO column. The RNO action directs a search for the initiating break as it is assumed that the break has been isolated by the previous closure of the MSIV and bypass. Once the search is begun the action portion of the step is satisfied and movement through the procedure may continue. The RNO step now tells the user to GO TO Step 5. This bypasses the Step 4 isolation as no faulted S/G now exists.

Step 4 tells the operators to "Isolate Faulted S/G" and provides a list of inlet and outlet flow paths to be isolated. These are listed with bullet designators thereby noting that no particular order of isolation is required. The operators proceed to verify isolated or isolate paths from the control room and dispatch personnel to the listed areas for other paths. If some aspect of the control room isolation process is not satisfied, the RNO column is accessed. The RNO column directs closing valves from the control room and, if that is not possible, dispatching personnel to perform local isolations. With contingency actions completed or local actions initiated, the operator proceeds to Step 5.

Step 5 requires a check of the Condensate Storage Tanks level. If the level is greater than 5 feet, the expected response is satisfied and the operator moves to Step 6. If the level is not greater than 5 feet then the RNO column instructs a switch to an alternate AFW water supply and provides a reference to ER-AFW.1.

Since this is a REFER TO statement the E-2 procedure is not exited. The ER-AFW.1 procedure is used in parallel with the E-2 procedure, as possible and appropriate, and the operator moves on to Step 6.

Step 6 directs a check of secondary radiation indicators. Several substeps are used to satisfy the high level action step. In the first substep the operator will request periodic samples be collected by HP personnel. The desired samples are specified and the appropriate procedures are referenced. Once the HP department is notified this substep is satisfied and the operator proceeds to the next substep. Here the operators are directed to check any unisolated secondary radiation monitors. A list of those monitors which may be used from the control room is included. The third substep is a conclusion of the radiation check process. If the radiation levels are normal the operator proceeds to step 7. If abnormal radiation is detected, then the operator moves to the RNO column. This entry directs a transition to E-3, therefore the E-2 procedure is exited and entry is made into the E-3 procedure.

Step 7 directs the operator to GO TO E-1, this ends the use of the E-2 procedure and provides direction for transition to another appropriate procedure, E-1 is entered at step one, the CAUTIONS and NOTE before step one in E-1 are to be read.



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ATTACHMENT 2

CRITICAL SAFETY FUNCTION STATUS TREE USE

The process of working through the status trees can be illustrated by using CSFST: F-0.1, SUBCRITICALITY. (FIGURE 1) The user enters the tree on the left-hand side of the arrow. The first block asks if the power range instruments indicate less than 5%. The possible answers are YES or NO.

If indicated power is greater than 5%, then the response is NO. Exiting the decision box at the NO segment places the user on a path which leads directly to a terminus. At this point it is determined that:

- o the response priority is RED
- o the appropriate Function Restoration procedure is FR-S.1

According to the rules of priority any procedure in effect, other than ECA-0.0 or the immediate actions of E-0, would be suspended and actions for FR-S.1 would be initiated. Since Subcriticality is the highest priority Critical Safety Function, this would also suspend any FR procedure in effect other than FR-S.1. Monitoring of the CSFSTs may continue for information purposes. When FR-S.1 is complete the user is directed to return to the procedure and step in effect. This permits a return to the suspended procedure at the point of suspension, or any other RED or ORANGE paths identified would now be addressed in their priority order.

If indicated power is less than 5%, the first decision block is exited at the YES section pathway which leads to the next decision block.

This block asks the user if the intermediate range startup rate is zero or negative. If the startup rate is positive the block is exited at the NO section. This path leads directly to a terminus where it is determined that:

- o the response priority is ORANGE
- o the procedure to be used is FR-S.1

The user now must check the other status trees to determine if a RED path exists on another tree. If no RED path conditions exist the Subcriticality ORANGE path becomes the priority procedure and suspension of an in use procedure occurs as previously described. Under these conditions monitoring of the CSFSTs continues and if a RED path condition arises it takes priority. When FR-S.1 is completed, a return to the previously suspended procedure takes place. If any other ORANGE path conditions had occurred, they would now be addresses in the order of priority.



If the startup rate is determined to be zero or negative, exit is by the YES segment which leads to another decision block.

The user is now asked to determine if a source range is energized. If no source range is energized this block is exited via the NO segment to another decision block. This block asks if the intermediate range startup rate is more negative than -0.2 DPM. If the indicated startup rate is between 0 and -0.2 DPM, the user now exits at the NO section and reaches a terminus where it is determined that:

- o the response priority is YELLOW
- o the appropriate response procedure is FR-S.2

Since the status is a Yellow condition, the remaining trees are checked to determine if any Red or Orange conditions exist. If no condition color-coded higher than Yellow exists, then a decision is made whether FR-S.2 is to be performed or not. Often a Yellow path indicates an off-normal condition which may be restored to satisfied status by actions in progress. It may also be the case that the condition is expected or acceptable for a particular transient or evolution in progress.

If the intermediate range startup rate is more negative than -0.2 DPM, then the decision block is exited from the YES segment. This leads directly to a Green terminus which is annotated CSF SAT. The Subcriticality Safety Function is satisfied and the user moves on to the next tree in the sequence.

If in the third decision block it is determined that a source range is energized, the YES exit is taken which leads to another decision block. This time the user is asked to determine if the source range startup rate is zero or negative. If the startup rate is determined to be positive the NO exit is taken which leads directly to a Yellow terminus. Again the other trees are checked and then a decision may be made whether or not to implement FR-S.2.

If the source range startup rate is determined to be zero or negative the YES segment exit leads directly to a Green or satisfied terminus and the user moves on the next status tree.

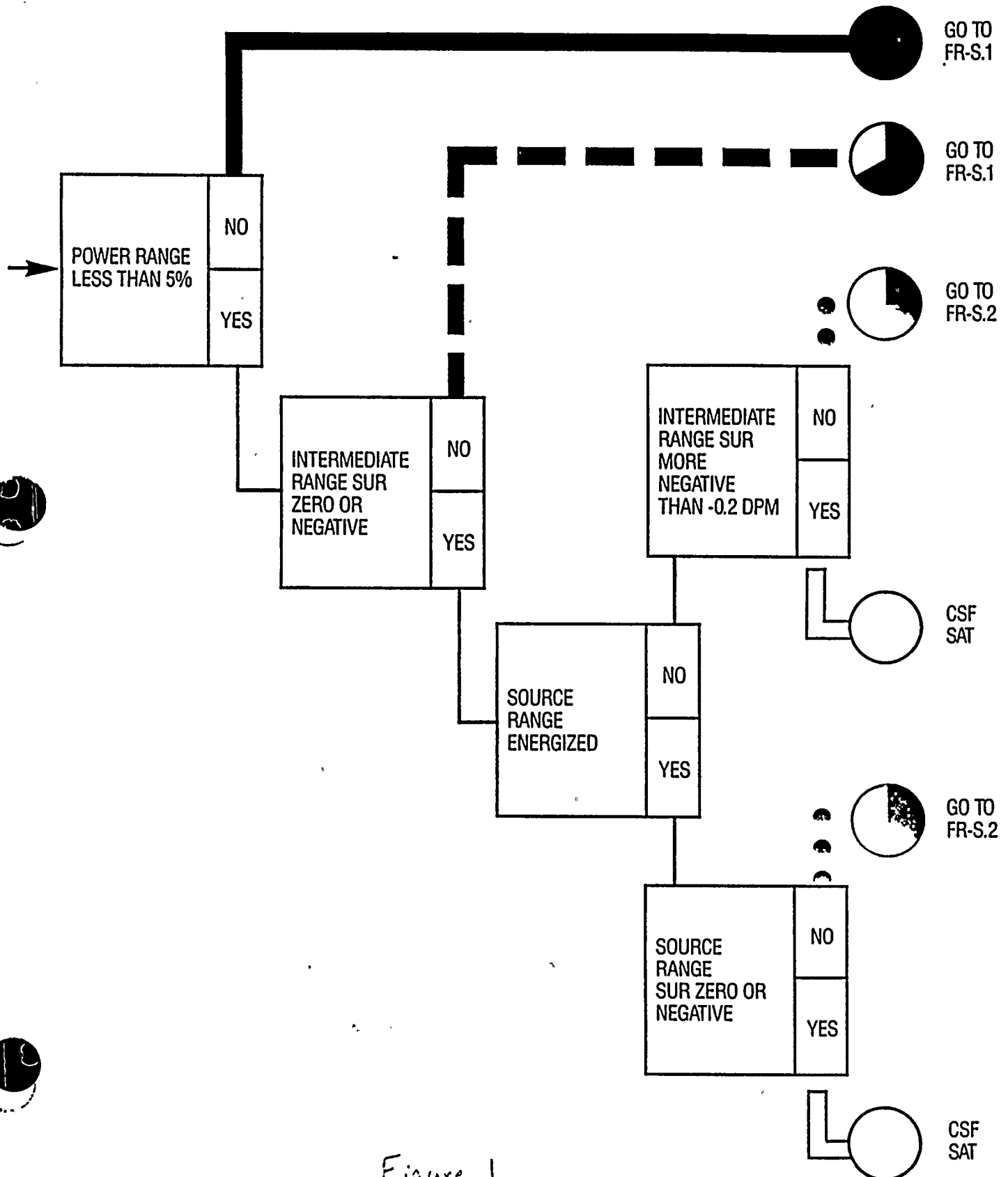


Figure 1

