PROCEDURES GENERATION PACKAGE

Turkey Point Plant

Unit 3 and Unit 4

PROCEDURES GENERATION PACKAGE

TABLE OF CONTENTS

PROCEDURES GENERATION PACKAGE

TABLE OF CONTENTS

PROCEDURES GENERATION PACKAGE

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this Procedures Generation Package (PGP) is to describe the Emergency Operating Procedures (EOPs) development at Turkey Point Plant Units 3 and 4 which are Westinghouse 3 - loop pressurized water reactors.

1.2 SCOPE

This document was developed in response to Supplement 1 to NUREG-0737, Item 7.2b, Page 15, NUREG-0899.

1.3 ORGANIZATION

This document consists of the following six parts:

Section 1.0	Introduction
Section 2.0	Plant Specific Technical Guidelines
Section 3.0	Writers Guide for EOPs
Section 4.0	EOP Verification Program
Section 5.0	EOP Validation Program
Section 6.0	EOP Training Program

Each part describes the approach taken as part of the overall EOP Implementation Plan for Turkey Point Plant Unit 3 and Unit 4.

2.0 PLANT-SPECIFIC TECHNICAL GUIDELINES

2.1 GENERAL

2.1.1 The following program for converting the Westinghouse Owners Group Emergency Response Guidelines (ERGs) into EOPs has been developed and will be used by Turkey Point Plant Unit 3 and Unit 4.

2.1.2 The Westinghouse Owners Group Emergency Response Guidelines, Revision 1, dated September 1, 1983, will be used for the implemented EOPs.

2.1.3 The following major items were considered in the methodology to be used:

1. Mechanics of conversion
2. Location of the plant-specific technical information
3. How the plant-specific technical information will be used
4. The use of existing EOP's
5. Documentation requirements
6. Use of the background information supplied with technical guidelines

2.2 PROGRAM DESCRIPTION

2.2.1 Mechanics of Conversion

1. Preparation

The designated EOP writing team will obtain and review the following Plant-specific Technical Information (EOP source documents):

a. Westinghouse Owners Group Emergency Response Guidelines (ERGs), Revision 1, with background information

b. FSAR Unit 3 and Unit 4

c. Turkey Point Plant Writers Guide for Emergency Operating Procedures

d. Technical Specifications for Unit 3 and Unit 4

e. The most current revision of existing EOPs

f. As-built plant drawings

2. Writing Plant Specific EOPs from Westinghouse ERGs

The EOP writing team will follow the ERG's step-by-step, adding footnoted information where designated. Concurrently, the writers will review appropriate EOP source documents. The use of plant specific technical information or analysis resulting from plant unique design will be included to the ERG format. The inclusion of these design requirements will be covered by two separate documents, the Basis Document, which outlines the logic used for inclusion of the step into the ERG, and the Transition Document, which delineates the flow of information from the ERGs to the plant specific EOPs. The Basis Document is described in 0-ADM-109, Writers Guide for EOPs, for Turkey Point.

2.2 PROGRAM DESCRIPTION

2.2.1 Mechanics of Conversion (Cont'd)

3. Plant Specific Deviation Form

   Plant specific differences generated between generic guidelines and plant specific EOPs will be documented on the deviation form shown in Enclosure 1. This form will provide the technical justification for step deviations between the generic guidelines and the plant specific procedures.

4. Transition from Existing EOPs to the Upgraded Plant Specific EOPs

   The EOP writing team will ensure that required information in the existing EOPs is properly incorporated into the upgraded plant specific EOPs which are derived from the Westinghouse ERGs. This will be accomplished by means of a Transition Document, detailed in the Turkey Point EOP Writers Guide, 0-ADM-109.

2.2.2 Documentation

The completed Transition Documents will be provided as a source document to assist in the EOP verification process and in the revision, review and approval process.

2.2.3 Task Analysis Upgrade Program

The task analysis to identify operator information and control requirements will be completed as part of the task analysis upgrade program plan being conducted in support of the Detailed Control Room Design Review.

3.0 WRITERS GUIDE FOR EOPs

3.1 GENERAL

3.1.1 A writers guide for EOPs is a plant-specific document that provides instructions for writing EOPs. In addition to establishing sound writing principles, the guide helps to promote consistency among all EOPs and their revisions, independent of the number of EOP writers.

3.1.2 The writers guide will be revised, as necessary, based on feedback from operator training, experience, and procedure validation.

3.2 DOCUMENT DESCRIPTION

3.2.1 Information on the following major items is included in the plant-specific writers guide for EOPs.

1. EOP format
2. EOP organization
3. EOP content
4. Mechanics of style

3.2.2 The Turkey Point Plant Writers Guide for Emergency Operating Procedures, is based on both the industry document Emergency Operating Procedures Writing Guideline (INPO 82-017), and the Writers Guide for Emergency Response Guidelines dated September 1, 1983, developed by the Westinghouse Owners Group.

4.0 EOP VERIFICATION PROGRAM

4.1 GENERAL

EOP verification is the evaluation performed to confirm the written correctness of the procedure and to ensure that applicable géneric and plant-specific technical information has been incorporated properly. This evaluation also checks that the human factors aspects presented in the writers guide for EOPs have been applied.

4.2 PROGRAM DESCRIPTION

4.2.1 When developing this EOP verification program, the following major items were considered:

1. How EOP verification will be performed

2. How completion of the EOP verification process will be documented

3. What process will be used in resolving discrepancies

4.2.2 The verification program is based on the industry document Emergency Operating Procedures Verification Guideline (INPO 83-004), developed by the EOPIA Review Group and published by INPO.

4.2.3 The Turkey Point Plant verification procedure for emergency operating procedures is provided in Administrative Procedure 0-ADM-110 and addresses the following objectives:

1. EOPs are technically correct, i.e, they accurately reflect the technical guidelines and other EOP source documents

2. EOPs are written correctly, i.e., they accurately reflect the Plant-specific Writers Guide

3. A correspondence exists between the procedures and the control room/plant hardware

4. The language and level of information presented in the EOPs are compatible with the qualifications, training, and experience of the operating staff

5.0 EOP VALIDATION PROGRAM

5.1 GENERAL

EOP validation is the evaluation performed to determine that the actions specified in the procedure can be performed by the operator to manage the emergency conditions effectively. The methodology for EOP validation utilizes present, available methods at the Turkey Point Plant while recognizing and allowing for future improvements. The EOP validation will evaluate the operators' ability to manage emergency conditions using the EOPs. It will validate that part of the EOP not covered by any technical validation of generic technical guidelines.

5.2 PROGRAM DESCRIPTION

5.2.1 When developing this EOP validation program, the following major items were considered:

1. How EOP validation will be performed
2. How to appropriately use simulator walk-throughs or table-top methods of validation
3. How operating and training experience will be integrated into the program evaluation
4. The evaluation criteria to be applied and the methods to be followed in resolving discrepancies
5. How completion of the EOP validation process will be documented

5.2.2 The program is based on the industry document Emergency Operating Procedures Validation Guideline, (INPO 83-006), developed by the EOPIA Review Group and published by INPO. The Turkey Point Plant validation procedure for emergency operating procedures is provided in Administrative Procedure 0-ADM-111 and addresses the following objectives:

1. EOPs are usable, i.e., they can be understood and followed without confusion, delays, and errors
2. A correspondence exists between the procedures and the control room/plant hardware
3. The instructions presented in the EOPs are compatible with the shift manpower, qualifications, training, and experience of the operating staff
4. A high level of assurance exists that the procedures will work, i.e., the procedures guide the operator in mitigating transients and accidents

6.0 EOP TRAINING PROGRAM

6.1 GENERAL

The EOP training program was developed to support implementation of the EOPs and to train all licensed operators on all EOPs. The EOP writer interfaces with the Training Department to ensure a supportive program.

6.2 PROGRAM DESCRIPTION

6.2.1 When developing the EOP training program, the following major items were considered:

1. What type of operator training should be provided (initial, requalification)
2. What method of operator training should be followed
3. What operator knowledge and skill level is desired
4. What training material is needed to support EOP training requirements
5. What current operator licensing requirements exist
6. What method should be provided for operator feedback into the training program and EOP development

6.3 TRAINING PROGRAM GOALS

6.3.1 The initial, overall training goals for the EOP training program are as follows:

1. To enable the operators to understand the structure of the EOPs
2. To enable the operators to understand the technical basis of the EOPs
3. To enable the operators to use the EOPs under operational conditions
4. To enable the operators to have a working knowledge of the technical content of the EOPs
5. To enable the operators to understand and perform each step in all EOPs to achieve EOP objectives

6.3.2 Training program objectives to support these goals will be developed for each lesson plan.

6.4 INITIAL EOP TRAINING METHODS

The EOP training program is established to instruct operators in the EOPs. The program consists of classroom instruction and procedure walk-throughs. Non-plant specific simulator exercises will be conducted to train operators prior to the implementation of EOPs.

6.4.1 Classroom Instruction

Classroom instruction sessions will be conducted. Included in the information presented during this method will be the following:

1. The logic behind the development of EOPs
2. The process used to develop the EOPs
3. The EOPs themselves, including supporting technical and human-factors information

6.4.2 Procedure Walk-Throughs

An important part of the instruction on EOPs will be the practical experience gained through procedure walk-throughs. This walk-through training will also concentrate on information flow and interaction with the physical plant.

6.4.3 Simulator Exercises

Training on the EOPs will be conducted for all licensed operators using scenarios on a non-plant specific simulator. The plant referenced simulator when available will be used to provide all further EOP training. Training will be conducted with all operators performing their normal control room functions. Simulator exercises will include a wide variety of scenarios including multiple (simultaneous and sequential) failures, to fully exercise the EOPs on the simulator.

6.5 REQUALIFICATION TRAINING

All licensed operators will conduct procedural walk-throughs for refresher training. The walk-throughs may be conducted either in the plant control room or at a simulator. Simulator scenarios will be as described in Section 6.4.3. Simulator exercises will be evaluated by the Nuclear Training Department or Operations Department Supervision. Evaluation results will be critiqued for feedback to the operators and to determine additional training needs.

6.6 TRAINING ON REVISIONS TO EOPs

Training on revisions to EOPs will be accomplished through a program of required readings (self taught), pre-shift briefings, or lectures in the requalification program. Determination of appropriate methods will be made by the Nuclear Training Department.

6.7 INPUTS INTO TRAINING PROGRAM CHANGES

6.7.1 Supporting Training Material Changes

Changes to supporting training material will be factored into updated lesson plans and operator memos. Some of the supporting material identified to date is as follows:

1. ERGs
2. Background Information
3. Associated WCAPs

6.7.2 Operator Feedback

Operator feedback resulting from EOP verification, EOP validation, and training critique forms will be used to keep the training program and EOPs current and relevant.

6.8 EVALUATION

An evaluation will be performed to ensure that the training program goals have been accomplished. All operators will be formally evaluated following Simulator exercises to determine a students' performance on selected exercises that measures mastery of specified skills in accordance with stated objectives. The following are examples of categories evaluated:

1. Control Board Awareness
2. Event Diagnosis
3. Immediate Actions/Entry Level Actions
4. Subsequent Actions
5. Console Manipulations
6. Use of Proc/Tech Specs/Reference Data
7. Communications
8. Supervisory Ability

The instructor grades the student in each category listed for each evolution utilizing the criteria:

Satisfactory

Marginal

Unsatisfactory

The ability of the operator to understand the structure of the EOPs, technical bases of the EOPs and areas missed in the simulator exercises is instructed in classroom training or required reading. The method of evaluation is by written examination.

PROCEDURES GENERATION PACKAGE

ENCLOSURE 1

Turkey Point Plant

Plant Specific Deviation
Documentation Sheet

PROCEDURES GENERATION PACKAGE

ATTACHMENT 1

TURKEY POINT PLANT

WRITERS GUIDE

FOR

EMERGENCY OPERATING PROCEDURES

Florida Power & Light Company

Turkey Point Nuclear Plant

0-ADM-109

Title:

Writers Guide for Emergency Operating Procedures

Safety Related Procedure	
Responsible Department:	Procedure Upgrade
Reviewed by PNSC:	XX-XXX
Approved by Plant Manager-N:	XX/XX/XX

MBS tf
DRAFT: 7 1 87

LIST OF EFFECTIVE PAGES

Page	Revision Date	Page	Revision Date
1	XXXXX	23	XXXXX
2	XXXXX	24	XXXXX
3	XXXXX	25	XXXXX
4	XXXXX	26	XXXXX
5	XXXXX	27	XXXXX
6	XXXXX	28	XXXXX
7	XXXXX	29	XXXXX
8	XXXXX	30	XXXXX
9	XXXXX	31	XXXXX
10	XXXXX	32	XXXXX
11	XXXXX	33	XXXXX
12	XXXXX	34	XXXXX
13	XXXXX	35	XXXXX
14	XXXXX	36	XXXXX
15	XXXXX	37	XXXXX
16	XXXXX	38	XXXXX
17	XXXXX	39	XXXXX
18	XXXXX	40	XXXXX
19	XXXXX	41	XXXXX
20	XXXXX	42	XXXXX
21	XXXXX	43	XXXXX
22	XXXXX		

TABLE OF CONTENTS

1.0 PURPOSE

1.1 This procedure provides administrative and technical guidance on the preparation of Emergency Operating Procedures. This guide applies to Optimal Recovery Procedures, Function Restoration Procedures, and Critical Safety Function Status Trees.

2.0 REFERENCES/RECORDS REQUIRED/COMMITMENT DOCUMENTS

2.1 References

2.1.1 AP-0103.37, Standard Acronyms and Abbreviations

2.1.2 0-ADM-100, Procedure Preparation, Review and Approval

2.1.3 0-ADM-101, Writers Guide for Administrative and Normal Operating Procedures

2.1.4 NUREG-0899 Guidelines for the Preparation of Emergency Operating Procedures

2.1.5 INPO 82-017 Emergency Operating Procedures Writing Guideline

2.1.6 INPO 83-007 Emergency Operating Procedures Generation Package Guideline

2.1.7 Westinghouse Owners Group Emergency Response Guidelines

2.2 Records Required

2.2.1 Completed copies of the below listed section(s), enclosure(s) and/or attachment(s) constitute Quality Assurance Records and shall be transmitted to Document Control and be retained for the lifetime of the plant in accordance with Quality Assurance records requirements:

1. Archival copies of Basis Documents and subsequent revisions
2. Transition Documents

2.3 Commitment Documents

2.3.1 Inter - Office Correspondence, C.J. Baker to L.W. Bladow, March 30, 1987; PTP-PMN-87-152, Response to CAR-87-007, Recommendations 2, 3, and 4; Regulatory Commitment Identification in Implementing Procedures

3.0 RESPONSIBILITIES

3.1 Originator

The originator of any Emergency Operating Procedure is responsible for researching reference sources, verifying the accuracy of technical information, and confirming the usability of new or revised procedures.

4.0. DEFINITIONS

4.1 Caution

A procedure element containing information about potential danger to equipment or personnel.

4.2 Challenge

A condition which is expected to jeopardize the plant safety state (in reference to a Critical Safety Function).

4.3 Critical Safety Function

An activity which serves to protect the integrity of one or more of the physical barriers against radiation release.

4.4 Diagnosis

The process of identifying a particular plant state by examining the existing symptoms. In symptom-based procedures, diagnosis is the process used to direct the operator to the appropriate procedure steps to address the existing plant state (symptoms) and does not require identification of the cause (event) of the symptoms.

4.5 Emergency Operating Procedures (EOPs)

Plant procedures that specify the operator actions required to mitigate the consequences of transients and accidents that cause plant parameters to exceed reactor protection system setpoints, engineered safety features setpoints, or other appropriate technical limits.

4.6 EOP Source Documents

Documents or records upon which EOPs are based.

4.7 Emergency Response Guidelines (ERGs)

The detailed and complete network of generic emergency response guidance developed by the Westinghouse Owners Group for Westinghouse plants. The guidance includes Optimal Recovery Guidelines, Critical Safety Function Status Trees and Function Restoration Guidelines.

4.8 Event Tree

A branching diagram which illustrates schematically the possible combinations of sequential or multiple events.

4.9 Function Restoration Procedures (FRs)

Those procedures which respond to Critical Safety Function challenges. Guidance is provided to restore the Critical Safety Function to a satisfied condition. Typically, actions are based on the severity of the challenge and may not correspond to "good operational practice".

4.10 Human Factors

The elements of relationship between a human and his work, i.e., those things which effect how well a Control Room operator is able to use a procedure: legibility, vocabulary, grammar, training, external stress, etc.

4.11 Immediate Actions (steps)

Actions which can be performed from memory, i.e., without reference to the written procedure (typically verification of automatic actions).

4.12 May

Used to denote permission; neither a requirement nor a recommendation.

4.13 Note

A procedure element conveying advisory or administrative information.

4.14 Optimal

Most favorable or best (response) for the particular situation.

4.15 Optimal Recovery Procedures (ORP)

Those procedures network which provide guidance to recover the plant in the most efficient manner to a safe and stable end state. Typically, actions correspond to "good operational practice".

4.16 Recovery

The process of returning to a stable and safe condition. Recovery implies establishing operator control over plant processes and taking the plant to a stable and safe end state.

4.17 Restoration

The act of putting something into a prior state. Restoration implies establishing operator control over plant processes and returning the plant state to one in which the Critical Safety Functions are satisfied.

4.18 Shall

Used to denote a requirement.

4.19 Should

Used to denote a recommendation.

4.20 Status Tree

A graphical device to quickly evaluate the condition of a Critical Safety Function. This identifies off-normal conditions and the appropriate procedure for restoration of the Critical Safety Function to a satisfied condition:

4.21 Symptoms

Process parameters used to identify and characterize a plant or condition.

4.22 Transition

A change from one place to another in the EOPs, either from one step to another step or from one procedure to another.

4.23 Two-column format

The manner of presenting operator instruction steps in the EOPs. Expected conditions and responses are listed in the left-hand column to facilitate normal usage. Contingency actions are separated by placement in the right-hand column.

4.24 Will

Used to denote a requirement.

5.0 PROCEDURE

5.1 EOP Identification

5.1.1 Designation and Numbering

1. The emergency operating procedures (EOPs) shall specify operator actions to be taken during plant emergency situations to return the plant to a safe stable condition. Each procedure shall be uniquely identified to facilitate preparation, review, use, and subsequent revision.

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

3. Every separate EOP shall have its own alpha-numeric designation to supplement the descriptive title. Letter designators are to be assigned according to the definitions as follows:

   a. E — a procedure for diagnosis and recovery from design basis events.

   b. ES — a procedure which supplements the recovery actions of an E procedure.

   c. ECA — a procedure which supplements both the E and ES procedures by providing recovery actions for low probability or unique event sequences which are not easily covered in the E or ES procedures or which may complicate or reduce the effectiveness of these procedures.

   d. F — a procedure for diagnosis of challenges to a Critical Safety Function -represented in tree format.

   e. FR — a procedure for restoration of a Critical Safety Function (CSF) to a satisfied condition.

   f. S — designator for SUBCRITICALITY CSF

   g. C — designator for CORE COOLING CSF

   h. H — designator for HEAT SINK CSF

   i. P — designator for INTEGRITY CSF

   j. Z — designator for CONTAINMENT CSF

   k. I — designator for INVENTORY CSF

5.1.1 (Cont'd)

4. Optimal recovery procedures shall be designated by the letters E, ES or ECA plus a sequentially assigned number designator. Each E procedure number designator shall consist of a single integer. Each ES procedure shall consist of the number designator of the reference E procedure, plus a sequentially assigned decimal integer.

5. ECA procedures shall each have a number designator consisting of an integer plus a decimal integer. Related procedures shall be assigned sequential decimal integers.

6. Letter and number designators shall be separated by a hyphen.

EXAMPLE

EOP-E-0
EOP-ES-0.1
EOP-ES-1.2
EOP-ES-1.3
EOP-ECA-0.0
EOP-ECA-1.1
EOP-ECA-2.1

7. Critical Safety Function Status Trees shall be designated by the letter F plus a number designator. Number designators shall consist of the sequentially assigned number zero plus a decimal integer.

8. Letter and number designators shall be separated by a hyphen.

EXAMPLE

EOP-F-0.1
EOP-F-0.2

5.1.1 (Cont'd)

9. Function Restoration Procedures shall be designated by the letters FR plus additional letter which corresponds to the respective Critical Safety Function. All the separate procedures related to a particular Critical Safety Function are assigned decimal integers in increasing order.

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

EXAMPLE

EOP-FR-S.1
EOP-FR-S.2

5.1.2 Revision Numbering

Each Emergency Operating Procedure shall have an assigned approval date reflecting the approval date of the new procedure or the approval date of the most recent revision. If a List of Effective Pages is provided, it shall designate the effective revision approval date(s) of all procedure pages.

5.1.3 Page Numbering and Identification

Each page of the procedure shall be identified by the procedure title, alpha-numeric designator, approval date, and page number in a title block at the top of the page. The last page of instructions shall have the word "END OF TEXT" following the last instruction step.

5.2 Format

NOTE

This section describes the format that is to be applied consistently to all Emergency Operating Procedures.

5.2.1 Procedure Organization

NOTE

Any individual procedure might contain only the required elements, or additional elements as necessary to present the intent of the procedure.

1. All EOP's are to employ a common structure as required consisting of those applicable elements as follows:

   a. COVER SHEET — (all procedures) - identifies procedures by title, number, revision, applicable unit, etc.

   b. LIST OF EFFECTIVE PAGES — (optional) - may be used to indicate the revised page date(s) to aid in procedure validation. If the EOP is short and will be revised in its entirety, a List of Effective Pages is not required.

   c. PURPOSE/SYMPTOMS OR ENTRY CONDITIONS — (all procedures) - summarizes procedure intent and either entry symptoms or transition

   d. COMMITMENT DOCUMENTS — (all procedures drafted or revised after 6-30-87) - includes a list of source documents for commitments that are addressed by specific steps, sections, or subsections within the procedure.

   e. INSTRUCTION STEPS — (all procedures) - presents the stepwise operator instructions.

   f. FIGURES — (as required) -presents usually graphical data to supplement action steps.

5.2.1.1 (Cont'd)

g. ATTACHMENTS (as required) - presents non-graphical information to supplement action steps.

h. FOLDOUT PAGE (as required) - presents information which is applicable throughout the guideline(s) that it follows.

2. The sequence of procedure elements is always in the order specified. Page numbering is sequential through all the elements comprising any procedure.

5.2.2 Page Formats

1. All pages of the Emergency Operating Procedures shall use the same page structure. This page structure employs a pre-printed border to assure all margins are correctly maintained, and pre-printed designator and page boxes to verify completeness and consistency.

2. The pages for presentation of operator action steps shall use a two-column format within the pre-printed border. The left-hand column is designated for expected operator actions and response, and the right-hand column is designated for contingency actions when the expected response is not obtained. These pages shall use pre-printed title blocks above the separate columns (including the "step" column) for uniformity See Enclosure 1.

3. The Foldout is intended to summarize only the information which an operator should have continuously available, so page content will vary by procedure. Each Foldout Page shall be titled at the top in large bold type "FOLDOUT FOR E-X SERIES PROCEDURES".

5.2.3 Instructional Step Numbering

1. Procedures steps shall be numbered as follows:

EXAMPLE

1. High-level step

a. Substep instructional step (if necessary)

1) Detailed instructional step (if necessary)

2. Substeps are lettered sequentially according to expected order of performance. If the order of substep performance is not important, the substeps are designated by bullets (●). This same numbering scheme is to be used in both the right-hand and left-hand columns of the procedures.

3. For those procedures which are the entry procedures into the ERG set, certain initial steps may be designated "immediate actions". This designation implies that those steps may be performed by the operator, based on his memory, without reference to the written procedure. These steps should be limited to verifications, if possible. Immediate action steps are identified by a NOTE prior to the first action step.

NOTE

Steps 1 through 14 are IMMEDIATE ACTION steps.

4. Many of the operator actions provided in a procedure provide procedural guidance for continuous performance throughout the remainder of the procedure. This intent is conveyed by the use of appropriate action verbs including, but not limited to such verbs as monitor, maintain; or control.

5.3 Writing the Procedure

5.3.1 Purpose and Symptom

1. The first section shall be titled PURPOSE and should briefly describe what the procedure is intended to do. The second section is a summary of those conditions which require entry into the procedure. This section shall be titled SYMPTOMS OR ENTRY CONDITIONS. For procedures that are entry Optimal Recovery Procedures, a symptom summary is sufficient. For other procedures, which can only be entered by transition from previous procedures, a summary of the entry conditions should be provided.

5.3.2 Commitment Documents

1. The Commitment Documents section shall be numbered 3.0. [Commitment - Step 2.3.1]

2. The Commitment Documents section shall include a list of source documents for commitments that are addressed by specific steps, sections, or subsections within the procedure. [Commitment - Step 2.3.1]

3. Commitment Documents listed in Section 3.0 may include, but are not limited to the following: Licensee Event Reports (LER's), NRC IE Notices/Bulletins, Inspector Followup Items (IFI's), NRC Inspection Reports (NIR) and FPL responses, INPO SOER's and SER's, JPE JCO's, Quality Assurance Corrective Action Requests (CAR's), Nonconformance Reports (NCR's), and FPL Departmental Letters. [Commitment - Step 2.3.1]

4. Commitment Documents listed in Section 3.0 should be formatted in a manner similar to the following: Type of document, Number/Identifier of Document, Description/Title, Applicable step number, CTRAC Number. [Commitment Step 2.3.1]

5. Commitment Documents shall be cross-referenced in the procedure as follows: [Commitment - Step 2.3.1]

EXAMPLE

If temperatures exceed 95°F, the PS-N shall be notified immediately. [Commitment - Step 3.X]

   a. If one or several steps implement(s) a commitment from a source document listed in Section 3.0, the commitment document cross-reference ([Commitment - Step 3.X]) shall follow the individual step(s), in the applicable column.

5.3.2.5 (Cont'd)

b. If an entire section or subsection implements a commitment from a source document listed in Section 3.0, the commitment document cross-reference ([Commitment - Step 3.X]) shall follow the section/subsection heading. The commitment document cross-reference shall also appear in the upper right or left hand corner of every succeeding page containing a portion of the applicable section or subsection, depending on the applicable column(s).

5.3.3 Operator Actions

1. Steps directing operator action should be written in short and precise language. The statement should present exactly the task which the operator is to perform. The equipment to be operated should be specifically identified, and only those plant parameters should be specified which are presented by instrumentation available in the Control Room. It is not necessary to state expected results of routine tasks.

2. EOPs should be structured so that they can be executed by the minimum shift staffing and Control Room staffing required by the Technical Specifications.

3. Action steps should be consistent with the roles and responsibilities of Operations Department personnel.

4. Action steps should be structured to minimize the movement of personnel around the Control Room while performing the procedures.

5. Action steps should be structured to avoid unintentional duplication of tasks.

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

7. Actions required in a particular step should not be expected to be complete before the next step is begun. If a particular task must be completed prior to continuation, this condition must be stated clearly in that step or substep.

8. Refer to Enclosure 1 as an example of the format for presenting operator actions in the following steps.

5.3.3 (Cont'd)

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

   a. High Level Action steps shall be written as complete imperative sentences and should begin with an appropriate verb, or verb modifier. High Level Action steps are procedure steps that present primary, sequential tasks to be performed in response to the specific emergency operating condition.

EXAMPLE

21. Check PRZR PORVs and Spray Valves: (High Level Action step)

   b. Instructional substeps in the form of a verification are not required to be written as complete sentences.

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

   d. If a step requires multiple instructional steps, then each instructional step should have its own expected response.

EXAMPLE

1. Check SI Accumulator Isolation Valve Status: (High Level Action step)

a. Power to isolation valves - AVAILABLE (Instructional step)

b. Isolation valves - OPEN (Instructional step)

   e. If only a single task is required by the step, the high-level step contains its own expected response.

EXAMPLE

21. Check RCP Status - AT LEAST ONE RUNNING

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

5.3.3.9 (Cont'd)

g. When the expected response of the left-hand column is not obtained, the user is expected to move to the right-hand column for contingency instructions. This diagnostic approach is intended to assist the operator in diagnosis, and to provide clear guidance leading to the diagnostic decision, and referencing to the appropriate step or procedure for additional actions.

h. All procedures should end with a transition to another procedure, or with direction to consult the Plant Supervisor - Nuclear for guidance.

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

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

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

c. Contingency instructions are to be written in sentence format.

d. If the right-hand column contains multiple contingency actions for a single high-level action in the left-hand column, the phrase "Perform the following:" should be used as the introductory high- level statement.

5.3.3.10 (Cont'd)

e. If the right-hand column contains multiple contingency actions which do not correspond to multiple substeps in the left-hand column, then different designators shall be used in the two columns as shown in the following example:

EXAMPLE

Establish Letdown:	*Establish excess letdown:*
a.	*1.*
b.	*2.*
c.	*3.*
1.	*a.*
2.	*b.*

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

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

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

11. Some procedure steps may specify a number of alternative actions that are equally acceptable. Equally acceptable steps are those for which any of several alternative steps or sequence of steps may be equally correct. Equally acceptable steps should appear as instructional substeps, and shall be designated by the use of bullets (●).

12. Some operator actions are required at some specified time intervals, or some time after an action has taken place. In such time-dependent steps, the time frame for required actions shall be specified.

13. Operator action steps should be complete on one page when possible. In addition, no page rotation or breaking of words is allowed.

5.3.4 Use of Logic Terms

1. The logic terms AND, OR, IF, IF NOT, WHEN, and THEN, are to be used to describe a set of conditions, to sequence action steps, or to express complex combinations of conditions, other antecedents, and actions. Logic terms shall be highlighted for emphasis by capitalizing (all caps) and underlining.

2. The two-column format equates to the following logic: "IF NOT the expected response in the left-hand column, THEN perform the contingency action in the right-hand column." The logic terms should not be repeated in the right-hand column contingency. However, the logic terms may be used to introduce a secondary contingency in the right-hand column.

3. When action steps are contingent upon certain conditions or combinations of conditions, the step shall begin with the words IF, IF NOT, or WHEN followed by a description of those conditions, a comma, the word THEN, and the action to be taken.

EXAMPLE

WHEN pressurizer level reaches 50%,
THEN stop the charging pump.

4. Use of IF NOT should be limited to those cases where the operator must respond to the second of two possible conditions. IF should be used to specify the first condition.

EXAMPLE

IF pressure is increasing, THEN stop the injection pump. IF NOT, THEN start an additional injection pump.

5.3.4 (cont'd)

5. The logic word THEN should not be used at the end of an action to instruct the operator to perform another action within the same step, because it runs actions together. Actions which are embedded in this way (1) may be overlooked and not be performed, (2) make it difficult to verify the performance of each action step, and, (3) can be confused with a logic statement.

EXAMPLE

Verify all SI accumulators are isolated, THEN cooldown pressurizer with auxiliary spray. (Unacceptable)

6. Action steps will normally be performed in sequence so that a conjunction such as "and" is not required between the steps. However, in the case of combinations of conditions, the word AND should be placed between the description of each condition.

EXAMPLE

IF RCS pressure is increasing,
AND pressure level is increasing,
AND RCS temperature is increasing,
THEN go to Step 24.

7. In order to simplify a long sequence of conditions, the word AND should not be used to join more than four conditions. If more than four conditions need to be joined, a list format should be used.

EXAMPLE

IF all of the following conditions are met,

a) Condition 1
b) Condition 2
c) Condition 3
d) Condition 4
e) Condition 5
:
:

THEN (action)

5.3.4 (Cont'd)

8. When used as a simple or compound conjunction, the word "and" need not be emphasized (e.g., to connect actions in a step, as in: "stop low-head SI pumps and place them in standby").

9. The word OR should be used to call attention to alternative combinations of conditions. The use of the word OR, for conditions, should be in the inclusive sense. (i.e., any one or all conditions may be present.)

EXAMPLE

IF RCS pressure is less than or equal to ruptured Steam Generator pressure,

OR

IF Pressurizer level is greater than 20%,

THEN stop RCS depressurization.

10. For alternative actions, the use of OR should be minimized and priorities should be established where possible. If priorities cannot be established, and alternative actions are equally acceptable, then it is necessary to specify the exclusive "or" using an approach similar to the following:

EXAMPLE

Start either EDG A OR EDG B, but not both.

5.3.4 (Cont'd)

11. The use of AND and OR, along with IF and THEN, within the same step should be avoided. When AND and OR are used together, the logic statements can be confusing and ambiguous.

EXAMPLE

IF condition A AND condition B OR condition C occurs,
THEN go to Step 26. (unacceptable)

This statement has two possible meanings:

a. IF both condition A AND condition B occur,
THEN go to Step 5.3.6.

OR

IF condition C occurs,
THEN go to Step 5.3.6.

b. IF both condition A AND condition B occur,
THEN go to Step 5.3.6.

OR

IF both condition A AND condition C occur,
THEN go to Step 5.3.6.

If the use of AND and OR within the same step cannot be avoided, the more explicit form (as illustrated in a. and b. above) should be used.

5.3.5 Notes and Cautions

1. Because the present action step wording is reduced to the minimum essential, certain additional information is sometimes desired, or necessary. This non-action information is presented as either a NOTE or a CAUTION.

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

3. CAUTION denotes some potential hazard to personnel or equipment associated with the following instructional step. NOTE is used to present advisory or administrative information necessary to support the following action instruction. CAUTIONs and NOTEs may also advise in a passive voice regarding actions or transitions which may become necessary due to change in plant conditions.

4. As a general rule, neither a CAUTION or a NOTE shall contain an instruction/operator action; however, reference may be made to expected actions in progress.

5. CAUTIONs precede NOTEs when they occur together unless the NOTE contains information which clarifies the CAUTION.

6. CAUTIONs shall be highlighted as shown below:

CAUTION

7. NOTESs shall be highlighted as shown below:

NOTE

8. CAUTIONs and the first applicable step shall not be split between pages. CAUTIONs themselves shall also not be split between pages.

9. NOTEs and the first applicable step shall not be split between pages. NOTEs themselves shall also not be split between pages.

5.3.6 Transitions to Other Procedures or Steps

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

EXAMPLE

Go to ES-0.1, REACTOR TRIP RESPONSE, Step 1

2. Transitions shall not contain a "return" feature (e.g., perform steps X through Y in some other procedure and then return).

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

EXAMPLE

Go to Step 20

4. Transitions to an earlier step in a procedure are specified by using the words "return to".

EXAMPLE

Return to Step 2

5. Transitions to a step which is preceded by a CAUTION or NOTE may include special wording (in ALL CAPITAL LETTERS) to emphasize that the CAUTION or NOTE is to be observed.

EXAMPLE

IF conditions are NOT satisfied, THEN go to Step 22. OBSERVE CAUTION PRIOR TO STEP 22.

5.3.6 (Cont'd)

6. Referencing in procedure usage is when the sequence of an activity proceeds through a series of steps in one procedure then is continued by reference to another procedure. Referencing should be limited to complex operations. Referencing should not be used to prescribe a few steps in a sequence. It is more appropriate to incorporate those few steps into both procedures.

7. As a general rule, procedures should be written so that steps can be performed without obtaining additional information from persons or documents not specified by the step.

8. Branching is the term used to describe the condition where alternative sequences must be followed to complete a procedure. For example, a procedure may state "IF conditions are NOT satisfied, THEN perform actions specified in Enclosure 1. IF conditions are satisfied, THEN proceed with Step 22."

9. Branching within procedures is to be avoided when practicable. Branching is likely to lead to errors in implementation by interrupting the flow of instructions. Procedures should be self-sufficient and continuous to the maximum practical extent.

5.3.7 Component Identification

1. Equipment, controls and displays should be identified as on equipment tagging. Standard abbreviations which may be used throughout the procedures are listed alphabetically in AP-0103.37, Standard Acronyms, and Abbreviations.

2. Where similar components are used in both primary and secondary systems, it is always necessary to clarify the location, even if the wording appears redundant.

3. Location information should also be provided if the components are infrequently used or if there would otherwise be a possibility of operator confusion.

EXAMPLE

Reset lockout relay in Penetration Room for Backup Group A.

5.3.8 Level of Detail

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

   a. Use "start/stop" for power-driven rotating equipment.

   b. Use "open/close/throttle" for valves.

   c. Use "control" to describe a manually maintained process variable (flow, level, temperature, pressure).

   d. Use "trip/close" for electrical breakers.

   e. Use "place in standby" to refer to equipment when actuation is to be controlled by available (e.g., not reset or blocked) automatic logic circuitry.

5.3.9 Figures

1. If needed to clarify operator action instructions, figures shall be added to a procedure. Any figure used should be constructed to fit within the pre-printed page format. Certain rules of construction shall apply:

   a. All wording on the figure should be at least as legible (type size and spacing) as the instruction steps in the procedures.

   b. Each figure should occupy a complete page and should be uniquely identified by a figure and title. The figure number should consist of the procedure designator, without punctuation, followed by a hyphen and an integer. Multiple figures shall be assigned sequential integers.

EXAMPLE

Figure ES-03-1

Figure FR-13-1

   c. Figure titles should explain the intent or content of the figure.

   d. The figure number and title will be placed at the top of the page just above the pre-printed border.

   e. If the figure is a graph, all the numbers and wording should be horizontal and the independent variable should be plotted on the horizontal (X) axis. Grid line density should be consistent with the resolution expected from the graph. Any labeling required on the graph should have a white (not graph) background.

   f. All figures for a procedure are numbered sequentially and are located immediately after the instruction step pages. Figure pages are numbered as pages of that procedure.

   g. References to a figure from an action step should use only the figure number and not the title.

5.3.10 Tables

1. Tables may be used within the text of a procedure to clearly present a large number of separate options. A table shall immediately follow the step or substep which makes use of it. Therefore, it does not require a unique number and title. Any table should be completely enclosed by a distinct outline; if necessary, it may extend into the adjacent column because of this delineation.

2. All information presented in a table shall be at least as legible (type size and spacing) as the instruction steps in the procedure.

3. All columns and rows of information in a table should be defined by solid lines.

4. All column and row headings shall be presented in ALL CAPITAL LETTERS.

5.3.11 Attachments

1. Supplementary information or detailed instructions which would unnecessarily complicate the flow of a procedure may be placed in an attachment to that procedure.

2. Attachments are identified by the title "ATTACHMENT" followed by a single letter designator. This title is centered at the top of a standard format page. The pre-printed title blocks should be the same as for the procedure. Attachments should use a single- column, full-page-width format.

3. Physically, Attachments should be located after any Figures belonging to the procedure. Attachment pages are numbered in sequence with normal procedure pages.

5.3.12 Foldout Page

1. A foldout page shall be supplied for each procedure that contains the note "Foldout Page should be open" prior to Step 1. Its page number shall reflect its position in that procedure. The foldout page will be titled "FOLDOUT FOR E-X SERIES PROCEDURES", and should use a single-column, full-page-width, format.

2. Each set of operator information shall be numbered sequentially and have an explanatory title. The title shall be capitalized and underlined for emphasis. This page contains those important actions which can be performed at any step in the applicable procedure.

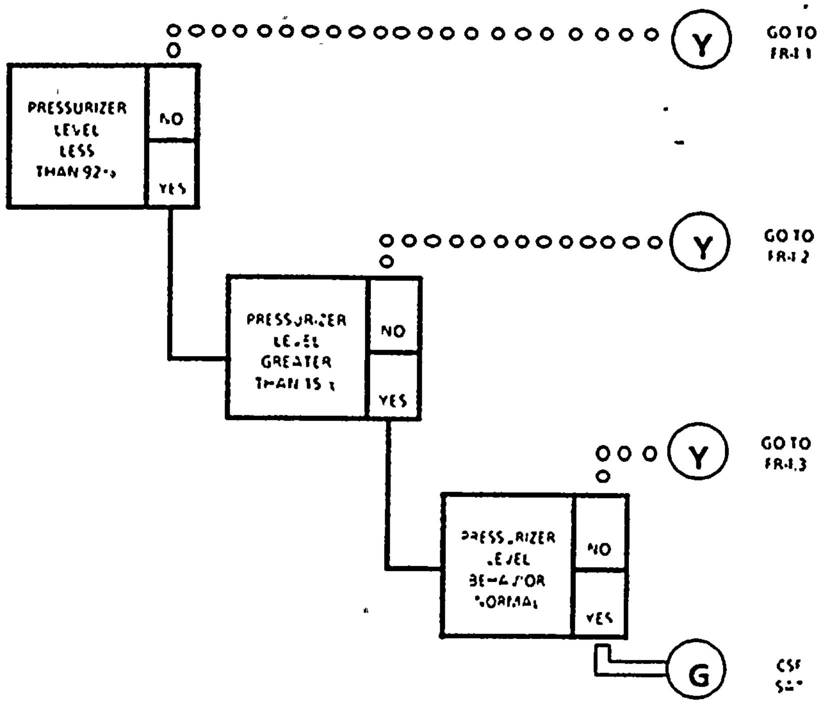
3. "Foldout Pages" are so called because of the original intent for these pages to fold open for operator reference during emergency operating conditions. In practice, such foldout pages are subject to wear that may lead to tearing. Therefore, it is not a requirement that "foldout pages" be designed to fold open. The actual form of the foldout page will be determined by the Operations Department and Document Control Department.

4. An Example of a formatted Foldout Page is provided for writer reference in Enclosure 4, EOP Foldout Page Sample Format.

5.3.13 Status Tree Format

1. Critical Safety Function Status Trees shall be presented in "block" style. The trees shall be oriented vertically on the page.

EXAMPLE



2. Color-codes and line-pattern-codes specified in Enclosure 2 shall be used from each last branch point to its terminus.

3. Each Status Tree shall have at the top of the page, a designator block identical to that used in the standard procedure format, and containing the same information.

4. Statements shall be worded so that the favorable response is the yes exit. Termini shall be ordered so that REDs are uniformly at the top and GREENs at the bottom. Termini order should be RED - ORANGE - YELLOW - GREEN if possible.

5.4 Mechanics of Style

5.4.1 Spelling

1. All spelling should be consistent with modern usage as specified in the Webster's Third New International Dictionary and Webster's New Collegiate Dictionary.

5.4.2 Punctuation

1. Punctuation should be used only as necessary to aid reading and prevent misunderstanding. Word order should be selected to require a minimum of punctuation. The following rules apply:

   a. Use a colon to indicate that an item or a list of items is to follow.

EXAMPLE

Stop the following equipment:

   b. Use a comma after conditional phrases for ease of reading.

EXAMPLE

IF level exceeds 50%, THEN ...

   c. Use a period to indicate the end of complete sentences (except for imperative sentences appearing as left-hand column action steps) and for indicating the decimal place in numbers.

5.4.3 Capitalization

1. Capitalization shall be used in the procedures for emphasis in the following cases:

   a. Logic terms shall be capitalized and underlined.

   b. Expected responses (left-hand column of instructions) are capitalized.

   c. Titles of procedures should be completely capitalized whenever referenced within any procedure.

   d. Abbreviations are commonly capitalized.

   e. Section headings on foldout pages are capitalized and underlined.

5.4.4 Vocabulary

1. Words used in the procedures should convey precise meaning to the trained operator. Simple words having few syllables are preferred. These are typical of words in common usage.

2. Verbs with specific meaning should be used. The verb should exactly define the task expected to be performed by the operator. A list of acceptable verbs is included as Enclosure 3, Action Verbs. The list is not inclusive and is placed as an example in the procedure.

3. Some words have unique meanings as listed below:

   a. Manual (manually) - an action performed by the operator in the Control Room. (The word is used in contrast to an automatic action, which takes place without operator intervention.)

   b. Local (locally) - an action performed by an operator outside the Control Room.

EXAMPLE

"Locally close valve" means directly turning a handwheel to close a valve.

4. Certain other words are to be avoided simply because they are not defined when used without modification. These include: approximately, rapidly and slowly. The same words become acceptable when some clarification is provided; clarification is provided; clarification normally is part of a lower-level substep.

EXAMPLE

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

5. Inequalities are to be expressed in words rather than symbols: i.e., "greater than, less than". These words are always appropriate for comparing pressures, temperatures, levels and flowrates. The words "above" and "below" should not be used in this context.

5.4.5 Numerical Values

1. All numerical values presented in the procedures should be consistent with what can be read on instruments in the Control Room (i.e., consistent with instrument scale and range).

2. The number of significant digits presented should be equal to the reading precision of the operator.

3. Acceptance values should be stated in such a way that any addition and subtraction operations are avoided, if possible. This is done by stating acceptance values as limits.

EXAMPLE

250 psig maximum
350°F minimum
between 450°F and 500°F

4. Tolerances can be expressed by stating the normal value followed by the acceptable range in parenthesis.

EXAMPLE

550°F (540°F to 560°F) - Correct

550°F + 10°F - Incorrect

5. Engineering units should always be specified when presenting numerical values for process parameters. They should be the same as those used on the Control Room displays.

5.4.6 Abbreviations and Acronyms

1. Abbreviations and acronyms should be limited to those commonly used by operators. Abbreviations and acronyms should be used only to simplify complicated expressions.

2. Abbreviations and acronyms should be consistent with control panel markings and units of measure used in procedures. Abbreviations and acronyms should be used in the same format as they are shown in AP-0103.37, Standard Acronyms and Abbreviations.

5.5 Reproduction

5.5.1 Quality of Reproduction

1. Reproduction will normally be performed by the Document Control Department.
2. All copies will be checked for readability. The quality of EOP copies should approximate the quality of the originals.
3. All copies will be checked to insure that all four (4) borders are visible.

5.6 Basis Documents

5.6.1 A Basis Document shall be prepared for each Emergency Operating Procedure, providing explanatory and other background information regarding the content of its associated procedure. Purposes of the Basis Document are as follows:

1. The Basis Document is intended to serve as a reference source for personnel making procedure changes. This is to help ensure that identified regulatory and other audit commitments are not deleted, and that other procedure changes are not made without sufficient justification.
2. The Basis Document is intended to serve as a reference source for personnel training.

5.6.2 Each basis document shall have the same alphanumeric designator as its associated procedure.

EXAMPLE

Procedure Number/Title	*Basis Document Number/Title*
3-EOP-E-0, Reactor Trip or Safety Injection	*3-BD-EOP-E-0, Reactor Trip or Safety Injection*

5.6.3 Revision and Dating

1. When a revision to a procedure is approved, appropriate modifications shall be made to its Basis Document when necessary.
2. If an approved procedure change does not alter the content of a procedure's Basis Document, the Basis Document need not be re-dated.
3. Changes to Basis Documents which do not involve changes to the associated procedure(s) may be made. Such changes shall be approved by the Procedure Upgrade Supervisor or his Procedures Upgrade Program (PUP) Group designee.

5.6.4 Basis Document Contents

1. The originator of a Basis Document shall determine the contents of the initial draft of the Basis Document. The originator of the associated procedure should originate the initial draft of the Basis Document.

2. Basis Documents should include the identification of commitments fulfilled by implementation of the procedure and the source(s)/bases of the commitments; e.g. CTRAC, Technical Specifications, FSAR, PLS Document, Plant Curve Book, ASME Codes, ANSI Standards.

3. Basis Documents should include sources of other technical information in the procedure; e.g. Acceptance Criteria, equipment tolerances, setpoints, limitations.

4. Basis Documents may include additional explanatory and background information as deemed appropriate by personnel preparing or updating the Basis Documents. This information may include explanation of symptoms or entry conditions, or instruction steps that are not readily apparent. It should include explanations of critical step sequences that are not readily apparent and/or consequences of changing or not following the sequence.

5. References to individual procedure step or substep numbers should be minimized in Basis Documents. This is intended to reduce the number of Basis Document revisions made necessary by minor step changes in the associated procedure.

6. Explanatory information may be provided, but is not required in the Basis Document for the following EOP sections:

   a. Purpose

   b. Symptoms or Entry Conditions

   c. Figures

   d. Attachments

   e. Foldout Page

5.7 Transition Document

5.7.1 Use of Transition Documents

1. The Transition Document is used to indicate to the Plant Nuclear Safety Committee where the information is located in the old procedure in respect to an upgrade procedure.

5.7.1 (Cont'd)

2. Topics in the old procedure shall be enclosed in a block and a reference made to the location of the old information. If the information has been deleted, this shall be indicated and a general reason stated.

EXAMPLE

EMERGENCY OPERATING PROCEDURE 20000 (E-0), Page 4
IMMEDIATE ACTIONS AND DIAGNOSTICS

NOTE 1

5.1.3 Verify the following:

1. Safety Injection flow (FI--943) from at least one train is being delivered on the reactor coolant system when the Reactor Coolant System pressure is below the safety injection pump shutoff head (approximately 1400 psig.) If not, attempt to operate equipment manually or locally.*

NOTE 2

NOTE: Safety Injection initiation with flow to the core is an UNUSUAL EVENT. Notify the Plant Supervisor-Nuclear.

NOTE 3

2. Auxiliary Feed water flow from at least one train is being delivered to the steam generators. If not, attempt to operate equipment manually or locally.

TRANSITION DOCUMENT:

NOTE 1

This information is now presented in E-O Step 3.

NOTE 2

This information is now presented in EP-20101.

NOTE 3

This information is now presented in E.0 Step 3.

5.7.1 (Cont'd)

3. This transition document shall be included with the upgrade procedures generated from the Procedure Development Group.

END OF TEXT

ENCLOSURE 1
(Page 1 of 1)

EOP SAMPLE PAGE FORMAT

3-EOP-E-0	REACTOR TRIP OR SAFETY INJECTION	8 / 6/16/87

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Verify Containment Spray Not Required:	
	a Containment pressure - HAS REMAINED LESS THAN 20 PSIG	a Perform the following: 1) Verify containment spray initiated. IF NOT, THEN manually initiate. 2) Verify containment isolation Phase B valves closed. IF NOT, THEN manually close valves. 3) Stop all RCPs
15	Verify SI Flow	
	a RCS pressure - LESS THAN 1588 PSIG [1993 PSIG]	a Go to Step 16
	b High-head SI pump flow indicators - CHECK FOR FLOW	b Manually start pumps and align valves
	c RCS pressure - LESS THAN 225 PSIG [630 PSIG]	c Go to Step 16
	d RHR pump flow indicators - CHECK FOR FLOW	d Manually start pumps and align valves

CAUTION

In the event both units require AFW under natural circulation conditions and Train 1 of AFW is inoperable, within 3 minutes the AFW flow controllers should be placed in manual and flow adjusted to 300 GPM per unit, rather than the 130 GPM per S/G value given in Step 16.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	Verify Total AFW Flow - GREATER THAN 130 GPM per S/G	Manually start pumps and align valves as necessary. IF AFW flow greater than 130 GPM per S/G can NOT be established, THEN go to FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, Step 1
17	Verify AFW Valve Alignment - PROPER EMERGENCY ALIGNMENT	Manually align valves as necessary
18	Verify SI Valves That Receive A SI Signal Have Assumed Their Required Position As Indicated By Bright Amber Lights On VPB	Manually align valves as necessary

• MBS:tf
DRAFT 7/1/87

ENCLOSURE 2
(Page 1 of 1)

STATUS TREE PRIORITY IDENTIFICATION SYMBOLS

STATUS TREE PRIORITY IDENTIFICATION

Color	Line Code	Color Code	Status/Response
Red	▭	R	The critical safety function is under extreme challenge; immediate operator action is required.
Orange	□□□□□	O	The critical safety function is under severe challenge; prompt operator action is required.
Yellow	○○○○○	y	The critical safety function condition is off - normal. Operator action may be taken.
Green	▭	G	The critical safety function is satisfied. No operator action is needed.

ENCLOSURE 3
(Page 1 of 3)

ACTION VERBS

Actuate	To put into action or motion; commonly used to refer to automated, multi-faceted operations
Align	To arrange components into a desired configuration
Allow	To permit a stated condition to be achieved prior to proceeding, for example, "allow discharge pressure to stabilize"
Block	To inhibit an automatic actuation
Check	To perform a comparison with a procedural requirement "Check if SI can be terminated"
Close	To change the physical position of a mechanical device so that it prevents physical access or flow or permits passage of electrical current, for example, "close valve V2530"
Complete	To accomplish specified procedural requirements, for example, "complete valve checkoff list "A", "complete data report QA-1," "complete steps 7 through 9 of Section III "
Continue	To go on with a particular process
Control	To manually operate equipment as necessary to satisfy guideline requirements on process parameters: pressure, temperature, level, flow, etc.
Decrease	Avoid use because of oral communication problems. To cause a reduction in inventory.
Determine	To calculate or evaluate using formulae or graphs
Energize	To supply electrical energy to (something); commonly used to describe an electrical bus or other dedicated electrical path
Enter	To insert into or add to; commonly used in reference to plant-specific additions
Establish	To make arrangements for a stated condition, for example, "establish communication with Control Room"
Evaluate	To examine and decide; commonly used in reference to plant conditions and operations
Equalize	To make the value of a given parameter equal to the value of another parameter

ENCLOSURE 3
(Page 2 of 3)

ACTION VERBS

Increase	To make or become greater or larger. (Avoid its use because of oral communication problems)
Initiate	To begin a process
Inspect	To measure, observe, or evaluate a feature or characteristic for comparison with specified limits; method of inspection should be included, for example, "visually inspect for leaks"
Load	To connect an electrical component or unit to a source of electrical energy, may involve a "start" in certain cases.
Lower	To decrease, as in setpoint, flow, pressure, etc.
Maintain	To control a given plant parameter to some guideline requirement continuously
Minimize	To make as small as possible
Monitor	Similar to "check", except implies a continuous activity
Open	To change the physical position of a mechanical device, such as valve or door to the unobstructed position that permits access or flow, for example, "open valve IFP143"
Operate	To turn on or turn off as necessary to achieve the stated objective
Place	To move a control to a stated position
Place in Standby	To return a piece of equipment to an inactive status but ready for start on demand; commonly used to refer to a mid-position on a switch labeled AUTO
Raise	To increase, as in setpoint, flow, pressure, etc.
Record	To document specified condition or characteristic, for example, "record discharge pressure"
Reset	To remove an active output signal from a retentive logic device even with the input signal still present; commonly used in reference to protection/safeguards logics in which the actuating signal is "locked-in". The reset allows equipment energized by the initial signal to be deenergized.

ENCLOSURE 3
(Page 3 of 3)

ACTION VERBS

Sample	To take a representative portion for the purpose of examination; commonly used to refer to chemical or radiological examination
Set	To physically adjust to a specified value an adjustable feature, for example, "set diesel speed to ...rpm"
Shut down	To deenergize equipment and place in standby
Start	To originate motion of an electric or mechanical device directly or by remote control, for example, "start...pump"
Stop	To terminate operation, for example, "stop...pump"
Throttle	To operate a valve in an intermediate position to obtain a certain flow rate, for example, "throttle valve V6550 to..."
Trip	To manually activate a semi-automatic feature, for example, "trip breaker..."
Vent	To permit a gas or liquid confined under pressure to escape at a vent, for example, "vent...pump"
Verify	To observe an expected condition or characteristic, for example, "verify discharge pressure is stable"

ENCLOSURE 4
(Page 1 of 1)

EOP FOLDOUT PAGE SAMPLE FORMAT

FOLDOUT FOR E-0 SERIES PROCEDURES

1 RCP TRIP CRITERIA

Trip all RCPs if BOTH conditions listed below occur

a High-head SI pumps - AT LEAST ONE RUNNING

b RCS Subcooling - LESS THAN 25 F [65°F]

2 SI ACTUATION CRITERIA

Actuate SI and go to E-0, REACTOR TRIP OR SAFETY INJECTION, Step 1, if EITHER condition listed below occurs

- RCS SUBCOOLING BASED ON CORE EXIT TCs - LESS THAN 30 F [45° F]
- PRZ LEVEL - CANNOT BE MAINTAINED GREATER THAN 12% [50%]

3 RED PATH SUMMARY

a SUBCRITICALITY - Nuclear power GREATER THAN 5%

b CORE COOLING - Core exit TCs GREATER THAN 1200 F

c HEAT SINK - Narrow Range level in all S/Gs LESS THAN 32% AND total feedwater flow LESS THAN 130 GPM per S/G

d INTEGRITY - Cold leg temperature decrease GREATER THAN 100 F in last 60 minutes AND RCS cold leg temperature LESS THAN 317 F

e CONTAINMENT - Containment pressure GREATER THAN 59 PSIG

4 CST MAKEUP WATER CRITERIA

Makeup water sources for the CST will be necessary if level decreases to LESS THAN 10%

5 HYDROGEN ANALYZER START CRITERIA

Hydrogen analyzer should be placed in service per Attachment A of E-0 within 30 minutes of a valid safety injection signal

6 ADVERSE CONTAINMENT CONDITIONS

Adverse Containment conditions are defined as either a Containment Atmosphere temperature of 180°F or Containment radiation levels equal to or greater than 1 3 x 10⁵ R/hr Under these conditions the setpoint values in brackets, [ ], are required to be used

If the Containment temperature subsequently falls below 180 F, the normal setpoint values may be used If the Containment radiation level subsequently falls below 1 3 x 10⁵ R/hr, the adverse Containment setpoints are required to be used until permission is granted by the Technical Support Staff to use normal setpoints

FINAL PAGE

• -IFv c'

Florida Power & Light Company

Turkey Point Nuclear Plant

0-ADM-110

Title:

Verification Guideline for Emergency Operating Procedures

Safety Related Procedure

Responsible Department:	Procedure Upgrade
Reviewed by PNSC:	XX-XXX
Approved by Plant Manager-N:	XX/XX/XX

MBS tf
DRAFT 7 1 87

LIST OF EFFECTIVE PAGES

TABLE OF CONTENTS

1.0 PURPOSE

1.1 Purpose

The purpose of this procedure is to guide the administrative process used in the verification of the emergency operating procedures (EOPs) and to assign responsibilities for carrying out the activities of the process.

1.2 Scope

This procedure identifies and directs the phases of the verification process.

1.3 Applicability

This procedure applies to Unit 3 and Unit 4 of the Turkey Point Plant Emergency Operating Procedures.

2.0 REFERENCES/RECORDS REQUIRED/COMMITMENT DOCUMENTS

2.1 References

2.1.1 0-ADM-100, Procedure Preparation, Review, and Approval

2.1.2 0-ADM-109, Writers Guide for Emergency Operating Procedures

2.1.3 0-ADM-111, Emergency Operating Procedure Validation Plan

2.1.4 INPO 83-004 - Emergency Operating Procedures Verification Guideline

2.2 Records Required

2.2.1 None

2.3 Commitment Documents

2.3.1 None

3.0 RESPONSIBILITIES

3.1 Plant Manager-Nuclear

The Plant Manager - Nuclear shall approve all EOPs and revisions.

3.2 Procedures Upgrade Supervisor

The Procedures Upgrade Supervisor shall have overall responsibility for the EOP verification process. He shall determine when EOP verification is needed and its scope. He shall approve the verification resolutions.

The Procedure Upgrade Supervisor shall manage the written correctness and technical accuracy evaluation process, including reviews conducted in accordance with 0-ADM-100, Procedure Preparation, Review, and Approval.

4.0 DEFINITIONS

4.1 Emergency Operating Procedures (EOPs)

Plant procedures directing operator action necessary to mitigate the consequences of transients and accidents that cause plant parameters to exceed reactor protection system setpoints, engineered safety features setpoints, or other appropriate technical limits.

4.2 EOP Source Documents

Documents or records upon which EOPs are based.

4.3 EOP Technical Accuracy

A characteristic of EOPs that indicates the degree to which proper incorporation of generic and/or plant-specific technical information from EOP source documents and plant hardware has been made.

4.4 EOP Verification

The evaluation performed to confirm the written correctness of the EOPs and to ensure that the generic and/or plant-specific technical aspects have been properly incorporated.

4.5 EOP Written Correctness

A characteristic of EOPs that indicates the degree to which proper incorporation of information from the PTP Writers Guide for EOPs and other appropriate administrative policies has been made.

4.6 Emergency Response Guidelines (ERGs)

The detailed and complete network of generic emergency response guidance developed by the Westinghouse Owners Group for Westinghouse plants. The guidance includes Optimal Recovery Guidelines, Critical Safety Function Status Trees and Function Restoration Guidelines.

5.0 PROCEDURE

5.1 EOP Verification Process

NOTE

The process of EOP verification consists of four phases: preparation, assessment, resolution, and documentation.

5.1.1 Preparation Phase

1. The preparation phase consists of the following activities:

   a. Designate Personnel: The Procedure Upgrade Supervisor shall appoint the necessary personnel as evaluators to conduct the comparative evaluation. Personnel should be appointed based on operating experience and understanding of plant hardware, the ERGs, and the writers guide. Personnel may include operators, subject matter experts. and procedure writers.

   b. Obtain and Review the EOP Source Documents: The listing of EOP source documents is provided on Attachment 1. General Verification Checklist. These shall be reviewed by the personnel conducting the assessment phase to ensure they are complete, current, and applicable. Any additional applicable source documents shall be listed.

5.1.2 Assessment Phase

1. During the assessment phase, each upgrade Emergency Operating Procedure shall undergo the review process specified in 0-ADM-100, Procedure Preparation, Review, and Approval.

2. In addition, EOP assessment shall include additional evaluation in which the evaluator shall:

   a. Make a general review of the EOP using the procedure-specific portion of the evaluation criteria and source documents.

   b. Indicate on Attachment 1, General Verification Checklist. that the evaluation was performed, either by initialing indicating acceptance or by designating the appropriate discrepancy on Attachment 3. Discrepancy Sheet,

      OR

      Indicate in a summary report that the evaluation was performed, indicating acceptance in the report and/or designating discrepancies within the report.

5.1.2.2 (Cont'd)

c. Make a step-by-step review of the EOP using the step, caution, note-specific portion of the evaluation criteria and source documents.

d. Complete Attachment 2, Technical Accuracy Checklist Verification , and forward the verification checklist with any discrepancy sheets to the Procedure Upgrade Supervisor,

OR

Utilize the summary report format specified in 5.1.2.2.b.

5.1.3 Resolution Phase

1. In the resolution phase, the Procedure Upgrade Supervisor shall:

a. Review the evaluator's comments and resolve any conflicts between the writers' and evaluators' comments.

b. Update applicable source documents and procedures with approved resolutions as directed by the Procedure Upgrade Supervisor.

5.1.4 Documentation Phase

1. The documentation associated with the development of Emergency Operating Procedures, and its associated retention requirements are delineated in 0-ADM-100, Procedure Preparation, Review, and Approval, and 0-ADM-109, Writers Guide for Emergency Operating Procedures.

END OF TEXT

ATTACHMENT 1
(Page 1 of 5)

GENERAL VERIFICATION CHECKLIST

EOP Title: ____________________

EOP Number: ____________ Revision: ____________

Unit: ____________

Revision/ Approval Date

1. Westinghouse Emergency Response Guidelines, (ERG) ______
2. Technical Specifications, Turkey Point Plant ______
3. FSAR, Turkey Point Plant ______
4. 0-ADM-109, Writers Guide for Emergency Operating Procedures ______
5. 0-ADM-100, Procedure Preparation, Review, and Approval ______
6. Other: ____________________ ______

____________________ ______

____________________ ______

1.0 PROCEDURE-GENERAL

1.1 Written Correctness

Initials

1.1.1 Legibility

______ a. Are the printed borders visible on all procedure pages?

______ b. Are the text, tables, graphs, figures, and charts legible to the evaluator?

1.1.2 EOP Format Consistency

______ 1. Do the following segments exist in each EOP:

a. TITLE

b. ENTRY CONDITIONS

c. OPERATOR ACTIONS

ATTACHMENT 1
(Page 2 of 5)

GENERAL VERIFICATION CHECKLIST

1.0 PROCEDURE-GENERAL

1.1 Written Correctness (Cont'd)

Initials

_______ 2. Is the operator actions segment presented in a dual-column format?

_______ 3. Is the page layout consistent?

1.1.3 Identification Information

_______ 1. Is the procedure title descriptive of the purpose of the procedure.

_______ 2. Does the cover sheet correctly provide the following:

a. Procedure title

b. Procedure number

c. Unit number

d. Revision date

e. Number of pages

_______ 3. Does each page correctly provide the following?

a. Procedure designator

b. Revision date

_______ 4. Does the procedure have all its pages in the correct order?

ATTACHMENT 1
(Page 3 of 5)

GENERAL VERIFICATION CHECKLIST

2.0 STEP, CAUTION, NOTE-SPECIFIC

2.1 Written Correctness

Initials

2.1.1 Information Presentation

________ 1. Are instruction steps numbered correctly?

________ 2. Are operator-optional sequence steps identified?

3. Are instruction steps constructed to comply with the following:

________ a. Steps deal with only one idea.

________ b. Sentences are short and simple.

________ c. Operator actions are specifically stated.

________ d. Objects of operator actions are specifically stated.

________ e. Objects of operator actions are adequately stated.

________ f. Punctuation and capitalization are proper.

________ g. Abbreviations are correct and understandable to the operator.

________ 4. Do instruction steps make proper use of logic structure?

________ 5. When an action instruction is based on receipt of an alarm, is the setpoint of the alarm identified?

________ 6. Are notes and cautions used appropriately?

________ 7. Are notes and cautions placed properly?

ATTACHMENT 1
(Page 4 of 5)

GENERAL VERIFICATION CHECKLIST

2.1 Written Correctness

2.1.1 Information Presentation (Cont'd)

Initials

8. Are notes and cautions constructed to comply with the following:

______ a. They do not contain operator actions.

______ b. They do not use extensive punctuation for clarity.

______ c. They make proper use of emphasis.

______ 9. Are numerical values properly written?

______ 10. Are values specified in such a way that mathematical operations are not required of the user?

______ 11. Is a chart or graph provided in the procedure for necessary operator calculations?

______ 12. Are units of measurement in the EOP the same as those used on equipment?

2.1.2 Procedure Referencing and Branching

______ 1. Do the referenced and branched procedures identified in the EOPs exist for operator use?

______ 2. Is the use of referencing minimized?

3. Are referencing and branching instructions correctly worked?

a. "go to" (branching)

______ b. "refer to" (referencing)

ATTACHMENT 1
(Page 5 of 5)

GENERAL VERIFICATION CHECKLIST

2.1 Written Correctness

2.1.2 Procedure Referencing and Branching (Cont'd)

Initials

_______ 4. Do the instructions avoid routing users past important information such as cautions preceding steps?

_______ 5. Are the exit conditions compatible with the entry conditions of the referenced or branched procedure?

Verification Completion Date: ______________________________

Performed By: ______________________________

____

____

____

Reviewed By: ______________________________

All actions required by the verification have been completed:

Approved: ____________________ Date: ____________________

ATTACHMENT 2
(Page 1 of 3)

TECHNICAL ACCURACY VERIFICATION CHECKLIST

EOP Title: ______________________________

EOP Number: ______________ Revision: ______________

Unit: ______________

Revision/
Approval
Date

1. Westinghouse Emergency Response Guidelines, (ERG) ______
2. Technical Specifications, Turkey Point Plant ______
3. FSAR, Turkey Point Plant ______
4. 0-ADM-109, Writers Guide for Emergency Operating Procedures ______
5. 0-ADM-100, Procedure Preparation, Review, and Approval ______
6. Other: ______________________________ ______

______________________________ ______

______________________________ ______

1.0 STEP, CAUTION, NOTE-SPECIFIC

1.1 Technical Accuracy

1.1.1 Entry Conditions or Symptoms Information

Initials

________ 1. Are the entry conditions of the ERG listed correctly?

ATTACHMENT 2
(Page 2 of 3)

TECHNICAL ACCURACY VERIFICATION CHECKLIST

1.1 Technical Accuracy (Cont'd)

1.1.2 Instructional Step, Caution, and Note Information

Initials

________ 1. Are EOP/ERG differences documented or in the Basis Document?

________ 2. Is the ERG technical foundation (strategy) changed by the following changes in EOP steps, cautions, or notes:

a. Elimination

b. Addition

c. Sequence

d. Alteration

________ 3. Are correct, plant-specific adaptations incorporated per ERG:

a. Systems

b. Instrumentation

c. Limits

d. Controls

e. Indications

________ 4. Have licensing commitments applicable to EOPs been addressed.

________ 5. Are differences between the licensing commitments and the EOPs or ERGs documented?

1.1.3 Quantitative Information

________ 1. Do the quantitative values, including tolerance bands, used in the EOP comply with applicable EOP source document?

ATTACHMENT 2
(Page 3 of 3)

TECHNICAL ACCURACY VERIFICATION CHECKLIST

1.1 Technical Accuracy

Initials

1.1.3 Quantitative Information (Cont'd)

______ 2. Where ERG values are not used in the EOP, are the EOP values computed accurately?

______ 3. When calculations are required by the EOP, are equations presented with sufficient information for operator use?

1.1.4 Plant Hardware Information

______ 1. Is the following plant hardware specified in the EOP available for operator use?

a. Equipment

b. Controls

c. Indicators

d. Instrumentation

Verification Completion Date: ______________________

Performed By: ______________________

____

____

____

Reviewed By: ______________________

All actions required by the verification have been completed:

Approved: ______________ Date: ______________

ATTACHMENT 3
(Page 1 of 1)

DISCREPANCY SHEET

DISCREPANCY SHEET

EOP:__________ Rev:______ Number__________ Step Number:______

Discrepancy: ______________________________

____

____

____

____

____

____

____

____

____

Evaluator:______________________ Date:__________

Resolution: ______________________________

____

____

____

____

____

____

____

____

Supervisor:______________________ Date.__________

Approved: Yes No (Circle one)

Operations Supervisor.______________________ Date.__________

Resolution Incorporated By.______________________ Date __________

FINAL PAGE

Florida Power & Light Company

Turkey Point Nuclear Plant

0-ADM-111

Title:

Emergency Operating Procedure Validation Plan

Safety Related Procedure	
Responsible Department:	Procedure Upgrade
Reviewed by PNSC:	XX-XXX
Approved by Plant Manager-N:	XX/XX/XX

LIST OF EFFECTIVE PAGES

Page		Page	Revision Date
1	XXXXX	17	XXXXX
2	XXXXX	18	XXXXX
3	XXXXX	19	XXXXX
4	XXXXX	20	XXXXX
5	XXXXX	21	XXXXX
6	XXXXX	22	XXXXX
7	XXXXX	23	XXXXX
8	XXXXX	24	XXXXX
9	XXXXX	25	XXXXX
10	XXXXX	26	XXXXX
11	XXXXX	27	XXXXX
12	XXXXX	28	XXXXX
13	XXXXX	29	XXXXX
14	XXXXX	30	XXXXX
15	XXXXX	31	XXXXX
16	XXXXX	32	XXXXX

TABLE OF CONTENTS

1.0 PURPOSE

1.1 This procedure provides guidance in the administrative process used in validation of the emergency operating procedures (EOPs) and to assign responsibilities for the process.

This procedure applies to EOP validation prior to implementation for Unit 3 and Unit 4 of Turkey Point Plant and re-validation of all EOPs on the Plant Specific Simulator upon simulator completion.

2.0 REFERENCES/RECORDS REQUIRED/COMMITMENT DOCUMENTS

2.1 References

2.1.1 PTP Technical Specifications

2.1.2 Turkey Point Plant FSAR.

2.1.3 Westinghouse Owners Group Emergency Response Guidelines, Revision 1, dated September 1982.

2.1.4 Emergency Operating Procedures Validation Guideline (INPO 83-006).

2.2 Records Required

2.2.1 None

2.3 Commitment Documents

2.3.1 None

3.0 RESPONSIBILITIES

3.1 Plant Manager Nuclear

The Plant Manager - Nuclear shall approve all EOPs and revisions.

3.2 Procedure Upgrade Supervisor

3.2.1 The Procedure Upgrade Supervisor shall be responsible for the following:

1. Managing the validation program and ensuring its smooth coordination with the training program.

2. Determining the scope of required validation.

3.2.1 (Cont'd)

3. Selecting the validation method or methods.

   a. Criteria for selecting validation methods for EOPs that cannot be validated on the simulator will be determined by the Procedure Upgrade Supervisor of his designee.

   b. Multiple unit scenarios will be validated using the simulator method or another method as determined by the Procedure Upgrade Supervisor.

4. Appointing an observer/reviewer team

   a. One person per operator for the walk-through validation method (one-on-one).

   b. One person for the table-top validation method (one-on-group).

   c. One person for observation of simulator exercises.

5. Reviewing discrepancies and resolutions forwarded to him by observer/review personnel.

6. Forwarding recommended resolutions and procedure changes to the Plant Manager for approval.

4.0 DEFINITIONS

4.1 Emergency Operating Procedure (EOPs)

Plant procedures directing operator actions necessary to mitigate consequences of transients and accidents that cause plant parameters to exceed reactor protection setpoints, engineered safety feature setpoints, or other appropriate technical limits.

4.2 Emergency Response Guidelines (ERGs)

Guidelines that provide technical bases for the development of EOPs.

4.3 EOP Source Documents

Documents or records upon which EOPs are based.

4.4 EOP Validation

The evaluation preformed to determine that the actions specified in the EOP can be followed by trained operators to manage the emergency conditions in the plant.

4.5 Mock-Up

Static device (e.g., models, photos, drawings) that portrays Control Room hardware and configuration.

4.6 Reference Validation

Method of validation whereby data developed in common EOP validation program is referenced by similar plants.

4.7 Scenario

A structural plan of parameter and plant symptom changes that provide operating cues for the conduct of assessment.

4.8 Table-Top Validation

Method of validation whereby personnel explain and/or discuss procedure actions steps for an observer/reviewer in response to a scenario or as part of an actual industry operating experience review.

4.9 Walk-Through Validation

Method of validation whereby Control Room operators conduct a step-by-step enactment of their actions during a scenario for an observer/review team without carrying out the actual control functions.

4.10 Simulator Validation

Method of validation whereby Control Room operators perform actual control functions on simulated equipment during a scenario for an observer/review team.

5.0 PROCEDURE

5.1 Table Top/Walk-Through Methods of Validation

NOTE

Regardless of the validation method, the EOP validation process can be described by the three phases of preparation, assessment, and resolution.

5.1.1 Preparation

1. Table top/walk-through validation method shall use the applicable evaluation criteria presented in Enclosure 1, Evaluation Criteria.

2. The designated reviewer shall be responsible for the following:

   a. Using and completing Attachment 2, EOP Validation Form.

   b. Reviewing the scope of the validation designated by the Procedure Upgrade Supervisor or his representative.

   c. Developing or modifying scenarios to support the scope of validation and filling out Attachment 3, Table-Top/Walk-Through Scenario Form.

   d. Modifying/selecting the developed evaluation criteria to support the scope of validation.

   e. Selecting operators that are representative of the training level expected of all the operators.

   f. Scheduling the needed resources for table-top:

      (1) Observer/reviewer

      (2) Operator(s) involved

      (3) Conference Room

      (4) Sets of EOPs and support procedures

   g. Scheduling the needed resources for walk-through

      (1) Observer/reviewer(s)

      (2) Operator(s) involved

      (3) Control Room or Control Room mock-up

      (4) Set of EOPs and support procedures

5.1.2 Assessment

1. Specific guidance for assessment using the Table Top/Walk-Through methods is presented on Enclosure 1, Evaluation Criteria.

2. The designated reviewer shall perform the following duties:

   a. Brief the operator on the scope of validation and how the assessment will be conducted.

   b. Follow the developed or modified scenario by first giving the plant initial conditions and then give the changing plant parameters as talking or walking through the procedures.

   c. Stop the talk-through or walk-through assessment for discussion of any identified discrepancies.

   d. Conduct a debriefing with the operators as soon as possible after each walk-through assessment, using the following sequence:

      (1) Brief the participants on the purpose and objectives for debriefing.

      (2) Have operators present problems and discrepancies which they had identified during assessment.

      (3) Have operators provide possible reasons for problems.

      (4) Present other problems and discrepancies identified during assessment.

      (5) Have operators describe possible reasons for the other problems.

      (6) Summarize the findings of the debriefing for the operators.

   e. Record discrepancies and comments on Attachment 1, Discrepancy Sheet.

5.1.3 Resolution

1. The designated observer/reviewer shall perform the following duties:

   a. Review comments and discrepancies.

   b. Propose resolutions on Attachment 1, Discrepancy Sheet, for the Procedure Upgrade Supervisor.

   c. Submit the validation package to the Procedure Upgrade Supervisor.

2. The Procedure Upgrade Supervisor shall perform the following duties:

   a. Review proposed resolutions with appropriate staff.

   b. Select resolutions for incorporation in the EOPs.

   c. Present the revised EOPs to the Plant Manager for approval.

3. The following documentation shall be submitted as a validation package:

   a. Completed Attachment 1, Discrepancy Sheet

   b. Completed Attachment 2, EOP Validation Form

   c. Completed Attachment 3, Table Top/Walk-Through Scenario Form

   d. Evaluation criteria used

5.2 Referenced Method of Validation

5.2.1 Preparation

1. The designated reviewer shall be responsible for the following:

   a. Using and completing Attachment 2, EOP Validation Form.

   b. Identifying all differences in hardware and shift manpower between the Turkey Point Plant Unit 3 or 4 and the referenced plant.

   c. Identifying the differences in the format and the level of detail between the EOP to be validated and the referenced EOP.

   d. Selecting the applicable data from the referenced validation.

5.2.2 Assessment

1. The designated reviewer shall be responsible for the following:

   a. Evaluation the differences in hardware and shift manpower.

   b. Evaluation the differences in the format and the level of detail.

   c. Recording discrepancies and comments on Attachment 1, Discrepancy Sheet, with the applicable data selected from the referenced validation.

5.2.3 Resolution

1. The designated reviewer shall perform the following duties:

   a. Review comments and discrepancies.

   b. Evaluate the potential impact of any differences between the EOP to be validated and the referenced validation.

   c. Propose resolution on completed Attachment 1, Discrepancy Sheet for the Procedures Upgrade Supervisor.

   d. Recommend EOP validation by table-top/walk-through method to confirm reference validation results.

2. The Procedures Upgrade Supervisor shall perform the following duties:

   a. Review the validation package.

   b. Determine the scope of validation needed to confirm the resolutions and initiate an Attachment 2, EOP Validation Form, if necessary.

   c. Present the revised EOPs to the Plant Manager for approval if subsequent validation is not required.

3. The following documentation shall be submitted with the validation package:

   a. Completed Attachment 1, Discrepancy Sheet

   b. Completed Attachment 2, EOP Validation Form used

   c. Reference validation package

   d. Selected reference data

5.3 Simulator Method of Validation

5.3.1 Preparation

1. The designated observer/review team will be responsible for the following:

   a. Completing the EOP Validation Form (Attachment 2).

   b. Reviewing the scope and the criteria of the validation as directed by the Procedures Upgrade Supervisor or his designee.

   c. Completing the simulator scenario form (Attachment 4).

   d. Developing Data Collection Techniques

   e. Evaluating plant-to-simulator characteristics.

   f. Proposing the evaluation criteria to support the scope of validation.

   g. Ensuring the EOPs and supporting documentation are maintained and available.

5.3.2 Assessment

1. The designated observer/reviewer will perform the following duties:

   a. Ensure the observer/reviewer team does not interfere or interact with the operating crew.

   b. Record discrepancies and comments on the Discrepancy Sheet (Attachment 1).

5.3.3 Resolution

1. The designated observer/reviewer will perform the following duties:

   a. Review comments and discrepancies.

   b. Propose resolutions on the Discrepancy Sheet to the Procedure Upgrade Supervisor.

   c. Submit the validation package to the Procedure Upgrade Supervisor.

   d. Review proposed resolutions with appropriate staff.

   e. Select resolutions for incorporation in the EOPs.

5.3.4 Evaluation Criteria

1. The Evaluation/Observation Guide (Attachment 5) will be administered by the designated observer/reviewer to assess the operational correctness of the EOP System.

5.3.5 The following documentation will be submitted with the Validation Program:

1. EOP Validation Form
2. EOP Simulator Scenario Form
3. EOP Discrepancy Sheet
4. EOP and Basis Document used for Validation
5. Evaluation Criteria Guide

5.4 Documentation

The documented items needed to provide a history of the validation program are specified on each validation method. These items shall be maintained as a validation package.

END OF TEXT

ENCLOSURE 1
(Page 1 of 3)

EVALUATION CRITERIA

LEGEND

x	=	*Applicable to the validation method*
o	=	*Not Applicable to the validation method*
T-T	=	*Table-top validation method*
W-T	=	*Walk-through validation method*

T-T	W-T		
		1.0	USABILITY
		1.1	LEVEL OF DETAIL
x	x	1.1.1	Is there sufficient information to perform the specified actions at each step?
x	x	1.1.2	Are the alternatives adequately described at each decision point?
x	x	1.1.3	Are the labeling, abbreviations, and location information as provided in the EOP sufficient to enable the operator to find the needed equipment?
x	x	1.1.4	Is the EOP missing information needed to manage the emergency condition?
x	x	1.1.5	Are the contingency actions sufficient to address the symptoms?
x	x	1.1.6	Are the titles and numbers sufficiently descriptive to enable the operator to find referenced and branched procedures?
		1.2	UNDERSTANDABILITY
x	x	1.2.1	Is the EOP easy to read?
x	x	1.2.2	Are the figures and tables easy to read with accuracy?
x	x	1.2.3	Can the values on figures and charts be easily determined?
x	x	1.2.4	Are caution and note statements readily understandable?
x	x	1.2.5	Are the EOP steps readily understandable?

ENCLOSURE 1
(Page 2 of 3)

EVALUATION CRITERIA

T-T	W-T		
		2.0	OPERATIONAL CORRECTNESS
		2.1	PLANT COMPATIBILITY
o	x	2.1.1	Can the actions specified in the procedure be performed in the designated sequence?
x	x	2.1.2	Are there alternate success paths that are not included in the EOPs?
o	x	2.1.3	Can the information from the plant instrumentation be obtained, as specified by the EOP?
o	o	2.1.4	Are the plant symptoms specified by the EOP adequate to enable the operator to select the applicable EOP?
o	o	2.1.5	Are the EOP entry conditions appropriate for the plant symptoms displayed to the operator?
o	x	2.1.6	Is information or equipment not specified in the EOP required to accomplish the task.
o	x	2.1.7	Do the plant responses agree with the EOP basis?
o	x	2.1.8	Are the instrument readings and tolerances stated in the EOP consistent with the instrument values displayed on the instruments?
o	x	2.1.9	Is the EOP physically compatible with the work situation (too bulky to hold, binding would not allow them to lay flat in work space, no place to lay the EOPs down to use)?
o	x	2.1.10	Are the instrument readings and tolerances specified by the EOP for remotely located instruments accurate?

ENCLOSURE 1
(Page 3 of 3)

EVALUATION CRITERIA

T-T	W-T		
		2.2	**OPERATOR COMPATIBILITY**
o	x	2.2.1	If time intervals are specified, can the procedure action steps be performed on the plant within or at the designated time intervals?
o	x	2.2.2	Can the procedure action steps be performed by the operating shift?
o	x	2.2.3	If specific actions are assigned to individual shift personnel, does the EOP adequately aid in the coordination of actions among shift personnel where necessary?
o	x	2.2.4	Can the operating shift follow the designated action step sequences?
o	x	2.2.5	Can the particular steps or sets of steps be readily located when required?
o	x	2.2.6	Can procedure exit point be returned to without omitting steps when required?
x	x	2.2.7	Can procedure branches be entered at the correct point?
x	x	2.2.8	Are EOP exit points specified adequately?

ATTACHMENT 1
(Page 1 of 1)

DISCREPANCY SHEET

EOP:__________ Rev:_____ Number_______ Step Number:_____

Discrepancy: ____________________________________

Evaluator:____________________ Date_________

Resolution: ____________________________________

Supervisor:____________________ Date_________

Approved: Yes No (Circle one)

Operations Supervisor _______________ Date_________

Resolution Incorporated By _______________ Date_________

ATTACHMENT 2
(Page 1 of 1)

EOP VALIDATION FORM

EOP Title: ______________________________

EOP Number: ______________ Revision: ______________

Scope of Validation: ______________________________

____

____

____

Designated Observer/Reviewer(s) ______________________________

____

____

____

____

____

Preparation Completed on ______________ By: ______________

Assessment Completed on ______________ By: ______________

Operator(s) Involved	Qualifications: (SRO,RO, Other)

Resolution Completed on ______________ By: ______________

Documentation Package Forwarded on ______________ By: ______________

*1-003 XXXXX

ATTACHMENT 3
(Page 1 of 1)

TABLE-TOP /WALK-THROUGH SCENARIO FORM

Procedure No.:________________

Title:____

Date:________________

Purpose: ____

Scenario Description: ____

Initial Plant Conditions: ____

Procedure Step Description	Plant Parameter Symptoms to Cause Transition	Transition to (Procedure, Step)

*3.004

ATTACHMENT 4
(Page 1 of 1)

SIMULATOR SCENARIO FORM

Procedure Title: ____________________

Procedure Number: ____________________

Date: ____________

Purpose: ____________________

____

____

____

Scenario Description: ____________________

____

____

____

Initial Plant Conditions: ____________________

____

____

Simulator Sequence:

Event Number	Malfunction Description	Intent

ATTACHMENT 5
(Page 1 of 13)

Evaluation Criteria Guide

I. USABILITY

A. Level of Detail

YES	NO	N/A		
☐	☐	☐	1.	Is there sufficient information to perform the specified actions at each step? Comment/Answer:________
☐	☐	☐	2.	Are the alternatives adequately described at each decision points? Comment/Answer:________
☐	☐	☐	3.	Are the labeling, abbreviations, and location information as provided in the EOP sufficient to enable the operator to find the needed equipment? Comment/Answer:________
☐	☐	☐	4.	Is the EOP missing information needed to manage the emergency condition? Comment/Answer:________
☐	☐	☐	5.	Are the contingency actions sufficient to address the symptoms? Comment/Answer:________
☐	☐	☐	6.	Are the titles and numbers sufficiently descriptive to enable the operator to find referenced and branched procedures? Comment/Answer:________
☐	☐	☐	7.	Can the particular steps or sets or steps be readily located when required? Comment/Answer:________

ATTACHMENT 5
(Page 2 of 13)

Evaluation Criteria Guide

I. USABILITY

A. Level of Detail (Cont'd)

YES NO N/A

☐ ☐ ☐ 8. Can procedure exit points be returned to without omitting steps when required?
Comment/Answer: ____________________

☐ ☐ ☐ 9. Can procedure branches be entered at the correct point?
Comment/Answer: ____________________

☐ ☐ ☐ 10. Are EOP exit points specified adequately?
Comment/Answer: ____________________

B. Understandability

☐ ☐ ☐ 1. Is the EOP easy to read?
Comment/Answer: ____________________

☐ ☐ ☐ 2. Are the figures and tables easy to read with accuracy?
Comment/Answer: ____________________

☐ ☐ ☐ 3. Can the values on figures and charts be easily determined?
Comment/Answer: ____________________

☐ ☐ ☐ 4. Are caution and note statements readily understandable?
Comment/Answer: ____________________

☐ ☐ ☐ 5. Are the EOP steps readily understandable?
Comment/Answer: ____________________

ATTACHMENT 5
(Page 3 of 13)

Evaluation Criteria Guide

II. OPERATIONAL CORRECTNESS

A. Plant Compatibility

YES	NO	N/A		
☐	☐	☐	1.	Can the actions specified in the procedure be performed in the designated sequence? Comment/Answer: ____
☐	☐	☐	2.	Are there alternate success paths that are not included in the EOPs? Comment/Answer: ____
☐	☐	☐	3.	Can the information from the plant instrumentation be obtained, as specified by the EOP? Comment/Answer: ____
☐	☐	☐	4.	Are the plant symptoms specified by the EOP adequate to enable the operator to select the applicable EOP? Comment/Answer: ____
☐	☐	☐	5.	Are the EOP entry conditions appropriate for the plant symptoms displayed to the operator? Comment/Answer: ____
☐	☐	☐	6.	Is information or equipment not specified in the EOP required to accomplish the task? Comment/Answer: ____
☐	☐	☐	7.	Do the plant responses agree with the EOP basis? Comment/Answer: ____

ATTACHMENT 5
(Page 4 of 13)

Evaluation Criteria Guide

II. OPERATIONAL CORRECTNESS

A. Plant Compatibility (Cont'd)

YES NO N/A

☐ ☐ ☐ 8. Is the EOP physically compatible with the work situation (too bulky to hold, binding would not allow them to lay flat in work space, no place to lay the EOPs down to use)?
Comment/Answer:______________________________

B. Operator Compatibility

☐ ☐ ☐ 1. If time intervals are specified, can the procedure action steps be performed on the plant within or at the designated time intervals?
Comment/Answer:______________________________

☐ ☐ ☐ 2. Can the procedure actions steps be performed by the operating shift?
Comment/Answer:______________________________

☐ ☐ ☐ 3. If specific actions are assigned to individual shift personnel, does the EOP adequately aid in the coordination of actions among shift personnel where necessary?
Comment/Answer:______________________________

☐ ☐ ☐ 4. Can the operating shift follow the designated action step sequences?
Comment/Answer:______________________________

ATTACHMENT 5
(Page 5 of 13)

Evaluation Criteria Guide

III. PROCEDURES/PLANT

YES NO N/A

☐ ☐ ☐ A. Can the actions specified in the procedure be performed in the designated sequence?

Comment/Answer:____

☐ ☐ ☐ B. Are alternate success paths found that are not included in the procedure?

Comment/Answer:____

☐ ☐ ☐ C. Can the procedure actions be performed on the plant at or within the designated time intervals?

Comment/Answer:____

☐ ☐ ☐ D. As specified in the procedure, can the operator obtain the necessary information from the plant instrumentation provided?

Comment/Answer:____

☐ ☐ ☐ E. Do the plant symptoms provide adequate information for the operator to select the applicable procedure?

Comment/Answer:____

☐ ☐ ☐ F. Does the operator have to use information or equipment not specified in the procedure to accomplish his task?

Comment/Answer:____

☐ ☐ ☐ G. Do the plant conditions seen by the operator correspond to what was in the procedure?

Comment/Answer:____

ATTACHMENT 5
(Page 6 of 13)

Evaluation Criteria Guide

III. PROCEDURES/PLANT (Cont'd)

YES NO N/A

☐ ☐ ☐ H. Can the operator use labeling, abbreviations, symbols, and location information provided in the procedures to find the needed equipment?

Comment/Answer:____

☐ ☐ ☐ I. Are the instrument responses consistent with the instrument values stated in the procedure?

Comment/Answer:____

☐ ☐ ☐ J. Are the operators able to distinguish the procedure from other procedures in the control room?

Comment/Answer:____

☐ ☐ ☐ K. Are the procedures physically compatible with the work situation (too bulky to hold, binding will not allow them to lay flat on work space, no place to lay the EOPs down to use)?

Comment/Answer:____

ATTACHMENT 5
(Page 7 of 13)

Evaluation Criteria Guide

IV. PROCEDURES/OPERATOR

YES NO N/A

☐ ☐ ☐ A. Are the procedure instructions compatible with the shift manpower?

Comment/Answer:____________________

☐ ☐ ☐ B. Can the procedure action be performed by the operating shift?

Comment/Answer:____________________

☐ ☐ ☐ C. Do the procedures help coordinate the actions of the operating shift?

Comment/Answer:____________________

☐ ☐ ☐ D. Is the operating shift able to follow the designated action step sequences?

Comment/Answer:____________________

☐ ☐ ☐ E. Do the plant conditions allow the operator to follow the action step correctly?

Comment/Answer:____________________

☐ ☐ ☐ F. Is there sufficient information to perform the specified actions at each step?

Comment/Answer:____________________

☐ ☐ ☐ G. Are all alternatives explicit at each decision point?

Comment/Answer:____________________

☐ ☐ ☐ H. Are the procedures missing information needed to manage the operating condition?

Comment/Answer:____________________

ATTACHMENT 5
(Page 8 of 13)

Evaluation Criteria Guide

IV. PROCEDURES/OPERATOR (Cont'd)

YES NO N/A

☐ ☐ ☐ I. Are the contingency actions sufficient?
Comment/Answer: ______

☐ ☐ ☐ J. Can the operator use title and numbers to find referenced or branched procedures?
Comment/Answer: ______

☐ ☐ ☐ K. Is the EOP easy to read?
Comment/Answer: ______

☐ ☐ ☐ L. Are the emphasized items noticed?
Comment/Answer: ______

☐ ☐ ☐ M. Are the values on figures and tables read easily and accurately?
Comment/Answer: ______

☐ ☐ ☐ N. Are caution and note statements complied with?
Comment/Answer: ______

☐ ☐ ☐ O. Is the organization of the procedures understood?
Comment/Answer: ______

☐ ☐ ☐ P. Is the procedure step complied with?
Comment/Answer: ______

ATTACHMENT 5
(Page 9 of 13)

Evaluation Criteria Guide

IV. PROCEDURES/OPERATOR (Cont'd)

YES	NO	N/A		
☐	☐	☐	Q.	Are the step sequences complied with? Comment/Answer:______
☐	☐	☐	R.	Can the operator find the particular step or set of steps when required? Comment/Answer:______
☐	☐	☐	S.	Can the operator return to the procedure exit point without omitting steps when required? Comment/Answer:______
☐	☐	☐	T.	Can the operator enter the branched procedure at the correct point? Comment/Answer:______
☐	☐	☐	U.	Can the operator exit from a given procedure at the correct branch? Comment/Answer:______

ATTACHMENT 5
(Page 10 of 13)

Evaluation Criteria Guide

V. OPERATOR/PLANT

YES	NO	N/A		
☐	☐	☐	A.	Are particular annunciators or instruments that the operator uses as cues adequate to make him realize that a step within a task should be expected? Comment/Answer:________
☐	☐	☐	B.	Are annunciators redundant? Does more than one alarm tell him the same information? Comment/Answer:________
☐	☐	☐	C.	Are controls reachable and displays readable for the appropriate system panel? Comment/Answer:________
☐	☐	☐	D.	Are the identification labels of instrumentation and controls sufficiently detailed to permit the operator to locate the panel and the particular control without resorting to other documentation? Comment/Answer:________
☐	☐	☐	E.	Do indications exist to allow the operator to determine that a step has been completed or that a condition has cleared? Does this indication convey the information satisfactorily? Comment/Answer:________
☐	☐	☐	F.	If the primary cues, controls, or indicators are not available, is there still some way to complete a given step? Comment/Answer:________

ATTACHMENT 5
(Page 11 of 13)

Evaluation Criteria Guide

V. OPERATOR/PLANT (Cont'd)

YES	NO	N/A		
☐	☐	☐	G.	If it is necessary for the operator to take some action when a parameter reaches a particular value, is the instrument for the parameter accurate and readable to that value? Comment/Answer:______
☐	☐	☐	H.	Are all instrument scales and ranges appropriate to the required reading precision? Comment/Answer:______

VI. TRAINING/PLANT

YES	NO	N/A		
☐	☐	☐	A.	Are all plant systems and equipment operated safely and correctly with the available controls and instrumentation? Comment/Answer:______
☐	☐	☐	B.	Is any system or equipment operated incorrectly due to a lack of understanding of a modification to that system or equipment? Comment/Answer:______
☐	☐	☐	C.	Is prompt and proper action taken in response to annunciators? Comment/Answer:______
☐	☐	☐	D.	Is information misinterpreted from controls and instrumentation? Comment/Answer:______
☐	☐	☐	E.	Are erroneous conclusions drawn from controls and instrumentation? Comment/Answer:______

ATTACHMENT 5
(Page 12 of 13)

Evaluation Criteria Guide

VII. TRAINING/OPERATOR

YES NO N/A

☐ ☐ ☐ A. Does one operator consistently direct the activities of the other operators? Are responsibilities designated among the operators?

Comment/Answer:____________________________________

____

☐ ☐ ☐ B. Does any verbal instruction between operators have to be repeated?

Comment/Answer:____________________________________

____

☐ ☐ ☐ C. Are any verbal instructions between operators not carried out?

Comment/Answer:____________________________________

____

D. For order that went from the control room to another station, does/did the other station

☐ ☐ ☐ 1. acknowledge the order

☐ ☐ ☐ 2. report when the order has been carried out

E. Does an error occur due to deficiencies in

☐ ☐ ☐ 1. manpower planning and staffing

☐ ☐ ☐ 2. supervisory control and coordination

☐ ☐ ☐ 3. monitoring

F. Does an error occur due to

☐ ☐ ☐ 1. failure to communicate or report information

☐ ☐ ☐ 2. operator workload being too high

ATTACHMENT 5
(Page 13 of 13)

Evaluation Criteria Guide

VIII. TRAINING/PROCEDURES

YES NO N/A

☐ ☐ ☐ A. Is sufficient information available to perform the specified action at each step?
Comment/Answer:____________________
____

☐ ☐ ☐ B. Are all alternatives explicit at each decision point?
Comment/Answer:____________________
____

☐ ☐ ☐ C. Can the operator use labeling, abbreviations, symbols, and location information provided in the procedures to find the needed equipment?
Comment/Answer:____________________
____

☐ ☐ ☐ D. Are the procedures missing information needed to manage the operating condition?
Comment/Answer:____________________
____

☐ ☐ ☐ E. Are the contingency actions sufficient?
Comment/Answer:____________________
____

☐ ☐ ☐ F. Can the operator use title and numbers to find referenced or branched procedures?
Comment/Answer:____________________
____

☐ ☐ ☐ G. Does an error occur due to revisions in the procedures?
Comment/Answer:____________________
____

FINAL PAGE

FLORIDA POWER AND LIGHT COMPANY
TURKEY POINT UNITS 3 AND 4
ADMINISTRATIVE PROCEDURE 0103.37
MARCH 17, 1987

1.0 Title:

STANDARDIZATION OF ACRONYMS AND ABBREVIATIONS

2.0 Approval and List of Effective Pages:

2.1 Approval:

Change Dated: 3/17/87 Reviewed by Plant Nuclear Safety Committee: 87-064

and Approved by Plant Manager - Nuclear: 3/17/87

2.2 List of Effective Pages:

Page	Date	Page	Date	Page	Date	Page	Date
1	3/17/87	10	3/17/87	19	3/17/87	28	3/17/87
2	3/17/87	11	3/17/87	20	3/17/87	29	3/17/87
3	3/17/87	12	3/17/87	21	3/17/87	30	3/17/87
4	3/17/87	13	3/17/87	22	3/17/87	31	3/17/87
5	3/17/87	14	3/17/87	23	3/17/87	32	3/17/87
6	3/17/87	15	3/17/87	24	3/17/87	33	3/17/87
7	3/17/87	16	3/17/87	25	3/17/87		
8	3/17/87	17	3/17/87	26	3/17/87		
9	3/17/87	18	3/17/87	27	3/17/87		

3.0 Scope:

3.1 Purpose:

To provide a reference set of acronyms and abbreviations to be used when able or necessary to use an abbreviation or acronym in procedures, drawings (P and ID's), valve and instrument indexes, and Component Identification Tags.

3.2 Discussion:

3.2.1 It is the intention of this procedure to provide a standardized list of acronyms and abbreviations to be used, when necessary, in the documents mentioned in 3.1. It is not the intention of this procedure to invalidate those documents that are presently in use.

RTS 86-1207, 87-0293
/emm/fb

3.3 Authority:

INPO Guidelines

3.4 Definitions:

Documents - Include all procedures, drawings (P and IDs), valve and instrument indexes and component identification tags.

4.0 Precautions:

None

5.0 Responsibilities:

All persons who are using acronyms or abbreviations should refer to and use the approved acronyms and abbreviations provided in the Appendicies of this procedure.

6.0 References:

6.1 INPO Good Practice Operating Procedure 0208

7.0 Records and Notification:

None

8.0 Instructions:

8.1 Refer to Appendix A, B, or C when it is necessary or desirable to use an acronym or abbreviation.

* Labels and Tags should read the same as identifying information found on the system valve line up procedures and piping and instrument drawings.

 3/17/87

APPENDIX A

LIST OF ABBREVIATIONS AND ACRONYMS

ABNORMAL	ABNRML
ABSOLUTE	abs
ACCELERATE, ACCELERATION	ACCEL
ACCELEROGRAPH	ACCLGR
ACCIDENT IDENTIFICATION AND DISPLAY SYSTEM	AIDS
ACCUMULATED, ACCUMULATOR	ACCUM
ACKNOWLEDGE	acknl
ACCEPTANCE	acpt
ACTIVATE	ACTV
ADAPTER	ADPTR
ADJUST, ADJUSTMENT, ADJUSTABLE	adj
ADMINISTRATIVE PROCEDURE	AP, ADM
ADSORBER	ADSORB
AIR CIRCUIT BREAKER	ACB
AIR CONDITIONING	A/C
AIR-OPERATED VALVE	AOV
ALARM	ALM
ALL RODS OUT	ARO
ALTERNATE SHUTDOWN PANEL	ASP
ALTERNATING CURRENT	AC
ALTERNATOR	ALT
AMBIENT	AMB
AMMETER	AMM
AMPERE(S)	A(s)
AMPERE - HOUR	Ah
AMPERE HOUR METER	Ahm
AMPLIFIER	AMPL
ANALYZER	ANAL
ANNUNCIATOR	ANN
ANTICIPATED TRANSIENT WITHOUT SCRAM	ATWS
APPENDIX	app, App
APPROXIMATE, APPROXIMATELY	APPROX, approx

APPENDIX A (Cont'd)

AREA RADIATION MONITOR	ARM
AREA RADIATION MONITOR SYSTEM	ARMS
ARMATURE	ARMT
ARRANGEMENT	ARR
ARRESTOR	ARSTR
AS LOW AS REASONABLY ACHIEVABLE	ALARA
ASSEMBLY	assy
ASSISTANT PLANT SUPERVISOR - NUCLEAR	APS-N
ASSISTANT SUPERINTENDENT ELECTRICAL	ASE
ASSISTANT SUPERINTENDENT MECHANICAL	ASM
ASSOCIATE NUCLEAR PLANT OPERATOR	ANPO
ATMOSPHERE, ATMOSPHERIC	ATM
AUTOMATIC	auto, AUTO
AUTOMATIC FREQUENCY CONTROL	afc
AUTOMATIC VOLUME CONTROL	AVC
AUTOMATIC WITHDRAWAL PROHIBIT	AWP
ATOMIC INDUSTRIAL FORUM	AIF
AUXILIARY	aux
AUXILIARY BUILDING	AB
AUXILIARY COOLANT SYSTEM	ACS
AUXILIARY EQUIPMENT OPERATOR	AEO
AUXILIARY FEEDWATER	AFW
AUXILIARY FEEDWATER ACTUATION SIGNAL	AFAS
AUXILIARY FEEDWATER PUMP	AFWP
AVERAGE	avg
AVERAGE REACTOR COOLANT TEMPERATURE	T_{avg}
AXIAL	AX

BACKUP	BU
BALANCE	BAL
BALANCED VOLTAGE	BAL VOLT
BALANCE OF PLANT	BOP
BAROMETER	BAROM

APPENDIX A (Cont'd)

BARRIER	BARR
BATCHING	BACH
BATTERY	BATT
BEARING	BRG, brg
BEGINNING OF LIFE	BOL
BENCHBOARD	bnchbd
BILL OF MATERIAL	B/M
BISTABLE	B/S
BLEED	bld
BLEEDOFF	BLDOFF
BLOCKED	blkd
BLOWDOWN	BLDN
BOILER	BLR
BOOSTER	BSTR
BORIC ACID	BA
BORIC ACID CONCENTRATION	C_B
BORIC ACID EVAPORATOR	BAE
BORON ADDITION TANK	BAT
BORON INJECTION TANK	BIT
BRAKE HORSEPOWER	bhp
BREAKERS	bkr
BREATHING AIR COMPRESSOR	BAC
BRITISH THERMAL UNIT	BTU
BUILDING	bldg
BURNABLE POISON ROD ASSEMBLY	BPRA
BUSHING CURRENT TRANSFORMER	BCT
BUTTERFLY	BTFLY
BYPASS	BYP

CABINET	CAB
CABLE SPREADING ROOM	CSR
CALCULATION, CALCULATOR, CALCULATE	CAL
CALIBRATE	calib
CAPACITY, CAPACITOR	CAP

APPENDIX A (Cont'd)

CARBON DIOXIDE	CO_2
CARBON MONOXIDE	CO
CARRIER	CARR
CASING	CSG
CATHODE RAY TUBE	CRT
CAUTION	CAUTION*
CAVITY	CAV
CENTIMETER	cm
CHANNEL	CHNL
CHARGER	CHGR
CHARGING	CHRG
CHEMICAL, CHEMISTRY	CHEM
CHEMICAL VOLUME CONTROL SYSTEM	CVCS
CHEMISTRY SUPERVISOR	CHS
CHILLER	CHILL
CHLORINATION	CLRNTN
CHLORINATOR	CHLORNR
CHLORINE	cl
CIRCUIT	ckt
CIRCULAR	CIR
CIRCULATING, CIRCULATE, CIRCULATION	CIRC
CLASSIFICATION	CLASS
CLOCKWISE	CLKWS
CONTAINMENT PURGE PERMIT	CPP
COLD LEG TEMPERATURE	T_{cold} or T_c
COLLECTOR/COLLECTION	COLL
COLUMN	CLMN
COMMON	COM
COMMUNICATION	COMM
COMPONENT	COMP
COMPONENT COOLING WATER	CCW
COMPONENT COOLING WATER DISTRIBUTION HEADER	CCW distr hdr
COMPONENT COOLING WATER SUCTION HEADER	CCW suct hdr
COMPRESSOR	COMPR

* NO ABBREVIATION PERMITTED

APPENDIX A (Cont'd)

COMPUTER	CMPTR
CONCENTRATED, CONCENTRATION,	conc
CONCENTRATES HOLDING TANK	CHT
CONDENSATE	cond
CONDENSATE POLISHING DEMIN SYSTEM	CPDL
CONDENSATE STORAGE TANK	CST
CONDENSER	cndsr
CONDITIONER	CNDTNR
CONDUCTIVITY	CNDTVY
CONNECTOR, CONNECTION, CONNECTED	conn
CONSOLE	CONS
CONSTRUCTION WORK ORDER	CWO
CONTAINMENT	cntmt
CONTAINMENT ISOLATION ACTUATION SIGNAL	CIAS
CONTAINMENT ISOLATION SIGNAL	CIS
CONTAINMENT SPRAY	CS
CONTAINMENT SPRAY ACTUATION SIGNAL	CSAS
CONTAINMENT SPRAY PUMP	CSP
CONTAMINATED, CONTAMINATION	contam
CONTROLLED	CONTRD
CONTROL ROD DRIVE	CRD
CONTROL ROD DRIVE MECHANISM	CRDM
CONTROL ROD DRIVE SYSTEM	CRDS
CONTROL ROOM AIR CONDITIONING	CRAC
CONTROL VALVE	CV
CONVERTER	CONV
COOLER	clr
COOLING	CLG
COOLING WATER	CW
CORRECTED, CORRECTION, CORRECT	CORR
CORRECTIVE MAINTENANCE ELECTRICAL PROCEDURE	CME
CORRECTIVE MAINTENANCE INSTRUMENTATION PROCEDURE	CMI
CORRECTIVE MAINTENANCE MECHANICAL PROCEDURE	CMM
COUNTERCLOCKWISE	CCLKWE
COUNTS PER MINUTE	cpm
COUNTS PER SECOND	cps

APPENDIX A (Cont'd)

COUPLING	cplg
CRITICAL SAFETY FUNCTION	CSF
CUBIC	cu
CUBIC CENTIMETERS	cc
CUBIC FEET PER MINUTE	cfm
CURRENT	I
CURRENT TRANSFORMER	CT
CYCLES PER SECOND (HERTZ)	Hz
DAMPER	dmpr
DANGER	DANGER *
DEAERATOR	DEAER
DECONTAMINATION FACTOR	DF
DECREASE	decr
DEGREE	DEG (°)
DEGREES CELSIUS	°C
DEGREES FAHRENHEIT	°F
DEMAND	DMND
DEMINERALIZED, DEMINERALIZER	demin
DEMINERALIZED WATER DEGASSIFICATION SYSTEM	DWDS
DEMINERALIZED WATER STORAGE TANK	DWST
DEPARTMENT	dept
DESUPERHEATER	dsuphtr
DETECTOR, DETECTION, DETECTED	DET
DEVIATION	DEV
DIAPHRAGM	DIAPH
DIESEL DRIVEN FIRE PUMP	DDFP
DIESEL FUEL OIL	DFO
DIESEL GENERATOR	DG or D/G
DIFFERENCE, DIFFERENTIAL	diff
DIRRERENTIAL FLUX	$\Delta\phi$ or FΔI
DIFFERENTIAL PRESSURE	ΔP or D/P
DIFFERENTIAL TEMPERATURE	ΔT or D/T

* NO ABBREVIATION PERMITTED

APPENDIX A (Cont'd)

DIGITAL DATA PROCESS SYSTEM	DDPS
DIGITAL ELECTRO-HYDRAULIC	DEH
DIRECT CURRENT	DC
DIRECT, DIRECTION	DIR
DISCHARGE, DISCHARGING	DISCH
DISENGAGED	DSENGA
DISINTEGRATIONS PER MINUTE	dpm
DISTANCE	DIST
DISTILLATE	DISTL
DISTRIBUTION	DISTR
DIVISION	DIV
DOUBLE POLE	DP
DOWNCOMER	DNCMR
DOWNWARD	DNWD
DRAIN	DRN
DRAIN HEADER	DH

ECCENTRICITY	ECCY
EFFLUENT	EFF
EJECTOR	EJECT
ELECTRICAL (CURRENT)/PNEUMATIC	I/P
ELECTRIC DRIVEN FIRE PUMP	EDFP
ELECTRIC POWER RESEARCH INSTITUTE	EPRI
ELECTRO-HYDRAULIC CONTROL	EHC
ELECTROMOTIVE FORCE	EMF
ELEMENT	ELEM
EMERGENCY	emerg
EMERGENCY CONTAINMENT FILTERS	ECF
EMERGENCY CORE COOLING SYSTEM	ECCS
EMERGENCY DIESEL GENERATOR	EDG
EMERGENCY OPERATING PROCEDURE	EOP

APPENDIX A (Cont'd)

EMERGENCY PLANNING COORDINATOR	EPC
ENABLE	ENBL
ENCLOSE, ENCLOSURE	encl
END OF LIFE	EOL
ENERGIZED	ENRGZ
ENGINE, ENGINEERING	ENG
ENGINEERED SAFEGUARDS	ES
ENGINEERED SAFEGUARDS FEATURES	ESF
ENGINEERED SAFEGUARDS SYSTEM	ESS
ENVIRONMENTAL QUALIFICATION	EQ
EQUIPMENT	equip
EQUIPMENT OUT OF SERVICE	EOOS
EQUIPMENT TEMPORARY IDENTIFICATION	ETI
ESTIMATED CRITICAL CONDITION	ECC
EVACUATION	evac
EVAPORATION, EVAPORATOR	evap
EXCHANGE, EXCHANGER	EXCH, exch
EXCITATION	EXCTN
EXCITER	EXCTR
EXHAUST	EXH
EXHAUSTER	EXHR
EXPANSION	EXPAN
EXTRACT, EXTRACTION, EXTRACTOR	EXTR

FAIL AS IS	FAI
FAIL CLOSED	FC
FAIL OPEN	FO
FEED	FD
FEEDER	FDR
FEEDWATER	FW
FEEDWATER FLOW	FWF
FEET	ft
FIELD	FLD
FILTER	fltr

APPENDIX A (Cont'd)

FILTRATION	fltrn
FINAL SAFETY ANALYSIS REPORT	FSAR
FIRST	1st
FLORIDA POWER AND LIGHT	FPL
FLOW CONTROL DEVICE INDICATION	FIC
FLOW CONTROL VALVE	FCV
FLOW ELEMENT	FE
FLOW FUNCTION (SQ. ROOT EXTRACTOR)	FLO FUNC
FLOW INDICATING SWITCH	FIS
FLOW INDICATOR	FI
FLOW RECORDER	FR
FLOW SOLENOID ELEMENT	FSE
FLOW SWITCH	FS
FLUX	Ø
FOOT	ft
FOOTCANDLE	fc
FOOTPOUND	ft-lb
FORWARD	fwd
FREQUENCY	freq
FREQUENCY METER	FM
FUEL/AIR RATIO	F/A RATIO
GALLONS	gal
GALLONS PER DAY	gpd
GALLONS PER HOUR	gph
GALLONS PER MINUTE	gpm
GAS ANALYZER	GA
GAS COLLECTION HEADER	GCH
GAS DECAY TANKS	GDT
GAS RELEASE PERMIT	GRP
GAS STRIPPER	GS
GAS SURGE HEADER	GSH
GENERATOR	gen
GLOBE VALVE	GLBV

APPENDIX A (Cont'd)

GOVERNOR	gov
GROUND	gnd
HAND AUTOMATIC STATION	HA
HAND CONTROL VALVE	HCV
HANDLE	hdl
HANDLING	HDLG
HAND SWITCH	HS
HEADER	HDR, hdr
HEALTH PHYSICS	HP
HEALTH PHYSICS SUPERVISOR	HPS
HEATER	htr
HEATER DRAIN TANK	HDT
HEAT EXCHANGER	hx
HEATING	HTG
HEATING AND VENTILATION	HV
HEATING AND VENTILATION SYSTEM	HV SYS
HEATING, VENTILATION AND AIR CONDITIONING	HVAC
HERTZ (FREQUENCY-CYCLES PER SECOND)	Hz
HIGH	HI
HIGH EFFICIENCY PARTICULATE AIR	HEPA
HIGH - HIGH	HI - HI
HIGH/HIGH HIGH	HI/HI-HI
HIGH/LOW	HI/LO
HIGH PRESSURE	HP or High Press
HIGH PRESSURE SAFETY INJECTION	HPSI
HOLDUP TANK	HUT
HORIZONTAL	HORZ
HOT FULL POWER	HFP
HOT LEG TEMPERATURE	T_{hot} or T_h
HOT SHUTDOWN	HSD

APPENDIX A (Cont'd)

HOT SHUTDOWN CONTROL PANEL	HSCP
HOT STANDBY	HSB
HOTWELL	htwl
HOT ZERO POWER	HZP
HOUR	hr
HOUSING	HSG
HUMIDITY	HUMD
HYDRAULIC	hyd
HYDRAZINE	N_2H_4 or Hydrz
HYDROELECTRIC	HYDRO ELEC
HYDROGEN	H_2
INADEQUATE CORE COOLING	ICC
INADEQUATE CORE COOLING SYSTEM KEY	ICCS KEY
INCHES	in
INCOMING	INCMG
INCREASE	INC
INDEPENDENT REVIEW COMMITTEE	IRC
INDICATION/INDICATORS/INDICATING	indic
INDUCED DRAFT FAN	IDFAN
INFORMATION	info
INJECTION	INJ
INOPERATIVE, INOPERABLE	INOP
INSERVICE INSPECTION	ISI
INSERVICE TEST	IST
INSIDE CONTAINMENT	IC
INSIDE MISSILE BARRIER	IMB
INSTRUMENT AIR COMPRESSOR	IAC
INSTRUMENT AIR SYSTEM	IAS
INSTRUMENT, INSTRUMENTATION	instr
INSTRUMENT AND CONTROLS DEPARTMENT	I and C or I&C
INSTRUMENT AND CONTROL SUPERVISOR	ICS
INTAKE COOLING WATER	ICW
INTEGRATE, INTEGRATOR	INTEG
INTERLOCK	INTLK

APPENDIX A (Cont'd)

INTERMEDIATE RANGE	IR
INTERMEDIATE RANGE MONITOR	IRM
INTERRUPT	INTRPT
INVERTER	INVTR
ION EXCHANGER	IX
ISOLATED	ISOLD
ISOLATION	isol
ISOLATION AMPLIFIER (CURRENT TO CURRENT)	I/I
(SIGNAL ISOLATOR)	I/I
KILOGRAM	kg
KILOMETER	km
KILOVARS	kVAR
KILOVOLT	kV
KILOVOLT-AMPERE	kVA
KILOVOLT-AMPERE HOUR	kVAH
KILOWATT	kW
KILOWATT HOUR	kWH
LATE ENTRY	L. ENT.
LEAK DETECTION SYSTEM	LDS
LEAKOFF	LKOFF
LETDOWN	L/D or LTDN
LEVEL	lvl
LEVEL CONTROL DEVICE WITH INDICATION	LIC
LEVEL CONTROL VALVE	LCV
LEVEL ELEMENT	LE
LEVEL INDICATING SYSTEM	LIS
LEVEL INDICATION WITH CONTROL	LIC
LEVEL INDICATOR	LI
LEVEL, PRESSURE, RADIATION	LPR

APPENDIX A (Cont'd)

LEVEL RECORDER	LR
LEVEL SOLENOID ELEMENT	LSE
LEVEL SWITCH	LS
LEVEL TRANSMITTER	LT
LICENSEE EVENT REPORT	LER
LIGHT/LIGHTING	ltg
LIMIT, LIMITING	LMT
LIMITED	LTD
LIMITING CONDITION for OPERATION	LCO
LIMITER	LMTR
LINEAR	LIN
LINEAR VARIABLE DIFFERENTIAL TRANSMITTER	LVDT
LINEUP	L/U
LIQUID	LIQ
LIQUID RELEASE PERMIT	LRP
LIQUID WASTE PROCESSING SYSTEM	LQPS
LOAD TAP CHANGE	LTC
LOCAL CONTROL(ER)	LCL
LOCATION, LOCATE	LOC
LOCKED CLOSED	LC
LOCKED OPEN	LO
LOCKOUT	LCKOUT
LOCKOUT RELAY	LOR
LOGARITHMIC, LOGARITHM	LOG
LOOSE PARTS MONITORING SYSTEM	LPDS
LOSS OF COOLANT ACCIDENT	LOCA
LOSS OF SECONDARY COOLANT	LOSC
LOW	LO
LOWER	LWR
LOW - LOW	LO-LO
LOW/LOW-LOW	LO/LO-LO
LOW PRESSURE	LP, lp or Low Press
LOW PRESSURE CONTROL VALVE	LPCV
LOW PRESSURE HEATER	LP Htr or Low Press Htr.
LOW PRESSURE SAFETY INJECTION	LPSI
LOW PRESSURE STOP VALVE	LPSV

APPENDIX A (Cont'd)

LOW TEMPERATURE OPERATING PRESSURE	LTOP
LUBRICATION	lube
MAIN FEEDWATER CONTROL SYSTEM	MFCS
MAIN OIL PUMP	MOP
MAIN STEAM	MS
MAIN STEAM ISOLATION SIGNAL	MSIS
MAIN STEAM ISOLATION VALVE	MSIV
MAIN STEAM LINE	MSL
MAIN STEAM VALVE	MSV
MAINTENANCE, MAINTAINED	MAINT
MAINTENANCE PROCEDURE	MP
MAKEUP, MAKE-UP	MKUP
MANIFOLD	MANF
MANUAL	man
MANUAL/AUTOMATIC	M/A
MAXIMUM	max
MAXIMUM HYPOTHETICAL ACCIDENT	MHA
MEASUREMENT/MEASURE	MEAS
MECHANICAL, MECHANISM	mech
MEGAHERTZ	M z
MEGAVAR HOURS	MVARh
MEGAVARS	MVAR
MEGAWATT	MW
MEGAWATT HOURS	MWh
MEGAWATTS ELECTRIC	MWe
MEGAWATT THERMAL	MWth
MEGOHM	Mohm, MΩ
MERCURY	Hg
METAL IMPACT MONITORING SYSTEM	MIMS
MICROCURIES	μCi
MICROMHO	μMho, μ℧

APPENDIX A (Cont'd)

MICROWAVE	MCWV
MIDNIGHT SHIFT	MID
MILLIAMPERE	mA
MILLIGRAM	mg
MILLIMETER	mm
MILLIREM	mRem
MILLISECOND	ms
MILLIVOLT	mV
MILLIWATT	mW
MINI INCORE DETECTOR SYSTEM	MIDS
MINIMUM	min
MISALIGNED	MISALGN
MISCELLANEOUS	misc
MIXTURE	MIX
MOISTURE SEPARATOR REHEATER	MSR
MONITOR	MON
MONITOR TANK	MT
MOTOR CONTROL CENTER	MCC
MOTOR DRIVEN	MD
MOTOR GENERATOR	MG
MOTORING	MTRG
MOTOR OPERATED	MO
MOTOR OPERATED DISCONNECT	MOD
MOTOR OPERATED VALVE	MOV

NARROW RANGE	NR
NEEDLE VALVE	NDL VLV
NEGATIVE	NEG
NET POSITIVE SUCTION HEAD	NPSH
NEUTRALIZING, NEUTRAL	NEUT
NEW FUEL POOL	NFP
NEW FUEL STORAGE	NFS

APPENDIX A (Cont'd)

NILDUCTILITY TRANSITION TEMPERATURE	NDTT
NITROGEN	N_2
NOMENCLATURE	NOMEN
NON-CRITICAL	NON-CRIT
NON-ESSENTIAL	NON-ESSN
NONNUCLEAR SAFETY	NNS
NONREGENERATIVE HEAT EXCHANGER	NRHX
NON-SAFETY	N/S
NORMAL	norm
NORMALLY CLOSED	NC
NORMALLY OPEN	NO
NOT APPLICABLE	N/A
NUCLEAR	NUC
NUCLEAR INSTRUMENTATION SYSTEM	NIS
NUCLEAR OPERATIONS SUPPORT	NOS
NUCLEAR PLANT OPERATOR	NPO
NUCLEAR REGULATORY COMMISSION	NRC
NUCLEAR SAFETY ANALYSIS CENTER	NSAC
NUCLEAR STEAM SUPPLY SYSTEM	NSSS
NUCLEAR PLANT OPERATOR	NPO
NUCLEAR WATCH ENGINEER	NWE
NUMBER	No

OFF NORMAL OPERATING PROCEDURE	ONOP
OIL CIRCUIT BREAKER	OCB
ON THE SPOT CHANGE	OTSC
OPERATE, OPERATED, OPERATION, OPERATING	OPER
OPERATIONS	OPS
OPERATING PROCEDURE	OP
OPERATIONS SURVEILLANCE PROCEDURE	OSP

APPENDIX A (Cont'd)

ORIFICE	ORFC
OUTBOARD	outbd
OUTDOOR	OUTDR
OUT OF CALIBRATION	OOC
OUT OF SEQUENCE	OUT OF SEQ
OUT OF SERVICE	OOS
OUTSIDE	OUTSD
OUTSIDE AIR	OA
OUTSIDE CONTAINMENT	OC
OUTSIDE MISSILE BARRIER	OMB
OUTSIDE SCREW AND YOLK	os and y
OVERCURRENT	OVRCURR
OVERLOAD	OVRLD
OVERPOWER, DIFFERENTIAL TEMPERATURE	OP,ΔT
OVERPRESSURE MITIGATING SYSTEM	OMS
OVERRIDE	OVRRD
OVERSPEED	OVRSPD
OVER TEMPERATURE	OT
OXYGEN	O_2

PAGES	pp
PANEL	PNL
PARTICULATE	PART
PARTS PER BILLION	ppb
PARTS PER MILLION	ppm
PENETRATION	PENET
PERCENT	pct or %
PERMANENT	perm
PERMISSIVE, PERMISSIBLE/PERMIT	PERMISS
PERSONNEL	PRSNL

APPENDIX A (Cont'd)

PH (HYDROGEN ION CONCENTRATION)	pH
PHASE	ph or Ø
PINT	pt
PICOSECOND	ps
PLANT	PLT
|PLANT CHANGES AND MODIFICATIONS	PC/M
PLANT MANAGER NUCLEAR	PMN or PM-N|
PLANT NUCLEAR SAFETY COMMITTE	PNSC
PLANT SUPERVISOR - NUCLEAR	PS-N
PLANT WORK ORDER	PWO
|PLASMA DISPLAY UNIT	PDU|
PLENUM	PLNM
PNEUMATIC	pneu
|PNEUMATIC/ELECTRICAL/CURRENT	I/P|
POINT	PNT
POSITIVE	POS
POSITIVE DISPLACEMENT PUMP	PDP
POST ACCIDENT CONTAINMENT VENTILATION	PACV
POST ACCIDENT MONITORING SYSTEM	PAMS
POST ACCIDENT PANEL	PAP
POST ACCIDENT SAMPLING SYSTEM	PASS
POST INDICATING VALVE	PIV
POTENTIAL	POTX
POTENTIAL DEVICE	PD
POTENTIAL TRANSFORMER	PT
POTENTIOMETER	pot
POUND	lb
POUNDS PER HOUR	PPH, pph
POUNDS PER SQUARE INCH	psi
POUNDS PER SQUARE INCH ABSOLUTE	psia
POUNDS PER SQUARE INCH DIFFERENTIAL	psid
POUNDS PER SQUARE INCH GAUGE	psig
POWER	pwr
POWER DEPENDENT INSERTION LIMIT	PDIL
POWER FACTOR	PF
POWER OPERATED RELIEF VALVE	PORV

APPENDIX A (Cont'd)

PRECIPITATOR	precip
PREHEATER	prehtr
PELIMINARY	prelim
PREPARE/PREPARATION	PREP
PRE-POWER DEPENDENT INSERTION LIMIT	PPDIL
PRESSURE	PRESS, press
PRESSURE CONTROL VALVE	PCV
PRESSURE DIFFERENTIAL INDICATING SWITCH	PDIS, pdis
PRESSURE DIFFERENTIAL INDICATOR	PDI
PRESSURE INDICATING SWITCH	PIS
PRESSURE INDICATOR	PI
PRESSURE INDICATOR CONTROLLER	PIC
PRESSURE RECORDER	PR
PRESSURE SWITCH	PS
PRESSURE TRANSMITTER	PT
PRESSURIZATION	przn
PRESSURIZED SAMPLE VESSEL	PSV
PRESSURIZED WATER REACTOR	PWR
PRESSURIZER	PRZR, PRZ, PZR, prz, przr or pzr
PRESSURIZER RELIEF TANK	PRT
PREVENTATIVE MAINTENANCE ELECTRICAL PROCEDURE	PME
PREVENTATIVE MAINTENANCE INSTRUMENTATION PROCEDURE	PMI
PREVENTATIVE MAINTENANCE MECHANICAL PROCEDURE	PMM
PRIMARY	PRI
PRIMARY AIDS PARAMETERS	PAPS
PRIMARY MAKEUP SYSTEM	PMUS
PRIMARY SAMPLING COOLER	PSC
PRIMARY WATER	PW
PRIMARY WATER STORAGE TANK	PWST
PRIMING	PRMG
PROCESS, PROCESSING/PROCEDURE	PROC
PROCESS RADIATION MONITOR SYSTEM	PRMS
PROCESS SAMPLING SYSTEM	PSS
PROCEDURE UPGRADE PROGRAM	PUP
PROPORTION (AL)	PROPN
PROTECT, PROTECTION, PROTECTIVE	PROT

APPENDIX A (Cont'd)

PUMP	Pp
PURIFICATION	PURIF
PUSHBUTTON	PB
QUALIFIED SAFETY PARAMETER DISPLAY SYSTEM	QSPDS
QUALITY	Q
QUALITY ASSURANCE	QA
QUALITY INSTRUCTION	QI
QUALITY RELATED	QR
QUALITY CONTROL	QC
QUART	qt
QUENCH	QNCH
RADIATION CONTROL AREA	RCA
RADIATION ELEMENT (DETECTOR)	RE
RADIATION INDICATOR	RI
RADIATION MEASUREMENT MONITORING	RMM
RADIATION MONITORING SYSTEM	RMS
RADIATION ADSORBED DOSE	RAD
RADIATION WASTE	RADWST, Rad Wst
RADIATION WORK PERMIT	RWP
RANGE	RNG
RATE OF CHANGE	ROC
REACH ROD	RR
REACTOR	Rx
REACTOR CONTROL OPERATOR	RCO
REACTOR COOLANT	RC
REACTOR COOLANT DRAIN TANK	RCDT
REACTOR COOLANT PUMP	RCP
REACTOR COOLANT SYSTEM	RCS

APPENDIX A (Cont'd)

REACTOR MAKEUP WATER	RMW
REACTOR PROTECTIVE SYSTEM	RPS
REACTOR REGULATING SYSTEM	RRS
REACTOR SUPERVISOR	RXS
RECEIVER	rcvr
RECIRCULATION, RECIRCULATING	recirc
RECIRCULATION ACTUATION SIGNAL	RAS
RECOMBINER	RCMB
RECORD, RECORDER, RECORDING	RCD, RCDR, RCDG
RECTIFIER	RECT
RECYCLE HOLDUP TANK	RHUT
REFERENCE	ref
REFUELING	REFUEL
REFUELING WATER STORAGE TANK	RWST
REGENERATING, REGENERATIVE, REGENERATION	REGEN, Regen
REGENERATIVE HEAT EXCHANGER	RHX
REGULATOR, REGULATING	REG
REHEAT	RHT
REHEATER	RHTR
REHEATER DRAIN TANK	RDT
RELAY	RLY
RELAY WORK ORDER	RWO
RELIEF VALVE	RV
REM	R
REMOTE	RMT
REMOTE SHUTDOWN CONTROL PANEL	RSDCP
REMOVE, REMOVABLE	RMV
REMS PER HOUR	R/hr or Rem/hr
REPLACEMENT	repl
RESERVOIR	rsvr
RESIDUAL HEAT REMOVAL	RHR
RESISTANCE TEMPERATURE DETECTOR	RTD
RESISTOR, RESISTANCE	RES
RESPONSIBLE DEPARTMENT REVIEW	RDR
RESTRICTOR ORIFICE	RESTR ORFC

APPENDIX A (Cont'd)

RETURN	RTN
REVERSE CURRENT VALVE	RCV
REVISION	rev
REVOLUTIONS PER MINUTE	RPM
REVOLUTIONS PER SECOND	R/S
RHEOSTAT	rheo
ROD CONTROL CLUSTER	RCC
ROD CONTROL CLUSTER ASSEMBLY	RCCA
ROD POSITION INDICATOR	RPI
ROOT - MEAN - SQUARE	rms
ROTATION	ROTN
ROTOR	ROT

SAFEGUARD	SFGD
SAFETY ASSESSMENT SYSTEM	SAS
SAFETY INJECTION	SI
SAFETY INJECTION ACTUATION SIGNAL	SIAS
SAFETY INJECTION PUMP	SIP
SAFETY INJECTION SYSTEM	SIS
SAFETY PARAMETER DISPLAY SYSTEM	SPDS
SAFETY RELATED	SR
SAFETY VALVE	SV
SAMPLE, SAMPLING	smpl
SATURATION/SATURATED	SAT
SCREEN	SCRN
SEAL STEAM BYPASS VALVE	SSBV
SEAL STEAM CONTROL	SSC
SEAL STEAM CONTROL VALVE	SSCV
SEAL WATER HEAT EXCHANGER	SWHX
SECOND	sec, s
SECONDARY	SECDRY

APPENDIX A (Cont'd)

SECONDARY AIDS PARAMETERS	SAPS
SECONDARY SAMPLE SYSTEM	SSS
SECTION	sect
SELECTED, SELECTION, SELECTOR	SEL
SELSYN	SELS
SENIOR NUCLEAR PLANT OPERATOR	SNPO
SENIOR REACTOR OPERATOR	SRO
SEPARATOR	SEPR
SEQUENCE	seq
SEQUENCE OF EVENTS	SOE
SEQUENTIAL	SEQL
SERVICE	serv
SERVICE AIR COMPRESSOR	SAC
SERVICE WATER	SW
SERVICE WATER SYSTEM	SWS
SETPOINT	SETPT
SHEET	Sh
SHIELD	SHLD
SHIELD BUILDING VENTILATION SYSTEM	SBVS
SHIFT SUPERVISOR	SS
SHIFT TECHNICAL ADVISOR	STA
SHUTDOWN	S/D
SHUTDOWN BANK	SB
SHUTDOWN COOLING	SDC
SHUTOFF	S/O
SIGNAL	SIG
SNUBBER	SNBR
SODIUM	Na
SODIUM HYDROXIDE	NaOH
SODIUM ION	Na+
SOLENOID	SOL
SOLENOID OPERATED VALVE	SV
SOLID WASTE PROCESSING SYSTEM	SWPS
SOUND POWERED TELEPHONE SYSTEM	SPTS
SOURCE RANGE	SR
SOURCE RANGE MONITOR	SRM

APPENDIX A (Cont'd)

SPECIFICATION	SPEC
SPEED	spd
SPENT FUEL ASSEMBLY	SFA
SPENT FUEL PIT	SFP
SPENT FUEL PIT COOLING SYSTEM	SFPC
SPENT RESIN STORAGE TANK	SRST
SPILLOVER	SPLOVR
SPRAY	SPR
SPREAD/SPREADING	SPRD
SPRINKLER	SPKLR
|SQUARE	sq
SQUARE FOOT	sqft or ft^2
SQUARE ROOT	sqrt or $\sqrt{\ }$
STABILIZER	STAB
STAGE/STAGING	STG
STANDARD	STD
STANDBY	stby
START-UP	S/U
START-UP RATE	SUR
STEAM	stm
STEAM BYPASS CONTROL SYSTEM	SBCS
STEAM FLOW	SF
STEAM GENERATOR	S/G
STEAM GENERATOR FEED PUMP	SGFP
STEAM GENERATOR TUBE RUPTURE	SGTR
STEAM JET AIR EJECTOR	SJAE
STORAGE	STOR
STRAINER	strnr
STUFFING BOX	STFG BX
SUBCOOLED	SC
SUBCOOLING MARGIN MONITOR	SMM
SUBSTATION	substa
SUCTION	SUCT
SUPERHEAT(ER) (ED)	SUPHT (R) (D)
SUPERVISORY/SUPERVISION	SUPV
SUPERINTENDENT	SUPT

APPENDIX A (Cont'd)

SUPPRESSION, SUPPRESSOR	SUPPR
SURVEILLANCE MAINTENANCE ELECTRICAL PROCEDURE	SME
SURVEILLANCE MAINTENANCE INSTRUMENTATION PROCEDURE	SMI
SURVEILLANCE MAINTENANCE MECHANICAL PROCEDURE	SMM
SWITCH BOARD	SWBD
SWITCH GEAR	SWGR
SWITCHYARD	SWYD
SYNCHRONIZE, SYNCHRONIZER, SYNCHRONIZING, SYNCHRONOUS	SYNC
SYNCHROSCOPE	SYNSCP
SYSTEM	syst
SYSTEM ENHANCEMENT COORDINATOR	SEC
SYSTEM OPERATIONAL REQUIREMENT PROCEDURE	SORP
SYSTEM PROTECTION SUPERVISOR	SPS
TACHOMETER	tach
TANK	TK, tk
TECHNICAL	Tech, tech
TECHNICAL SUPERVISOR	TDS
TECHNICAL SUPPORT CENTER	TSC
TELEMETER	TLM
TEMPERATURE	temp
TEMPERATURE AVERAGE	T_{avg}
TEMPERATURE CONTROL DEVICE WITH INDICATOR	TIC
TEMPERATURE CONTROL VALVE	TCV
TEMPERATURE DIFFERENCE	ΔT, D/T
TEMPERATURE ELEMENT	TE
TEMPERATURE INDICATOR	TI
TEMPERATURE INDICATING SWITCH	TIS
TEMPERATURE INDICATOR CONTROL	TIC
TEMPERATURE RECORDER	TR
TEMPERATURE REFERENCE	Tref or T_{ref}
TEMPERATURE SWITCH	TS
TEMPERATURE TRANSMITTER	TT
TEMPORARY PROCEDURE	TP
TEMPORARY SYSTEM ALTERATION	TSA

APPENDIX A (Cont'd)

TENSILE STRENGTH	ts
TERMINAL	TERM
THERMAL	thrml
THERMOMETER	therm
THERMOSTAT	THERMO
THOUSAND (KILO)	k
THROTTLE	THROT
THYRISTOR VOLTAGE REGULATOR	TVR
TIME DELAY CLOSE	TDC
TIME DELAY DROPOUT	TDD
TIME DELAY OPEN	TDO
TIME DELAY PICKUP	TDP/U
TIMING	TMG
TOTALIZER	TOTLZR
TON	tn
TRANSFER	tfr, transf, xfer
TRANSFORMER	XFMR
TRANSMITTER	XMTR
TRAVELING	TRVLG
TRIAXIAL	TRIAX
TRINISTAT	TRIN
TRIP	TRIP *
TRIP CIRCUIT BREAKER	TCB
TROUBLE	TRBL
TURBIDITY	TRBY
TURBINE	TURB
TURBINE BUILDING	TB
TURBINE DRIVEN	TD
TURBINE GENERATOR	TURB GEN.
TURBINE GLAND SEAL SYSTEM	TGSS
TURBINE PLANT COOLING WATER	TPCW
TURKEY POINT PLANT	PTN

* NO ABBREVIATION PERMITTED

APPENDIX A (Cont'd)

ULTIMATE HEAT SINK	UHS
UNAVAILABLE	UNAVAIL, unavail
UNBALANCED	UNBAL, unbal
UNDERFREQUENCY	U/F
UNDERGROUND	UG
UNDERVOLTAGE	U/V
UPPER GUIDE STRUCTURE	UGS
UPSTREAM	Upstrm
VACUUM	vac
VALVE(S)	vlv
VAPOR	VAP.
VENT HEADER	VH
VENTILATION	vent
VERTICAL	VERT, vert
VERTICAL PANEL A	VPA
VERTICAL PANEL B	VPB
VERTICAL PANEL C	VPC
VESSEL	vsl
VIBRATION	VIB
VIBRATION ECCENTRICITY MONITOR	VEM
VISCOSITY	visc
VOLT	V
VOLTAGE	volt or E
VOLT OHM METER	VOM
VOLTMETER	VM
VOLTS ALTERNATING CURRENT	VAC
VOLTS AMPERES REACTIVE	VAR
VOLTS DIRECT CURRENT	VDC
VOLUME	vol
VOLUME CONTROL TANK	VCT

APPENDIX A (Cont'd)

WARMUP	W/U
WASTE	WST
WASTE DISPOSAL-BORON RECYCLE	WB
WASTE DISPOSAL SYSTEM	WDS
WASTE GAS DECAY TANK	WGDT
WASTE HOLDUP TANK	WHT
WASTE MANAGEMENT SYSTEM	WMS
WASTE PROCESSING SYSTEM	WPS
WATER	WTR, H_2O
WATER TREATMENT PLANT	WTP
WATTMETER	Wm
WATT HOUR	Wh
WATTS PER CANDLE	WPC
WATT HOUR METER	WHM
WEIGHT	wt
WEEK	wk
WESTINGHOUSE	W
WIDE RANGE	WR
WINDING	wdg
WITHDRAWAL	WTHDRWL, wthdrwl
WITHOUT	W/O
WORDS PER MINUTE	wpm
YARD	yd
YEAR	yr

APPENDIX B

Standard Prefixes to Signify Powers of Ten

Prefix	Symbol	Power of Ten
atto	a	10^{-18}
femto	f	10^{-15}
pico	p	10^{-12}
nano	n	10^{-9}
micro	µ	10^{-6}
milli	m	10^{-3}
centi	c	10^{-2}
deci	d	10^{-1}
deka	da	10
hecto	h	10^{2}
kilo	k	10^{3}
mega	M	10^{6}
giga	G	10^{9}
tera	T	10^{12}
peta	P	10^{15}
exa	E	10^{18}

APPENDIX C

AND	&
APPROXIMATELY	≈
AT	@
DIFFERENTIAL	Δ
EQUAL TO OR GREATER THAN	≥
EQUAL TO OR LESS THAN	≤
FLUX	Ø
FOUR CONDUCTOR	4/C
FOUR POLE	4 P
GREATER THAN	>
LESS THAN	<
OHM (diagrams only)	Ω
OR	/
PERCENT	%
SEVEN CONDUCTOR	7/C
SINGLE CONDUCTOR	1/C
SINGLE PHASE	1 PH or 1Ø
THREE CONDUCTOR	3/C
THREE PHASE	3 PH or 3Ø
THREE POLE	3 P
TWO CONDUCTOR	2/C
TWO PHASE	2 PH or 2Ø

ENCLOSURE 1

RESPONSIBLE SUPERVISOR	
ASSISTANT SUPERINTENDENT ELECTRICAL-NUCLEAR	ASE
ASSISTANT SUPERINTENDENT MECHANICAL-NUCLEAR	ASM
CHEMISTRY SUPERVISOR	CHS
EMERGENCY PLANNING COORDINATOR	EPC
HEALTH PHYSICS DEPARTMENT SUPERVISOR	HPS
INSTRUMENT AND CONTROL SUPERVISOR	ICS
PLANT SUPERVISOR-NUCLEAR	PS-N
REACTOR SUPERVISOR	RXS
SHIFT TECHNICAL ADVISOR	STA
TECHNICAL DEPARTMENT SUPERVISOR	TDS
SYSTEM ENHANCEMENT COORDINATOR	SEC
DAYS	
MONDAY	M
TUESDAY	T
WEDNESDAY	W
THURSDAY	R
FRIDAY	F
SATURDAY	S
SUNDAY	N
SHIFTS	
MID	M
DAY	D
PEAK	P

PROCEDURES GENERATION PACKAGE

ENCLOSURE 1

Turkey Point Plant

Plant Specific Deviation
Documentation Sheet

LEGEND FOR DEVIATION TYPES

1 Modification to the mitigative strategy of the generic guidelines

2 Differences in equipment operating criteria and operating characteristics

3 Additional actions taken in addition to those specified in the ERGs and that effect the mitigative strategy

4 Different instrument or control parameters other than specified in ERGs

5 Differences affecting equipment ability to adequately provide the necessary mitigative function

6 Plant specific setpoints or action levels that are calculated or determined in a manner other than specified in the ERGs

7 Methods or equipment used to address the technical areas of the generic guidelines that are specified as "plant specific"

8 Plant specific terminology

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-E-0 (Sheet 1 of 3)

EOP Title: Reactor Trip or Safety Injection

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
Symptoms or Entry Conditions	Symptoms or Entry Conditions	7	The Symptoms or Entry Conditions Section provides plant specific setpoints for Reactor Trip and Safety Injection. See attached procedure.
1	1	8	The word LIT is replaced by the word ON, plant specific terminology for lights is ON or OFF. See attached procedure.
2	2	2	Steps b, c, and d and a Note were added to Step 2 due to plant specific requirements that follow a reactor or turbine trip. See attached procedure.
3	3	8	AC Emergency Buses changed to 4KV Buses due to plant specific terminology. Changes in all procedures from AC Emergency Buses to 4KV Buses is justified by this entry.
4	4a	7	Step 4 provides plant specific means for checking if safety injection has been actuated. See attached uprocedure.
4	4b and 4c	2	Steps 4b and 4c have been added due to plant specific requirements of providing procedural guidance in the event of a single failure of an Emergency Diesel Generator.
	Caution 1 prior to Step 9	2	The first caution prior to Step 9 cautions the operator on overloading the Emergency Diesel Generator. See attached procedure.
	Caution 2 prior to Step 9	2	The second caution prior to Step 9 cautions the operator on exceeding the capacity of the Component Cooling Water Heat Exchanger. See attached procedure.
5	5	2	FW Isolation Valves - Closed has been changed to close Feedwater Isolation Valves due to the plant specific design that does not automatically close the Feedwater Isolation Valves on a reactor trip or safety injection. See attached procedure.
7a	7a	2	MD Pumps - Running has been replaced with Auxiliary Feedwater Steam Supply MOVs OPEN due to plant specific requirements. See attached procedure.

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-E-0

EOP Title: Reactor Trip or Safety Injection

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
7b	7b	2	Turbine Driven Pump - Running if necessary has been changed to Auxiliary Feedwater Regulator Valves OPEN to complete the high level step of verify AFW Pumps running. See attached procedure.
8	8b	8	Low Head SI Pumps changed to RHR Pumps due to plant specific terminology. Changes in all procedures from Low Head SI Pumps to RHR Pumps is justified by this entry. See attached procedure.
---	First Caution prior to Step 9	2	Plant specific information justified by providing procedural guidance in the event a failure of one EDG occurs. See attached procedure.
	Second Caution prior to Step 9	2	Plant specific information justified by CCW configuration that could be in effect. See attached procedure.
9	9	2	Verify CCW Pumps running has been changed to verify 2 of 3 CCW Pumps running. Due to plant specific safeguards requirement. See attached procedure.
---	9a	2	Normally one CCW Pump is in operation upon a SI signal. The increased flow supplied by the additional CCW Pump could close FCV-3-426, therefore, verifying the valve in the open position is essential to plant operation. See attached procedure.
10	10	2	Verify Service Water Pumps - Running has changed to verify 2 of 3 Intake Cooling Water Pumps - running due to plant terminology and plant specific safeguards requirement. See attached procedure.
11	11	2	Verify Containment Fan Coolers - Running in Emergency Mode has been changed to verify 2 of 3 Emergency Containment Coolers and Filter Fans - running due to plant specific safeguards requirement. See attached procedure.

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-E-0

EOP Title: Reactor Trip or Safety Injection

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
12	12 a, b c, d	2	Steps 12a, b, c, and d, were added due to plant terminology and plant specific requirements. See attached procedure.
13	13a	7	Plant specific information due to Turkey Point operating characteristics.
13	13	7	Step 13 provides plant specific means for determining if main steamlines should be isolated. See attached procedure.
	Caution prior to Step 16	7	The caution prior to Step 16 cautions the operator to reduce feedflow to both units in the event that Train 1 of Auxiliary Feedwater is inoperable and both Units 3 and 4 are in Natural Circulation. See attached procedure.
18	18	2	Verify SI valve alignment, proper emergency alignment changed to support plant specific requirements. See attached procedure.
Caution 2 prior to Step 19	---	2	Caution deleted due to plant specific design. See attached procedure.
30	30	7	Step 30 provides plant specific means of checking secondary radiation normal. See attached procedure.
Caution 2 prior to Step 33	---	2	The second caution prior to Step 19 has been deleted due to plant specific design which does not include automatic transfer capability and normally has the Safety Injection Pumps suction aligned to the Refueling Water Storage Tanks. See attached procedure.
33	33	7	Step 33 provides plant specific steps concerning the use of the shared safety injection pumps. See attached procedure.
38	38	7	Step 38 provides plant specific means for establishing charging flow. See attached procedure.
39	39	7	Step 39 provides plant specific equipment loaded to the 4KV Bus. See attached procedure.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-E-0

Title:

REACTOR TRIP OR SAFETY INJECTION

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	87-009
Approved by Plant Manager-N:	1/7/87

RTSs 86-1170, 86-1891P, 86-1863, 86-1832P *OTSC 4174*

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LIST OF EFFECTIVE PAGES

Page	Revision Date
1	01/07/87
2	01/07/87
3	01/07/87
4	01/07/87
5	01/07/87
6	01/07/87
7	01/07/87
8	01/07/87
9	01/07/87
10	01/07/87
11	01/07/87
12	01/07/87
13	01/07/87
14	01/07/87
15	01/07/87
16	01/07/87
17	01/07/87
18	01/07/87
19	01/07/87
20	01/07/87
21	01/07/87
22	01/07/87

1.0 PURPOSE

This procedure provides actions to verify proper response of the automatic protection systems following manual or automatic actuation of a reactor trip or safety injection, to assess plant conditions, and to identify the appropriate recovery procedure.

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 The following are symptoms that require a reactor trip, if one has not occurred:

1. Source range high level trip 10^5 CPS.
2. Intermediate range high level trip, 25% of full power, current equivalent.
3. Power range, low range, high level trip, 25% of full power.
4. Power range high level trip, 108% of full power..
5. Pressurizer high pressure trip, 2370 PSIG.
6. Pressurizer high level trip, 91% of span.
7. Pressurizer low pressure trip 1843 PSIG
8. Low RCS flow trip, 91% of rated flow.
9. RCP breaker open.
10. 4 KV bus low voltage trip.
11. Over power Δ T trip.
12. Over temperature ΔT trip.
13. Safety Injection.
14. Turbine trip.
15. Low-low S/G level, 15% of span.
16. Steam flow greater than feed flow coincident with a low S/G level.

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2.2 The following are symptoms of a reactor trip:

1. Any reactor trip annunciator ON.
2. Rapid decrease in neutron level indicated by nuclear instrumentation.
3. All shutdown and control rods are fully inserted. Rod bottom lights are ON.

2.3 The following are symptoms that require a reactor trip and safety injection, if one has not occurred:

1. Low pressurizer pressure, 1723 PSIG.
2. High containment pressure, 4 PSIG.
3. High steam line differential pressure, 100 psid.
4. High steam flow and low S/G pressure or low Tavg.

2.4 The following are symptoms of a reactor trip and safety injection:

1. Any SI annunciator ON.
2. SI pumps running.
3. RHR pumps running.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

- *Steps 1 through 14 are IMMEDIATE ACTION steps.*
- *Foldout page should be open.*

1	Verify Reactor Trip: • Rod bottom lights - ON • Reactor trip and bypass breakers-OPEN • Rod position indicators - AT ZERO • Neutron flux - DECREASING	Manually trip reactor. IF reactor will NOT trip, THEN go to FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS, Step 1.
2	Verify Turbine Trip:	
	a. All turbine stop valves - CLOSED	a. Manually trip turbine.
	b. Generator breakers OPEN (Normally 30 second delay)	

NOTE

If trip occurred while timing in the reheaters, manual isolation of the timing valves is required.

	c. CLOSE - reheat steam supply MOVs	c. Manually close valves
	d. OPEN - turbine drain valves	
3	Verify Power to 4 KV Buses:	
	a. 4 KV buses - AT LEAST ONE ENERGIZED	a. Try to restore power to at least one 4 KV bus. IF power can NOT be restored to at least one 4 KV bus, THEN go to ECA-0.0, LOSS OF ALL AC POWER, Step 1.
	b. 4KV buses - ALL ENERGIZED	b. Try to restore power to de-energized 4KV bus.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Check If SI Is Actuated:	
	a. SI ANN. ON	a. Check if SI is required. IF SI is required THEN manually actuate. IF SI is NOT required, THEN go to ES-0.1, REACTOR TRIP RESPONSE, Step 1.
	b. A and B 4KV Bus - ENERGIZED	b. Perform steps of Attachment C while continuing with E-0.
	c. Verify proper Battery Charger and Inverter operation	c. Place Battery Charger Normal Bypass Switch to Bypass Position
5	Verify Feedwater Isolation:	
	a. Feedwater control valves - CLOSED	a. Manually close valves.
	b. Feedwater bypass valves - CLOSED	b. Manually close valves.
	c. CLOSE feedwater isolation valves	c. Manually close valves.
	d. S/G blowdown isolation valves - CLOSED	d. Manually close valves.
	e. S/G sample isolation valves - CLOSED	e. Manually close valves.
6	Verify Containment Isolation Phase A:	
	a. Phase A - ACTUATED	a. Manually actuate Phase A.
	b. Phase A valves - CLOSED	b. Manually close valves.
7	Verify AFW Pumps Running:	
	a. Aux. feedwater steam supply MOVs - OPEN	a. Manually open valves.
	b. Aux. feedwater regulator valves - OPEN	b. Manually open valves.
8	Verify SI Pumps Running:	Manually start pumps.
	a. High-head SI pumps - RUNNING	
	b. RHR pumps - RUNNING	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *Only one (1) CCW pump A or C and one (1) ICW pump B or C should be powered from a single 4KV bus when the bus is powered from an EDG.*
- *In the event one CCW heat exchanger is out of service, one CCW pump should be placed in the pull-to-lock position.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Verify 2 of 3 CCW Pumps - RUNNING:	Manually start pumps.
	a. Verify RCP seal cooling water outlet FCV-3-626 is OPEN	a. OPEN FCV-3-626
10	Verify 2 of 3 Intake Cooling Water Pumps - RUNNING	Manually start pumps.
		a. IF only one pump is available THEN Dispatch personnel to isolate CV-3-2201 TPCW Hx Outlet Control Valve by closing the following manual isolation valves: 1) 3-50-401 2) 3-50-403
11	Verify 2 of 3 Emergency Containment Cooler And Filter Fans - RUNNING	Manually start 2 coolers and filter fans.
12	Verify Containment Ventilation Isolation:	
	a. Containment purge and supply fans - OFF	a. Manually stop fans
	b. Purge valves - CLOSED	b. Manually close purge valves.
	c. Instrument air bleed valves - CLOSED	c. Manually close valves.
	d. Verify control room ventilation isolation	d. Place control room ventilation in emergency recirculation mode.
13	Check If Main Steamlines Should Be Isolated:	
	a. IF the following status lights on VPB are ON • High steam flow • Low Tavg OR low S/G pressure OR • Hi-Hi containment pressure THEN	a. Go to Step 14.
	b. Verify main steam isolation	b. Manually close valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Verify Containment Spray Not Required:	
	a. Containment pressure - HAS REMAINED LESS THAN 20 PSIG	a. Perform the following: 1) Verify containment spray initiated. <u>IF NOT, THEN</u> manually initiate 2) Verify containment isolation Phase B valves closed. <u>IF NOT, THEN</u> manually close valves. 3) Stop all RCPs.
15	Verify SI Flow	
	a. RCS pressure - LESS THAN 1588 PSIG [1993 PSIG]	a. Go to Step 16.
	b. High-head SI pump flow indicators - CHECK FOR FLOW	b. Manually start pumps and align valves.
	c. RCS pressure - LESS THAN 225 PSIG [630 PSIG]	c. Go to Step 16.
	d. RHR pump flow indicators - CHECK FOR FLOW	d. Manually start pumps and align valves.

CAUTION

In the event both units require AFW under natural circulation conditions and Train 1 of AFW is inoperable, within 3 minutes the AFW flow controllers should be placed in manual and flow adjusted to 300 GPM per unit, rather than the 130 GPM per S/G value given in Step 16.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	Verify Total AFW Flow - GREATER THAN 130 GPM per S/G	Manually start pumps and align valves as necessary. <u>IF</u> AFW flow greater than 130 GPM per S/G can <u>NOT</u> be established, <u>THEN</u> go to FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, Step 1.
17	Verify AFW Valve Alignment - PROPER EMERGENCY ALIGNMENT	Manually align valves as necessary.
18	Verify SI Valves That Receive A SI Signal Have Assumed Their Required Position As Indicated By Bright Amber Lights On VPB	Manually align valves as necessary.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	Check RCP Seal Cooling	
	a. CCW flow to RCP thermal barriers - NORMAL	a. IF CCW to an RCP is lost, THEN: 1) Trip the RCP. 2) Reset SI. 3) IF offsite power is not available, ensure adequate power available to run one charging pump. If necessary, shed nonessential loads. (Refer to E-0, attachment D for component KW load rating.) 4) Start one charging pump at minimum speed for seal injection.
20	Check RCS Average Temperature - STABLE AT OR TRENDING TO 547°F	IF temperature less than 547°F and decreasing, THEN: a. Stop dumping steam. b. IF cooldown continues, THEN control total feed flow. Maintain total feed flow greater than 130 GPM per S/G until narrow range level greater than 6% [32%] in at least one S/G. c. IF cooldown continues, THEN close main steamline isolation and bypass valves. IF temperature greater than 547°F and increasing, THEN: • Dump steam to condenser. OR • Dump steam using S/G steam dump to atmosphere valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21	Check PRZ PORVs And Spray Valves:	
	a. PORVs - CLOSED	a. <u>IF</u> PRZ pressure less than 2335 PSIG, <u>THEN</u> manually close PORVs. <u>IF</u> any valve can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve. <u>IF</u> block valve can <u>NOT</u> be closed, <u>THEN</u> go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	b. Normal PRZ spray valves - CLOSED	b. <u>IF</u> PRZ Pressure is less than 2260 PSIG, <u>THEN</u> manually close valves. <u>IF</u> valves can <u>NOT</u> be closed. <u>THEN</u> stop RCP(s) supplying failed spray valve(s).
22	Check If RCPs Should Be Stopped:	
	a. High-head SI pumps - AT LEAST ONE RUNNING	a. Go to Step 23.
	b. RCS subcooling LESS THAN 25°F [65°F]	b. Go to Step 23.
	c. Stop all RCPs	
23	Check If S/Gs Are Not Faulted:	
	a. Check pressure in all S/Gs - • NO S/G PRESSURE DECREASING IN AN UNCONTROLLED MANNER • NO S/G COMPLETELY DEPRESSURIZED	a. Go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.
24	Check If S/G Tubes Are Not Ruptured: • CONDENSER AIR EJECTOR RADIATION - NORMAL • S/G BLOWDOWN RADIATION - NORMAL	Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.
25	Check If RCS Is Intact: • CONTAINMENT RADIATION - NORMAL • CONTAINMENT PRESSURE - NORMAL • CONTAINMENT SUMP LEVEL - NORMAL	Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26	**Check If SI Flow Should Be Terminated:**	
	a. RCS subcooling based on core exit TCs - GREATER THAN 30°F	a. DO NOT STOP SI PUMPS. Go to Step 28
	b. Secondary heat sink: • TOTAL FEED FLOW TO S/Gs - GREATER THAN 130 GPM per S/G <u>OR</u> • NARROW RANGE LEVEL IN AT LEAST ONE S/G - GREATER THAN 6%	b. <u>IF</u> neither condition satisfied, <u>THEN</u> DO NOT STOP SI PUMPS. Go to Step 28.
	c. RCS pressure: • PRESSURE - GREATER THAN 1588 PSIG • PRESSURE - STABLE OR INCREASING	c. DO NOT STOP SI PUMPS. Go to Step 28
	d. PRZ Level - GREATER THAN 12%	d. DO NOT STOP SI PUMPS. Try to stabilize RCS pressure with normal PRZ spray Go to Step 28.
27	Go To ES-1.1, SI TERMINATION, Step 1	
28	Initiate Monitoring Of Critical Safety Function Status Trees	

<u>CAUTION</u>

Makeup water sources for CST will be necessary if level decreases to less than 10%

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
29	**Check S/G Levels:**	
	a. Narrow range level - GREATER THAN 6%	a. Maintain total feed flow greater than 130 GPM per S/G until narrow range level greater than 6% in at least one S/G.
	b. Control feed flow to maintain narrow range level between 6% and 50%	b. <u>IF</u> narrow range level in any S/G continues to increase in an uncontrolled manner, <u>THEN</u> go to E-3 STEAM GENERATOR TUBE RUPTURE, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30	Check Secondary Radiation - NORMAL	
	a. Contact the Nuclear Chemistry Department for sampling of the S/G blowdown	a. Go to E-3 STEAM GENERATOR TUBE RUPTURE, Step 1.
31	Check Auxiliary Building Radiation - NORMAL	Evaluate cause of abnormal conditions. <u>IF</u> the cause is a loss of RCS inventory outside containment, <u>THEN</u> go to ECA-1.2, LOCA OUTSIDE CONTAINMENT, Step 1.
32	Check PRT Conditions - NORMAL	Evaluate cause of abnormal conditions.

CAUTION

If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
33	Reset SI	
	a. Verify unit 4 SI pumps NOT REQUIRED	a. Perform the following: 1) OPEN the following SI pump manual suction intertie valves: a) 870A b) 870B 2) OPEN the following SI pump manual recirculation tie valves: a) 892A b) 892B 3) Unlock and rack in the following unit 4 RWST outlet isolation valve breakers: a) 40712 b) 40605

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
33	Reset SI (Cont'd)	4) CLOSE the following unit 4 RWST outlet isolation valves: a) MOV-4-864A b) MOV-4-864B 5) Remove the manual gag from valves and CLOSE the following unit 4 SI test return to RWST valves: a) CV-4-856A b) CV-4-856B 6) Go to Step 34
	b. Stop the unit 4 SI pumps and place in standby	
	c. CLOSE the following SI pump discharge header isolation valves 1) MOV-878A 2) MOV-878B	
34	Reset Containment Isolation Phase A And Phase B	
35	Verify Instrument Air To Containment	Start the diesel powered air compressors.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

RCS pressure should be monitored. If RCS pressure decreases to less than 225 PSIG, the RHR pumps must be manually restarted to supply water to the RCS.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
36	Check If RHR Pumps Should Be Stopped:	
	a. Check RCS pressure:	
	1) Pressure - GREATER THAN 225 PSIG	1) Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	2) Pressure - STABLE OR INCREASING	2) Go to Step 37.
	b. Stop RHR pumps and place in standby	
37	Check Power Supply To Charging Pumps - OFFSITE POWER AVAILABLE	Verify adequate diesel capacity to run charging pumps. If necessary, shed sufficient nonessential loads. (Refer to E-0, Attachment D for component KW load rating.)
38	Check If Charging Flow Has Been Established:	
	a. Charging pumps - AT LEAST ONE RUNNING	a. Perform the following: 1) <u>IF</u> CCW flow to RCP(s) thermal barrier is lost, <u>THEN</u> isolate seal injection to affected RCP(s) before starting charging pumps. 2) Start charging pumps as necessary.
	b. Establish flow as necessary:	
	1) Adjust HCV-3-121 to desired flow	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
39	Check If Diesel Generators Should Be Stopped:	
	a. Verify 4KV buses - ENERGIZED BY OFFSITE POWER	a. Try to restore offsite power to 4 KV buses. IF offsite power can NOT be restored, perform the following: 1) Verify adequate diesel capacity to place the following equipment in service. IF necessary, shed non-essential loads. (Refer to E-0, Attachment D for component KW load rating.) a) Pressurizer Heaters backup groups per Attachment B. b) Computer room chiller B
	b. Stop any unloaded diesel generator and place in standby.	
40	Return To Step 20	

END OF TEXT

ATTACHMENT A
HYDROGEN ANALYZER START CRITERIA

NOTE

Completion of this attachment insures that the sample system is isolated, and permits operation of the H_2 monitoring system, future operation of the post accident sampling system and the waste hold-up tank pump back system.

1. Place the following Unit 4 valves in their designated positions:

a.	PAHM-002A CTMT Atmosphere to H_2 Analyzer	Close
b.	PAHM-002B CTMT Atmosphere to H_2 Analyzer	Close
c.	PAHM-001A H_2 Sample Return to CTMT	Close
d.	PAHM-001B H_2 Sample Return to CTMT	Close

2. Place the following Unit 3 valves in their designated positions:

a.	CV-951 PRZ Steam Space Sample Valve	Close
b.	CV-953 PRZ Liquid Space Sample Valve	Close
c.	SV-6427A Hot Leg Loop A Sample Valve	Close
d.	SV-6427B Hot Leg Loop B Sample Valve	Close
e.	CV-955C Accumulator A Sample Valve	Close
f.	CV-955D Accumulator B Sample Valve	Close
g.	CV-955E Accumulator C Sample Valve	Close
h.	SV-6428 A & B Hot Leg to Sample System	Close
i.	SV-6429 RHR System to Sample System	Close
j.	MPAS-005 Inst. Air Bleed to CTMT Purge Exhaust	Close
k.	MPAS-004 W.H.T. Pump Discharge to CTMT Sump	Open
l.	MPAS-001 W.H.T. Pump Discharge to Radwaste Bldg.	Close
m.	PAHM-001A H_2 Sample Return to CTMT	Open
n.	PAHM-001B H_2 Sample Return to CTMT	Open
o.	PAHM-002A CTMT Atmosphere to H_2 Analyzer	Open
p.	PAHM-002B CTMT Atmosphere to H_2 Analyzer	Open
q.	HV-1 CTMT Atmosphere to H_2 Analyzer	Open
r.	HV-3 CTMT Atmosphere to H_2 Analyzer	Open

3. Notify Nuclear Chemistry Department to perform the P.A.S.S. valve alignment.

4. WHEN the Nuclear Chemistry Department has completed their valve alignment, perform the following:

   a. Verify the following function selector switches on the hydrogen analyzer panels are in the SAMPLE position.

      1) QR 81

      2) QR 82

   b. Place the control switches to ANALYZE

   c. Depress the REMOTE selector buttons

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

ATTACHMENT B
RE-ENERGIZATION OF PRESSURIZER BACKUP HEATERS

CAUTION

Loading on the EDG should not exceed the Orange mark (2000 hour rating of 2850 KW). However, loads placed on the energized 4 KV buses (the power source) may approach the Red mark (168 hour rating) on the wattmeter for short periods.

a. 4KV Buses - ALL ENERGIZED

- IF EDG A is available, go to Step b.
- IF EDG B is available, to to Step g.

b. Verify EDG A Load is LESS THAN 2300 KW

b. Dispatch personnel to cabinet 3812 to OPEN all nine (9) breakers.

1. Reset heater Group A lockout relay in the penetration room.
2. Place control switch for Group A to the ON position.
3. CLOSE 3 individual heater breakers one at a time.

   AND

   Verify between each closure A diesel load DOES NOT exceed the capacity of the power source.
4. Return to procedure and Step in effect.

c. Reset lockout relay in penetration room for backup Group A

d. Place control switch for Group A to the ON position

e. Verify EDG A load DOES NOT exceed the capacity of the power source

f. Return to procedure and Step in effect

g. Place control switch for Group B backup heaters to "OFF"

h. Place the keylock switch for breaker 0408 in the EMERGENCY position

i. Dispatch personnel to cabinet 3813 to OPEN all nine (9) breakers

j. Place console control switch to the ON position

k. CLOSE 3 individual heater breakers one at a time

   AND

   Verify between each closure B diesel load DOES NOT exceed the capacity of the power source

l. Return to procedure and Step in effect

ATTACHMENT C

LOSS OF OFFSITE POWER CONCURRENT WITH SI AND LOSS OF ONE EDG EQUIPMENT MANIPULATION

CAUTION

- *The unaffected unit should be aware or cautioned on the affects of EDG loading.*
- *In the event A or B 4KV Bus has failed due to breaker failure, one battery charger on the affected unit (4KV bus failure) will be energized upon SI reset.*
- *Steps one, two and three of this attachment must be performed as indicated time intervals permit.*

1. At 20-30 minutes after reactor trip place the following RHR pump control switches in the pull-to-lock position provided two HHSI pumps are in operation supplying RWST water to the RCS:

   a. RHR Pump A

   b. RHR Pump B

CAUTION

The reset switch on the sequencer panel should not be used to energize battery chargers.

2. At 20-30 minutes after reactor trip verify completion of Step 1 THEN align spare battery chargers as follows:

   a. IF EDG A is inoperable perform the following:

      1) Place Battery Charger 4A, Breaker 4D23-21, to the OFF position.

      2) Unlock and place Battery Charger 4S, Breaker 4D23-22, to the ON position.

      3) Place Battery Charger 3A, Breaker 3D01-43, to the OFF position.

      4) Unlock and place Battery Charger 3S, Breaker 3D01-44, to the ON position.

      5) Place the Battery Charger Normal Bypass Switch in the Control Room to BYPASS.

ATTACHMENT C (Cont'd)

LOSS OF OFFSITE POWER CONCURRENT WITH SI AND LOSS OF ONE EDG EQUIPMENT MANIPULATION

2. b. IF EDG B is inoperable perform the following:

    1) Place Battery Charger 3B, Breaker 3D23-21, to the OFF position.

    2) Unlock and place Battery Charger 4S, Breaker 3D23-22, to the ON position.

    3) Place Battery Charger 4B, Breaker 4D01-43, to the OFF position.

    4) Unlock and place Battery Charger 3S, Breaker 4D01-44, to the ON position

    5) Place the Battery Charger Normal Bypass Switch in the Control Room to BYPASS.

3. At 30 minutes after reactor trip place the following Containment Spray Pump Control Switches in the pull-to-lock position provided two Emergency Containment Coolers are in operation:

    a. CSP-A

    b. CSP-B

4. One of the following Control Room Air Conditioners units may be secured to facilitate EDG load management.

    a. Unit A, MCC-3B Breaker 30636

    b. Unit B, MCC-4C Breaker 40710

5. No secondary plant or turbine support equipment shall be powered from the EDG.

6. Verify that the following DC Emergency Pumps operate at design setpoint:

    a. DC Emergency Bearing Oil Pump (3.5 PSIG)

    b. DC Air Side Seal Oil Backup Pump (4 to 6 PSID)

7. IF opposite units SI pumps are required perform the following:

    a. Open the following SI Pump Manual Suction Intertie Valves:

        1) 870A

        2) 870B

    b. Open the following SI Pump Manual Recirculation Tie Valves:

        1) 892A

        2) 892B

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ATTACHMENT C (Cont'd)

LOSS OF OFFSITE POWER CONCURRENT WITH SI AND LOSS OF ONE EDG EQUIPMENT MANIPULATION

7. c. Unlock and rack in the following Unit 4 RWST Outlet Isolation Valve Breakers:

   1) 40712

   2) 40605

   d. Close the following Unit 4 RWST Outlet Isolation Valves:

   1) MOV-4-864A

   2) MOV-4-864B

   e. Remove the manual gag and close the following Unit 4 SI Test Return Isolation Valves:

   1) CV-4-856A

   2) CV-4-856B

8. Steps one, two and three of this attachment must be performed as indicated time intervals permit.

ATTACHMENT D
COMPONENT KW LOAD RATING CHART

CAUTION

Loading on the EDG should not exceed Orange mark (2000 hour rating of 2850 KW). However loads placed on the energized 4 KV buses (the power source) may approach the red mark (168 hour rating) on the wattmeter for short periods.

ESSENTIAL LOAD

	COMPONENT	KW	COMPONENT	KW	
	CCW PUMP	380	CTR. ROOM A/C (1)	26	
	ICW PUMP	265	CTR. ROOM SUP FAN	1	
Note 1	RHR PUMP	220	BATTERY CHGR 3B	41	
Note 3	SI PUMP 3	302	BATTERY CHGR 4A	41	
Note 3	SI PUMP 4	302	BATTERY RM A/C	22	
	CS PUMP	216	BA HEAT TRACE	40	
	BATTERY CHGR 3A	56	PAGE SYSTEM	5	
	EM. CT. FILTER	52	COMP. RM CHILLER	54	Note 4
	EM. CT. COOLER	22	DG VENT FAN (1)	5	
	BATTERY CHGR 4B	56	DG LO PUMP (1)	1	
	EMERG LTG	31	DG AIR COMP (1)	5	
	H2 ANAL HT TRACE	8	DG FO PUMP (1)	1	
	H2 ANALYZER PUMP	1	SECU. BLDG XFMR	8	
	CRDM COOLER	50	BATTERY CHGR 3S	56	
	NORM. CONT. CLR	64	BATTERY CHGR 4S	41	

NON-ESSENTIAL LOADS

	COMPONENT	KW	COMPONENT	KW	
Note 2	CHARGING PUMP	101	BRG LIFT OIL PUMP	13	
	SFP PUMP	86	PRZ HEATER (EA)	50	Note 1 & 2
	OIL VAPOR EXTR	7	AUX. STM CR PUMP	3	
	AIR SIDE SO PUMP	21	WDCR PUMP	3	
	H2 SIDE SO PUMP	3	BA TK HEATER	15	Note 5
	TURN GR DRIVE	42	BA XFER PUMP	27	Note 6
	TURN GR. LO PUMP	34			

NOTES

(Notes 1, 2 & 3 apply to the one-EDG available case only)

1. *For a loss of off-site power and failure of one EDG, the operating RHR pump is required to be secured at 20-30 minutes after the reactor trip in order to maintain EDG load limits, provided two HHSI pumps are in service supplying RWST water to the RCS.*

2. *On the non-accident unit, one charging pump (if needed) should be established during the 1-30 minute EDG load interval. Pressurizer Heaters (150 KW) should be established in the 30 minute to one (1) hour EDG load interval, provided the charging pumps are secured. 30 Minutes after a reactor trip the charging pump and PRZ heaters should be alternated to prevent EDG overload.*

3. *For a loss of off-site power and failure of one EDG, utilization of only one HHSI pump for cold leg recirculation is permitted in order to maintain EDG load limits.*

4. *The computer room chiller is required to maintain operation of ICCS. Chiller B is required to be in operation at 55 minutes to one (1) hour after reactor trip provided the Containment Spray Pump has been secured per Attachment C of E-0.*

5. *Calculations have been performed to demonstrate that this equipment is not required until 8 hours following a loss of off-site power.*

6. *The BA transfer pumps are not required for post-LOCA pH neutralization until 8 hours after the accident.*

a/HEB'sr'dj

FOLDOUT FOR E-0 SERIES PROCEDURES

1. RCP TRIP CRITERIA

Trip all RCPs if BOTH conditions listed below occur:

a. High-head SI pumps - AT LEAST ONE RUNNING.

b. RCS Subcooling - LESS THAN 25°F [65°F]

2. SI ACTUATION CRITERIA

Actuate SI and go to E-O, REACTOR TRIP OR SAFETY INJECTION, Step 1, if EITHER condition listed below occurs:

- RCS SUBCOOLING BASED ON CORE EXIT TCs - LESS THAN 30°F [45° F]
- PRZ LEVEL - CANNOT BE MAINTAINED GREATER THAN 12% [50%]

3. RED PATH SUMMARY

a. SUBCRITICALITY - Nuclear power GREATER THAN 5%.

b. CORE COOLING - Core exit TCs GREATER THAN 1200°F.

c. HEAT SINK - Narrow Range level in all S/Gs LESS THAN 32% AND total feedwater flow LESS THAN 130 GPM per S/G.

d. INTEGRITY - Cold leg temperature decrease GREATER THAN 100°F in last 60 minutes AND RCS cold leg temperature LESS THAN 317°F.

e. CONTAINMENT - Containment pressure GREATER THAN 59 PSIG.

4. CST MAKEUP WATER CRITERIA

Makeup water sources for the CST will be necessary if level decreases to LESS THAN 10%

5. HYDROGEN ANALYZER START CRITERIA

Hydrogen analyzer should be placed in service per Attachment A of E-0 within 30 minutes of a valid safety injection signal.

6. ADVERSE CONTAINMENT CONDITIONS

Adverse Containment conditions are defined as either a Containment Atmosphere temperature of 180°F or Containment radiation levels equal to or greater than 1.3×10^5 R/hr. Under these conditions the setpoint values in brackets, [ ], are required to be used.

If the Containment temperature subsequently falls below 180°F, the normal setpoint values may be used. If the Containment radiation level subsequently falls below 1.3×10^5 R/hr, the adverse Containment setpoints are required to be used until permission is granted by the Technical Support Staff to use normal setpoints.

FINAL PAGE

*/HEB/sr/dj

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ES-0.1 (Sheet 1 of 2)

EOP Title: Reactor Trip Response

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
	Caution 2 prior to Step 1	2	The second caution prior to Step 1 cautions the operator to reduce feedflow to both units in the event that Train 1 of auxiliary feedwater is inoperable and both Units 3 and 4 are in natural circulation. See attached procedure.
	Caution 3 prior to Step 1	2	The third caution prior to Step 1 cautions the operator to ensure that containment temperature remain within Technical Specification limits. See attached procedure.
	Caution 4 prior to Step 1	2	The fourth caution prior to Step 1 cautions the operator on emergency diesel loading and provides directions as to the use of Attachment C, requirements for a loss of offsite power, concurrent with a safety injection on Unit 4 and a loss of one Emergency Diesel Generator. See attached procedure.
	Caution prior to Step 7	2	Caution is provided to supply specific procedural guidance to prevent overloading the EDG in the event of a single failure of one EDG occurs. See attached procedure.
Note prior to Step 9	Note prior to Step 9	2	Specific RCP Pumps have been added for clarification.
11	11	7	Normal major equipment required to be inservice in Hot Standby conditions is common operator knowledge. Step is changed to reflect this condition. See attached procedure. All similar steps in this package are justified by this entry.
12	12e	2	Step 12e has been added to provide procedural guidance for checking plant specific equipment required for the secondary plant. See attached procedure.
4b RNO	4b RNO	7	Step 4b RNO provides plant specific means for placing charging and letdown in service. See attached procedure.
7 RNO	7 RNO	7	Step 7 provides plant specific means for responding to a loss of offsite power. See attached procedure.

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ES-0.1 (Sheet 2 of 2)

EOP Title: Reactor Trip Response

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
9 RNO	9 RNO	7	Step 9 RNO provides plant specific means for establishing conditions for starting a Reactor Coolant Pump.
13	13	7	Step 13 provides plant specific means for determining if natural circulation is required.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-ES-0.1

Title:

REACTOR TRIP RESPONSE

Safety Related Procedure

Responsible Department:	Operations
Reviewed by PNSC:	87-009
Approved by Plant Manager-N:	1/7/87

RTSs 86-1180, 86-1891P, 86-1832P

LIST OF EFFECTIVE PAGES

Page	Revision Date
1	01/07/87
2	01/07/87
3	11/20/86
4	11/20/86
5	11/20/86
6	11/20/86
7	11/20/86
8	11/20/86
9	11/20/86
10	11/20/86
11	11/20/86
12	11/20/86
13	11/20/86
14	11/20/86
15	01/07/87

1.0 PURPOSE

This procedure provides the necessary instructions to stabilize and control the plant following a reactor trip without a safety injection.

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 This procedure is entered from E-0, REACTOR TRIP OR SAFETY INJECTION, Step 4, when SI is neither actuated nor required.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *If SI actuation occurs during this procedure, E-O, REACTOR TRIP OR SAFETY INJECTION, should be performed.*
- *In the event that both units require AFW under natural circulation conditions and Train 1 of AFW is inoperable, within 3 minutes the AFW flow controllers should be placed in manual and adjusted to 300 GPM per unit rather than the 130 GPM per S/G value given in Step 1.*
- *In the event a loss of offsite power occurs and no SI exists on Unit 4, 2 NCCs are required to be placed in service to maintain normal containment temperatures.*
- *In the event a loss of offsite power has occurred concurrent with a SI on Unit 4 and only one 4 KV Bus is energized by the EDG perform steps of Attachment C of ES-0.1. Completion of Attachment C supercedes steps of this procedure that could potentially overload the EDG.*

NOTE

Foldout page should be open.

1	Check RCS Average Temperature - STABLE AT OR TRENDING TO 547°F	<u>IF</u> temperature less than 547°F and decreasing, <u>THEN</u>: a. Stop dumping steam. b. <u>IF</u> cooldown continues, <u>THEN</u> control total feed flow. Maintain total feed flow greater than 130 GPM per S/G until narrow range level greater than 6% in at least one S/G. c. <u>IF</u> cooldown continues, <u>THEN</u> close main steamline isolation and bypass valves <u>IF</u> temperature greater than 547°F and increasing, <u>THEN</u>: • Dump steam to condenser. <u>OR</u> • Dump steam using S/G steam dump to atmosphere valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	Check FW Status:	
	a. Check RCS average temperatures - LESS THAN 554°F	a. Continue with Step 3. WHEN temperature less than 554°F, THEN do Steps 2b and c.
	b. Verify main FW flow control valves - CLOSED	b. Manually close valves.
	c. Verify S/G levels EQUAL TO OR GREATER THAN 6% NARROW RANGE	c. Establish feed flow to the S/Gs as necessary: • Main FW on bypass. OR • AFW.
3	Verify All Control Rods Fully Inserted	IF two or more control rods NOT fully inserted, THEN emergency borate 60 GPM for 5 minutes, for each rod NOT fully inserted.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Check PRZ Level Control:	
	a. Level - GREATER THAN 15%	a. Perform the following: 1) Verify letdown isolation. IF NOT, THEN manually isolate. 2) Verify PRZ heaters off IF NOT, THEN place control switch in Off position 3) IF offsite power is not available verify adequate diesel capacity to run charging pumps (refer to E-0, Attachment D for component KW load rating). 4) Control charging to restore PRZ level greater than 15%.
	b. Verify one charging pump - IN SERVICE	b. IF charging is not in service, THEN perform the following: 1) Verify VCT makeup controls are in the AUTO position. 2) Place one charging pump in operation. 3) Adjust HCV-3-121 to desired flow.
	c. Verify letdown - IN SERVICE	c. IF letdown is not in service, perform the following: 1) Verify CCW flow to the nonregenerative letdown heat exchangers. 2) Verify that the letdown orifice isolation valves are closed. 3) OPEN the letdown containment isolation valve CV-3-204. 4) OPEN the letdown line isolation valve LCV-3-460. 5) OPEN the letdown orifice isolation valves as necessary.
	d. Level - TRENDING TO 22%	d. Control charging and letdown to maintain level at 22%.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Check PRZ Pressure Control:	
	a. Pressure - GREATER THAN 1723 PSIG	a. Verify SI actuation. IF NOT, THEN manually actuate SI. Go to E-0, REACTOR TRIP OR SAFETY INJECTION, Step 5.
	b. Pressure - STABLE AT OR TRENDING TO 2235 PSIG	b. IF pressure less than 2235 PSIG and decreasing, THEN: 1) Verify PRZ PORVs closed. IF NOT, THEN manually close. IF any valve can NOT be closed, THEN manually close its block valve. 2) Verify PRZ spray valves closed IF NOT, THEN manually close. IF valve(s) can NOT be closed, THEN stop RCP(s) supplying failed spray valve(s). 3) IF offsite power is not available verify adequate diesel capacity to energize pressurizer heaters. IF necessary shed non-essential loads (refer to E-0, Attachment D for component KW load rating.) 4) Verify PRZ heaters on. IF NOT, THEN manually turn on. IF pressure greater than 2235 PSIG and increasing, THEN: 1) Verify PRZ heaters off. IF NOT, THEN manually turn off. 2) Control pressure using normal PRZ spray. IF NOT available and letdown is in service, THEN use auxiliary spray. IF NOT, THEN use one PRZ PORV.
6	Check S/G Levels:	
	a. Narrow range level - GREATER THAN 6%	a. Maintain total feed flow greater than 130 gpm per S/G until narrow range level greater than 6% in at least one S/G.
	b. Control feed flow to maintain narrow range level between 6% and 50%	b. IF narrow range level in any S/G continues to increase, THEN stop feed to that S/G.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

Only one (1) CCW pump A or C and one (1) ICW pump B or C should be powered from a single 4KV bus when the bus is powered from an EDG.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Verify All 4KV Buses - ENERGIZED BY OFFSITE POWER	Perform the following: a. Verify diesel generators have assumed the following loads: 1) Intake cooling water pumps 2) Component cooling water pumps b. Try to restore offsite power: 1) Dispatch personnel for a visual inspection of startup transformers and their associated breakers 2) Verify proper battery charger and inverter operation IF NECESSARY place the Battery Charger Normal, Bypass Switch to BYPASS c. Verify adequate diesel capacity to energize the following equipment. IF necessary shed non-essential loads (Refer to E-0, Attachment D for component KW load rating). 1) Pressurizer backup heaters per Attachment B 2) Charging pump 3) Computer room chiller B
8	Transfer Condenser Steam Dump To Manual	IF condenser NOT available, THEN use S/G steam dump to atmosphere valves

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

On natural circulation, RTD bypass temperatures and associated interlocks will be inaccurate.

NOTE

RCPs B or C should be run to provide normal PRZ spray.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Check RCP Status - AT LEAST ONE RUNNING	Try to start one RCP: a. Establish conditions for starting a RCP: 1) Verify offsite power available to the 4KV buses. IF offsite power is not available THEN go to step 9.b RNO. 2) Start the oil lift pump. 3) Verify that the number 1 seal leak-off valve is OPEN and seal flow is established. 4) Verify the seal injection water flow to be approximately 8 to 12 GPM (refer to Enclosure #1 of OP-41.1, REACTOR COOLANT PUMP OPERATION) 5) Verify ΔP across the thermal barrier to be 15 inches of water. 6) Verify Greater Than 200 PSID across the number 1 seal. 7) Verify that the oil lift pump has been running for two minutes and the oil pressure interlock light is ON. b. Start one RCP. IF an RCP can NOT be started, THEN refer to ATTACHMENT A to verify natural circulation. IF natural circulation NOT verified, THEN increase dumping steam.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Check If Source Range Detectors Should Be Energized:	
	a. Check intermediate range flux - LESS THAN 10^{-10} AMPS	a. Continue with Step 11. <u>WHEN</u> flux less than 10^{-10} AMPS, <u>THEN</u> do Steps 10b and 10c.
	b. Verify source range detectors - ENERGIZED	b. Manually energize source range detectors.
	c. Transfer nuclear recorders to source range scale	
11	Shut Down Unnecessary Plant Equipment Not Required To Maintain Hot Standby Conditions	
12	Maintain Stable Plant Conditions:	
	a. PRZ pressure - AT 2235 PSIG	
	b. PRZ level - AT 22%	
	c. S/G narrow range levels - BETWEEN 6% AND 50%	
	d. RCS average temperature - AT 547°F	
	e. Secondary Plant Status	
	1) A and B 4KV buses energized	1) Within 30 minutes, place the battery charger bypass switch to BYPASS and place the spare charger in service per OP-003.1, 125V VITAL DC SYSTEM, <u>THEN</u> go to step 12f.
	2) Place Generator Core Monitor in "MANUAL START ONLY" mode of operation.	
	3) Verify the following equipment operates at design setpoints	Place equipment in service.
	a) Auxiliary oil pump	
	b) Turning gear oil pump	
	c) Bearing oil lift pump	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Maintain Stable Plant Conditions: (Cont'd)	
	4) Maintain bearing oil temperature between 90° - 100°F	
	f. Notify Nuclear Chemistry Dept. to obtain required sampling	
	g. If the reactor is to be maintained at Hot Standby, borate to xenon free conditions per Plant Curve Book	
13	Determine If Natural Circulation Cooldown Is Required:	
	a. Check RCP status - At least one running	a. Consult with Plant Supervisor - Nuclear to determine if cooldown is to be started per ES-0.2, NATURAL CIRCULATION COOLDOWN, STEP 1.
	b. Go to appropriate plant procedure as determined by the Plant Supervisor - Nuclear	

END OF TEXT

ATTACHMENT A

The following conditions support or indicate natural circulation flow:

- RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]
- S/G pressures - STABLE OR DECREASING
- RCS hot leg temperatures - STABLE OR DECREASING
- Core exit TCs - STABLE OR DECREASING
- RCS cold leg temperatures - NEAR SATURATION TEMPERATURE FOR S/G PRESSURE

ATTACHMENT B
RE-ENERGIZATION OF PRESSURIZER BACKUP HEATERS

CAUTION

Loading on the EDG should not exceed the Orange mark (2000 hour rating of 2850 KW). However loads placed on the energized 4 KV buses (the power source) may approach the Red mark (168 hour rating) on the wattmeter for short periods.

a. 4KV Buses - ALL ENERGIZED

- IF EDG A is available, go to Step b.
- IF EDG B is available, go to Step g.

b. Verify EDG A Load is LESS THAN 2300KW

b. Dispatch personnel to cabinet 3B12 to OPEN a[illegible] nine (9) breakers.

1. Reset heater Group A lockout relay in the penetration room.
2. Place control switch for Group A to the ON position.
3. CLOSE 3 individual heater breakers one at a time.

   AND

   Verify between each closure A diesel load DOES NOT exceed the capacity of power source.
4. Return to procedure and Step in effect.

c. Reset lockout relay in penetration room for backup Group A

d. Place control switch for Group A to the ON position

e. Verify EDG A load DOES NOT exceed the capacity of power source

f. Return to procedure and Step in effect

g. Place control switch for Group B backup heaters to "OFF"

h. Place the keylock switch for breaker 0408 in the EMERGENCY position

i. Dispatch personnel to cabinet 3B13 to OPEN all nine (9) breakers

j. Place console control switch to the ON position

k. CLOSE 3 individual heater breakers one at a time.

   AND

   Verify between each closure B diesel load DOES NOT exceed the capacity of power source

m. Return to procedure and Step in effect

ATTACHMENT C

REQUIREMENTS FOR A LOSS OF OFFSITE POWER, CONCURRENT WITH A SI ON UNIT 4 AND A LOSS OF ONE EDG

1. Place the CS, RHR and the non-running SI pumps in the pull to lock position.

2. One charging pump shall be started to establish charging flow in the 1 to 30 minute EDG load interval, if required.

3. Close the MSIVs and the main feedwater isolation valves.

4. After restoring and stabilizing S/G level at 6%, minimize AFW flow to maintain RCS Tavg greater than 543°F.

5. Backup Pressurizer Heaters (150 KW maximum) shall be energized during the 30 minute to 1 hour interval, provided the charging pumps are secured.

6. 30 Minutes after a reactor trip the charging pump and pressurizer heaters are to be alternated to prevent EDG overload.

7. At one hour after reactor trip, one NCC shall be placed in service.

8. If EDG capacity prevents starting a second NCC before 24 hours after reactor trip all NCC dampers shall be disabled to prevent damper failure.

9. No secondary plant or turbine support equipment shall be powered from the EDG.

10. Verify that the following DC emergency pumps operate at design setpoint:

    a. DC Emergency Bearing Oil Pump

    b. DC Air Side Seal Oil Backup Pump

11. The following criteria should be used to ensure stable plant conditions. Adverse trends shall be reported immediately to the PS-N and the TSC Staff:

    a. Pressurizer pressure greater than 1800 psig

    b. Containment pressure less than 3 psig

    c. S/G pressures within 50 psid

    d. S/G pressures greater than 600 psig

    e. Restore and stabilize S/G level to 6%

FOLDOUT FOR E-0 SERIES PROCEDURES

1. RCP TRIP CRITERIA

Trip all RCPs if BOTH conditions listed below occur:

a. High-head SI pumps - AT LEAST ONE RUNNING.

b. RCS subcooling - LESS THAN 25°F [65°F]

2. SI ACTUATION CRITERIA

Actuate SI and go to E-O, REACTOR TRIP OR SAFETY INJECTION, Step 1, if EITHER condition listed below occurs:

- RCS subcooling based on core exit TCs - LESS THAN 30°F [45° F]
- PRZ level - CANNOT BE MAINTAINED GREATER THAN 12% [50%]

3. RED PATH SUMMARY

a. SUBCRITICALITY - Nuclear power GREATER THAN 5%.

b. CORE COOLING - Core exit TCs GREATER THAN 1200°F.

c. HEAT SINK : Narrow Range level in all S/Gs LESS THAN 32% AND total feedwater flow LESS THAN 130 GPM per S/G.

d. INTEGRITY - Cold leg temperature decrease GREATER THAN 100°F in last 60 minutes AND RCS cold leg temperature LESS THAN 317°F.

e. CONTAINMENT - Containment pressure GREATER THAN 59 PSIG.

4. CST MAKEUP WATER CRITERIA

Makeup water sources for the CST will be necessary if level decreases to LESS THAN 10%

5. HYDROGEN ANALYZER START CRITERIA

Hydrogen analyzer should be placed in service per Attachment A of E-0 within 30 minutes of a valid safety injection signal.

6. ADVERSE CONTAINMENT CONDITIONS

Adverse Containment conditions are defined as either a Containment Atmosphere temperature of 180°F or Containment radiation levels equal to or greater than 1.3 x 10^5 R/hr. Under these conditions the setpoint values in brackets, [ ], are required to be used.

If the Containment temperature subsequently falls below 180°F, the normal setpoint values may be used. If the Containment radiation level subsequently falls below 1.3 x 10^5 R/hr, the adverse Containment setpoints are required to be used until permission is granted by the Technical Support Staff to use normal setpoints.

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-E-0

EOP Title: Reactor Trip or Safety Injection

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
Symptoms or Entry Conditions	Symptoms or Entry Conditions	7	The Symptoms or Entry Conditions Section provides plant specific setpoints for Reactor Trip and Safety Injection. See attached procedure.
1	1	8	The word LIT is replaced by the word ON, plant specific terminology for lights is ON or OFF. See attached procedure.
2	2	2	Steps b, c, and d and a Note were added to Step 2 due to plant specific requirements that follow a reactor or turbine trip. See attached procedure.
3	3	8	AC Emergency Buses changed to 4KV Buses due to plant specific terminology. Changes in all procedures from AC Emergency Buses to 4KV Buses is justified by this entry.
4	4a	7	Step 4 provides plant specific means for checking if safety injection has been actuated. See attached uprocedure.
4	4b and 4c	2	Steps 4b and 4c have been added due to plant specific requirements of providing procedural guidance in the event of a single failure of an Emergency Diesel Generator.
	Caution 1 prior to Step 9	2	The first caution prior to Step 9 cautions the operator on overloading the Emergency Diesel Generator. See attached procedure.
	Caution 2 prior to Step 9	2	The second caution prior to Step 9 cautions the operator on exceeding the capacity of the Component Cooling Water Heat Exchanger. See attached procedure.
5	5	2	FW Isolation Valves - Closed has been changed to close Feedwater Isolation Valves due to the plant specific design that does not automatically close the Feedwater Isolation Valves on a reactor trip or safety injection. See attached procedure.
7a	7a	2	MD Pumps - Running has been replaced with Auxiliary Feedwater Steam Supply MOVs OPEN due to plant specific requirements. See attached procedure.

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-E-0

EOP Title: Reactor Trip or Safety Injection

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
7b	7b	2	Turbine Driven Pump - Running if necessary has been changed to Auxiliary Feedwater Regulator Valves OPEN to complete the high level step of verify AFW Pumps running: See attached procedure.
8	8b	8	Low Head SI Pumps changed to RHR Pumps due to plant specific terminology. Changes in all procedures from Low Head SI Pumps to RHR Pumps is justified by this entry. See attached procedure.
---	First Caution prior to Step 9	2	Plant specific information justified by providing procedural guidance in the event a failure of one EDG occurs. See attached procedure.
	Second Caution prior to Step 9	2	Plant specific information justified by CCW configuration that could be in effect. See attached procedure.
9	9	2	Verify CCW Pumps running has been changed to verify 2 of 3 CCW Pumps running. Due to plant specific safeguards requirement. See attached procedure.
---	9a	2	Normally one CCW Pump is in operation upon a SI signal. The increased flow supplied by the additional CCW Pump could close FCV-3-426, therefore, verifying the valve in the open position is essential to plant operation. See attached procedure.
10	10	2	Verify Service Water Pumps - Running has changed to verify 2 of 3 Intake Cooling Water Pumps - running due to plant terminology and plant specific safeguards requirement. See attached procedure.
11	11	2	Verify Containment Fan Coolers - Running in Emergency Mode has been changed to verify 2 of 3 Emergency Containment Coolers and Filter Fans - running due to plant specific safeguards requirement. See attached procedure.

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-E-0 (Sheet 3 of 3,

EOP Title: Reactor Trip or Safety Injection

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
12	12 a, b c, d	2	Steps 12a, b, c, and d, were added due to plant terminology and plant specific requirements. See attached procedure.
13	13a	7	Plant specific information due to Turkey Point operating characteristics.
13	13	7	Step 13 provides plant specific means for determining if main steamlines should be isolated. See attached procedure.
	Caution prior to Step 16	7	The caution prior to Step 16 cautions the operator to reduce feedflow to both units i- the event that Train 1 of Auxiliary Feedwater is inoperable and both Units 3 ar: 4 are in Natural Circulation. See attache: procedure.
18	18	2	Verify SI valve alignment, proper emergenc; alignment changed to support plant specific requirements. See attached procedure.
Caution 2 prior to Step 19	---	2	Caution deleted due to plant specific design. See attached procedure.
30	30	7	Step 30 provides plant specific means of checking secondary radiation normal. See attached procedure.
Caution 2 prior to Step 33	---	2	The second caution prior to Step 19 has bee- deleted due to plant specific design which does not include automatic transfer capability and normally has the Safety Injection Pumps suction aligned to the Refueling Water Storage Tanks. See attache: procedure.
33	33	7	Step 33 provides plant specific steps concerning the use of the shared safety injection pumps. See attached procedure.
38	38	7	Step 38 provides plant specific means for establishing charging flow. See attached procedure.
39	39	7	Step 39 provides plant specific equipment loaded to the 4KV Bus. See attached procedure.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-E-0

Title:

REACTOR TRIP OR SAFETY INJECTION

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	87-009
Approved by Plant Manager-N:	1/7/87

RTSs 86-1170, 86-1891P, 86-1863, 86-1832P *OTSC 4174*

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LIST OF EFFECTIVE PAGES

Page	Revision Date
1	01/07/87
2	01/07/87
3	01/07/87
4	01/07/87
5	01/07/87
6	01/07/87
7	01/07/87
8	01/07/87
9	01/07/87
10	01/07/87
11	01/07/87
12	01/07/87
13	01/07/87
14	01/07/87
15	01/07/87
16	01/07/87
17	01/07/87
18	01/07/87
19	01/07/87
20	01/07/87
21	01/07/87
22	01/07/87

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1.0 PURPOSE

This procedure provides actions to verify proper response of the automatic protection systems following manual or automatic actuation of a reactor trip or safety injection, to assess plant conditions, and to identify the appropriate recovery procedure.

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 The following are symptoms that require a reactor trip, if one has not occurred:

1. Source range high level trip 10^5 CPS.
2. Intermediate range high level trip, 25% of full power, current equivalent.
3. Power range, low range, high level trip, 25% of full power.
4. Power range high level trip, 108% of full power.
5. Pressurizer high pressure trip, 2370 PSIG.
6. Pressurizer high level trip, 91% of span.
7. Pressurizer low pressure trip 1843 PSIG
8. Low RCS flow trip, 91% of rated flow.
9. RCP breaker open.
10. 4 KV bus low voltage trip.
11. Over power Δ T trip.
12. Over temperature ΔT trip.
13. Safety Injection.
14. Turbine trip.
15. Low-low S/G level, 15% of span.
16. Steam flow greater than feed flow coincident with a low S/G level.

2.2 The following are symptoms of a reactor trip:

1. Any reactor trip annunciator ON.
2. Rapid decrease in neutron level indicated by nuclear instrumentation.
3. All shutdown and control rods are fully inserted. Rod bottom lights are ON.

2.3 The following are symptoms that require a reactor trip and safety injection, if one has not occurred:

1. Low pressurizer pressure, 1723 PSIG.
2. High containment pressure, 4 PSIG.
3. High steam line differential pressure, 100 psid.
4. High steam flow and low S/G pressure or low Tavg.

2.4 The following are symptoms of a reactor trip and safety injection:

1. Any SI annunciator ON.
2. SI pumps running.
3. RHR pumps running.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

- *Steps 1 through 14 are IMMEDIATE ACTION steps.*
- *Foldout page should be open.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Verify Reactor Trip: • Rod bottom lights - ON • Reactor trip and bypass breakers- OPEN • Rod position indicators - AT ZERO • Neutron flux - DECREASING	Manually trip reactor. IF reactor will NOT trip, THEN go to FR-S.1, RESPONSE TO NUCLEAR POWER GENERATION/ATWS, Step 1.
2	Verify Turbine Trip:	
	a. All turbine stop valves - CLOSED	a. Manually trip turbine.
	b. Generator breakers OPEN (Normally 30 second delay)	

NOTE

If trip occurred while timing in the reheaters, manual isolation of the timing valves is required.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	c. CLOSE - reheat steam supply MOVs	c. Manually close valves
	d. OPEN - turbine drain valves	
3	Verify Power to 4 KV Buses:	
	a. 4 KV buses - AT LEAST ONE ENERGIZED	a. Try to restore power to at least one 4 KV bus. IF power can NOT be restored to at least one 4 KV bus, THEN go to ECA-0.0, LOSS OF ALL AC POWER, Step 1.
	b. 4KV buses - ALL ENERGIZED	b. Try to restore power to de-energized 4KV bus.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Check If SI Is Actuated:	
	a. SI ANN. ON	a. Check if SI is required. IF SI is required THEN manually actuate. IF SI is NOT required, THEN go to ES-0.1, REACTOR TRIP RESPONSE, Step 1.
	b. A and B 4KV Bus - ENERGIZED	b. Perform steps of Attachment C while continuing with E-0.
	c. Verify proper Battery Charger and Inverter operation	c. Place Battery Charger Normal Bypass Switch to Bypass Position
5	Verify Feedwater Isolation:	
	a. Feedwater control valves - CLOSED	a. Manually close valves.
	b. Feedwater bypass valves - CLOSED	b. Manually close valves.
	c. CLOSE feedwater isolation valves	c. Manually close valves.
	d. S/G blowdown isolation valves - CLOSED	d. Manually close valves.
	e. S/G sample isolation valves - CLOSED	e. Manually close valves.
6	Verify Containment Isolation Phase A:	
	a. Phase A - ACTUATED	a. Manually actuate Phase A.
	b. Phase A valves - CLOSED	b. Manually close valves.
7	Verify AFW Pumps Running:	
	a. Aux. feedwater steam supply MOVs - OPEN	a. Manually open valves.
	b. Aux. feedwater regulator valves - OPEN	b. Manually open valves.
8	Verify SI Pumps Running:	Manually start pumps.
	a. High-head SI pumps - RUNNING	
	b. RHR pumps - RUNNING	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *Only one (1) CCW pump A or C and one (1) ICW pump B or C should be powered from a single 4KV bus when the bus is powered from an EDG.*
- *In the event one CCW heat exchanger is out of service, one CCW pump should be placed in the pull-to-lock position.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Verify 2 of 3 CCW Pumps - RUNNING:	Manually start pumps.
	a. Verify RCP seal cooling water outlet FCV-3-626 is OPEN	a. OPEN FCV-3-626
10	Verify 2 of 3 Intake Cooling Water Pumps - RUNNING	Manually start pumps. a. IF only one pump is available THEN Dispatch personnel to isolate CV-3-2201 TPCW Hx Outlet Control Valve by closing the following manual isolation valves. 1) 3-50-401 2) 3-50-403
11	Verify 2 of 3 Emergency Containment Cooler And Filter Fans - RUNNING	Manually start 2 coolers and filter fans.
12	Verify Containment Ventilation Isolation:	
	a. Containment purge and supply fans - OFF	a. Manually stop fans
	b. Purge valves - CLOSED	b. Manually close purge valves.
	c. Instrument air bleed valves - CLOSED	c. Manually close valves.
	d. Verify control room ventilation isolation	d. Place control room ventilation in emergency recirculation mode.
13	Check If Main Steamlines Should Be Isolated:	
	a. IF the following status lights on VPB are ON • High steam flow • Low Tavg OR low S/G pressure OR • Hi-Hi containment pressure THEN	a. Go to Step 14.
	b. Verify main steam isolation	b. Manually close valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	**Verify Containment Spray Not Required:**	
	a. Containment pressure - HAS REMAINED LESS THAN 20 PSIG	a. Perform the following: 1) Verify containment spray initiated. IF NOT, THEN manually initiate 2) Verify containment isolation Phase B valves closed. IF NOT, THEN manually close valves. 3) Stop all RCPs.
15	**Verify SI Flow**	
	a. RCS pressure - LESS THAN 1588 PSIG [1993 PSIG]	a. Go to Step 16.
	b. High-head SI pump flow indicators - CHECK FOR FLOW	b. Manually start pumps and align valves.
	c. RCS pressure - LESS THAN 225 PSIG [630 PSIG]	c. Go to Step 16.
	d. RHR pump flow indicators - CHECK FOR FLOW	d. Manually start pumps and align valves.

CAUTION

In the event both units require AFW under natural circulation conditions and Train 1 of AFW is inoperable, within 3 minutes the AFW flow controllers should be placed in manual and flow adjusted to 300 GPM per unit, rather than the 130 GPM per S/G value given in Step 16.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	**Verify Total AFW Flow - GREATER THAN 130 GPM per S/G**	Manually start pumps and align valves as necessary. IF AFW flow greater than 130 GPM per S/G can NOT be established, THEN go to FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, Step 1.
17	**Verify AFW Valve Alignment - PROPER EMERGENCY ALIGNMENT**	Manually align valves as necessary.
18	**Verify SI Valves That Receive A SI Signal Have Assumed Their Required Position As Indicated By Bright Amber Lights On VPB**	Manually align valves as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	Check RCP Seal Cooling	
	a. CCW flow to RCP thermal barriers - NORMAL	a. IF CCW to an RCP is lost, THEN: 1) Trip the RCP. 2) Reset SI. 3) IF offsite power is not available, ensure adequate power available to run one charging pump. If necessary, shed nonessential loads. (Refer to E-0, attachment D for component KW load rating.) 4) Start one charging pump at minimum speed for seal injection.
20	Check RCS Average Temperature - STABLE AT OR TRENDING TO 547°F	IF temperature less than 547°F and decreasing, THEN: a. Stop dumping steam. b. IF cooldown continues, THEN control total feed flow. Maintain total feed flow greater than 130 GPM per S/G until narrow range level greater than 6% [32%] in at least one S/G. c. IF cooldown continues, THEN close main steamline isolation and bypass valves. IF temperature greater than 547°F and increasing, THEN: • Dump steam to condenser. OR • Dump steam using S/G steam dump to atmosphere valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21	Check PRZ PORVs And Spray Valves:	
	a. PORVs - CLOSED	a. IF PRZ pressure less than 2335 PSIG, THEN manually close PORVs. IF any valve can NOT be closed, THEN manually close its block valve. IF block valve can NOT be closed, THEN go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	b. Normal PRZ spray valves - CLOSED	b. IF PRZ Pressure is less than 2260 PSIG, THEN manually close valves. IF valves can NOT be closed. THEN stop RCP(s) supplying failed spray valve(s).
22	Check If RCPs Should Be Stopped:	
	a. High-head SI pumps - AT LEAST ONE RUNNING	a. Go to Step 23.
	b. RCS subcooling LESS THAN 25°F [65°F]	b. Go to Step 23.
	c. Stop all RCPs	
23	Check If S/Gs Are Not Faulted:	
	a. Check pressure in all S/Gs - • NO S/G PRESSURE DECREASING IN AN UNCONTROLLED MANNER • NO S/G COMPLETELY DEPRESSURIZED	a. Go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.
24	Check If S/G Tubes Are Not Ruptured: • CONDENSER AIR EJECTOR RADIATION - NORMAL • S/G BLOWDOWN RADIATION - NORMAL	Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.
25	Check If RCS Is Intact: • CONTAINMENT RADIATION - NORMAL • CONTAINMENT PRESSURE - NORMAL • CONTAINMENT SUMP LEVEL - NORMAL	Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26	Check If SI Flow Should Be Terminated:	
	a. RCS subcooling based on core exit TCs - GREATER THAN 30°F	a. DO NOT STOP SI PUMPS. Go to Step 28
	b. Secondary heat sink: • TOTAL FEED FLOW TO S/Gs - GREATER THAN 130 GPM per S/G OR • NARROW RANGE LEVEL IN AT LEAST ONE S/G - GREATER THAN 6%	b. IF neither condition satisfied, THEN DO NOT STOP SI PUMPS. Go to Step 28.
	c. RCS pressure: • PRESSURE - GREATER THAN 1588 PSIG • PRESSURE - STABLE OR INCREASING	c. DO NOT STOP SI PUMPS. Go to Step 28.
	d. PRZ Level - GREATER THAN 12%	d. DO NOT STOP SI PUMPS. Try to stabilize RCS pressure with normal PRZ spray Go to Step 28.
27	Go To ES-1.1, SI TERMINATION, Step 1	
28	Initiate Monitoring Of Critical Safety Function Status Trees	

CAUTION

Makeup water sources for CST will be necessary if level decreases to less than 10%

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
29	Check S/G Levels:	
	a. Narrow range level - GREATER THAN 6%	a. Maintain total feed flow greater than 130 GPM per S/G until narrow range level greater than 6% in at least one S/G.
	b. Control feed flow to maintain narrow range level between 6% and 50%	b. IF narrow range level in any S/G continues to increase in an uncontrolled manner, THEN go to E-3 STEAM GENERATOR TUBE RUPTURE, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30	Check Secondary Radiation - NORMAL	
	a. Contact the Nuclear Chemistry Department for sampling of the S/G blowdown	a. Go to E-3 STEAM GENERATOR TUBE RUPTURE, Step 1.
31	Check Auxiliary Building Radiation - NORMAL	Evaluate cause of abnormal conditions. <u>IF</u> the cause is a loss of RCS inventory outside containment, <u>THEN</u> go to ECA-1:2, LOCA OUTSIDE CONTAINMENT, Step 1.
32	Check PRT Conditions - NORMAL	Evaluate cause of abnormal conditions.

CAUTION

If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
33	Reset SI	
	a. Verify unit 4 SI pumps NOT REQUIRED	a. Perform the following: 1) OPEN the following SI pump manual suction intertie valves: a) 870A b) 870B 2) OPEN the following SI pump manual recirculation tie valves: a) 892A b) 892B 3) Unlock and rack in the following unit 4 RWST outlet isolation valve breakers: a) 40712 b) 40605

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
33	Reset SI (Cont'd)	
		4) CLOSE the following unit 4 RWST outlet isolation valves: a) MOV-4-864A b) MOV-4-864B 5) Remove the manual gag from valves and CLOSE the following unit 4 SI test return to RWST valves: a) CV-4-856A b) CV-4-856B 6) Go to Step 34
	b. Stop the unit 4 SI pumps and place in standby	
	c. CLOSE the following SI pump discharge header isolation valves 1) MOV-878A 2) MOV-878B	
34	Reset Containment Isolation Phase A And Phase B	
35	Verify Instrument Air To Containment	Start the diesel powered air compressors.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

RCS pressure should be monitored. If RCS pressure decreases to less than 225 PSIG, the RHR pumps must be manually restarted to supply water to the RCS.

36	Check If RHR Pumps Should Be Stopped:	
	a. Check RCS pressure:	
	1) Pressure - GREATER THAN 225 PSIG	1) Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	2) Pressure - STABLE OR INCREASING	2) Go to Step 37.
	b. Stop RHR pumps and place in standby	
37	Check Power Supply To Charging Pumps - OFFSITE POWER AVAILABLE	Verify adequate diesel capacity to run charging pumps. If necessary, shed sufficient nonessential loads. (Refer to E-0; Attachment D for component KW load rating.)
38	Check If Charging Flow Has Been Established:	
	a. Charging pumps - AT LEAST ONE RUNNING	a. Perform the following: 1) IF CCW flow to RCP(s) thermal barrier is lost, THEN isolate seal injection to affected RCP(s) before starting charging pumps. 2) Start charging pumps as necessary.
	b. Establish flow as necessary:	
	1) Adjust HCV-3-121 to desired flow	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
39	Check If Diesel Generators Should Be Stopped:	
	a. Verify 4KV buses - ENERGIZED BY OFFSITE POWER	a. Try to restore offsite power to 4 KV buses. IF offsite power can NOT be restored, perform the following: 1) Verify adequate diesel capacity to place the following equipment in service. IF necessary, shed non-essential loads. (Refer to E-0, Attachment D for component KW load rating.) a) Pressurizer Heaters backup groups per Attachment B. b) Computer room chiller B
	b. Stop any unloaded diesel generator and place in standby	
40	Return To Step 20	

END OF TEXT

ATTACHMENT A
HYDROGEN ANALYZER START CRITERIA

NOTE

Completion of this attachment insures that the sample system is isolated, and permits operation of the H_2 monitoring system, future operation of the post accident sampling system and the waste hold-up tank pump back system.

1. Place the following Unit 4 valves in their designated positions:

a.	PAHM-002A CTMT Atmosphere to H_2 Analyzer	Close
b.	PAHM-002B CTMT Atmosphere to H_2 Analyzer	Close
c.	PAHM-001A H_2 Sample Return to CTMT	Close
d.	PAHM-001B H_2 Sample Return to CTMT	Close

2. Place the following Unit 3 valves in their designated positions:

a.	CV-951 PRZ Steam Space Sample Valve	Close
b.	CV-953 PRZ Liquid Space Sample Valve	Close
c.	SV-6427A Hot Leg Loop A Sample Valve	Close
d.	SV-6427B Hot Leg Loop B Sample Valve	Close
e.	CV-955C Accumulator A Sample Valve	Close
f.	CV-955D Accumulator B Sample Valve	Close
g.	CV-955E Accumulator C Sample Valve	Close
h.	SV-6428 A & B Hot Leg to Sample System	Close
i.	SV-6429 RHR System to Sample System	Close
j.	MPAS-005 Inst. Air Bleed to CTMT Purge Exhaust	Close
k.	MPAS-004 W.H.T. Pump Discharge to CTMT Sump	Open
l.	MPAS-001 W.H.T. Pump Discharge to Radwaste Bldg.	Close
m.	PAHM-001A H_2 Sample Return to CTMT	Open
n.	PAHM-001B H_2 Sample Return to CTMT	Open
o.	PAHM-002A CTMT Atmosphere to H_2 Analyzer	Open
p.	PAHM-002B CTMT Atmosphere to H_2 Analyzer	Open
q.	HV-1 CTMT Atmosphere to H_2 Analyzer	Open
r.	HV-3 CTMT Atmosphere to H_2 Analyzer	Open

3. Notify Nuclear Chemistry Department to perform the P.A.S.S. valve alignment.

4. WHEN the Nuclear Chemistry Department has completed their valve alignment, perform the following:

   a. Verify the following function selector switches on the hydrogen analyzer panels are in the SAMPLE position.

      1) QR 81

      2) QR 82

   b. Place the control switches to ANALYZE

   c. Depress the REMOTE selector buttons

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

ATTACHMENT B
RE-ENERGIZATION OF PRESSURIZER BACKUP HEATERS

CAUTION

Loading on the EDG should not exceed the Orange mark (2000 hour rating of 2850 KW). However, loads placed on the energized 4 KV buses (the power source) may approach the Red mark (168 hour rating) on the wattmeter for short periods.

a. 4KV Buses - ALL ENERGIZED

- IF EDG A is available, go to Step b.
- IF EDG B is available, to to Step g.

b. Verify EDG A Load is LESS THAN 2300 KW

b. Dispatch personnel to cabinet 3B12 to OPEN all nine (9) breakers.

1. Reset heater Group A lockout relay in the penetration room.
2. Place control switch for Group A to the ON position.
3. CLOSE 3 individual heater breakers one at a time.

   AND

   Verify between each closure A diesel load DOES NOT exceed the capacity of the power source.
4. Return to procedure and Step in effect.

c. Reset lockout relay in penetration room for backup Group A

d. Place control switch for Group A to the ON position

e. Verify EDG A load DOES NOT exceed the capacity of the power source

f. Return to procedure and Step in effect

g. Place control switch for Group B backup heaters to "OFF"

h. Place the keylock switch for breaker 0408 in the EMERGENCY position

i. Dispatch personnel to cabinet 3B13 to OPEN all nine (9) breakers

j. Place console control switch to the ON position

k. CLOSE 3 individual heater breakers one at a time

AND

Verify between each closure B diesel load DOES NOT exceed the capacity of the power source

l. Return to procedure and Step in effect

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ATTACHMENT C

LOSS OF OFFSITE POWER CONCURRENT WITH SI AND LOSS OF ONE EDG EQUIPMENT MANIPULATION

CAUTION

- *The unaffected unit should be aware or cautioned on the affects of EDG loading.*
- *In the event A or B 4KV Bus has failed due to breaker failure, one battery charger on the affected unit (4KV bus failure) will be energized upon SI reset.*
- *Steps one, two and three of this attachment must be performed as indicated time intervals permit.*

1. At 20-30 minutes after reactor trip place the following RHR pump control switches in the pull-to-lock position provided two HHSI pumps are in operation supplying RWST water to the RCS:

   a. RHR Pump A

   b. RHR Pump B

CAUTION

The reset switch on the sequencer panel should not be used to energize battery chargers.

2. At 20-30 minutes after reactor trip verify completion of Step 1 THEN align spare battery chargers as follows:

   a. IF EDG A is inoperable perform the following:

      1) Place Battery Charger 4A, Breaker 4D23-21, to the OFF position.

      2) Unlock and place Battery Charger 4S, Breaker 4D23-22, to the ON position.

      3) Place Battery Charger 3A, Breaker 3D01-43, to the OFF position.

      4) Unlock and place Battery Charger 3S, Breaker 3D01-44, to the ON position.

      5) Place the Battery Charger Normal Bypass Switch in the Control Room to BYPASS.

ATTACHMENT C (Cont'd)

LOSS OF OFFSITE POWER CONCURRENT WITH SI AND LOSS OF ONE EDG EQUIPMENT MANIPULATION

2. b. IF EDG B is inoperable perform the following:
   1) Place Battery Charger 3B, Breaker 3D23-21, to the OFF position.
   2) Unlock and place Battery Charger 4S, Breaker 3D23-22, to the ON position.
   3) Place Battery Charger 4B, Breaker 4D01-43, to the OFF position.
   4) Unlock and place Battery Charger 3S, Breaker 4D01-44, to the ON position
   5) Place the Battery Charger Normal Bypass Switch in the Control Room to BYPASS.

3. At 30 minutes after reactor trip place the following Containment Spray Pump Control Switches in the pull-to-lock position provided two Emergency Containment Coolers are in operation:
   a. CSP-A
   b. CSP-B

4. One of the following Control Room Air Conditioners units may be secured to facilitate EDG load management.
   a. Unit A, MCC-3B Breaker 30636
   b. Unit B, MCC-4C Breaker 40710

5. No secondary plant or turbine support equipment shall be powered from the EDG.

6. Verify that the following DC Emergency Pumps operate at design setpoint:
   a. DC Emergency Bearing Oil Pump (3.5 PSIG)
   b. DC Air Side Seal Oil Backup Pump (4 to 6 PSID)

7. IF opposite units SI pumps are required perform the following:
   a. Open the following SI Pump Manual Suction Intertie Valves:
      1) 870A
      2) 870B
   b. Open the following SI Pump Manual Recirculation Tie Valves:
      1) 892A
      2) 892B

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ATTACHMENT C (Cont'd)

LOSS OF OFFSITE POWER CONCURRENT WITH SI AND LOSS OF ONE EDG EQUIPMENT MANIPULATION

7. c. Unlock and rack in the following Unit 4 RWST Outlet Isolation Valve Breakers:

    1) 40712

    2) 40605

   d. Close the following Unit 4 RWST Outlet Isolation Valves:

    1) MOV-4-864A

    2) MOV-4-864B

   e. Remove the manual gag and close the following Unit 4 SI Test Return Isolation Valves:

    1) CV-4-856A

    2) CV-4-856B

8. Steps one, two and three of this attachment must be performed as indicated time intervals permit.

ATTACHMENT D
COMPONENT KW LOAD RATING CHART

CAUTION

Loading on the EDG should not exceed Orange mark (2000 hour rating of 2850 KW). However loads placed on the energized 4 KV buses (the power source) may approach the red mark (168 hour rating) on the wattmeter for short periods.

ESSENTIAL LOAD

	COMPONENT	KW	COMPONENT	KW	
	CCW PUMP	380	CTR. ROOM A/C (1)	26	
	ICW PUMP	265	CTR. ROOM SUP FAN	1	
Note 1	RHR PUMP	220	BATTERY CHGR 3B	41	
Note 3	SI PUMP 3	302	BATTERY CHGR 4A	41	
Note 3	SI PUMP 4	302	BATTERY RM A/C	22	
	CS PUMP	216	BA HEAT TRACE	40	
	BATTERY CHGR 3A	56	PAGE SYSTEM	5	
	EM. CT. FILTER	52	COMP. RM CHILLER	54	Note 4
	EM. CT. COOLER	22	DG VENT FAN (1)	5	
	BATTERY CHGR 4B	56	DG LO PUMP (1)	1	
	EMERG. LTG.	31	DG AIR COMP (1)	5	
	H2 ANAL HT. TRACE	8	DG FO PUMP (1)	1	
	H2 ANALYZER PUMP	1	SECU. BLDG. XFMR	8	
	CRDM COOLER	50	BATTERY CHGR 3S	56	
	NORM. CONT. CLR	64	BATTERY CHGR 4S	41	

NON-ESSENTIAL LOADS

	COMPONENT	KW	COMPONENT	KW	
Note 2	CHARGING PUMP	101	BRG. LIFT OIL PUMP	13	
	SFP PUMP	86	PRZ HEATER (EA)	50	Note 1 & 2
	OIL VAPOR EXTR	7	AUX. STM CR PUMP	3	
	AIR SIDE SO PUMP	21	WDCR PUMP	3	
	H2 SIDE SO PUMP	3	BA TK HEATER	15	Note 5
	TURN GR DRIVE	42	BA XFER PUMP	27	Note 6
	TURN GR LO PUMP	34			

NOTES

(Notes 1, 2 & 3 apply to the one-EDG available case only)

1. *For a loss of off-site power and failure of one EDG, the operating RHR pump is required to be secured at 20-30 minutes after the reactor trip in order to maintain EDG load limits, provided two HHSI pumps are in service supplying RWST water to the RCS.*

2. *On the non-accident unit, one charging pump (if needed) should be established during the 1-30 minute EDG load interval. Pressurizer Heaters (150 KW) should be established in the 30 minute to one (1) hour EDG load interval, provided the charging pumps are secured. 30 Minutes after a reactor trip the charging pump and PRZ heaters should be alternated to prevent EDG overload.*

3. *For a loss of off-site power and failure of one EDG, utilization of only one HHSI pump for cold leg recirculation is permitted in order to maintain EDG load limits.*

4. *The computer room chiller is required to maintain operation of ICCS. Chiller B is required to be in operation at 55 minutes to one (1) hour after reactor trip provided the Containment Spray Pump has been secured per Attachment C of E-0.*

5. *Calculations have been performed to demonstrate that this equipment is not required until 8 hours following a loss of off-site power.*

6. *The BA transfer pumps are not required for post-LOCA pH neutralization until 8 hours after the accident.*

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FOLDOUT FOR E-0 SERIES PROCEDURES

1. RCP TRIP CRITERIA

Trip all RCPs if BOTH conditions listed below occur:

a. High-head SI pumps - AT LEAST ONE RUNNING.

b. RCS Subcooling - LESS THAN 25°F [65°F]

2. SI ACTUATION CRITERIA

Actuate SI and go to E-O, REACTOR TRIP OR SAFETY INJECTION, Step 1, if EITHER condition listed below occurs:

- RCS SUBCOOLING BASED ON CORE EXIT TCs - LESS THAN 30°F [45° F]
- PRZ LEVEL - CANNOT BE MAINTAINED GREATER THAN 12% [50%]

3. RED PATH SUMMARY

a. SUBCRITICALITY - Nuclear power GREATER THAN 5%.

b. CORE COOLING - Core exit TCs GREATER THAN 1200°F.

c. HEAT SINK - Narrow Range level in all S/Gs LESS THAN 32% AND total feedwater flow LESS THAN 130 GPM per S/G.

d. INTEGRITY - Cold leg temperature decrease GREATER THAN 100°F in last 60 minutes AND RCS cold leg temperature LESS THAN 317°F.

e. CONTAINMENT - Containment pressure GREATER THAN 59 PSIG.

4. CST MAKEUP WATER CRITERIA

Makeup water sources for the CST will be necessary if level decreases to LESS THAN 10%

5. HYDROGEN ANALYZER START CRITERIA

Hydrogen analyzer should be placed in service per Attachment A of E-0 within 30 minutes of a valid safety injection signal.

6. ADVERSE CONTAINMENT CONDITIONS

Adverse Containment conditions are defined as either a Containment Atmosphere temperature of 180°F or Containment radiation levels equal to or greater than 1.3 x 10^5 R/hr. Under these conditions the setpoint values in brackets, [ ], are required to be used.

If the Containment temperature subsequently falls below 180°F, the normal setpoint values may be used. If the Containment radiation level subsequently falls below 1.3 x 10^5 R/hr, the adverse Containment setpoints are required to be used until permission is granted by the Technical Support Staff to use normal setpoints.

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ES-0.2 (Sheet 1 of 1)

EOP Title: Natural Circulation Cooldown

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
	Caution 2 prior to Step 1	7	The second caution prior to Step 1 provides direction to contact the Plant Supervisor - Nuclear and the Technical Support Center Staff prior to performing the procedure in the event that the opposite unit has a safety injection, loss of offsite power and a loss of one Emergency Diesel Generator. See attached procedure.
1	1	7	Step 1 provides plant specific means for establishing conditions for starting a reactor coolant pump. See attached procedure.
3	3	7	Step 3 provides plant specific means for verifying Reactor Coolant System boron concentrations. See attached procedure.
15	15	7	Step 15 provides plant specific means for locking out the Safety Injection System. See attached procedure.
17	17	7	Step 17 provides plant specific means for maintaining reactor coolant pump seal injection flow. See attached procedure.
18	18	7	Step 18 provides the plant specific procedure for placing the Residual Heat Removal System in service. See attached procedure.

Rec'd FEB 18 1987

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-ES-0.2

Title:

NATURAL CIRCULATION COOLDOWN

Safety Related Procedure

Responsible Department:	Operations
Reviewed by PNSC:	87-009
Approved by Plant Manager-N:	1/7/87

RTS 86-1092P, 86-1832P

LIST OF EFFECTIVE PAGES

Page	Revision Date
1	01/07/87
2	01/07/87
3	01/07/87
4	01/07/87
5	01/07/87
6	01/07/87
7	01/07/87
8	01/07/87
9	01/07/87
10	01/07/87
11	01/07/87

1.0 PURPOSE

This procedure provides actions to perform a natural circulation RCS cooldown and depressurization to cold shutdown, with no accident in progress, under requirements that will preclude any upper head void formation.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from ES-0.1, REACTOR TRIP RESPONSE, Step 13, and ECA-0.1, LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED, Step 21 when it has been determined that a natural circulation cooldown is required.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *If SI actuation occurs during this procedure, E-0, REACTOR TRIP OR SAFETY INJECTION, should be performed.*
- *In the event a loss of offsite power has occurred concurrent with a SI on Unit 4 and a loss at one EDG, permission from the PS-N and the TSC Staff is required prior to continuing with this procedure.*

NOTE

- *Foldout page should be open.*
- *RCPs should be run in order of priority to provide normal PRZ spray.*
- *If conditions can be established for starting an RCP during this procedure Step 1 should be repeated.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Try To Restart An RCP:	
	a Establish conditions for starting an RCP:	a Go to Step 2
	1) Verify off-site power available to the 4KV buses IF offsite power is not available THEN go to Step 2	
	2) Start the oil lift pump	
	3) Verify that the number 1 seal leakoff valve is OPEN and seal flow is established	
	4) Verify the seal injection water flow to be approximately 8 to 12 GPM (refer to Enclosure 1 of OP-041.1, REACTOR COOLANT PUMP OPERATION)	
	5) Verify ΔP across the thermal barrier to be 15 inches of water	
	6) Verify GREATER THAN 200 PSID across the number 1 seal	
	7) Verify that the oil lift pump has been running for two minutes and the oil pressure interlock light is ON	
	b. Start one RCP	b Go to Step 2
	c Go to appropriate plant procedure as determined by the Plant Supervisor - Nuclear	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	Borate RCS To Cold Shutdown Boron Concentration per Plant Curve Book, Section III	
3	Verify Cold Shutdown RCS Boron Concentration By Sampling:	Return to Step 2
	a Request the Chemistry Department to take a boron sample	
4	Check VCT Makeup Control System	Adjust controls as necessary
	a. Makeup set for cold shutdown boron concentration	
	b. Makeup set for automatic control	
5	Verify All CRDM Fans - RUNNING	<u>IF</u> offsite power is not available, verify adequate diesel capacity to run CRDM fans <u>THEN</u> Start all fans.

CAUTION

Makeup water sources for CST will be necessary if level decreases to less than 10%.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	Initiate RCS Cooldown To Cold Shutdown:	
	a Maintain cooldown rate in RCS cold legs - LESS THAN 25°F/hr	
	b Dump Steam To Condenser	b Dump Steam to Atmosphere
	c Maintain S/G Narrow Range Level - AT 50%	c Control feed flow as necessary
	d RCS temperature and pressure - Stay to the right of the 60°F/hr curve	

Procedure No.	Procedure Title	Page
3-EOP-ES-0.2	NATURAL CIRCULATION COOLDOWN	6
		Approval Date 1/7/87

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Check RCS Hot Leg Temperatures - LESS THAN 550° F	Return to Step 6
8	Depressurize RCS to 1950 PSIG:	
	a Check letdown - IN SERVICE	a Try to establish letdown. <u>IF</u> letdown can <u>NOT</u> be established, <u>THEN</u> use one PRZ PORV. Go to Step 9
	b Use auxiliary spray	

<u>CAUTION</u>

SI Actuation Circuits will automatically unblock if PRZ pressure increases to GREATER THAN 2000 PSIG.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Block SI Actuation: • LOW PRZ PRESSURE, 1723 PSIG • HIGH STEAM FLOW WITH LOW S/G PRESSURE, OR LOW TAVG	
10	Maintain Following RCS Conditions: • RCS PRESSURE - AT 1950 PSIG • PRZ LEVEL - AT 22% • COOLDOWN RATE IN RCS COLD LEGS LESS THAN 25°F/HR • RCS TEMPERATURE AND PRESSURE - STAY TO THE RIGHT OF THE 60°F/HR CURVE	
11	Monitor RCS Cooldown: • CORE EXIT TCs - DECREASING • RCS HOT LEG TEMPERATURES - DECREASING • RCS SUBCOOLING BASED ON CORE EXIT TCs - INCREASING	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

If at any time it is determined that a natural circulation cooldown and depressurization must be performed at a rate that may form a steam void in the vessel, procedure ES-0.3, NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL (WITH RVLMS) or ES-0.4, NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL (WITHOUT RVLMS), should be used.

12 Initiate RCS Depressurization

a Check CRDM Fans - ALL RUNNING

- RNO: a Maintain RCS subcooling based on core Exit TCs GREATER THAN 226°F. Go to Step 12c.

b Maintain RCS Subcooling based on core exit TCs - GREATER THAN 76° F

c Check letdown - IN SERVICE

d. Use auxiliary spray

- RNO: d Use one PRZ PORV. Go to Step 13

13 Continue RCS Cooldown And Depressurization:

a Maintain cooldown rate in RCS Cold Legs - LESS THAN 25° F/hr

b Maintain subcooling requirements - GREATER THAN 76°F.

- RNO: b Stop depressurization and re-establish subcooling

c. Maintain RCS temperature and pressure - Stay to the right of the 60°F/hr curve

14 Check PRZ Level - NO UNEXPECTED LARGE VARIATIONS

- RNO: Repressurize RCS within limits of P-T curves to collapse potential voids in system and continue cooldown. IF CRDM fans are not available hold RCS depressurization at 1200 psig for 9 hours to enable the upper head to cool below saturation temperature. IF RCS depressurization must continue, THEN go to ES-0.3, NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL (WITH RVLMS) or ES-0.4, NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL (WITHOUT RVLMS).

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

15 Check If SI System Should Be Locked Out

a. Verify the following conditions exist

- RCS PRESSURE LESS THAN 1000 PSIG

AND

- BORON CONCENTRATION GREATER THAN THE COLD SHUTDOWN CONCENTRATION

Response not obtained: a. Do NOT Lock Out SI System, Continue With Step 16, WHEN Requirements Met THEN Do Step 15b, 15c, 15d, 15e, 15f, and 15g.

b. Unlock and CLOSE the following 480V breakers:

1) 30532, MOV-3-865A

2) 30631, MOV-3-865B

3) 30733, MOV-3-865C

c. CLOSE and verify Locked the following accumulator isolation MOV's:

1) MOV-3-865A

2) MOV-3-865B

3) MOV-3-865C

d. Close and Lock the following containment spray pump isolation valves:

1) 3-891A

2) 3-891B

e. Verify the following breakers to be unlocked and closed:

1) 30732 for MOV-3-866A

2) 30621 for MOV-3-866B

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	Check If SI System Should Be Locked Out (Cont'd)	

f Verify the following valves closed:

1) MOV-3-843A SI PUMP DISCHARGE TO COLD LEG
2) MOV-3-843B SI PUMP DISCHARGE TO COLD LEG
3) MOV-3-866A SI PUMP DISCHARGE TO HOT LEG
4) MOV-3-866B SI PUMP DISCHARGE TO COLD LEG
5) MOV-3-869 SI PUMP DISCHARGE TO COLD LEG

g Dispatch personnel to open and lock the following breakers:

1) 30532 - MOV-3-865A
2) 30631 - MOV-3-865B
3) 30733 - MOV-3-865C
4) 30738 - MOV-3-843A
5) 30622 - MOV-3-843B
6) 30737 - MOV-3-869
7) 30732 - MOV-3-866A
8) 30621 - MOV-3-866B

16 Maintain Letdown Flow:

a Open letdown orifice isolation valves as necessary

b Adjust low pressure letdown control valve setpoint as necessary

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

17 Maintain Required RCP Seal Injection Flow:

a Verify approximately 15 inches of water ΔP across the thermal barrier

b Verify Number 1 seal water ΔP GREATER THAN 200 PSID

c Adjust HCV-3-121 as necessary

18 Check If RHR System Can Be Placed In Service:

a RCS temperature - LESS THAN 324° F — a. Return to Step 13

b RCS pressure - LESS THAN 450 PSIG — b. Return to Step 13

c. Place the Control Room Air Conditioner Unit "C" Breaker 0823 on MCC-D in the OFF position.

c. Place RHR system in service using OP-050, RESIDUAL HEAT REMOVAL SYSTEM

19 Continue RCS Cooldown To Cold Shutdown

CAUTION

Depressurizing the RCS before the entire RCS is LESS THAN 200° F may result in void formation in the RCS.

20 Continue Cooldown Of Inactive Portion Of RCS:

a. Cool upper head region using CRDM fans — IF CRDM(s) are not running THEN coo cowr to 200°F and maintain 400 PSIG for 29 hours

b. Cool S/G U-Tubes by dumping steam from all S/Gs

21 Determine If RCS Depressurization Is Permitted:

a. Entire RCS - LESS THAN 200°F — a. Do NOT Depressurize RCS Return to Step 19.

b. Go to appropriate plant procedure as determined by the Plant Supervisor - Nuclear

END OF TEXT

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FOLDOUT FOR E-0 SERIES PROCEDURES

1. **RCP TRIP CRITERIA**

Trip all RCPs if BOTH conditions listed below occur:

a High-head SI pumps - AT LEAST ONE RUNNING

b RCS subcooling - LESS THAN 25°F [65°F]

2 **SI ACTUATION CRITERIA**

Actuate SI and go to E-O, REACTOR TRIP OR SAFETY INJECTION, Step 1, if EITHER condition listed below occurs:

- RCS subcooling based on core exit TCs - LESS THAN 30°F [45° F]
- PRZ level - CANNOT BE MAINTAINED GREATER THAN 12% [50%]

3 **RED PATH SUMMARY**

a. SUBCRITICALITY - Nuclear power GREATER THAN 5%

b CORE COOLING - Core exit TCs GREATER THAN 1200°F

c HEAT SINK - Narrow Range level in all S/Gs LESS THAN 32% AND total feedwater flow LESS THAN 130 GPM per S/G.

d. INTEGRITY - Cold leg temperature decrease GREATER THAN 100°F in last 60 minutes AND RCS cold leg temperature LESS THAN 3?7 F

e. CONTAINMENT - Containment pressure GREATER THAN 59 PSIG

4. **CST MAKEUP WATER CRITERIA**

Makeup water sources for the CST will be necessary if level decreases to LESS THAN 10%

5. **HYDROGEN ANALYZER START CRITERIA**

Hydrogen analyzer should be placed in service per Attachment A of E-0 within 30 minutes of a valid safety injection signal

6. **ADVERSE CONTAINMENT CONDITIONS**

Adverse Containment conditions are defined as either a Containment Atmosphere temperature of 180°F or Containment radiation levels equal to or greater than 1.3 x 10^5 R/hr. Under these conditions the setpoint values in brackets, [ ], are required to be used.

If the Containment temperature subsequently falls below 180°F, the normal setpoint values may be used. If the Containment radiation level subsequently falls below 1.3 x 10^5 R/hr, the adverse Containment setpoints are required to be used until permission is granted by the Technical Support Staff to use normal setpoints.

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ES-0.3 (Sheet 1 of 1)

EOP Title: Natural Circulation Cooldown With Steam Void in Vessel With RVLMS (QSPDS)

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
5	5	2	Step changed to RVLMS from RVLIS due to plant specific terminalogy, references to RVLIS in the remaining procedures is justified by this entry. See attached procedure.
	Caution 1 prior to Step 1	7	The first caution prior to Step 1 provides direction to contact the Plant Supervisor - Nuclear and the Technical Support Center Staff prior to performing the procedure in the event that the opposite unit has a safety injection, loss of offsite power and a loss of one emergency diesel generator. See attached procedure.
1	1	7	Step 1 provides plant specific means for establishing conditions for starting a reactor coolant pump. See attached procedure.
6	6	7	Step 10 provides plant specific means for locking out the Safety Injection System. See attached procedure.
8	8	7	Step 8 provides plant specific means for maintaining reactor coolant pump seal injection flow. See attached procedure.
9	9	7	Step 9 provides the plant specific procedure for placing the Residual Heat Removal System in service. See attached procedure.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-ES-0.3

<u>Title:</u>

NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL WITH RVLMS (QSPDS)

<u>**Safety Related Procedure**</u>

Responsible Department:	Operations
Reviewed by PNSC:	87-009
Approved by Plant Manager-N:	1/7/87

RTS 86-1092P, 86-1832P

GY/sr:dj

LIST OF EFFECTIVE PAGES

Page	Revision Date
1	01/07/87
2	01/07/87
3	01/07/87
4	01/07/87
5	01/07/87
6	01/07/87
7	01/07/87
8	01/07/87
9	01/07/87

1.0 PURPOSE

This procedure provides actions to continue plant cooldown and depressurization to cold shutdown, with no accident in progress, under conditions that allow for the potential formation of a void in the upper head region with a vessel level system available to monitor void growth.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from ES-0.2, NATURAL CIRCULATION COOLDOWN, after completing the first eleven steps.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *In the event a loss of offsite power has occurred concurrent with a SI on Unit 4 and a loss of one EDG, permission from the PS-N and the TSC Staff is required prior to continuing with this procedure.*
- *If SI actuation occurs during this procedure, E-0, REACTOR TRIP OR SAFETY INJECTION, should be performed.*
- *The first eleven steps of ES-0.2, NATURAL CIRCULATION COOLDOWN, should be performed before continuing with this procedure.*

NOTE

- *Foldout page should be open.*
- *RCPs should be run in order of priority to provide normal PRZ spray.*
- *If conditions can be established for starting an RCP during this procedure, Step 1 should be repeated.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Try To Restart an RCP:	
	a. Check RVLMS upper range indication-FULL	a. Perform the following: 1) Increase PRZ level to 68% using charging and letdown. 2) Establish subcooling greater than 55°F using steam dump.
	b. Establish conditions for starting an RCP: 1) Verify off-site power available to the 4KV buses 2) Start the oil lift pump 3) Verify number 1 seal leakoff valve is OPEN and seal flow is established 4) Verify the seal injection water flow to be approximately 8 to 12 GPM (refer to Enclosure 1 of OP-41.1, REACTOR COOLANT PUMP OPERATION) 5) Verify ΔP across the thermal barrier to be 15 inches of water 6) Verify GREATER THAN 200 PSID across the number 1 seal 7) Verify that the oil lift pump has been running for two minutes and the oil pressure interlock light is ON	b Go to Step 2.
	c. Start one RCP	c. Go to Step 2.
	d. Go to the appropriate plant procedure as determined by the Plant Supervisor - Nuclear	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

Saturated conditions in the PRZ should be established before trying to decrease PRZ level

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	Establish PRZ Level To Accommodate Void Growth:	
	a. Check PRZ Level - BETWEEN 20% AND 30%	a. Control charging and letdown as necessary.
	b. Place PRZ level control in manual	
3	Continue RCS Cooldown and Initiate Depressurization:	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Maintain RCS subcooling based on core exit TCs - GREATER THAN 30 °F	
	c. Maintain RCS temperature and pressure - Stay to the right of the 100°F/hr. curve	
	d. Check letdown - IN SERVICE	d. Depressurize RCS using one PRZ PORV Go to Step 4.
	e. Depressurize RCS using auxiliary spray	
4	Control PRZ Level:	
	a. Level - GREATER THAN 20%	a. Control charging and letdown, as necessary, to increase PRZ level to greater than 20%.
	b. Level - LESS THAN 90%	b. Perform the following: 1) Turn on PRZ heaters to maintain PRZ pressure stable. 2) Decrease PRZ level to less than 90% by one of the following: • Control charging and letdown as necessary. OR • Continue cooldown to shrink RCS inventory.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Check RVLMS Plenum Indication - GREATER THAN 40%	Repressurize RCS to maintain RVLMS plenum greater than 40%. Return to Step 3.
6	Check If SI System Should Be Locked Out:	
	a. Verify the following conditions exist: • RCS PRESSURE LESS THAN 1000 PSIG AND • BORON CONCENTRATION GREATER THAN THE COLD SHUTDOWN CONCENTRATION	a. DO NOT Lock Out SI System. Continue with Step 7. WHEN requirements met, THEN do Step 6b, 6c, 6d, 6e, 6f, and 6g.
	b. Unlock and CLOSE the following 480V breakers: 1) 30532, MOV-3-865A 2) 30631, MOV-3-865B 3) 30733, MOV-3-865C	
	c. Close and verify locked the following accumulator isolation MOV's: 1) MOV-3-865A 2) MOV-3-865B 3) MOV-3-865C	
	d. Close and lock the following containment spray pump isolation valves 1) 3-891A 2) 3-891B	
	e. Verify the following breakers to be unlocked and closed. 1) 30732 for MOV-866A 2) 30621 for MOV-866B	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

6 Check If SI System Should Be Locked Out: (Cont'd)

f. Verify the following valves closed.

1) MOV-3-843A, SI Pump Discharge to Cold Leg

2) MOV-3-843B, SI Pump Discharge to Cold Leg

3) MOV-3-866A, SI Pump Discharge to Hot Leg

4) MOV-3-866B, SI Pump Discharge to Hot Leg

5) MOV-3-869, SI Pump Discharge to Hot Leg

g. Dispatch personnel to OPEN and lock the following breakers:

1) 30532, MOV-3-865A

2) 30631, MOV-3-865B

3) 30733, MOV-3-865C

4) 30738, MOV-3-843A

5) 30622, MOV-3-843B

6) 30737, MOV-3-869

7) 30732, MOV-3-866A

8) 30621, MOV-3-866B

7 Maintain Letdown Flow:

a. Open letdown orifice isolation valves as necessary

b. Adjust low pressure letdown control valve setpoint as necessary

8 Maintain Required RCP Seal Injection Flow

a. Adjust HCV-3-121 as necessary to maintain ΔP of 15 inches across the thermal barrier

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Check If RHR System Can Be Placed In Service:	
	a. RCS Temperature - LESS THAN 324°F	a. Return to Step 3.
	b. RCS Pressure - LESS THAN 450 PSIG	b. Return to Step 3.
	c. Place the Control Room Air Conditioner Unit "C" Breaker 0823 on MCC-D in the OFF position	
	d. Place RHR System in service using OP-050, RESIDUAL HEAT REMOVAL SYSTEM	
10	Continue RCS Cooldown To Cold Shutdown	

CAUTION

Depressurizing the RCS before the entire RCS is less than 200°F may result in additional void formation in the RCS.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Continue Cooldown Of Inactive Portion Of RCS:	
	a. Cool upper head region using CRDM fans	
	b. Cool S/G U-Tubes by dumping steam from all S/Gs	
	c. RVLMS head indication - FULL	c. Return to Step 10.
12	Determine If RCS Depressurization Is Permitted:	
	a. Entire RCS - LESS THAN 200°F	a. <u>DO NOT</u> DEPRESSURIZE RCS. Return to Step 10.
	b. Go to appropriate plant procedure as determined by the Plant Supervisor - Nuclear.	

END OF TEXT

FOLDOUT FOR E-0 SERIES PROCEDURES

1. RCP TRIP CRITERIA

Trip all RCPs if BOTH conditions listed below occur:

a. High-head SI pumps - AT LEAST ONE RUNNING

b. RCP subcooling - LESS THAN 25°F [65°F]

2. SI ACTUATION CRITERIA

Actuate SI and go to E-O, REACTOR TRIP OR SAFETY INJECTION, Step 1, if EITHER condition listed below occurs:

- RCS subcooling based on core exit TCs - LESS THAN 30°F [45° F]
- PRZ level - CANNOT BE MAINTAINED GREATER THAN 12% [50%]

3. RED PATH SUMMARY

a. SUBCRITICALITY - Nuclear power GREATER THAN 5%

b. CORE COOLING - Core exit TCs GREATER THAN 1200°F

c. HEAT SINK - Narrow Range level in all S/Gs LESS THAN 32% AND total feedwater flow LESS THAN 130 GPM per S/G.

d. INTEGRITY - Cold leg temperature decrease GREATER THAN 100°F in last 60 minutes AND RCS cold leg temperature LESS THAN 317°F.

e. CONTAINMENT - Containment pressure GREATER THAN 59 PSIG

4. CST MAKEUP WATER CRITERIA

Makeup water sources for the CST will be necessary if level decreases to LESS THAN 10%

5. HYDROGEN ANALYZER START CRITERIA

Hydrogen analyzer should be placed in service per Attachment A of E-0 within 30 minutes of a valid safety injection signal

6. ADVERSE CONTAINMENT CONDITIONS

Adverse Containment conditions are defined as either a Containment Atmosphere temperature of 180°F or Containment radiation levels equal to or greater than 1.3.x 10^5 R/hr. Under these conditions the setpoint values in brackets, [ ], are required to be used.

If the Containment temperature subsequently falls below 180°F, the normal setpoint values may be used. If the Containment radiation level subsequently falls below 1.3 x 10^5 R/hr, the adverse Containment setpoints are required to be used until permission is granted by the Technical Support Staff to use normal setpoints.

FINAL PAGE

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PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ES-0.4 (Sheet 1 of 1)

EOP Title: Natural Circulation Cooldown With Steam Void in Vessel (Without RVLMS)

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
	Caution 1 prior to Step 1	7	The first caution prior to Step 1 provides direction to contact the Plant Supervisor - Nuclear and the Technical Support Center Staff prior to performing this procedure in the event that the opposite unit has a safety injection, loss of offsite power and a loss of one Emergency Diesel Generator. See attached procedure.
1	1	7	Step 1 provides for establishing conditions for starting an RCP. See attached procedure.
7	7	7	Step 7 provides plant specific means for maintaining reactor coolant pump seal injection flow. See attached procedure.
10	10	7	Step 10 provides plant specific steps for locking out the Safety Injection System. See attached procedure.
19	19	7	Step 19 provides the plant specific procedure for placing the Residual Heat Removal System in service. See attached procedure.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-ES-0.4

Title:

NATURAL CIRCULATION COOLDOWN WITH STEAM VOID IN VESSEL (WITHOUT RVLMS)

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	87-009
Approved by Plant Manager-N:	1/7/87

RTS 86-1092P, 86-1832P

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LIST OF EFFECTIVE PAGES

Page	Revision Date
1	01/07/87
2	01/07/87
3	01/07/87
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9	01/07/87
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1.0 PURPOSE

This procedure provides actions to continue plant cooldown and depressurization to cold shutdown, with no accident in progress, under conditions that allow for the potential formation of a void in the upper head region without a vessel level system available to monitor void growth.

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 This procedure is entered from ES-0.2, NATURAL CIRCULATION COOLDOWN, after completing the first eleven steps.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *In the event a loss of offsite power has occurred concurrent with a SI on Unit 4 and a loss of one EDG, permission from the PS-N and the TSC Staff is required prior to continuing with this procedure.*
- *If SI actuation occurs during this procedure, E-0, REACTOR TRIP OR SAFETY INJECTION, should be performed.*
- *The first eleven steps of ES-0.2, NATURAL CIRCULATION COOLDOWN should be performed before continuing with this procedure.*

NOTE

- *Foldout page should be open.*
- *RCPs should be run in order of priority to provide normal PRZ spray.*
- *If conditions can be established for starting an RCP during this procedure, Step 1 should be repeated.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Try To Restart An RCP:	
	a. Check PRZ level - GREATER THAN 68%.	a. Control charging and letdown as necessary to increase level to greater than 68%.
	b. RCS subcooling based on core exit TCs - GREATER THAN 55°F.	b. Establish subcooling based on core exit TCs greater than 55°F using steam dump
	c. Establish conditions for starting an RCP:	c. Go to Step 2.
	1) Verify offsite power available to the 4 KV busses.	
	2) Start the oil lift pump.	
	3) Verify that the number 1 seal leakoff valve is OPEN and seal flow is established.	
	4) Verify the seal injection water flow to be approximately 8 to 12 GPM. (refer to Enclosure #1 of OP-41.1, REACTOR COOLANT PUMP OPERATION.)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Try To Restart An RCP: (Cont'd)	
	5) Verify ΔP across the thermal barrier to be 15 inches of water	
	6) Verify GREATER THAN 200 PSID across the number 1 seal	
	7) Verify that the oil lift pump has been running for two minutes and the oil pressure interlock light is ON	
	d. Start one RCP	d. Go to Step 2.
	e. Go to appropriate plant procedure as determined by the Plant Supervisor-Nuclear	

NOTE

Saturated conditions in the PRZ should be established before trying to decrease PRZ level.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	Establish PRZ Level To Accommodate Void Growth:	
	a. Check PRZ level - BETWEEN 20% AND 25%	a. Control charging and letdown as necessary.
	b. Place PRZ level controls in manual	
3	Decrease RCS Hot Leg Temperatures To 500°F:	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 50°F/HR	
	b. Maintain RCS pressure - AT 1950 PSIG	
	c. Maintain RCS temperature and pressure - Stay to the right of the 100°F/hr P.T. curve	
	d. Maintain stable PRZ level using charging	
	e. Check RCS hot leg temperatures - LESS THAN 500°F	e. Return to Step 3A.
	f. Stop RCS cooldown	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Depressurize RCS To 1600 PSIG:	
	a. Check letdown - IN SERVICE	a. Use one PRZ PORV. Go to Step 4c.
	b. Use auxiliary spray	
	c. Check RCS pressure - LESS THAN 1600 PSIG	c. Return to Step 4a.
	d. Stop RCS depressurization	

NOTE

RCS hot leg temperatures will decrease after cooldown is stopped due to decrease in loop ΔTs.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Decrease RCS Hot Leg Temperatures To 450°F:	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Maintain RCS pressure - AT 1600 PSIG	
	c. Maintain RCS temperature and pressure - Stay to the right of the 100°F/hr P.T. curve	
	d. Maintain stable PRZ level using charging	
	e. Check RCS hot leg temperatures - LESS THAN 450°F	e. Return to Step 5a.
	f. Stop RCS cooldown	
6	Equalize Charging And Letdown Flows:	
	a. Place charging and letdown controls in manual	
	b. Control charging and seal injection flows to equal letdown and seal leakoff flows	
7	Maintain Required RCP Seal Injection Flow	
	a. Adjust HCV-3-121 as necessary to maintain ΔP of 15 inches across the thermal barrier	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

The upper head region may void during depressurization. This will result in a rapidly increasing PRZ level.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Depressurize RCS:	
	a. Check letdown - IN SERVICE	a. Use one PRZ PORV. Go to Step 8c.
	b. Use auxiliary spray	
	c. Depressurize RCS until either of the following conditions satisfied: • RCS pressure - LESS THAN 800 PSIG OR • PRZ level - GREATER THAN 90%	
	d. Stop RCS depressurization	

NOTE

In order to continue overall system depressurization, it may be necessary to cycle PRZ level (cycle pressure) to enhance upper head cooling.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Check PRZ Level - LESS THAN 90%	Increase RCS pressure by 100 PSI using PRZ heaters. Return to Step 8.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

10 Check If SI System Should Be Locked Out:

a. Verify the following conditions exist:

- RCS PRESSURE LESS THAN 1000 PSIG

  AND

- BORON CONCENTRATION GREATER THAN THE COLD SHUTDOWN CONCENTRATION

RESPONSE NOT OBTAINED: a. DO NOT Lock Out SI system. Continue with Step 11. WHEN requirements met, THEN do Step 10b, 10c, 10d, 10e, 10f, and 10g.

b. Unlock and CLOSE the following 480V breakers:

1) 30532, MOV-3-865A

2) 30631, MOV-3-865B

3) 30733, MOV-3-865C

c. Close and verify locked the following accumulator isolation MOV's:

1) MOV-3-865A

2) MOV-3-865B

3) MOV-3-865C

d. Close and lock the following containment spray pump isolation valves:

1) 3-891A

2) 3-891B

e. Verify the following breakers to be unlocked and closed:

1) 30732 for MOV-3-866A

2) 30621 for MOV-3-866B

f. Verify the following valves closed:

1) MOV-3-843A SI pump discharge to cold leg
2) MOV-3-843B SI pump discharge to cold leg
3) MOV-3-866A SI pump discharge to hot leg
4) MOV-3-866B SI pump discharge to hot leg
5) MOV-3-869 SI pump discharge to hot leg

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Check If SI System Should Be Locked Out: (Cont'd)	
	g. Dispatch personnel to OPEN and lock the following breakers: 1) 30532 - MOV-3-865A 2) 30631 - MOV-3-865B 3) 30733 - MOV-3-865C 4) 30738 - MOV-3-843A 5) 30622 - MOV-3-843B 6) 30737 - MOV-3-869 7) 30732 - MOV-3-866A 8) 30621 - MOV-3-866B	
11	Decrease RCS Hot Leg Temperatures To 400°F:	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Maintain RCS pressure - STABLE	
	c. Maintain RCS temperature and pressure - Stay to the right of the 100°F/hr P.T. curves	
	d. Maintain stable PRZ level using charging	
	e. Check RCS hot leg temperatures - LESS THAN 400°F	e. Return to Step 11a.
	f. Stop RCS cooldown	
12	Equalize Charging And Letdown Flows:	
	a. Place charging and letdown controls in manual	
	b. Control charging and seal injection flows to equal letdown and seal leakoff flows	
13	Depressurize RCS:	
	a. Check letdown - IN SERVICE	a. Use one PRZ PORV. Go to Step 13c.
	b. Use auxiliary spray	
	c. Depressurize RCS until either of the following conditions satisfied: • RCS PRESSURE-LESS THAN 600 PSIG OR • PRZ LEVEL - GREATER THAN 90%	
	d. Stop RCS depressurization	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Check PRZ Level - LESS THAN 90%	Increase RCS pressure by 100 PSI using PRZ heaters. Return to Step 13.
15	Decrease RCS Hot Leg Temperatures To 324°F:	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Maintain RCS pressure - STABLE	
	c. Maintain RCS temperature and pressure - Stay to the right of the 100°F/hr P.T. curve	
	d. Maintain stable PRZ level using charging	
	e. Check RCS hot leg temperatures - LESS THAN 324°F	e. Return to Step 15a.
	f. Stop RCS cooldown	
16	Equalize Charging And Letdown Flows:	
	a. Place charging and letdown controls in manual	
	b. Control charging and seal injection flows to equal letdown and seal leakoff flows	
17	Depressurize RCS:	
	a. Check letdown - IN SERVICE	a. Use one PRZ PORV. Go to Step 17c.
	b. Use auxiliary spray	
	c. Depressurize RCS until either of the following conditions satisfied: • RCS PRESSURE-LESS THAN 450 PSIG OR • PRZ LEVEL - GREATER THAN 90%	
	d. Stop RCS depressurization	
18	Check PRZ Level - LESS THAN 90%	Increase RCS pressure by 100 PSI using PRZ heaters. Return to Step 17.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	Check If RHR System Can Be Placed In Service:	
	a. RCS temperature - LESS THAN 324°F	a. Return to Step 15.
	b. RCS pressure - LESS THAN 450 PSIG	b. Return to Step 17.
	c. Place the Control Room Air Conditioner Unit "C" Breaker 0823 on MCC-D in the OFF position.	
	d. Place RHR System in service using OP-050, RESIDUAL HEAT REMOVAL SYSTEM	
20	Continue RCS Cooldown To Cold Shutdown	

CAUTION

Depressurizing the RCS before the entire RCS is less than 200°F may result in additional void formation in the RCS.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21	Continue Cooldown Of Inactive Portion Of RCS:	
	• COOL UPPER HEAD REGION USING CRDM FANS	
	• COOL S/G U-TUBES BY DUMPING STEAM FROM ALL S/Gs	
22	Determine If RCS Depressurization Is Permitted:	
	a. Entire RCS - LESS THAN 200°F	a. DO NOT DEPRESSURIZE RCS. Return to Step 20.
	b. Go to appropriate plant procedure as determined by the Plant Supervisor-Nuclear	

END OF TEXT

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FOLDOUT FOR E-0 SERIES PROCEDURES

1. **RCP TRIP CRITERIA**

Trip all RCPs if BOTH conditions listed below occur:

a. High-head SI pumps - AT LEAST ONE RUNNING

b. RCS SUBCOOLING - LESS THAN 25°F [65°F]

2. **SI ACTUATION CRITERIA**

Actuate SI and go to E-0, REACTOR TRIP OR SAFETY INJECTION, Step 1, if EITHER condition listed below occurs:

- RCS subcooling based on core exit TCs - LESS THAN 30°F [45° F]
- PRZ level - CANNOT BE MAINTAINED GREATER THAN 12% [50%]

3. **RED PATH SUMMARY**

a. SUBCRITICALITY - Nuclear power GREATER THAN 5%

b. CORE COOLING - Core exit TCs GREATER THAN 1200°F

c. HEAT SINK - Narrow Range level in all S/Gs LESS THAN 32% AND total feedwater flow LESS THAN 130 GPM per S/G

d. INTEGRITY - Cold leg temperature decrease GREATER THAN 100°F in last 60 minutes AND RCS cold leg temperature LESS THAN 317°F.

e. CONTAINMENT - Containment pressure GREATER THAN 59 PSIG

4. **CST MAKEUP WATER CRITERIA**

Makeup water sources for the CST will be necessary if level decreases to LESS THAN 10%

5. **HYDROGEN ANALYZER START CRITERIA**

Hydrogen analyzer should be placed in service per Attachment A of E-0 within 30 minutes of a valid safety injection signal

6. **ADVERSE CONTAINMENT CONDITIONS**

Adverse Containment conditions are defined as either a Containment Atmosphere temperature of 180°F or Containment radiation levels equal to or greater than 1.3 x 10^5 R/hr. Under these conditions the setpoint values in brackets, [ ], are required to be used.

If the Containment temperature subsequently falls below 180°F, the normal setpoint values may be used. If the Containment radiation level subsequently falls below 1.3 x 10^5 R/hr, the adverse Containment setpoints are required to be used until permission is granted by the Technical Support Staff to use normal setpoints.

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-E-1

EOP Title: Loss of Reactor or Secondary Coolant

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
---	Caution prior to Step 2	2	Operator guidance for plant specific requirements due to the shared system of AFW. See attached procedure.
8	8	2	Establish is changed to verify due to the diesel powered air compressors. See attached procedure.
4	4	7	Step 4 provides plant specific means for checking secondary radiation normal. See attached procedure.
Caution 2 prior to Step 6	Caution 2 prior to Step 6	7	The second caution prior to Step 6 is plant specific information that is required to be completed prior to resetting safety injection assuming a loss of offsite power concurrent with a safety injection signal with a loss of a 4KV Bus. See attached procedure.
6	6	7	Step 6 provides plant specific steps concerning the use of the shared safety injection pumps. See attached procedure.
10	10	7	Step 10 provides plant specific means of establishing charging flow. See attached procedure.
13	13	7	Step 13 provides plant specific means for placing containment spray pumps in standby. See attached procedure.
16	16a	7	Step 16a provides plant specific list of equipment manually loaded to the 4KV Bus. See attached procedure.
17	17	7	Step 17 provides plant specific evaluation of plant status. See attached procedure.
20	20	7	Step 20 provides plant specific means for determining steam generator radiation - normal. See attached procedure.
22	22	7	Step 22 provides plant specific preparation steps for hot leg recirculation. See attached procedure.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-E-1

Title:

LOSS OF REACTOR OR SECONDARY COOLANT

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	87-055
Approved by Plant Manager-N:	3/10/87

RTS 86-1146P, 86-1832P, 87-0344

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LIST OF EFFECTIVE PAGES

Page	Revision Date
1	03/10/87
2	03/10/87
3	01/07/87
4	01/07/87
5	01/07/87
6	01/07/87
7	01/07/87
8	01/07/87
9	01/07/87
10	01/07/87
11	01/07/87
12	01/07/87
13	03/10/87
14	01/07/87
15	01/07/87

1.0 PURPOSE

This procedure provides actions to recover from a loss of reactor or secondary coolant.

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 This procedure is entered from:

1) E-O, REACTOR TRIP OR SAFETY INJECTION, Step 21, and FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, Step 23, when a PRZ PORV is stuck open and its block valve can not be closed.

2) E-O, REACTOR TRIP OR SAFETY INJECTION, Step 25, with any of the following symptoms: high containment radiation, high containment pressure, or high containment recirculation sump level.

3) E-O, REACTOR TRIP OR SAFETY INJECTION, Step 36, and ECA-2.1, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS, Step 6, when RCS pressure is less than the shutoff head pressure of the low-head SI pumps.

4) ES-1.1, SI TERMINATION, Step 7 and Step 24, and FR-I.2, RESPONSE TO LOW PRESSURIZER LEVEL, Step 4, if SI has to be reinitiated.

5) E-2, FAULTED STEAM GENERATOR ISOLATION, Step 7, after identification and isolation of a faulted S/G.

6) ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 9, after normal injection mode conditions are established.

7) ECA-1.2, LOCA OUTSIDE CONTAINMENT, Step 3, when a LOCA outside containment is isolated.

8) FR-C.1, RESPONSE TO INADEQUATE CORE COOLING, Step 17 and Step 24, and FR-C.2, RESPONSE TO DEGRADED CORE COOLING, Step 19, after core cooling has been reestablished.

9) FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, Step 1, if RCS pressure is less than all non-faulted S/G(s) pressure.

10) FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, Step 23, after secondary heat sink has been reestablished and all PRZ PORVs are closed.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	NOTE • *Foldout page should be open.*	
1	Check If RCPs Should Be Stopped:	
	a. High-head SI pumps - AT LEAST ONE RUNNING	a. Go to Step 2.
	b. RCS Subcooling - LESS THAN 25°F [65°F]	b. Go to Step 2.
	c. Stop all RCPs	
	CAUTION ***In the event that SIG A is faulted valves 3-006 and 3-007 will require repositioning to provide steam supply to the B AFW pump.***	
2	Check If S/Gs Are Not Faulted:	
	a. Check pressures in all S/Gs -	Verify all faulted S/G(s) isolated:
	• NO S/G PRESSURE DECREASING IN AN UNCONTROLLED MANNER	• Steamlines.
	• NO S/G COMPLETELY DEPRESSURIZED	• Feedlines.
		<u>IF NOT</u>, <u>THEN</u> go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.
	CAUTION ***Makeup water sources for CST will be necessary if level decreases to less than 10%.***	
3	Check Intact S/G Levels:	
	a. Narrow range level - GREATER THAN 6% [32%]	a. Maintain total feed flow greater than 130 GPM per S/G until narrow range level greater than 6% [32%] in at least one S/G.
	b. Control feed flow to maintain narrow range level between 6% [32%] and 50%	b. <u>IF</u> narrow range level in any S/G continues to increase in an uncontrolled manner, <u>THEN</u> go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Check Secondary Radiation - NORMAL	Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.
	a. Contact Nuclear Chemistry Department for sampling of S/G blowdown.	

CAUTION

If any PRZ PORV opens because of high PRZ pressure, Step 5b should be repeated after pressure decreases to less than the PORV setpoint.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Check PRZ PORVs And Block Valves:	
	a. Power to block valves - AVAILABLE	a. Restore power to block valves.
	b. PORVs - CLOSED	b. IF PRZ pressure less than 2335 PSIG, THEN manually close PORVs. IF any valve can NOT be closed, THEN manually close its block valve.
	c. Block valves - AT LEAST ONE OPEN	c. Open one block valve unless it was closed to isolate an open PORV.

CAUTION

- *If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.*
- *In the event a loss of offsite power, concurrent with a SI and a loss of A or B 4KV bus has occurred due to breaker failure, E-0, Attachment C, Step 1 is required to be complete prior to SI Reset.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	Reset SI	
	a. Verify unit 4 SI pumps NOT REQUIRED	a. Perform the following: 1) OPEN the following SI pump manual suction intertie valves a) 870A b) 870B 2) OPEN the following SI pump manual recirculation tie valves a) 892A b) 892B

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	Reset SI (Cont'd)	
		3) Unlock and rack in the following unit 4 RWST outlet isolation valve breakers. a) 40712 b) 40605 4) CLOSE the following unit 4 RWST outlet isolation valves a) MOV-4-864A b) MOV-4-864B 5) Remove the manual gag from valves and CLOSE the following unit 4 SI test return to RWST valves a) CV-4-856A b) CV-4-856B 6) Go to Step 7
	b. Stop the unit 4 SI pumps and place in standby c. CLOSE the following SI pump discharge leader isolation valves 1) MOV-878A 2) MOV-878B	
7	Reset Containment Isolation Phase A And Phase B	
8	Verify Instrument Air To Containment	Start all Diesel powered air compressors
9	Check Power Supply to Charging Pumps - OFFSITE POWER AVAILABLE	Verify adequate diesel capacity to run charging pumps. <u>IF</u> necessary, shed non-essential loads. (Refer to E-0, Attachment D for component KW load rating.) <u>IF</u> adequate EDG capacity is not available, go to Step 11.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

10 Check If Charging Flow Has Been Established:

a. Charging pumps - AT LEAST ONE RUNNING

a. Perform the following:

1) IF CCW flow to RCP(s) thermal barrier is lost, THEN isolate seal injection to affected RCP(s) before starting charging pumps.

2) Start charging pumps as necessary

b. Establish flow as necessary:

1) Adjust HCV-3-121 to desired flow

11 Check If SI Should Be Terminated:

a. RCS subcooling based on core exit TCs - GREATER THAN 30°F[45°]

a. DO NOT STOP SI PUMPS. Go to Step 13.

b. Secondary heat sink:

- TOTAL FEED FLOW TO INTACT S/Gs - GREATER THAN 130 GPM per S/G

OR

- NARROW RANGE LEVEL IN AT LEAST ONE INTACT S/G - GREATER THAN 6% [32%]

b. IF neither condition satisfied, THEN DO NOT STOP SI PUMPS. Go to Step 13

c. RCS pressure:

- PRESSURE - GREATER THAN 1588 PSIG [1993 PSIG]
- PRESSURE - STABLE OR INCREASING

c. DO NOT STOP SI PUMPS. Go to Step 13.

d. PRZ level - GREATER THAN 12% [50%]

d. DO NOT STOP SI PUMPS. Try to stabilize RCS pressure with normal PRZ spray. Go to Step 13.

12 Go To ES-1.1, SI TERMINATION, Step 1

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13	Check If Containment Spray Should Be Stopped:	
	a. Spray pumps - RUNNING	a. Go to Step 14.
	b. Containment pressure - LESS THAN 14 PSIG	b. Continue with Step 14. <u>WHEN</u> containment pressure less than 14 PSIG, <u>THEN</u> do Steps 13c and d
	c. RESET containment spray signal	
	d. Stop containment spray pumps and place in standby: 1) PLACE HANDSWITCH IN AUTO 2) CLOSE DISCHARGE MOVs	

<u>*CAUTION*</u>

- *If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.*
- *RCS pressure should be monitored. If RCS pressure decreases to less than 225 PSIG [630 PSIG], the RHR pumps must be manually restarted to supply water to the RCS.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Check If RHR Pumps Should Be Stopped:	
	a. Check RCS pressure:	
	1) Pressure - GREATER THAN 225 PSIG [630 PSIG]	1) Go to Step 16.
	2) Pressure - STABLE OR INCREASING	2) Go to Step 15.
	b. Reset SI if necessary	
	c. Stop RHR pumps and place in standby	
15	Check All S/G Pressures - STABLE OR INCREASING	<u>IF</u> any S/G pressure decreasing in an uncontrolled manner, <u>THEN</u> return to Step 1.

STEP.	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	Check If Diesel Generators Should Be Stopped:	
	a. Verify 4KV buses - ENERGIZED BY OFFSITE POWER	a. Try to restore offsite power to 4KV buses IF offsite power can NOT be restored, THEN perform the following: 1) Verify adequate diesel capacity to place the following equipment in service IF necessary shed non-essential loads (Refer to E-0, Attachment D for component KW load rating) IF EDG capacity is not available, go to Step 17. a) PRZ backup heaters per Attachment B b) Computer Room Chiller B
	b. Stop any unloaded diesel generator and place in standby per 0-OP-23, EMERGENCY DIESEL GENERATOR	
17	Initiate Evaluation Of Plant Status:	
	a. Verify cold leg recirculation capability:	a. IF cold leg recirculation capability can NOT be verified, THEN go to ECA-1 1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.
	1) Power to RHR pumps - AVAILABLE	
	2) Dispatch operators to unlock and CLOSE the MCC breakers for the following MOVs:	

Breaker Number	Breaker Location	Valve Number
30621	"B" MCC	MOV-3-866B
30605	"B" MCC	MOV-3-864B
30615	"B" MCC	MOV-3-750
30616	"B" MCC	MOV-3-862B
30626	"B" MCC	MOV-3-863B
30712	"C" MCC	MOV-3-864A
30720	"C" MCC	MOV-3-862A
30726	"C" MCC	MOV-3-863A
30732	"C" MCC	MOV-3-866A
30731	"C" MCC	MOV-3-751

3) Verify the following Radiation Shield doors are closed

a) Containment Spray Pump Room

b) Charging Pump Room

c) Hot Sample Room

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	Initiate Evaluation Of Plant Status: (cont'd)	
	b. Check auxiliary building radiation - NORMAL	b. Place control room ventilation system in emergency recirculation mode
	1) Check plant vent (R-14) process radiation monitor.	
	2) Check auxiliary building area radiation monitors.	
	3) Check spent fuel pit SPING-4 monitor	
	4) Initiate H.P. survey of auxiliary building for abnormal radiation.	
	a) Pipe & valve room	
	b) Electrical penetration rooms	
	c. Evaluate plant equipment:	
	1) Check equipment availability.	
	a) High head safety injection pumps	
	b) RHR pumps	
	c) Auxiliary feedwater system	
	d) Containment spray system	
	e) Emergency diesel generators; fuel supply and starting air supply	
	f) ICW system	
	g) CCW system	
	h) Emergency containment coolers	
	i) Emergency containment filters	
	d. Start additional plant equipment to assist in recovery:	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	Initiate Evaluation Of Plant Status: (Cont'd)	
	1) Notify lab technician to place the P.A.S.S. in service.	1) Direct technician to obtain grab samples locally.
	2) Establish chemistry controls on the recirculation flow as directed by the radiochemist, per Attachment A, within 8 hours after the event	
18	Check If RCS Cooldown And Depressurization Is Required:	
	a. RCS pressure - GREATER THAN 225 PSIG [630 PSIG]	a. IF RHR pump flow greater than 285 GPM, THEN go to Step 19.
	b. Go to ES-1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION, Step 1	
19	Check If Transfer To Cold Leg Recirculation Is Required:	
	a. RWST level - LESS THAN 115,000 gals	a. Return to Step 17.
	b. Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1	
20	Check If Intact S/Gs Should Be Depressurized To RCS Pressure:	
	a. RCS pressure - LESS THAN INTACT S/G PRESSURES	a. Go to Step 21.
	b. Check S/Gs radiation - NORMAL 1. Condenser air ejector radiation - Normal 2. S/G blowdown radiation - Normal	b. Do not dump steam from a S/G with high radiation. Isolate feed flow to a S/G with high radioactivity.
	c. Dump steam to condenser from intact S/Gs until S/G pressure less than RCS pressure	c. Dump steam using steam dump valves to atmosphere until S/G pressure is less than RCS pressure.
21	Determine If Reactor Vessel Head Should Be Vented:	
	a. Consult TSC staff	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22	At 2 Hours After Event Initiation Prepare For Hot Leg Recirculation:	
	a. Verify CLOSED MOV-3-869 - high head hot leg injection header isolation valve	a. CLOSE MOV-3-869.
	b. OPEN MOV-3-866A	
	c. OPEN MOV-3-866B	
23	At 18 Hours After Event Initiation, Go To ES-1.4, TRANSFER TO HOT LEG RECIRCULATION, Step 1.	
24	Evaluate Long Term Plant Status:	
	a. Consult TSC staff	

END OF TEXT

ATTACHMENT A

POST ACCIDENT CHEMICAL INJECTION TO RCS

NOTE

The first batch of sodium tetraborate decahydrate must be injected prior to 8 hours after the loss of coolant accident.

1. Verify that the BA Batching Tank and related systems are operable per Operating Procedure 0-OP-046, CVCS-Boron Concentration Control.
2. Add 650 gallons of primary water (78 percent level) to the batching tank.
3. Preheat water to at least 150 degrees prior to adding Sodium Tetraborate Decahydrate.
4. Add 8 barrels of Sodium Tetraborate Decahydrate (1300 lbs.) to the batch tank and stir with the mixer until thorough mixing is achieved.
5. To minimize changes in valve alignments, use 3A or 3B BA Transfer Pump.
6. Secure the normal suction to the transfer pump to be used (close valve 338, 334, whichever is appropriate).
7. Open batch tank outlet valve 325 and transfer pump suction valve 398 A, B, C, or D, whichever is appropriate.
8. Align pump discharge to bypass the BA filter.
9. Check closed BA tank recirculation HCV-104, HCV-105, and HCV-110. Minimal recirculation will be maintained to protect pump by the orifice in the recirculation line.
10. Check for adequate VCT level prior to starting a charging pump. If VCT level is low and LCV-3-115B has not auto opened, open LCV-3-115B.
11. Close inlet valves to seal water injection filters (3-293B and 3-293D).
12. Observe that HCV-3-121 is full open and that either -3-310A or -3-310B is open.
13. Start the appropriate BA transfer pump. Open MOV-3-350. Start a charging pump.
14. Monitor FI-3-110 (Emergency Boration - VPA) and FI-3-122 (Charging Flow - VPA) for adequate flow (approximately 60 GPM).
15. Batching tank will empty in approximately 5 minutes. It is imperative that the batch tank level be monitored and the pump stopped before the level is gone to preclude burning up the pump.
16. Trip the running charging pump after each batch of Borax has been injected into the RCS.
17. Determine pH of containment sump water. If the pH is less than 8.5, repeat steps 3 through 17 above until the pH is at least 8.5.

*/GAY/ec'dj

ATTACHMENT B

RE-ENERGIZATION OF PRESSURIZER BACKUP HEATERS

CAUTION

Loading on the EDG should not exceed the Orange mark (2000 hour rating of 2850 KW). However, loads placed on the energized 4 KV buses (the power source) may approach the Red mark (168 hour rating) on the wattmeter for short periods.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
a.	4KV Buses - ALL ENERGIZED	• IF EDG A is available, go to Step b • IF EDG B is available, go to Step g.
b.	Verify EDG A Load is LESS THAN 2300KW	b. Dispatch personnel to cabinet 3812 to OPEN all nine (9) breakers. 1. Reset heater Group A lockout relay in the penetration room. 2. Place control switch for Group A to the ON position. 3. CLOSE 3 individual heater breakers one at a time. AND Verify between each closure A diesel load DOES NOT exceed the capacity of the power source. 4. Return to procedure and Step in effect
c.	Reset lockout relay in penetration room for backup Group A	
d.	Place control switch for Group A to the ON position	
e.	Verify EDG A load DOES NOT exceed the capacity of the power source	
f.	Return to procedure and Step in effect	
g.	Place control switch for Group B backup heaters to "OFF"	
h.	Place the keylock switch for breaker 0408 in the EMERGENCY position	
i.	Dispatch personnel to cabinet 3B13 to OPEN all nine (9) breakers	
j.	Place console control switch to the ON position	
k.	CLOSE 3 individual heater breakers one at a time AND Verify between each closure B diesel load DOES NOT exceed the capacity of the power source	
l.	Return to procedure and Step in effect	

*/GAY/ec/dj

FOLDOUT FOR E-1 SERIES PROCEDURES

1. SI TERMINATION CRITERIA
   Go to ES-1.1, SI TERMINATION, If ALL conditions listed below occur:
   a. RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]
   b. Total feed flow to intact SGs - GREATER THAN 130 GPM per S/G.
      OR
      Narrow range level in at least one intact SG - GREATER THAN 6% [32%].
   c. RCS pressure:
      - GREATER THAN 1588 PSIG [1993 PSIG]
      - STABLE OR INCREASING
   d. PRZ level - GREATER THAN 12% [50%]
2. SI RE-INITIATION CRITERIA
   Manually operate SI pumps as necessary If EITHER condition listed below occurs:
   - RCS SUBCOOLING BASED ON CORE EXIT TCs - LESS THAN 30°F [45°F]
   - PRZ LEVEL - CANNOT BE MAINTAINED GREATER THAN 12% [50%]
3. RED PATH SUMMARY
   a. SUBCRITICALITY - Nuclear power GREATER THAN 5%.
   b. CORE COOLING - Core exit TCs GREATER THAN 1200°F.
   c. HEAT SINK - Narrow level in all SGs LESS THAN 32% AND total feedwater flow LESS THAN 130 GPM per S/G.
   d. INTEGRITY - Cold leg temperature decrease GREATER THAN 100°F in last 60 minutes AND RCS cold leg temperature LESS THAN 317°F
   e. CONTAINMENT - Containment pressure GREATER THAN 59 PSIG.
4. SECONDARY INTEGRITY CRITERIA
   Go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1, If any S/G pressure is decreasing in an uncontrolled manner or has completely depressurized, and has not been isolated
5. E-3 TRANSITION CRITERIA
   Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1, If any S/G level increases in an uncontrolled manner or any S/G has abnormal radiation.
6. COLD LEG RECIRCULATION SWITCHOVER CRITERIA
   Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1, If RWST level decreases to LESS THAN 115,000 gal.
7. CST MAKEUP WATER CRITERIA
   Makeup water sources for the CST will be necessary if level decreases to LESS THAN 10%.
8. HYDROGEN ANALYZER START CRITERIA
   Hydrogen analyzers should be placed in service per Attachment A of E-0 within 30 minutes of a valid safety injection.
9. POST ACCIDENT CHEMICAL INJECTION TO RCS
   Within 8 hours after the event, establish chemistry controls on the recirculation flow as directed by the radiochemist per Attachment A of E-1.

10. ADVERSE CONTAINMENT CONDITIONS
    Adverse Containment conditions are defined as either a Containment Atmosphere temperature of 180°F or Containment radiation levels equal to or greater than 1.3×10^5 R/hr. Under these conditions the setpoint values in brackets, [ ], are required to be used.

    If the Containment temperature subsequently falls below 180°F, the normal setpoint values may be used. If the Containment radiation level subsequently falls below 1.3×10^5 R/hr, the adverse Containment setpoints are required to be used until permission is granted by the Technical Support Staff to use normal setpoints.

FINAL PAGE

GAY ec:dj

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ES-1.1 (Sheet 1 of 1)

EOP Title: SI Termination

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
Caution 2 prior to Step 1		2	The second caution prior to Step 1 has been deleted due to plant specific design which does not include automatic transfer of high head safety injection pump suction to the RWST on low level in the boric acid tank. See attached procedure.
Step 4	4	2	Step 4 reads "Continue to next step" due to the plant specific design which maintains high head safety injection pump suction from the refueling water storage tank as a normal suction alignment. See attached procedure.
Caution prior to Step 5		2	The caution prior to Step 5 in the guidelines has been deleted due to the plant specific design. See attached procedure.
9	9	7	Step 9 provides plant specific means for establishing letdown and excess letdown. See attached procedure.
12	12	7	Step 12 provides plant specific means for establishing reactor coolant pump seal return flow. See attached procedure.
17	17	7	Step 17 provides the plant specific means for establishing reactor coolant pump normal cooling water. See attached procedure.
18	18	7	Step 18 provides the plant specific equipment manually loaded on the 4KV Bus. See attached procedure.
19	19	7	Step 19 provides the plant specific conditions for starting a reactor coolant pump. See attached procedure.
	Attachment B	7	Attachment B provides plant specific components affected by a safety injection signal. See attached procedure.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-ES-1.1

Title:

SI TERMINATION

Safety Related Procedure

Responsible Department:	Operations
Reviewed by PNSC:	86-192
Approved by Plant Manager-N:	7/28/86

RTS 86-1092P

1.0 PURPOSE

This procedure provides the necessary instructions to terminate safety injection and stabilize plant conditions.

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 This procedure is entered from:

1. E-0, REACTOR TRIP OR SAFETY INJECTION, Step 27, and E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 12, when specified termination criteria are satisfied.

2. FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, Step 26, after secondary heat sink has been reestablished and SI has been terminated.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.

NOTE

Foldout page should be open.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Reset SI	
2	Reset Containment Isolation Phase A And Phase B	
	a. Reset containment ventilation isolation	
	b. Reset control room ventilation isolation	
	c. Open instrument air bleed valves	
3	Verify Instrument Air To Containment	Start all diesel powered air compressors.
4	Continue To Next Step	
5	Stop SI Pumps And Place In Standby:	
	a. RHR pumps	
	b. High-head SI pumps	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	Check If Charging Flow Has Been Established:	
	a. Charging pumps - AT LEAST ONE RUNNING	a. Perform the following: 1) IF CCW flow to RCP(s) thermal barrier is lost, THEN isolate seal injection to affected RCP(s)* before starting charging pumps. 2) IF offsite power is not available verify adequate diesel capacity to run charging pumps IF necessary shed non-essential loads. (Refer to E-0, Attachment D for component KW load rating). 3) Start charging pumps as necessary.
	b. Establish desired charging flow	
	c. Verify VCT makeup control system in AUTO	c. Adjust controls as necessary
7	Verify SI Flow Not Required:	
	a. RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]	a. Manually operate SI pumps as necessary Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	b. PRZ level - GREATER THAN 12% [50%]	b. Control charging flow to maintain PRZ level. IF PRZ level can NOT be maintained, THEN manually operate SI pumps as necessary. Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
8	Check PRZ Level - GREATER THAN 23% [50%]	Control charging as necessary.

* HEB/dt/sr

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Establish Letdown: a. Verify CCW flow to the Non-regenerative letdown heat exchanger b. Verify letdown orifice isolation valves closed c. Open letdown containment isolation valve CV-3-204 d. Open letdown line isolation valve LCV-3-460 e. Open letdown orifice isolation valve as appropriate	Establish excess letdown: 1) Verify OPEN FC-3-739, excess letdown heat exchanger CCW outlet valve. 2) Verify HCV-3-137, excess letdown heat exchanger outlet valve - CLOSED. 3) Verify CV-3-389, excess letdown heat exchanger divert valve is at the desired position: a) DIVERT to RCDT b) NORMAL to VCT 4) OPEN CV-3-387, excess letdown heat exchanger outlet valve. 5) OPEN HCV-3-187, excess letdown heat exchanger outlet valve. 6) Verify a delta T across the excess letdown heat exchanger.
10	Check VCT Makeup Control System: a. Makeup set for greater than RCS boron concentration b. Makeup set for automatic control	Adjust controls as necessary.
11	Check Charging Pump Suction - ALIGNED TO VCT	Align suction to VCT.
12	Check If RCP Seal Return Flow Should Be Established:	
	a. Verify CCW pump RUNNING AND CCW surge tank level NORMAL	a. Go to Step 13.
	b. Establish flow: 1) Verify OPEN MOV-3-381 2) OPEN MOV-3-6386	b. Verify the following manual Isolation valves in the OPEN position. 1) RCP-A seal injection manual isolation valve 3-297A 2) RCP-B seal injection manual isolation valve 3-297B 3) RCP-C seal injection manual isolation valve 3-297C
13	Transfer Condenser Steam Dump To Pressure Control Mode	IF condenser NOT available, THEN use S/G steam dump to atmosphere valve
14	Check RCS Hot Leg Temperatures - STABLE	Control steam dump and total feed flow as necessary to stabilize RCS temperatures.
15	Control PRZ Pressure:	
	a. Turn on heaters and operate normal spray as necessary to maintain pressure stable	a. IF normal spray NOT available and letdown is in service, THEN use auxiliary spray. IF NOT, THEN use one PRZ PORV.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

Makeup water sources for CST will be necessary if level decreases to less than 10%

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	Check Intact S/G Levels: a. Narrow range level - GREATER THAN 6% [32%] b. Control feed flow to maintain narrow range level between 6% [32%] and 50%	a. Maintain total feed flow greater than 130 GPM per S/G until narrow range level greater-than 6% [32%] in at least one S/G. b. IF narrow range level in any S/G continues to increase, THEN stop feed flow to that S/G.
17	Check RCP Cooling - NORMAL • RCP CCW SYSTEM FLOW • RCP SEAL INJECTION FLOW	Establish normal cooling to RCPs. Refer to: OP-030 COMPONENT COOLING WATER SYSTEM, for RCP CCW system valve alignment while continuing in this procedure.
18	Verify All 4KV Buses - ENERGIZED BY OFFSITE POWER	Try to restore offsite power. Verify adequate diesel capacity to run the following equipment. IF necessary shed non-essential loads (refer to E-0, Attachment D for component KW load rating.) a. Pressurizer backup heater per Attachment C b. Computer Room Chiller B

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *If seal cooling has previously been lost, the affected RCP(s) should not be started prior to a status evaluation.*
- *On natural circulation, RTD bypass temperatures and associated interlocks will be inaccurate.*

NOTE

RCPs should be run in order of priority to provide normal PRZ spray.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	Check RCP Status - AT LEAST ONE RUNNING	Try to start one RCP: a. Establish conditions for starting an RCP: 1) Verify offsite power available to the 4KV buses. IF off-site power is not available THEN refer to Attachment A to verify natural circulation IF natural circulation NOT verified THEN increase dumping steam and go to Step 20. 2) Start the oil lift pump. 3) Verify that the number 1 seal leak off valve is OPEN and seal flow is established. 4) Verify the seal injection water flow to be approximately 8 to 12 GPM. (Refer to Enclosure 1, of OP-41.1, REACTOR COOLANT PUMP OPERATION) 5) Verify ΔP across the Thermal Barrier to be 15 inches of water. 6) Verify GREATER THAN 200 PSID across the number 1 seal. 7) Verify that the oil lift pump has been running for two minutes and the oil pressure interlock light is ON. b. Start one RCP. IF an RCP can NOT be started, THEN refer to ATTACHMENT A to verify natural circulation. IF natural circulation NOT verified, THEN increase dumping steam from intact S/Gs.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20	Check If Source Range Detectors Should Be Energized:	
	a. Check intermediate range flux - LESS THAN 10^{-10} AMPS	a. Continue with Step 21. WHEN flux less than 10^{-10} AMPS, THEN do Steps 20b and 20c.
	b. Verify source range detectors - ENERGIZED	b. Manually energize source range detectors.
	c. Transfer nuclear recorders to source range scale	
21	Check If Diesel Generators Should Be Stopped:	
	a. Verify 4KV buses - ENERGIZED BY OFFSITE POWER	a. Try to restore offsite power to 4KV buses.
	b. Stop any unloaded diesel generator and place in standby	
22	Shut Down Unnecessary Plant Equipment Not Required. To Maintain Hot Standby Conditions	
23	Maintain Plant Conditions - STABLE • PRZ PRESSURE • PRZ LEVEL • RCS TEMPERATURES • INTACT S/G LEVELS	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24	Verify SI Flow Not Required:	
	a. RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]	a. Manually operate SI pumps as necessary. Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	b. PRZ level - GREATER THAN 12% [50%]	b. Control charging flow to maintain PRZ level. <u>IF</u> PRZ level can <u>NOT</u> be maintained, <u>THEN</u> manually operate SI pumps as necessary. Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
25	Verify The Status Of The Equipment And Components Listed In Attachment B And Return To Desired Position/Condition As Necessary To Facilitate Plant Recovery <u>THEN</u> Go To Appropriate Plant Procedure As Determined By The Plant Supervisor - Nuclear	

END OF TEXT

ATTACHMENT A

The following conditions support or indicate natural circulation flow:

- RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]
- S/G pressures - STABLE OR DECREASING
- RCS hot leg temperatures - STABLE OR DECREASING
- Core exit TCs - STABLE OR DECREASING
- RCS cold leg temperatures - AT SATURATION TEMPERATURE FOR S/G PRESSURE

ATTACHMENT B
COMPONENTS AFFECTED BY A SAFETY INJECTION SIGNAL

	Diesel Generators
	Emergency Containment Cooler Fans
	Emergency Containment Filter Fans
	Residual Heat Removal Pumps
	Auxiliary Feedwater Pumps
	CCW Pumps
	Feedwater Control Valves
	Containment Sump Pumps
	Charging Pumps
	Feedwater Pumps
MOV-3-744A	RHR to Cold Leg Injection
MOV-3-744B	RHR to Cold Leg Injection
MOV-3-843A	BIT Outlet to Cold Legs
MOV-3-843B	BIT Outlet to Cold Legs
MOV-3-1417	CCW to Normal Containment Coolers
MOV-3-1418	CCW From Normal Containment Coolers
	Normal Containment Cooling Fans
SV-3-2911	Containment Air Monitoring Isolation
SV-3-2912	Containment Air Monitor Isolation
SV-3-2913	Containment Monitoring Isolation
CV-3-6275A	Steam Generator Blowdown
CV-3-6275B	Steam Generator Blowdown
CV-3-6275C	Steam Generator Blowdown
MOV-3-1425	Steam Generator Liquid Sample (Keylock Bypass can be used)
MOV-3-1426	Steam Generator Liquid Sample (Keylock Bypass can be used)
MOV-3-1427	Steam Generator Liquid Sample (Keylock Bypass can be used)
CV-3-516	PZR Relief Tank to G. Anal Isolation
CV-3-739	Excess LTDN Hx CCW Outlet
CV-3-204	LTDN Isolation Valve
CV-3-855	Accum N_2 Isolation
CV-3-4658A	Reactor Coolant Drain Tank to Vent Header (WB Panel)
CV-3-4658B	Reactor Coolant Drain Tank to Vent Header (WB Panel)
CV-3-4659A	Rector Coolant Drain Tank G Anal Isolation
CV-3-4659B	Rector Coolant Drain Tank G Anal Isolation
CV-3-200A	LTDN Orifice Isolation
CV-3-200B	LTDN Orifice Isolation
CV-3-200C	LTDN Orifice Isolation
SV-3-519A	Primary Water to Containment Isolation
CV-3-956A	Sample System - Steam Space
CV-3-956B	Sample System - Liquid Space
CV-3-6428	Sample System - A and B Hot Legs
CV-3-956D	Sample System - Accumulators
SV-3-4668A	Reactor Coolant Drain Tank PP Discharge (WB Panel)
SV-3-4668B	Reactor Coolant Drain Tank PP Discharge (WB Panel)
MOV-3-381	Excess Letdown and RCP Seal Return Isolation
CV-3-2821	Containment Sump Isolation
CV-3-2822	Containment Sump Isolation
SV-3-6385	PZR Relief Tank to Gas Analyzer Isolation
MOV-3-6386	Reactor Coolant Pump Seal Water Return
CV-3-2819	Cont Instrument Air Bleed (I.C.)
CV-3-2826	Cont Instrument Air Bleed (O.C.)
POV-3-2600	Cont Purge Supply Isol (O.C.)
POV-3-2601	Cont Purge Supply Isol (I.C.)
POV-3-2602	Cont Purge Exhaust Isol (O.C.)
POV-3-2603	Cont Purge Exhaust Isol (I.C.)

*/HEB/dt/sr

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

ATTACHMENT C
RE-ENERGIZATION OF PRESSURIZER BACKUP HEATERS

CAUTION

Loading on the EDG should not exceed the Orange mark (2000 hour rating of 2850 KW). However, loads placed on the energized 4 KV buses (the power source) may approach the Red mark (168 hour rating) on the wattmeter for short periods.

a. 4KV Buses - ALL ENERGIZED

- IF EDG A is available, go to Step b.
- IF EDG B is available, go to Step g.

b. Verify EDG A Load is LESS THAN 2300 KW

b. Dispatch personnel to cabinet 3812 to OPEN all nine (9) breakers.

1. Reset heater Group A lockout relay in the penetration room.
2. Place control switch for Group A to the ON position.
3. CLOSE 3 individual heater breakers one at a time.

   AND

   Verify between each closure A diesel load DOES NOT exceed the capacity of the power source.
4. Return to procedure and Step in effect.

c. Reset lockout relay in penetration room for backup Group A

d. Place control switch for Group A to the ON position

e. Verify EDG A load DOES NOT exceed the capacity of the power source

f. Return to procedure and Step in effect

g. Place control switch for Group B backup heaters to "OFF"

h. Place the keylock switch for breaker 0408 in the EMERGENCY position

i. Dispatch personnel to cabinet 3B13 to OPEN all nine (9) breakers

j. Place console control switch to the ON position

k. CLOSE 3 individual heater breakers one at a time

AND

Verify between each closure B diesel load DOES NOT exceed the capacity of the power source

l. Return to procedure and Step in effect

FOLDOUT FOR E-1 SERIES PROCEDURES

1. SI TERMINATION CRITERIA
Go to ES-1.1, SI TERMINATION, If ALL conditions listed below occur:
    a. RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]
    b. Total feed flow to intact SGs - GREATER THAN 130 GPM per S/G.
    OR
    Narrow range level in at least one intact SG - GREATER THAN 6% [32%].
    c. RCS pressure:
        - GREATER THAN 1588 PSIG [1993 PSIG]
        - STABLE OR INCREASING
    d. PRZ level - GREATER THAN 12% [50%]
2. SI RE-INITIATION CRITERIA
Manually operate SI pumps as necessary If EITHER condition listed below occurs:
    - RCS subcooling based on core exit TCs - LESS THAN 30°F [45°F]
    - PRZ level - CANNOT BE MAINTAINED GREATER THAN 12% [50%]
3. RED PATH SUMMARY
    a. SUBCRITICALITY - Nuclear power GREATER THAN 5%.
    b. CORE COOLING - Core exit TCs GREATER THAN 1200°F.
    c. HEAT SINK - Narrow level in all SGs LESS THAN 32% AND total feedwater flow LESS THAN 130 GPM per S/G.
    d. INTEGRITY - Cold leg temperature decrease GREATER THAN 100°F in last 60 minutes AND RCS cold leg temperature LESS THAN 317°F.
    e. CONTAINMENT - Containment pressure GREATER THAN 59 PSIG.
4. SECONDARY INTEGRITY CRITERIA
Go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1, If any S/G pressure is decreasing in an uncontrolled manner or has completely depressurized, and has not been isolated.
5. E-3 TRANSITION CRITERIA
Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1, If any S/G level increases in an uncontrolled manner or any S/G has abnormal radiation.
6. COLD LEG RECIRCULATION SWITCHOVER CRITERIA
Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1, If RWST level decreases to LESS THAN 115,000 GAL.
7. CST MAKEUP WATER CRITERIA
Makeup water sources for the CST will be necessary if level decreases to LESS THAN 10%.
8. HYDROGEN ANALYZER START CRITERIA
Hydrogen analyzers should be placed in service per Attachment A of E-0 within 30 minutes of a valid safety injection.
9. POST ACCIDENT CHEMICAL INJECTION TO RCS
Within 8 hours after the event, establish chemistry controls on the recirculation flow as directed by the radiochemist per Attachment A of E-1.
10. ADVERSE CONTAINMENT CONDITIONS
Adverse Containment conditions are defined as either a Containment Atmosphere temperature of 180°F or Containment radiation levels equal to or greater than 1.3 x 10^5 R/hr. Under these conditions the setpoint values in brackets, [ ], are required to be used.

    If the Containment temperature subsequently falls below 180°F, the normal setpoint values may be used. If the Containment radiation level subsequently falls below 1.3 x 10^5 R/hr, the adverse Containment setpoints are required to be used until permission is granted by the Technical Support Staff to use normal setpoints.

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ES-1.2 (Sheet 1 of 1)

EOP Title: Post LOCA Cooldown and Depressurization

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
1	1	7	Step 1 provides plant specific equipment loaded to the 4KV Buses. See attached procedure.
3	3	7	Step 3 provides plant specific means for establishing charging flow. See attached procedure.
10	10	7	Step 10 provides plant specific means for establishing conditions for starting a reactor coolant pump. See attached procedure.
13	13 RNO	7	Step 13 provides plant specific means for establishing conditions for starting a reactor coolant pump. See attached procedure.
19	19	7	Step 19 provides the plant specific procedure for establishing normal cooling for reactor coolant pumps. See attached procedure.
20	20	7	Step 20 provides plant specific means for establishing reactor coolant pump seal return flow. See attached procedure.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-ES-1.2

Title:

POST LOCA COOLDOWN AND DEPRESSURIZATION

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	87-009
Approved by Plant Manager-N:	1/7/87

RTS 86-1092P, 86-1832P

LIST OF EFFECTIVE PAGES

Page	Revision Date
1	01/07/87
2	01/07/87
3	01/07/87
4	01/07/87
5	01/07/87
6	01/07/87
7	01/07/87
8	01/07/87
9	01/07/87
10	01/07/87
11	01/07/87
12	01/07/87
13	01/07/87
14	01/07/87
15	01/07/87

1.0 PURPOSE

This procedure provides actions to cool down and depressurize the RCS to cold shutdown conditions following a loss of reactor coolant inventory.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 18, when RCS pressure is greater than the shutoff head pressure of the RHR pumps.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

If RWST level decreases to less than 115,000 gallons, the SI System should be aligned for cold leg recirculation using ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.

NOTE

Foldout page should be open.

1 Verify All 4KV Buses - ENERGIZED BY OFFSITE POWER

Try to restore offsite power to 4KV buses. IF offsite power can NOT be restored perform the following:

a. Verify adequate diesel capacity to place the following equipment in service. IF necessary shed non-essential loads (refer to E-0, Attachment D for component KW load rating).

1) Charging pump

2) PRZ HTR backup groups per Attachment 8

CAUTION

RCS pressure should be monitored. If RCS pressure decreases to less than 225 PSIG [630 PSIG], the RHR pumps must be manually restarted to supply water to the RCS.

2 Check If RHR Pumps Should Be Stopped:

a. Check RCS pressure:

1) Pressure - GREATER THAN 225 PSIG [630 PSIG]

2) Pressure - STABLE OR INCREASING

a. Go to Step 3.

b. Stop RHR pumps and place in standby

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Establish Charging Flow:	
	a. Charging pumps - AT LEAST ONE RUNNING	a. Perform the following: 1) IF CCW flow to RCP(s) thermal barrier is lost, THEN isolate seal injection to affected RCP(s) before starting charging pumps. 2) Start charging pumps as necessary.
	b. Align charging pump suction to RWST	
	c. Establish maximum flow: 1) Place charging pump controls in MANUAL to establish maximum flow	

CAUTION

Makeup water sources for CST will be necessary if level decreases to less than 10%.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Check Intact S/G Levels:	
	a. Narrow range level - GREATER THAN 6% [32%]	a. Maintain total feed flow greater than 130 gpm per S/G until narrow range level greater than 6% [32%] in at least one S/G.
	b. Control feed flow to maintain narrow range level between 6% [32%] and 50%	b. IF narrow range level in any S/G continues to increase in an uncontrolled manner, THEN go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

- *Shutdown margin should be monitored during RCS cooldown.*
- *High steam flow with low Steam Generator pressure or low TAVG SI signal should be blocked prior to cooldown. When PRZ pressure decreases to less than 2000 PSIG, the low PRZ pressure SI should be blocked.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Initiate RCS Cooldown To Cold Shutdown:	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Use RHR system if in service	
	c. Dump steam to condenser from intact S/G(s)	c. Dump steam using intact S/G(s) steam dump to atmosphere valves.
6	Check RCS Subcooling Based On Core Exit TCs - GREATER THAN 30°F [45°F]	Go to Step 16.
7	Check High-Head SI Pumps - ANY RUNNING	Go to Step 12.
8	Place All PRZ Heater Switches In OFF Position	

CAUTION

Voiding may occur in the RCS during RCS depressurization. This will result in a rapidly increasing PRZ level.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Depressurize RCS To Refill PRZ:	
	a. Use normal PRZ spray	a. Use one PRZ PORV. IF no PORV available, THEN use auxiliary spray.
	b. PRZ Level - GREATER THAN 23% [50%]	b. Continue with Step 10. WHEN level greater than 23% [50%], THEN do Step 9c.
	c. Stop RCS depressurization	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *If seal cooling had previously been lost, the affected RCP(s) should not be started prior to a status evaluation.*
- *On natural circulation, RTD bypass temperatures and associated interlocks will be inaccurate.*

NOTE

RCPs should be run in order of priority to provide normal PRZ spray.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Check If An RCP Should Be Started:	
	a. All RCPs - STOPPED	a. Stop all but one RCP. Go to Step 11.
	b. RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]	b. Go to Step 16.
	c. PRZ level - GREATER THAN 23% [50%]	c. Return to Step 9.
	d. Try to start an RCP:	
	1) Establish conditions for starting an RCP:	1) Go to step 11.
	a) Verify off-site power available to the 4KV buses	
	b) Start the oil lift pump	
	c) Verify that the number 1 seal leakoff valve is OPEN and seal flow is established	
	d) Verify the seal injection water flow to be approximately 8 to 12 GPM (refer to Enclosure #1 of OP-041.1, REACTOR COOLANT PUMP OPERATION)	
	e) Verify ΔP across the thermal barrier to be 15 inches of water	
	f) Verify GREATER THAN 200 PSID across the number 1 seal	
	g) Verify that the oil lift pump has been running for two minutes and the oil pressure interlock light is ON.	
	2) Start one RCP	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

After stopping any high-head SI pump, RCS pressure should be allowed to stabilize before stopping another pump.

11 Check If One High-Head SI Pump Should Be Stopped:

a. Determine required RCS subcooling from table:

RCS SUBCOOLING (°F)				
CHARGING PUMP STATUS	ANY RCP RUNNING		NO RCP RUNNING	
	ONE HIGH-HEAD PUMP RUNNING	TWO HIGH-HEAD PUMPS RUNNING	ONE HIGH-HEAD PUMP RUNNING	TWO HIGH-HEAD PUMPS RUNNING
NONE RUNNING	DO NOT STOP HIGH-HEAD SI PUMP	59°F [235°F]	DO NOT STOP HIGH-HEAD SI PUMP	70°F [226°F]
ONE RUNNING	248°F [493°F]	55°F [261°F]	248°F [481°F]	66°F [261°F]
TWO RUNNING	232°F [221°F]	52°F [232°F]	237°F [210°F]	62°F [225°F]
THREE RUNNING	199°F [244°F]	49°F [254°F]	212°F [244°F]	58°F [253°F]

b. RCS subcooling based on core exit TCs - GREATER THAN REQUIRED SUBCOOLING

b. DO NOT STOP HIGH-HEAD SI PUMP. Go to Step 16.

c. PRZ level - GREATER THAN 23% [50%]

c. DO NOT STOP HIGH-HEAD SI PUMP. Return to Step 9.

d. Stop one additional high-head SI pump

e. Go to Step 16

12 Control Charging Flow To Maintain PRZ Level

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *If seal cooling had previously been lost, the affected RCP(s) should not be started prior to a status evaluation.*
- *On natural circulation, RTD bypass temperatures and associated interlocks will be inaccurate.*

NOTE

RCPs should be run in order of priority to provide normal PRZ spray.

13 Check RCP Status:

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13	a. RCPs - AT LEAST ONE RUNNING	a. Try to start one RCP: 1) Establish conditions for starting an RCP: (a) Verify off-site power available to the 4KV buses. IF off-site power is not available THEN go to step 14. (b) Start the oil lift pump (c) Verify that the number 1 seal leakoff valve is OPEN and seal flow is established. (d) Verify the seal injection water flow to be approximately 8 to 12 GPM (refer to Enclosure #1 of OP-041.1, REACTOR COOLANT PUMP OPERATION) (e) Verify ΔP across the thermal barrier to be 15 inches of water. (f) Verify GREATER THAN 200 PSID across the number 1 seal. (g) Verify that the oil lift pump has been running for two minutes and the oil pressure interlock light is ON. (2) Start one RCP. IF an RCP can NOT be started, THEN refer to ATTACHMENT A to verify natural circulation. IF natural circulation NOT verified, THEN increase dumping steam.
	b. Stop all but one RCP	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

Voiding may occur in the RCS during RCS depressurization. This will result in a rapidly increasing PRZ level.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Depressurize RCS To Minimize RCS Subcooling:	
	a. Use normal PRZ spray	a. Use one PRZ PORV. <u>IF</u> no PORV available, <u>THEN</u> use auxiliary spray.
	b. Turn on PRZ heaters as necessary	
	c. Depressurize RCS until <u>EITHER</u> of the following conditions satisfied: • PRZ LEVEL - GREATER THAN 71% [50%] <u>OR</u> • RCS SUBCOOLING BASED ON CORE EXIT TCs - LESS THAN 30°F [45°F]	
15	Verify Adequate Shutdown Margin:	
	a. Sample RCS	
	b. Shutdown margin - ADEQUATE	b. Borate as necessary.
16	Verify SI Flow Not Required:	
	a. RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]	a. Manually operate SI pumps as necessary. Go to Step 17.
	b. PRZ level - GREATER THAN 12% [50%]	b. Manually operate SI pumps as necessary. Return to Step 9.
17	Check If SI Accumulator Should Be Isolated:	
	a. RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]	a. <u>IF</u> RCS Hot leg temperatures greater than 400°F, <u>THEN</u> go to Step 18. <u>IF NOT</u>, <u>THEN</u> do Steps 17b and c.
	b. Check power to isolation valves - AVAILABLE	b. Restore power to isolation valves.
	c. Close all SI accumulator isolation valves	c. Vent any unisolated accumulators.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Check If Diesel Generators Should Be Stopped:	
	a. Verify 4KV buses - ENERGIZED BY OFFSITE POWER	a. Try to restore offsite power to 4KV buses
	b. Stop any unloaded diesel generator and place in standby	
19	Check RCP Cooling - NORMAL	Establish normal cooling to RCPs. Refer to OP-030, COMPONENT COOLING WATER.
	• RCP CCW SYSTEM FLOW	
	• RCP SEAL INJECTION FLOW	
20	Check If RCP Seal Return Flow Should Be Established:	
	a. Verify CCW pump RUNNING AND CCW surge tank level NORMAL	
	b. Establish flow:	
	1) Verify OPEN MOV-3-381	1) OPEN MOV-3-381
	2) OPEN MOV-3-6386	
21	Check If Source Range Detectors Should Be Energized:	
	a. Check intermediate range flux - LESS THAN 10^{-10} amps	a. Continue with Step 22. WHEN flux less than 10^{-10} amps THEN to Steps 21b and c.
	b. Verify source range detectors - ENERGIZED	b. Manually energize source range detectors.
	c. Transfer nuclear recorders to source range scale	
22	Shut Down Unnecessary Plant Equipment Not Required To Maintain Hot Standby Conditions:	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23	Check If RCPs Must Be Stopped:	
	a. Check the following: • NUMBER 1 SEAL DIFFERENTIAL PRESSURE - LESS THAN 200 PSID OR • NUMBER 1 SEAL LEAKOFF FLOW - LESS THAN 0.7 GPM	a. Go to Step 24.
	b. Stop affected RCP(s)	
24	Check If RHR System Can Be Placed In Service:	
	a. Check the following: • RCS temperature - LESS THAN 324°F [324°F] • RCS pressure - LESS THAN 450 PSIG [110 PSIG]	a. Go to Step 25.
	b. Consult TSC staff to determine if RHR system should be placed in service	
25	Check RCS Temperatures - LESS THAN 200°F	Return to Step 4.
26	Evaluate Long Term Plant Status:	
	a. Maintain cold shutdown conditions	
	b. Consult TSC staff	

END OF TEXT

•/GY/dc/dj

ATTACHMENT A

The following conditions support or indicate natural circulation flow:

- RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]
- S/G pressures - STABLE OR DECREASING
- RCS hot leg temperature - STABLE OR DECREASING
- Core exit TCs - STABLE OR DECREASING
- RCS cold leg temperatures - AT SATURATION TEMPERATURE FOR S/G PRESSURE

Procedure No.	Procedure Title	Page
3-EOP-ES-1.2	POST LOCA COOLDOWN AND DEPRESSURIZATION	14
		Approval Date 1/7/87

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

ATTACHMENT B
RE-ENERGIZATION OF PRESSURIZER BACKUP HEATERS

CAUTION

Loading on the EDG should not exceed the Orange mark (2000 hour rating of 2850 KW). However, loads placed on the energized 4 KV buses (the power source) may approach the Red mark (168 hour rating) on the wattmeter for short periods.

a. 4KV Buses - ALL ENERGIZED

- IF EDG A is available, go to Step b.
- IF EDG B is available, go to Step g.

b. Verify EDG A Load is LESS THAN 2300 KW

b. Dispatch personnel to cabinet 3812 to OPEN all nine (9) breakers.

1. Reset heater Group A lockout relay in the penetration room.
2. Place control switch for Group A to the ON position.
3. CLOSE 3 individual heater breakers one at a time.

   AND

   Verify between each closure A diesel load DOES NOT exceed the capacity of the power source.
4. Return to procedure and Step in effect.

c. Reset lockout relay in penetration room for backup Group A

d. Place control switch for Group A to the ON position

e. Verify EDG A load DOES NOT exceed the capacity of the power source

f. Return to procedure and Step in effect

g. Place control switch for Group B backup heaters to "OFF"

h. Place the keylock switch for breaker 0408 in the EMERGENCY position

i. Dispatch personnel to cabinet 3813 to OPEN all nine (9) breakers

j. Place console control switch to the ON position

k. CLOSE 3 individual heater breakers one at a time

AND

Verify between each closure B diesel load DOES NOT exceed the capacity of the power source

l. Return to procedure and Step in effect

•GY dc.dj

FOLDOUT FOR E-1 SERIES PROCEDURES

1. SI TERMINATION CRITERIA
   Go to ES-1.1, SI TERMINATION, If ALL conditions listed below occur:
   a. RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]
   b. Total feed flow to intact SGs - GREATER THAN 130 GPM per S/G.
      OR
      Narrow range level in at least one intact SG - GREATER THAN 6% [32%].
   c. RCS pressure:
      - GREATER THAN 1588 PSIG [1993 PSIG]
      - STABLE OR INCREASING
   d. PRZ level - GREATER THAN 12% [50%]
2. SI RE-INITIATION CRITERIA
   Manually operate SI pumps as necessary If EITHER condition listed below occurs:
   - RCS subcooling based on core exit TCs - LESS THAN 30°F [45°F]
   - PRZ level - CANNOT BE MAINTAINED GREATER THAN 12% [50%]
3. RED PATH SUMMARY
   a. SUBCRITICALITY - Nuclear power GREATER THAN 5%.
   b. CORE COOLING - Core exit TCs GREATER THAN 1200°F.
   c. HEAT SINK - Narrow level in all SGs LESS THAN 32% AND total feedwater flow LESS THAN 130 GPM per S/G.
   d. INTEGRITY - Cold leg temperature decrease GREATER THAN 100°F in last 60 minutes AND RCS cold leg temperature LESS THAN 317°F.
   e. CONTAINMENT - Containment pressure GREATER THAN 59 PSIG.
4. SECONDARY INTEGRITY CRITERIA
   Go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1, If any S/G pressure is decreasing in an uncontrolled manner or has completely depressurized, and has not been isolated.
5. E-3 TRANSITION CRITERIA
   Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1, If any S/G level increases in an uncontrolled manner or any S/G has abnormal radiation.
6. COLD LEG RECIRCULATION SWITCHOVER CRITERIA
   Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1, If RWST level decreases to LESS THAN 115,000 gal.
7. CST MAKEUP WATER CRITERIA
   Makeup water sources for the CST will be necessary if level decreases to LESS THAN 10%.
8. HYDROGEN ANALYZER START CRITERIA
   Hydrogen analyzers should be placed in service per Attachment A of E-0 within 30 minutes of a valid safety injection.
9. POST ACCIDENT CHEMICAL INJECTION TO RCS
   Within 8 hours after the event, establish chemistry controls on the recirculation flow as directed by the radiochemist per Attachment A of E-1.
10. ADVERSE CONTAINMENT CONDITIONS
    Adverse Containment conditions are defined as either a Containment Atmosphere temperature of 180°F or Containment radiation levels equal to or greater than 1.3×10^5 R/hr. Under these conditions the setpoint values in brackets, [ ], are required to be used.

    If the Containment temperature subsequently falls below 180°F, the normal setpoint values may be used. If the Containment radiation level subsequently falls below 1.3×10^5 R/hr, the adverse Containment setpoints are required to be used until permission is granted by the Technical Support Staff to use normal setpoints.

FINAL PAGE

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PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ES-1.3

EOP Title: Transfer to Cold Leg Recirculation

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
ES-1.3	ES-1.3	7	3-EOP-ES-1.3 Transfer to Cold Leg Recirculation, provides plant specific instructions for transferring to cold leg recirculation. See attached procedure.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-ES-1.3

Title:

TRANSFER TO COLD LEG RECIRCULATION

Safety Related Procedure

Responsible Department:	Operations
Reviewed by PNSC:	87-138
Approved by Plant Manager-N:	5/26/87

RTS 87-0880P

LIST OF EFFECTIVE PAGES

1.0 PURPOSE

This procedure provides the necessary instructions for transferring the Safety Injection Residual Heat Removal and Containment Spray Systems to the recirculation mode.

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 This procedure is entered from:

1. E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 19, on low RWST level.
2. ECA-2.1, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS, Step 8, on low RWST level.
3. Other procedures whenever RWST level reaches the switchover setpoint.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.

NOTE

Foldout page should be open.

1	Reset SI	

NOTE

The Unit 4 HHSI pump return to RWST valves listed in Step 2 will require removal of manual GAGS prior to closure.

2	Close The Following SI Pump Return to RWST Valves: a. CV-4-856A b. CV-4-856B c. MOV-3-856A d. MOV-3-856B	

CAUTION

HHSI pumps should be stopped if RCS pressure is greater than their shutoff head pressure.

3	VERIFY Charging Pump Status - ANY RUNNING a. STOP - all charging pumps	Go to Step 4.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Align SI System For Recirculation:	IF at least one flow path from the sump to the RCS can NOT be established or maintained, THEN go to ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.
	a. Reduce the operating emergency pumps to the following: 1) 2 HHSI pumps 2) 1 CSP (if needed and EDG loading allows)	
	b. Verify, or place the following RHR pumps in the PULL-TO-LOCK position. 1) RHR pump A 2) RHR pump B	
	c. Verify Step 17 of E-1, LOSS OF REACTOR OR SECONDARY COOLANT has been completed.	c. Perform steps of Attachment A prior to continuing to Step 4d.
	d. CLOSE the following RHR pump RWST Suction STOP vlvs:	
	1) MOV-3-862A	1) Locally close valves
	2) MOV-3-862B	2) Locally close valves
	e. Verify the following SI Pump Recirc Phase Suct Stop Vlvs are CLOSED. 1) MOV-3-863A 2) MOV-3-863B	
	f. OPEN the following containment Recirc Sump Isol Vlvs 1) MOV-3-860A 2) MOV-3-860B 3) MOV-3-861A 4) MOV-3-861B	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Align SI System For Recirculation: (Cont'd)	
	g. Verify that the Containment Recirculation Sump Level Indicator is equal to or greater than 427 inches.	g. Continue to inject with HHSI pumps until 427 inches in the Containment Sump is achieved, then continue to Step 4h.
	h. Place one HHSI Pump delivering flow to the RCS in the PULL-TO-LOCK position.	
	i. OPEN the RHR heat exchanger CCW outlet valve associated with the train of RHR to be selected in Step 4j.	i. Locally open valve.
	j. Start the RHR pump.	

NOTE

In the event RHR Flow Indicator FI-3-605 is inoperable or is erratic (i.e., pegged high or bouncing from 0 to full scale) flow to the RCS cannot be verified due to instrument failure.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	k. Verify RHR flow GREATER THAN 1500 gpm and stable on FI-3-605	k. <u>IF</u> flow CAN NOT be verified <u>THEN</u> go the Step 4m.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Align SI System For Recirculation: (Cont'd)	
	l. Upon initiation of the RWST Low-Low Level alarm (60,000 gals) perform the following:	
	1) Place the following ECCS pumps in the PULL-TO-LOCK position.	
	a) Operating HHSI pump	
	b) CSP A	
	c) CSP B	
	2) Close the following RWST Outlet Isol Vlvs:	2) Locally close valves
	a) MOV-3-864A	
	b) MOV-3-864B	
	3) Close the following SI pump Cold Leg Injection valves:	3) Locally close valves
	a) MOV-3-843A	
	b) MOV-3-843B	
	4) Check RCS Temperatures	
	a) Core Exit TCs-STABLE OR DECREASING	
	5) Go to Step 5	
	m. Perform the following steps upon the initiation of the RWST Low-Low Level alarm (60,000 gal)	
	1) Place the following ECCS pumps in the PULL-TO-LOCK position	
	a) Operating HHSI pump	
	b) CSP A	
	c) CSP B	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Align SI System For Recirculation: (Cont'd) m (Cont'd) 2) Close the RWST Outlet Isol Vlvs a) MOV-3-864A b) MOV-3-864B	2) Locally close valves

CAUTIONS

- *Step 4n should be performed in the most timely manner possible, maximum permissible time to complete step is 50 seconds. Completion of this step will reestablish flow to the core from the containment sump.*
- *Only one HHSI pump is permitted for Cold Leg Recirculation with a loss of offsite power and only one 4kv bus energized.*

	n) Perform the following 1) Close the following RHR Discharge to Cold Leg Isol Vlvs a) MOV-3-744A b) MOV-3-744B 2) Open the SI Pump Recirc Phase Suct Stop Vlv associated with the in service RHR Pump a) MOV-3-863A b) MOV-3-863B	
	3) Start TWO HHSI pumps if both A and B 4KV busses are available.	3) Start one HHSI pump
	o) Verify recirculation flow to the RCS through FI-3-943 p) Check RCS temperature 1) Core Exit TCs -STABLE OR DECREASING	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

In the event that RHR Cold Leg Injection can be established consultation with the TSC Staff is required prior to stopping HHSI pumps, closing the SI Pump Recirc Phase Suct Stop Vlv, MOV-3-863 and opening the RHR Discharge to Cold Leg Isol Vlvs, MOV-3-744A and MOV-3-744B.

5 Verify the following Cont. Spray Water to Charcoal Filter Valves are CLOSED — *Response not obtained:* Perform steps of Attachment 8

a. SV-3-2905
b. SV-3-2906
c. SV-3-2907
d. SV-3-2908
e. SV-3-2909
f. SV-3-2910

6 Notify The Nuclear Chemistry Department To Align The PASS For Recirculation Phase

7 Return To Procedure And Step In Effect

END OF TEXT

ATTACHMENT A
(Page 1 of 1)

COLD LEG RECIRCULATION BREAKER ALIGNMENT

1. Dispatch operator to unlock and CLOSE the MCC BREAKERS for the following MOVS:

Breaker Number	Breaker Location	Valve Number
30621	"B" MCC	MOV-3-866B
30605	"B" MCC	MOV-3-864B
30615	"B" MCC	MOV-3-750
30616	"B" MCC	MOV-3-862B
30626	"B" MCC	MOV-3-863B
30712	"C" MCC	MOV-3-864A
30720	"C" MCC	MOV-3-862A
30726	"C" MCC	MOV-3-863A
30732	"C" MCC	MOV-3-866A
30731	"C" MCC	MOV-3-751

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

ATTACHMENT B
(Page 1 of 2)

EMERGENCY CONTAINMENT FILTER FAN FAILURE

NOTE

The Emergency Containment Filter Temperature recorder is not qualified for post accident operation. The recorder should not be relied on to provide status of the ECF.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	Idle RHR train available	1. GO TO STEP 8
2.	Open the RHR Heat Exchanger CCW Outlet Valve associated with the idle RHR pump	2. Locally open valve
3.	Place the idle RHR pump in service	
4.	Open or verify open the following SI Pump Recirculation Phase Suction stop valves: a. MOV-3-863A b. MOV-3-863B	
5.	OPEN MOV-3-880A or B Containment Spray Pump Discharge valve	
6.	Place CSP in operation associated with the CSP Discharge valve opened in Step 5	
7.	Go to ES-1.3, Step 6	
8.	SI Pump - Running	8. GO TO Step 14 and observe Caution prior to Step 12.
9.	Open MOV-3-880A or B Containment Spray Pump Discharge valve.	
10.	Two SI pumps - Running	10. GO TO Step 12 and observe Caution prior to Step 12.
11.	Stop one SI pump	

CAUTIONS

- *In the event a loss of offsite power is in progress. Attachment D of EOP-E-0 should be consulted to ensure adequate diesel capacity is available to support the operation of the Containment Spray Pump, IF NOT the TSC Staff should be consulted for further instruction.*
- *If Containment Spray Pump operation in Step 12 or Step 18 decreases flow as indicated on FI-3-943 by 20 percent or more, Containment Spray should be terminated.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12.	Place CSP in operation associated with the CSP Discharge valve opened in Step 9	
13.	Go to ES-1.3, Step 6	
14.	Open MOV-3-863 SI Pump Recirculation Phase Suction Stop Valve associated with the RHR pump in operation	
15.	Verify the SI pump low suction pressure annunciator (Panel G) is NOT ON	Close MOV-3-744A, RHR Discharge to Cold Leg Isolation valve

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

ATTACHMENT B
(Page 2 of 2)

EMERGENCY CONTAINMENT FILTER FAN FAILURE

CAUTION

Step 16 should be performed in a timely manner. Completion of this step will terminate flow to the core through the MOV-3-744 valves and reestablish flow to the core utilizing the HHSI pumps through the MOV-3-843 valves.

16. Perform the following:
    a. Close or verify closed the following RHR Discharge to Cold Leg Injection valves:
        1) MOV-3-744A
        2) MOV-3-744B
    b. Open the following SI Pump Cold Leg Injection valves:
        1) MOV-3-843A
        2) MOV-3-843B
    c. Start one SI pump
    d. Verify flow indicated through FI-3-943
17. OPEN MOV-3-880A or B Containment Spray Pump Discharge valve
18. Place CSP in operation associated with the CSP Discharge valve opened in Step 17
19. Go to ES-1.3, Step 6

FOLDOUT FOR E-1 SERIES PROCEDURES

1. SI TERMINATION CRITERIA
   Go to ES-1.1, SI TERMINATION, If ALL conditions listed below occur:
   a. RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]
   b. Total feed flow to intact SGs - GREATER THAN 130 GPM per S/G.
   OR
   Narrow range level in at least one intact SG - GREATER THAN 6% [32%].
   c. RCS pressure:
   - GREATER THAN 1580 PSIG [1993 PSIG]
   - STABLE OR INCREASING
   d. PRZ level - GREATER THAN 12% [50%]
2. SI RE-INITIATION CRITERIA
   Manually operate SI pumps as necessary If EITHER condition listed below occurs:
   - RCS subcooling based on core exit TCs - LESS THAN 30°F [45°F]
   - PRZ level - CANNOT BE MAINTAINED GREATER THAN 12% [50%]
3. RED PATH SUMMARY
   a. SUBCRITICALITY - Nuclear power GREATER THAN 5%.
   b. CORE COOLING - Core exit TCs GREATER THAN 1200°F.
   c. HEAT SINK - Narrow level in all SGs LESS THAN 32% AND total feedwater flow LESS THAN 130 GPM per S/G.
   d. INTEGRITY - Cold leg temperature decrease GREATER THAN 100°F in last 60 minutes AND RCS cold leg temperature LESS THAN 317°F.
   e. CONTAINMENT - Containment pressure GREATER THAN 59 PSIG.
4. SECONDARY INTEGRITY CRITERIA
   Go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1, If any S/G pressure is decreasing in an uncontrolled manner or has completely depressurized, and has not been isolated.
5. E-3 TRANSITION CRITERIA
   Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1, If any S/G level increases in an uncontrolled manner or any S/G has abnormal radiation.
6. COLD LEG RECIRCULATION SWITCHOVER CRITERIA
   Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1, If RWST level decreases to LESS THAN 115,000 gal.
7. CST MAKEUP WATER CRITERIA
   Makeup water sources for the CST will be necessary if level decreases to LESS THAN 10%.
8. HYDROGEN ANALYZER START CRITERIA
   Hydrogen analyzers should be placed in service per Attachment A of E-0 within 30 minutes of a valid safety injection.
9. POST ACCIDENT CHEMICAL INJECTION TO RCS
   Within 8 hours after the event, establish chemistry controls on the recirculation flow as directed by the radiochemist per Attachment A of E-1.
10. ADVERSE CONTAINMENT CONDITIONS
    Adverse Containment conditions are defined as either a Containment Atmosphere temperature of 180°F or Containment radiation levels equal to or greater than 1.3×10^5 R/hr. Under these conditions the setpoint values in brackets, [ ], are required to be used.

    If the Containment temperature subsequently falls below 180°F, the normal setpoint values may be used. If the Containment radiation level subsequently falls below 1.3×10^5 R/hr, the adverse Containment setpoints are required to be used until permission is granted by the Technical Support Staff to use normal setpoints.

FINAL PAGE

HEB/dc/tf dj

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ES-1.4

EOP Title: Transfer to Hot Leg Recirculation

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
ES-1.4	ES-1.4	7	3-EOP-ES-1.4, Transfer to Hot Leg Recirculation, provides plant specific instructions for transferring to Hot Leg Recirculation. See attached procedure.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-ES-1.4

Title:

TRANSFER TO HOT LEG RECIRCULATION

<u>Safety Related Procedure</u>

Responsible Department:	Operations
Reviewed by PNSC:	87-138
Approved by Plant Manager-N:	5/26/87

RTS 87-0880P

*/HEB/sntf dj

LIST OF EFFECTIVE PAGES

Page	Revision Date
1	05/26/87
2	05/26/87
3	05/26/87
4	05/26/87
5	05/26/87
6	05/26/87
7	05/26/87
8	05/26/87
9	05/26/87

Procedure No.	Procedure Title	Page: 3
3-EOP-ES-1.4	TRANSFER TO HOT LEG RECIRCULATION	Approval Date: 5/26/87

1.0 PURPOSE

This procedure provides the necessary instructions for transferring the safety injection system to hot leg recirculation.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 23, when the specified time interval has elapsed.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTES

- *Foldout page should be open.*
- *In the event that a passive failure occurs and the HHSI pumps are not available for Hot Leg Recirculation, Attachment A should be performed to obtain RHR hot leg recirculation.*
- *In the event the alternate RHR recirculation path is needed, perform steps of Attachment B.*

1 Align SI Flow Path For Hot Leg Recirculation

a. Idle RHR Train available

RNO: a. Perform steps of Attachment C

b. Establish CCW flow through the idle RHR Heat Exchanger

RNO: b. Locally open valve

c. Dispatch operator to close the RHR Heat Exchanger Manual Outlet Valve, 3-759 associated with the idle RHR train

d. Close or Verify Closed the following Safety Injection Pump Cold Leg Injection Valves

1) MOV-3-843A

2) MOV-3-843B

e. Open the following SI Pump Recirculation Phase Suction Stop Valve on the idle RHR Train

1) MOV-3-863A

2) MOV-3-863B

f. Open the Safety Injection Pump Hot Leg Injection Valve MOV-3-869

RNO: f. Manually open valve <u>IF</u> valve cannot be opened <u>OR</u> conditions prevent hot leg recirculation utilizing the HHSI system close or verify closed the following SI Pump Recirculation Phase Suction Stop Valves.

1) MOV-3-863A

2) MOV-3-863B

<u>THEN</u>

Perform steps of Attachment A

g. Upon completion of Step 1c above, start the idle RHR Pump

h. Verify the HHSI Pump low suction pressure annunciator <u>IS</u> not ON

/HE3.s *d*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Align SI Flow Path For Hot Leg Recirculation (Cont'd)	

i. Start one HHSI Pump

j. Verify flow through FI-3-940

k. Start the second HHSI Pump

l. Verify increased flow through FI-3-940

m. Return to procedure and step in effect

END OF TEXT

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

ATTACHMENT A

HOT LEG RECIRCULATION UTILIZING THE RHR PUMPS

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Verify one RHR Pump in operation supplying flow to the RCS through MOV-3-744A and B	Stop one RHR pump
2	Dispatch ocerator to CLOSE the following RHR Pump Inlet Vlvs: a. 3-752A b. 3-752B	
3	Upon completion of Step 2 above OPEN the following RHR Loop Suction Stop Valves a. MOV-3-751 b. MOV-3-750	Verify MOV-3-863A and MOV-3-863B CLOSED <u>THEN</u> repeat Step 3
4	Close the following RHR Pump Discharge To Cold Leg Isolation Valves: a. MOV-3-744A b. MOV-3-744B	
5	<u>IF</u> normal hot leg recirculation can not be established, every twelve hours flow to the cold legs should be restarted and hot leg flow terminated by performing the following: a. OPEN the following RHR to Cold Leg Injection Valves 1) MOV-3-744A 2) MOV-3-744B b. CLOSE the RHR Loop Suction Stop Valve MOV-3-750	

ATTACHMENT B

ALTERNATE RHR RECIRCULATION PATH

NOTE

This RHR alternate flowpath would only be utilized in this configuration if Cold Leg Recirculation is in progress, normal flow to the RCS through HCV-3-758 is inoperable and flow through the HHSI Pumps cannot be established. HHSI Pumps or CSP should not be utilized unless both RHR Pumps are available and in operation supplying flow through the RHR alternate flow path.

1. Verify the following Safety Injection Pump Cold Leg Injection Valves are CLOSED:
   a. MOV-3-843A
   b. MOV-3-843B
2. Dispatch radio equipped operator to perform the following manual valve manipulation:
   a. CLOSE the RHR Heat Exchanger A Outlet Valve 3-759A
   b. CLOSE the RHR Heat Exchanger B Outlet Valve 3-759B
3. OPEN the following SI Pump Recirculation Phase Suction Stop valves:
   a. MOV-3-863A
   b. MOV-3-863B

CAUTION

Communications with the operator in the field performing Step 2 is required to enable the operator to open MOV-3-872 and start the RHR Pump as quickly as possible to re-establish flow to the core.

4. Stop all in service RHR Pumps
5. Verify field operator has CLOSED Vlvs, 3-759A and 3-759B
6. Open Alternate RHR Cold Leg Injection Vlv, MOV-3-872
7. Start two RHR Pumps.
8. Verify that differential pressure across the operating RHR Pump is maintained within 105 to 125 psig.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

ATTACHMENT C

HOT LEG RECIRCULATION WITH IDLE RHR TRAIN INOPERABLE

1.	Open MOV-3-863 SI Pump Recirculation Phase Suction Stop Valve associated with the RHR pump in operation	
2.	Verify the SI pump low suction pressure annunciator (Panel G) is NOT ON	Close MOV-3-744A, RHR Discharge to Cold Leg Isolation valve

CAUTION

Step 3 should be performed in a timely manner. Completion of this step will terminate flow to the core through the MOV-3-744 valves and reestablish flow to the core utilizing the HHSI pumps through the MOV-3-869 valve.

3. Perform the following

   a. Close or verify closed the following RHR Discharge to Cold Leg Injection Valves:

      1) MOV-3-744A

      2) MOV-3-744B

   b. Open the SI Pump Hot Leg Injection Valve MOV-3-869

   c. Start one HHSI Pump.

   d. Verify flow indicated through FI-3-940.

   e. Start the second HHSI Pump.

NOTE

If the second train of RHR cannot be made available, alternately injecting into the hot and cold legs using the single train of high head recirculation is required. The period for each mode of injection (hot leg or cold leg) should be 12 hours. Once the second train of low head injection is available, the high head injection path should be returned to the hot legs and left there as long as low head injection to the cold legs is maintained.

   f. Return to procedure and step in effect.

FOLDOUT FOR E-1 SERIES PROCEDURES

1. SI TERMINATION CRITERIA

Go to ES-1 1, SI TERMINATION, If ALL conditions listed below occur:

a. RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]

b. Total feed flow to intact SGs - GREATER THAN 130 GPM per S/G.

OR

Narrow range level in at least one intact SG - GREATER THAN 6% [32%].

c. RCS pressure:

- GREATER THAN 1580 PSIG [1993 PSIG]
- STABLE OR INCREASING

d. PRZ level - GREATER THAN 12% [50%]

2 SI RE-INITIATION CRITERIA

Manually operate SI pumps as necessary If EITHER condition listed below occurs:

- RCS subcooling based on core exit TCs - LESS THAN 30°F [45°F]
- PRZ level - CANNOT BE MAINTAINED GREATER THAN 12% [50%]

3. RED PATH SUMMARY

a. SUBCRITICALITY - Nuclear power GREATER THAN 5%.

b. CORE COOLING - Core exit TCs GREATER THAN 1200°F.

c. HEAT SINK - Narrow level in all SGs LESS THAN 32% AND total feedwater flow LESS THAN 130 GPM per S/G.

d. INTEGRITY - Cold leg temperature decrease GREATER THAN 100°F in last 60 minutes AND RCS cold leg temperature LESS THAN 317°F.

e. CONTAINMENT - Containment pressure GREATER THAN 59 PSIG.

4. SECONDARY INTEGRITY CRITERIA

Go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1, If any S/G pressure is decreasing in an uncontrolled manner or has completely depressurized, and has not been isolated.

5. E-3 TRANSITION CRITERIA

Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1, If any S/G level increases in an uncontrolled manner or any S/G has abnormal radiation.

6. COLD LEG RECIRCULATION SWITCHOVER CRITERIA

Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1, If RWST level decreases to LESS THAN 115,000 gal.

7 CST MAKEUP WATER CRITERIA

Makeup water sources for the CST will be necessary if level decreases to LESS THAN 10%.

8. HYDROGEN ANALYZER START CRITERIA

Hydrogen analyzers should be placed in service per Attachment A of E-0 within 30 minutes of a valid safety injection.

9. POST ACCIDENT CHEMICAL INJECTION TO RCS

Within 8 hours after the event, establish chemistry controls on the recirculation flow as directed by the radiochemist per Attachment A of E-1.

10. ADVERSE CONTAINMENT CONDITIONS

Adverse Containment conditions are defined as either a Containment Atmosphere temperature of 180°F or Containment radiation levels equal to or greater than 1.3×10^5 R/hr Under these conditions the setpoint values in brackets, [ ], are required to be used.

If the Containment temperature subsequently falls below 180°F, the normal setpoint values may be used. If the Containment radiation level subsequently falls below $1\ 3 \times 10^5$ R/hr, the adverse Containment setpoints are required to be used until permission is granted by the Technical Support Staff to use normal setpoints.

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-E-2 (Sheet 1 of 1)

EOP Title: Faulted Steam Generator Isolation

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
4	4	7	Step 4 provides plant specific means for isolating faulted steam generators. See attached procedure.
6	6	7	Step 6 provides plant specific means for sampling of all steam generators. See attached procedure.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-E-2

Title:

FAULTED STEAM GENERATOR ISOLATION

Safety Related Procedure

Responsible Department:	Operations
Reviewed by PNSC:	86-233
Approved by Plant Manager-N:	9/3/86

RTS 86-1356

*/HEB/ec/emm

1.0 PURPOSE

This procedure provides actions to identify and isolate a faulted steam generator.

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 This procedure is entered from:

1. E-0, REACTOR TRIP OR SAFETY INJECTION, Step 23, with the following symptoms:
   a. Any S/G pressure decreasing in an uncontrolled manner.
   b. Any S/G completely depressurized.
2. E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 2,
   E-3, STEAM GENERATOR TUBE RUPTURE, Step 6,
   ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED Step 9, and
   ECA-3.2, SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED, Step 3,
   with the following symptoms and/or conditions:
   a. Any S/G pressure decreasing in an uncontrolled manner.
   b. Any S/G completely depressurized.
   c. Faulted S/G isolation not verified.
3. FR-H.5, RESPONSE TO STEAM GENERATOR LOW LEVEL, Step 3, when the affected S/G is identified as faulted.
4. Other procedures whenever a faulted S/G is identified.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *At least one S/G must be maintained available for RCS cooldown.*
- *Any faulted S/G or secondary break should remain isolated during subsequent recovery actions unless needed for RCS cooldown.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Check Main Steamline Isolation And Bypass Valves Of Affected S/G(s) - CLOSED	Manually close valves.
2	Check If Any S/G Is Not Faulted:	
	a. Check pressures in all S/Gs - ANY STABLE OR INCREASING	a. IF all S/G pressures decreasing in an uncontrolled manner, THEN go to ECA-2.1, UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS, Step 1.
3	Identify Faulted SG(s):	
	a. Check pressures in all S/Gs:	a. Search for initiating break:
	• ANY S/G PRESSURE DECREASING IN AN UNCONTROLLED MANNER	• Main steamlines.
	OR	• Main feedlines.
	• ANY S/G COMPLETELY DEPRESSURIZED	• Other secondary piping.
		Go to Step 5

*/HEB/ec/emm

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

In the event that S G A is faulted, valves 3-006 and 3-007 will require repositioning to provide steam supply to the B AFW pump.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Isolate Faulted S/G(s):	
	a. Isolate main feedline	a. Manually isolate
	b. Isolate AFW flow	b. Manually isolate
	c. Place S/G feedwater pump CNTRL SW to OFF	
	d. RESET SI	
	e. CLOSE steam supply MOV to the AFW pumps.	e. Dispatch an Operator to locally OPEN the steam supply MOV breaker <u>THEN</u> manually CLOSE the valve. Go to Step 4g
	f. Dispatch an Operator to locally OPEN the steam supply MOV breaker	
	g. Verify S/G dump to atmosphere valves - CLOSED	
	h. Isolate other secondary piping:	
	1) Verify S/G blowdown isolated	
	2) Verify turbine stop and MSR valves CLOSED	
	3) Auxiliary steam supply header	
	4) Verify sample lines isolated	

*/HEB/ec/emm

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Check CST Level - GREATER THAN 10%	Refer to OP 018 1, Condensate Storage Tank for CST makeup
6	Check Secondary Radiation:	
	a. Request periodic activity samples of all S/Gs:	
	1) Notify Chemistry Lab for S/G samples	
	b. Check unisolated secondary radiation monitors	
	c. Secondary radiation - NORMAL	c. Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1
7	Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1	

END OF TEXT

FINAL PAGE

*/HEB/ec/emm

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-E-3 (Sheet 1 of 2)

EOP Title: Steam Generator Tube Rupture

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
	Caution 2 prior to Step 3	7	The second caution prior to Step 3 provides plant specific means for maintaining an auxiliary feedwater pump steam supply. See attached procedure.
3	3	7	Step 3 provides plant specific means for isolating flow from ruptured steam generators. See attached procedure.
Caution 2 prior to Step 8		7	The second caution prior to Step 8 has been deleted due to plant specific design which does not include automatic transfer of high head safety injection pump suction to the RWST on low level in the boric acid tank. Safety injection pumps are normally aligned to the RWST. See attached procedure.
Caution prior to Step 7	Caution prior to Step 7	2	The caution prior to Step 4 provides plant specific level criteria for condensate storage tank makeup.
Caution prior to Step 12	Caution prior to Step 11		The caution prior to Step 11 has been moved from prior to Step 12 in the guidelines to prior to Step 11 to support Step 11. See attached procedure.
Step 12	Step 11	2	Step 11 ensures emergency diesel generator capacity by stopping the residual heat removal pumps if RCS pressure criteria is met, and the single emergency diesel scenario is assumed. See attached procedure.
Step 11	Step 12	2	Step 12 verifies offsite power or tries to restore offsite power while ensuring adequate diesel capacity in the single diesel scenario. See attached procedure.
Step 15	Step 15	7	Step 15 provides plant specific means for establishing maximum charging flow. See attached procedure.
20	20	7	Step 20 provides plant specific indications of leakage from the pressurizer power operated relief valves. See attached procedure.

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-E-3

EOP Title: Steam Generator Tube Rupture

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
23	23	7	Step 23 has been revised to "Continue to next step" due to plant specific design which maintains high head safety injection pump suction aligned to the refueling water storage tank. See attached procedure.
24	24	7	Step 24 provides plant specific means for establishing charging flow. See attached procedure.
27	27	7	Step 27 provides plant specific means for establishing letdown. See attached procedure.
31	31	7	Step 31 provides plant specific means for minimizing secondary system contamination. See attached procedure.
34	34	7	Step 34 provides plant specific means for establishing reactor coolant pump seal return flow. See attached procedure.
35	35	7	Step 35 provides plant specific means for establishing conditions for starting a reactor coolant pump. See attached procedure.
Caution 1 prior to Step 3	Caution 1 prior to Step 3	2	The first caution prior to Step 1 provides plant specific auxiliary feedwater pump steam supply information.
10	10	2	Step 10 provides plant specific response for establishing instrument air to containment.
Caution prior to Step 14	Caution prior to Step 14	2	The caution prior to Step 14 provides plant specific logic for blocking safety injection.
18c2 RNO		2	Step 18c2 RNO has been deleted due to plant specific design.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-E-3

Title:

STEAM GENERATOR TUBE RUPTURE

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	87-009
Approved by Plant Manager-N:	1/7/87

RTSs 86-1169, 86-1357, 86-1832P

LIST OF EFFECTIVE PAGES

1.0 PURPOSE

This procedure provides actions to terminate leakage of reactor coolant into the secondary system following a steam generator tube rupture.

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 This procedure is entered from:

1. E-0, REACTOR TRIP OR SAFETY INJECTION, Step 24, when condenser air ejector radiation or S/G blowdown radiation is abnormal.

2. E-0, REACTOR TRIP OR SAFETY INJECTION, Step 30,
E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 4,
E-2, FAULTED STEAM GENERATOR ISOLATION, Step 6, and
FR-H.3, RESPONSE TO STEAM GENERATOR HIGH LEVEL, Step 7,
when secondary radiation is abnormal.

3. E-0, REACTOR TRIP OR SAFETY INJECTION, Step 29,
E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 3,
ES-1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION, Step 4,
ES-3.1, POST-SGTR COOLDOWN USING BACKFILL, Step 4,
ES-3.2, POST-SGTR COOLDOWN USING BLOWDOWN, Step 4,
ES-3.3, POST-SGTR COOLDOWN USING STEAM DUMP, Step 4,
ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 10,
ECA-3.2, SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED, Step 4, and
ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, Step 5, when a S/G narrow range level increases in an uncontrolled manner.

4. ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, Steps 2, 3, and 4 when pressurizer pressure control is restored.

5. E-1 series foldout page whenever any S/G level increases in an uncontrolled manner or any S/G has abnormal radiation.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

- *Foldout page should be open.*
- *Personnel should be available for sampling during this procedure.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Check If RCPs Should Be Stopped:	
	a. High-head SI pumps - AT LEAST ONE RUNNING	a. Go to Step 2.
	b. RCS subcooling - LESS THAN 25°F [65°F]	b. Go to Step 2.
	c. Stop all RCPs	
2	Identify Ruptured S/G(s):	Continue with Steps 5 through 12. <u>When</u> ruptured S/G(s) identified, <u>THEN</u> do Steps 3 and 4.
	• UNEXPECTED INCREASE IN ANY S/G NARROW RANGE LEVEL	
	<u>OR</u>	
	• HIGH RADIATION FROM ANY S/G SAMPLE	
	<u>OR</u>	
	• CONTACT NUCLEAR CHEMISTRY DEPARTMENT TO TAKE RADIATION READINGS ON MAIN STEAM LINES	
	<u>OR</u>	
	• |<u>HIGH</u> RADIATION FROM ANY S/G BLOWDOWN <u>LINE:</u>|	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *Steam supply to the AFW pump must be maintained from at least one S/G.*
- *In the event that S/G A is ruptured, valve 3-006 and 3-007 will require repositioning to provide steam supply to the B AFW pump.*
- *At least one S/G must be maintained available for RCS cooldown.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Isolate Flow From Ruptured S/G(s):	
	a. Adjust ruptured S/G(s) steam dump to atmosphere controller setpoint to 1060 PSIG	
	b. Close ruptured S/G(s) main steamline isolation and bypass valves	b. Close the intact S/G(s) main steam line isolation and bypass valves and use intact S/G(s) steam dump to atmosphere valves for steam dump. <u>THEN</u> close the MS to AUX STM HDR Manual Isolation Valve, 3-10-007. <u>IF</u> any ruptured S/G can <u>NOT</u> be isolated from at least one intact S/G, <u>THEN</u> go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	c. Check ruptured S/G(s) steam dump to atmosphere - CLOSED	c. <u>WHEN</u> ruptured S/G pressure less than 1060 PSIG, <u>THEN</u> verify S/G steam dump to atmosphere closed. <u>IF</u> <u>NOT</u> closed, <u>THEN</u> place steam dump to atmosphere controller in manual and close the steam dump to atmosphere valves.
	d. Reset SI if not already reset	
	e. Place S/G feedwater pump CNTRL SW to OFF	
	f. Close steam supply MOVs from ruptured S/G(s) to AFW pump	f. Dispatch an Operator to locally OPEN the steam supply MOV breaker <u>THEN</u> manually CLOSE the valve. Go to Step 3h.
	g. Dispatch an Operator to locally OPEN the steam supply MOV breaker.	
	h. Verify blowdown isolation valve(s) from ruptured S/G(s) - CLOSED	h. Locally close valve(s), or it's associated manual isolation valve.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Check Ruptured S/G(s) Level:	
	a. Narrow range level - GREATER THAN 6% [32%]	a. Maintain feed flow to ruptured S/G until level greater than 6% [32%].
	b. Control feed flow to maintain narrow range level between 6% [32%] and 50%	

CAUTION

If any PRZ PORV opens because of high PRZ pressure, Step 5b should be repeated after pressure decreases to less than the PORV setpoint.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Check PRZ PORVs And Block Valves:	
	a. Power to block valves - AVAILABLE	a. Restore power to block valves.
	b. PORVs - CLOSED	b. IF PRZ Pressure less than 2335 PSIG, THEN manually close PORVs. IF any valve can NOT be closed THEN manually close its block valve. IF block valve can NOT be closed, THEN go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	c. Block valves - AT LEAST ONE OPEN	c. Open one block valve unless it was closed to isolate an open PORV.
6	Check If S/Gs Are Not Faulted:	
	a. Check pressures in all S/Gs - • NO S/G PRESSURE DECREASING IN AN UNCONTROLLED MANNER • NO S/G COMPLETELY DEPRESSURIZED	a. Verify all faulted S/Gs isolated unless needed for RCS cooldown: • Steamlines. • Feedlines. • IF NOT, THEN go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

Makeup water sources for CST will be necessary if level decreases to less than 10%

7	Check Intact S/G Levels:	
	a. Narrow range level - GREATER THAN 6% [32%]	a. Maintain total feed flow greater than 130 gpm per S/G until narrow range level greater than 6% [32%] in at least one S/G.
	b. Control feed flow to maintain narrow range level between 6% [32%] and 50%	b. IF narrow range level in any intact S/G continues to increase in an uncontrolled manner, THEN return to Step 1.

CAUTION

If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.

8	Reset SI If Necessary	
9	Reset Containment Isolation Phase A And Phase B	
10	Verify Instrument Air To Containment	Start all Diesel powered air compressors

CAUTION

RCS pressure should be monitored. If RCS pressure decreases to less than 220 PSIG [630 PSIG], the RHR pumps must be manually restarted to supply water to the RCS.

11	Check If RHR Pumps Should Be Stopped:	
	a. RCS pressure - GREATER THAN 225 PSIG [630 PSIG]	a. Go to Step 12.
	b. Stop RHR pumps and place in standby	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Verify All 4KV Buses - ENERGIZED BY OFFSITE POWER	Try to restore offsite power. Verify adequate diesel capacity to run the following equipment, IF necessary shed non-essential loads (refer to E-0, Attachment D for component KW load rating) a. Pressurizer heaters per Attachment B b. Charging pump c. Computer Room Chiller B

CAUTION

Isolation of the ruptured S/G(s) should be complete before continuing to Step 13 unless a ruptured S/G is needed for RCS cooldown.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13	Check Ruptured S/G(s) Pressure GREATER THAN 600 PSIG	Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

High steam flow with low steam generator pressure or low TAVG SI signal should be blocked prior to cooldown. When PRZ pressure decreases to less than 2000 PSIG the low PRZ pressure SI should be blocked.

14 Initiate RCS Cooldown:

a. Determine required core exit temperature:

RUPTURED S/G PRESSURE (PSIG)	CORE EXIT TEMPERATURE (°F)
1200	520°F [483°F]
1085	511°F [464°F]
985	499°F [445°F]
885	486°F [424°F]
785	472°F [397°F]
685	456°F [363°F]
600	440°F [322°F]

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Initiate RCS Cooldown: (Cont'd)	
	b. Dump steam to condenser from intact S/G(s) at maximum rate	b. Manually dump steam at maximum rate from intact S/G(s) using the steam dump to atmosphere valves IF no intact S/G available, THEN perform the following: • Use faulted S/G. OR • Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	c. Core exit TCs - LESS THAN REQUIRED TEMPERATURE	c. Continue with Step 15. WHEN core exit TCs less than required, THEN do Step 14d.
	d. Stop RCS cooldown	
15	Establish Charging Flow:	
	a. Charging pumps - AT LEAST ONE RUNNING	a. Perform the following: 1) IF CCW flow to RCP(s) thermal barrier is lost, THEN go to Step 16. OBSERVE CAUTION PRIOR TO STEP 16. 2) Verify adequate diesel capacity to run charging pumps IF necessary shed non-essential loads (refer to E-0, Attachment D for component KW load rating) 3) Start charging pumps as necessary
	b. Align charging pump suction to RWST	
	c. Establish maximum flow: 1) OPEN CV-3-310A 2) OPEN HCV-3-121	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

RCS cooldown in Step 14 should be completed before continuing to Step 16.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	Check Ruptured S/G(s) Pressure - STABLE OR INCREASING	IF pressure continues to decrease, THEN go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT-SUBCOOLED RECOVERY DESIRED, Step 1.
17	Check RCS Subcooling Based On Core Exit TCs - GREATER THAN 30°F [45°F]	Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT-SUBCOOLED RECOVERY DESIRED, Step 1.
18	Depressurize RCS To Minimize Break Flow And Refill PRZ:	
	a. Normal PRZ spray - AVAILABLE	a. Go to Step 19. OBSERVE CAUTION PRIOR TO STEP 19.
	b. Spray PRZ with maximum available spray until BOTH of the following conditions satisfied: • RCS pressure - LESS THAN RUPTURED S/G(s) PRESSURE • PRZ level - GREATER THAN 12% [50%] OR • PZR Level - GREATER THAN 71% [50%] OR • RCS subcooling based on core exit TCs - LESS THAN 30°F [45°F]	
	c. Close spray valve(s):	
	1) Normal spray valves	1) Stop RCP(s) supplying failed spray valves.
	2) Auxiliary spray valve	
	d. Go to Step 21. OBSERVE CAUTION PRIOR TO STEP 21	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *The PRT may rupture if a PRZ PORV is used to depressurize the RCS. This may result in abnormal containment conditions.*
- *Cycling of the PRZ PORV should be minimized.*

NOTE

The upper head region may void during RCS depressurization if RCPs are not running. This will result in a rapidly increasing PRZ level.

19 Depressurize RCS Using PRZ PORV To Minimize Break Flow And Refill PRZ:

a. PRZ PORV - AT LEAST ONE AVAILABLE

RESPONSE NOT OBTAINED: a. Establish auxiliary spray and return to Step 18b. IF auxiliary spray can NOT be established, THEN go to ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, Step 1.

b. Open one PRZ PORV until BOTH of the following conditions satisfied:

- RCS pressure - LESS THAN RUPTURED S/G(s) PRESSURE
- PRZ level - GREATER THAN 12% [50%]

OR

- PRZ level - GREATER THAN 71% [50%]

OR

- RCS Subcooling based on core exit TCs - LESS THAN 30°F [45°F]

c. Close PRZ PORV

RESPONSE NOT OBTAINED: c. Close PORV block valve.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

20 Check RCS Pressure - INCREASING

Close PRZ PORV block valve.

IF pressure continues to decrease, THEN perform the following:

1) Monitor following conditions for indication of leakage from PRZ PORV.

   a) PRZ relief line temp indicator TI-3-463.

   b) PRZ relief tank temp indicator TI-3-471.

   c) PRZ relief tank pressure PI-3-472.

   d) PRZ relief tank level LI-3-470.

2) Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

CAUTION

SI MUST BE TERMINATED when termination criteria are satisfied to prevent overfilling of the ruptured S/G(s)

21 Check If SI Flow Should Be Terminated:

a. RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]

a. DO NOT STOP SI PUMPS. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1

b. Secondary heat sink:

- TOTAL FEED FLOW TO S/G(s) - GREATER THAN 130 GPM per S/G AVAILABLE

  OR

- NARROW RANGE LEVEL IN AT LEAST ONE INTACT S/G - GREATER THAN 6% [32%]

b. IF neither condition satisfied, THEN DO NOT STOP SI PUMPS. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

c. RCS pressure - STABLE OR INCREASING

c. DO NOT STOP SI PUMPS. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

d. PRZ level - GREATER THAN 12% [50%]

d. DO NOT STOP SI PUMPS. Return to Step 13.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22	Stop High-Head SI Pumps And Place In Standby	
23	Continue To Next Step	
24	Establish Charging Flow	
	a. Charging pumps - AT LEAST ONE RUNNING	a. Perform the following: 1) IF CCW flow to RCP(s) thermal barrier is lost, THEN isolate seal injection to affected RCP(s) before starting charging pumps. 2) If IF offsite power is not available, verify adequate diesel capacity to run charging pumps IF necessary shed non-essential loads. (refer to E-0, Attachment D for component KW load rating) 3) Start charging pumps as necessary.
	b. Establish flow as necessary: 1) OPEN CV-3-310A 2) OPEN HCV-3-121	
25	Verify SI Flow Not Required:	
	a. RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]	a. Manually operate SI pumps as necessary. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	b. PRZ level - GREATER THAN 12% [50%]	b. Manually operate SI pumps as necessary. IF level can NOT be maintained, THEN go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
26	Check VCT Makeup Control System:	Adjust controls as necessary.
	a. Makeup set for greater than RCS boron concentration b. Makeup set for automatic control	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
27	Check If Letdown Can Be Established:	
	a. PRZ Level - GREATER THAN 23% [50%]	a. Continue with Step 28. <u>WHEN</u> PRZ level increases to greater than 23% [50%], <u>THEN</u> do Step 27b.
	b. Establish letdown:	b. Establish excess letdown:
	1) Verify CCW flow to the non-regenerative letdown heat exchanger	1) Verify CCW flow to excess letdown heat exchanger
	2) Verify letdown orifice isolation valves closed	2) Verify HCV-3-137 CLOSED
	3) Open letdown containment isolation valve CV-3-204	3) Verify CV-3-389 at desired position. a) Normal to the VCT b) Divert to the RCDT
	4) Open letdown line isolation valve LCV-3-460	4) Open CV-3-389 excess letdown to excess letdown heat exchanger
	5) Open letdown orifice isolation valves as appropriate	5) Adjust HCV-3-137 to desired flow.
28	Check Charging Pump Suction - ALIGNED TO VCT	Align suction to VCT.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

RCS and ruptured S/G(s) pressures must be maintained less than the ruptured S/G(s) steam dump to atmosphere setpoint.

29 Control RCS Pressure And Charging Flow To Minimize RCS-To-Secondary Leakage:

a. Perform appropriate action(s) from table:

PRZ level ↓	RUPTURED S/G(s) LEVEL		
	INCREASING	DECREASING	OFFSCALE HIGH
LESS THAN 23% [50%]	• Increase RCS Charging Flow • Depressurize RCS Using Step 29b	Increase RCS Charging Flow	• Increase RCS Charging Flow • Maintain RCS And Ruptured S/G(s) Pressures Equal
BETWEEN 23% [50%] and 50%	Depressurize RCS Using Step 29b	Turn On PRZ Heaters	Maintain RCS And Ruptured S/G(s) Pressures Equal
BETWEEN 50% and 71% [50%]	• Depressurize RCS Using Step 29b • Decrease RCS Makeup Flow	Turn On PRZ Heaters	Maintain RCS And Ruptured S/G(s) Pressures Equal
GREATER THAN 71% [50%]	Decrease RCS Makeup Flow	Turn On PRZ Heaters	Maintain RCS And Ruptured S/G(s) Pressures Equal

b. Use normal PRZ spray per Step 29a

RESPONSE NOT OBTAINED: b. If letdown is in service, THEN use auxiliary spray. IF NOT, THEN use one PRZ PORV.

30 Check If Diesel Generators Should Be Stopped:

a. Verify 4KV buses - ENERGIZED BY OFFSITE POWER

RESPONSE NOT OBTAINED: a. Try to restore offsite power to 4KV buses.

b. Stop any unloaded diesel generator and place in standby

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
31	Minimize Secondary System Contamination:	
	a. Verify closed CV-3-1500 condensate dump back to DWST	a. Manually isolate valve.
32	Turn On PRZ Heaters As Necessary To Saturate PRZ Water At Ruptured S/G(s) Pressure	
33	Check RCP Cooling - NORMAL • RCP CCW SYSTEM FLOW • RCP SEAL INJECTION FLOW	Establish normal cooling to RCPs. Refer to OP-030, COMPONENT COOLING WATER SYSTEM
34	Check If RCP Seal Return Flow Should Be Established:	
	a. Verify CCW pump RUNNING **AND** CCW surge tank level NORMAL	a. Go to Step 35.
	b. Establish flow:	
	1) Verify open MOV-3-381	1) Manually open valves.
	2) Open MOV-3-6386	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *If RCP seal cooling had previously been lost, the affected RCP should not be started prior to a status evaluation.*
- *On natural circulation, RTD bypass temperatures and associated interlocks will not be accurate.*

NOTE

RCPs should be run in order of priority to provide normal PRZ spray.

35 Check RCP Status:

a. RCPs - AT LEAST ONE RUNNING

a. Try to start one RCP:

1) IF RVLMS (QSPDS) head indication less than 100%, THEN perform the following:

- Increase PRZ Level greater than 68%[90%]
- Increase RCS subcooling based on core exit TCs greater than 55°F[163°F]

2) Establish conditions for starting an RCP:

a) Verify off-site power available to the 4KV buses

b) Start the oil lift pump

c) Verify that the number 1 seal leakoff valve is OPEN and seal flow is established

d) Verify the seal injection water flow to be approximately 8 to 12 GPM (refer to Enclosure #1 of OP-041.1, REACTOR COOLANT PUMP OPERATION)

e) Verify ΔP across the thermal barrier to be 15 inches of water

f) Verify GREATER THAN 200 PSID across the number 1 seal

g) Verify that the oil lift pump has been running for two minutes and the oil pressure interlock light is ON.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
35	Check RCP Status: (Cont'd)	a. Try to start one RCP: (Cont'd) 3) Start one RCP. IF an RCP can NOT be started, THEN refer to ATTACHMENT A to verify natural circulation. IF natural circulation NOT verified, THEN increase dumping steam.
	b. Stop all but one RCP	
36	Check If Source Range Detector Should Be Energized:	
	a. Check intermediate range flux - LESS THAN 10^{-10} AMPS	a. Continue with Step 37. WHEN flux less than 10^{-10} AMPS, THEN do Steps 36b and c.
	b. Verify source range detectors - ENERGIZED	b. Manually energize source range detectors.
	c. Transfer nuclear recorders to source range scale	
37	Shut Down Unnecessary Plant Equipment Not Required To Maintain Hot Standby Conditions	
38	Go To Appropriate Post - SGTR Cooldown Method: • Go to ES-3.1, POST-SGTR COOLDOWN USING BACKFILL, Step 1 OR • Go to ES-3.2, POST - SGTR COOLDOWN USING BLOWDOWN, Step 1 OR • Go to ES-3.3, POST - SGTR COOLDOWN USING STEAM DUMP, Step 1	

END OF TEXT

ATTACHMENT A

The following conditions support or indicate natural circulation flow:

- RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]
- S/G pressures - STABLE OR DECREASING
- RCS hot leg temperatures - STABLE OR DECREASING
- Core exit TCs - STABLE OR DECREASING
- RCS cold leg temperatures - AT SATURATION TEMPERATURE FOR S/G PRESSURE

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

ATTACHMENT B

RE-ENERGIZATION OF PRESSURIZER BACKUP HEATERS

CAUTION

Loading on the EDG should not exceed the Orange mark (2000 hour rating of 2850 KW). However, loads placed on the energized 4 KV buses (the power source) may approach the Red mark (168 hour rating) on the wattmeter for short periods.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
a. 4KV Buses - ALL ENERGIZED	• IF EDG A is available, go to Step b. • IF EDG B is available, go to Step g.
b. Verify EDG A Load is LESS THAN 2300KW	b. Dispatch personnel to cabinet 3812 to OPEN all nine (9) breakers. 1. Reset heater Group A lockout relay in the penetration room. 2. Place control switch for Group A to the ON position. 3. CLOSE 3 individual heater breakers one at a time. AND Verify between each closure A diesel load DOES NOT exceed the capacity of the power source. 4. Return to procedure and Step in effect.
c. Reset lockout relay in penetration room for backup Group A	
d. Place control switch for Group A to the ON position	
e. Verify EDG A load DOES NOT exceed the capacity of the power source	
f. Return to procedure and Step in effect	
g. Place control switch for Group B backup heaters to "OFF"	
h. Place the keylock switch for breaker 0408 in the EMERGENCY position	
i. Dispatch personnel to cabinet 3B13 to OPEN all nine (9) breakers	
j. Place console control switch to the ON position	
k. CLOSE 3 individual heater breakers one at a time AND Verify between each closure B diesel load DOES NOT exceed the capacity of the power source	
l. Return to procedure and Step in effect	

FOLDOUT FOR E-3 SERIES GUIDELINES

1. SI REINITIATION CRITERIA

Manually operate SI pumps as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1, if EITHER condition listed below occurs:

- RCS SUBCOOLING BASED ON CORE EXIT TCs - LESS THAN 30°F [45°F]
- PRZ LEVEL - CANNOT BE MAINTAINED GREATER THAN 12% [50%]

2. RED PATH SUMMARY

a. SUBCRITICALITY - Nuclear power GREATER THAN 5%

b. CORE COOLING - Core exit TCs GREATER THAN 1200°F

c. HEAT SINK - Narrow range level in all S/Gs LESS THAN 32% AND total feedwater flow LESS THAN 130 GPM per S/G

d. INTEGRITY - Cold leg temperature decrease GREATER THAN 100°F in last 60 minutes AND RCS cold leg temperature LESS THAN 317°F

e. CONTAINMENT - Containment pressure GREATER THAN 59 PSIG

3. SECONDARY INTEGRITY CRITERIA

Go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1, if any S/G pressure is decreasing in an uncontrolled manner or has completely depressurized, and has not been isolated, unless needed for RCS cooldown.

4. COLD LEG RECIRCULATION SWITCHOVER CRITERIA

Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1, if RWST level decreases to LESS THAN 115,000 gallons.

5. CST MAKEUP WATER CRITERIA

Makeup water sources for the CST will be necessary if level decreases to LESS THAN 10%.

6. HYDROGEN ANALYZER START CRITERIA

Hydrogen Analyzers should be placed in service per Attachment A of E-0 within 30 minutes of a valid Safety Injection Signal.

7. ADVERSE CONTAINMENT CONDITIONS

Adverse Containment conditions are defined as either a Containment Atmosphere temperature of 180°F or Containment radiation levels equal to or greater than 1.3 x 10^5 R/hr. Under these conditions the setpoint values in brackets, [ ], are required to be used.

- If the Containment temperature subsequently falls below 180°F, the normal setpoint values may be used. If the Containment radiation level subsequently falls below 1.3 x 10^5 R/hr, the adverse Containment setpoints are required to be used until permission is granted by the Technical Support Staff to use normal setpoints.

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ES-3.1

EOP Title: Post SGTR Cooldown Using Backfill

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
9b	9b	7	Step 9b provides the plant specific procedure for placing the residual heat removal system in service. See attached procedure.
Caution prior to Step 4	Caution prior to Step 4	2	The caution prior to Step 4 provides plant specific level criteria for condensate storage tank makeup.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-ES-3.1

<u>Title:</u>

POST-SGTR COOLDOWN USING BACKFILL

<u>Safety Related Procedure</u>	
Responsible Department:	Operations
Reviewed by PNSC:	86-192
Approved by Plant Manager-N:	7/28/86

RTS 86-1092P

1.0 PURPOSE

This procedure provides actions to cool down and depressurize the plant to cold shutdown conditions following a steam generator tube rupture. This recovery method depressurizes the ruptured S/G(s) by draining it through the ruptured S/G tube into the RCS.

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 This procedure is entered from:

1. E-3, STEAM GENERATOR TUBE RUPTURE, Step 38, if plant staff selects backfill method.
2. ES-3.2, POST-SGTR COOLDOWN USING BLOWDOWN, Step 9, when blowdown is not available and plant staff selects backfill method.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

Foldout page should be open.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Turn On PRZ Heaters As Necessary To Saturate PRZ Water At Ruptured S/G(s) Pressure	
2	Check If SI Accumulators Should Be Isolated:	
	a. Check the following: • RCS SUBCOOLING BASED ON CORE EXIT TCs - GREATER THAN 30°F [45°F] • PRZ LEVEL - GREATER THAN 12% [50%]	a. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	b. Check power to isolation valves - AVAILABLE	b. Restore power to isolation valves.
	c. CLOSE all SI accumulator isolation valves	c. Vent any unisolated accumulators.
3	Verify Adequate Shutdown Margin:	
	a. Sample ruptured S/G(s)	
	b. Sample RCS	
	c. Shutdown margin - ADEQUATE	c. Borate as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

Makeup water sources for CST will be necessary if level decreases to less than 10%.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Check Intact S/G Levels:	
	a. Narrow range level - GREATER THAN 6% [32%]	a. Maintain total feed flow greater than 130 GPM per S/G until narrow range level greater than 6% [32%] in at least one S/G.
	b. Control feed flow to maintain narrow range level between 6% [32%] and 50%	b. IF narrow range level in any intact S/G continues to increase in an uncontrolled manner, THEN go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

NOTE

Ambient heat losses or small steam leaks may continue to depressurize the ruptured S/G to less than the minimum RCS pressure necessary for continued RCP operation. In this case, a cooldown to cold shutdown should be completed as quickly as possible not to exceed 100°F/hour.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Initiate RCS Cooldown To Cold Shutdown:	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Use RHR System if in service	
	c. Dump steam to condenser from intact S/G(s)	c. Manually dump steam from intact S/G(s) using steam dump to atmosphere valves. IF no intact S/G available and RHR system NOT in service, THEN perform the following: • Use faulted S/G. OR • Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	Check Ruptured S/G(s) Narrow Range Level - GREATER THAN 6% [32%]	Refill ruptured S/G to 80% [53%] using feed flow. <u>IF</u> either of the following conditions occurs, <u>THEN</u> stop feed flow to ruptured S/G: • Ruptured S/G pressure decreases in an uncontrolled manner. <u>OR</u> • Ruptured S/G pressure increases to 1035 PSIG.
7	Control RCS Makeup Flow And Letdown To Maintain PRZ Level:	
	a. PRZ level - GREATER THAN 23% [50%]	a. Increase RCS makeup flow as necessary. Go to Step 8.
	b. PRZ level - LESS THAN 71% [50%]	b. Decrease RCS makeup flow to control level and decrease RCS pressure. Go to Step 9.

NOTE

The upper head region may void during RCS depressurization if RCPs are not running. This may result in a rapidly increasing PRZ level.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Depressurize RCS To Backfill From Ruptured S/G(s):	
	a. Use normal PRZ spray	a. <u>IF</u> letdown is in service, <u>THEN</u> use auxiliary spray. <u>IF NOT</u>, <u>THEN</u> use one PRZ PORV.
	b. Turn on PRZ heaters as necessary	
	c. Maintain RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Check If RHR System Can Be Placed In Service:	
	a. Check the following: • RCS TEMPERATURE - LESS THAN 324°F [324°F] • RCS PRESSURE - LESS THAN 450 PSIG [110 PSIG]	a. Go to Step 10.
	b. Place RHR system in service using 3-OP-050, RESIDUAL HEAT REMOVAL SYSTEM	
10	Check If RCPs Must Be Stopped:	
	a. Check the following: • NUMBER 1 SEAL DIFFERENTIAL PRESSURE - LESS THAN 200 PSID • NUMBER 1 SEAL LEAKOFF FLOW - LESS THAN 0.7 GPM	a. Go to Step 11.
	b. Stop affected RCP(s)	
11	Check RCS Temperatures - LESS THAN 200°F	Return to Step 3.
12	Evaluate Long Term Plant Status:	
	a. Maintain cold shutdown conditions	
	b. Consult TSC staff	

END OF TEXT

•/GAY'dtsr

FOLDOUT FOR E-3 SERIES PROCEDURES

1. SI REINITIATION CRITERIA

Manually operate SI pumps as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1, if EITHER condition listed below occurs:

- RCS SUBCOOLING BASED ON CORE EXIT TCs - LESS THAN 30°F [45°F]
- PRZ LEVEL - CANNOT BE MAINTAINED GREATER THAN 12% [50%]

2. RED PATH SUMMARY

a. SUBCRITICALITY - Nuclear power GREATER THAN 5%

b. CORE COOLING - Core exit TCs GREATER THAN 1200°F

c. HEAT SINK - Narrow range level in all S/Gs LESS THAN 32% AND total feedwater flow LESS THAN 130 GPM per S/G.

d. INTEGRITY - Cold leg temperature decrease GREATER THAN 317°F

e. CONTAINMENT - Containment pressure GREATER THAN 59 PSIG

3. SECONDARY INTEGRITY CRITERIA

Go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1, if any S/G pressure is decreasing in an uncontrolled manner or has completely depressurized, and has not been isolated, unless needed for RCS cooldown.

4. COLD LEG RECIRCULATION SWITCHOVER CRITERIA

Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1, if RWST level decreases to LESS THAN 115,000 gallons.

5. CST MAKEUP WATER CRITERIA

Makeup water sources for the CST will be necessary if level decreases to LESS THAN 10%.

6. HYDROGEN ANALYZER START CRITERIA

Hydrogen Analyzers should be placed in service per Attachment A of E-0 within 30 minutes of a valid Safety Injection signal.

7. ADVERSE CONTAINMENT CONDITIONS

Adverse Containment conditions are defined as either a Containment Atmosphere temperature of 180°F or Containment radiation levels equal to or greater than 1.3×10^5 R/hr. Under these conditions the setpoint values in brackets, [ ], are required to be used.

If the Containment temperature subsequently falls below 180°F, the normal setpoint values may be used. If the Containment radiation level subsequently falls below 1.3×10^5 R/hr, the adverse Containment setpoints are required to be used until permission is granted by the Technical Support Staff to use normal setpoints.

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ES-3.2

EOP Title: Post SGTR Cooldown Using Blowdown

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
9	9	7	Step 9 provides plant specific means for establishing blowdown from a ruptured steam generator. See attached procedure.
13b	13b	7	Step 13b provides the plant specific procedure for placing the residual heat removal system in service. See attached procedure.
Caution prior to Step 4	Caution prior to Step 4	2	The caution prior to Step 4 provides plant specific level criteria for condensate storage tank makeup.
Note prior to Step 5	Note prior to Step 5	2	The note prior to Step 5 provides plant specific information relating to reactor coolant system cooldown.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-ES-3.2

Title:

POST-SGTR COOLDOWN USING BLOWDOWN

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	86-191
Approved by Plant Manager-N:	7/27/86

RTS 86-1092P

•/HEB/sr/dc

1.0 PURPOSE

This procedure provides actions to cool down and depressurize the plant to cold shutdown conditions following a steam generator tube rupture. This recovery method depressurizes the ruptured S/G(s) by draining it using S/G blowdown.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from E-3, STEAM GENERATOR TUBE RUPTURE, Step 38, if plant staff selects the blowdown method.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

Foldout page should be open.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Turn On PRZ Heaters As Necessary To Saturate PRZ Water At Ruptured S/G(s) Pressure	
2	Check If SI Accumulators Should Be Isolated:	
	a. Check the following: • RCS SUBCOOLING BASED ON CORE EXIT TCs - GREATER THAN 30°F [45°F] • PRZ LEVEL - GREATER THAN 12% [50%]	a. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	b. Check power to isolation valves - AVAILABLE	b. Restore power to isolation valves
	c. Close all SI accumulator isolation valves	c. Vent any unisolated accumulators.
3	Verify Adequate Shutdown Margin:	
	a. Sample ruptured S/G(s)	
	b. Sample RCS	
	c. Shutdown margin - ADEQUATE	c. Borate as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

Makeup water sources for CST will be necessary if level decreases to less than 10%.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Check Intact S/G Levels:	
	a. Narrow range level - GREATER THAN 6% [35%]	a. Maintain total feed flow greater than 130 GPM per S/G until narrow range level greater than 6% [35%] in at least one S/G.
	b. Control feed flow to maintain narrow range level between 6% [35%] and 50%	b. IF narrow range level in any intact S/G continues to increase in an uncontrolled manner, THEN go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

NOTE

Ambient heat losses or small steam leaks may continue to depressurize the ruptured S/G to less than the minimum RCS pressure necessary for continued RCP operation. In this case, a cooldown to cold shutdown should be completed as quickly as possible, not to exceed 100°F/hr.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Initiate RCS Cooldown to 324°F [324°F]	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Dump steam to condenser from intact S/G(s)	b. Manually dump steam from intact S/G(s) using steam dump valves to atmosphere IF no intact S/G available, THEN perform the following: • Use faulted S/G. OR • Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

RCS and ruptured S/G(s) must be maintained less than the ruptured S/G(s) steam dump to atmosphere valves setpoint.

6 Control RCS Pressure And Makeup Flow To Minimize RCS-To-Secondary Leakage:

a. Perform appropriate action(s) from table:

PRZ level ↓	RUPTURED S/G(s) LEVEL		
	INCREASING	DECREASING	OFFSCALE HIGH
LESS THAN 23% [50%]	• Increase RCS Charging Flow • Depressurize RCS Using Step 6b	Increase RCS Charging Flow	• Increase RCS Charging Flow • Maintain RCS And Ruptured S/G(s) Pressures Equal
BETWEEN 23% [50%] and 50%	Depressurize RCS Using Step 6b	Turn On PRZ Heaters	Maintain RCS And Ruptured S/G(s) Pressures Equal
BETWEEN 50% and 71% [50%]	• Depressurize RCS Using Step 6b • Decrease RCS Makeup Flow	Turn On PRZ Heaters	Maintain RCS And Ruptured S/G(s) Pressures Equal
GREATER THAN 71% [50%]	Decrease RCS Makeup Flow	Turn On PRZ Heaters	Maintain RCS And Ruptured S/G(s) Pressures Equal

b. Use normal PRZ spray per step 6.a

Response not obtained: b. IF letdown in service, THEN use auxiliary spray. IF NOT, THEN use one PRZ PORV.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Check If RCS Cooldown Should Be Stopped:	
	a. RCS temperatures - LESS THAN 324°F [324°F]	a. Return to Step 3.
	b. Stop RCS cooldown	
8	Check Ruptured S/G(s) Narrow Range Level - GREATER THAN 6% [32%]	Refill ruptured S/G to 80% using feed flow. IF either of the following conditions occurs, THEN stop feed flow to the ruptured S/G: • Ruptured S/G pressure decreases in an uncontrolled manner. OR • Ruptured S/G pressure increases to 1035 psig.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

Blowdown from ruptured S/G(s) may be stopped when RHR System is in service.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Establish Blowdown From Ruptured S/G(s)	Go to alternate post-SGTR cooldown guideline, ES-3.1, POST-SGTR COOLDOWN USING BACKFILL, Step 1, or ES-3.3 POST-SGTR COOLDOWN USING STEAM DUMP, Step 1.
	a. Consult TSC staff on blowdown path to be used	
	b. Jumper RE19 in order to satisfy blowdown FCV interlocks	
	c. Verify closed FCV-3-6278A, B and C	
	d. Open CV-3-6267A vent to atmosphere	
	e. Close CV-3-6267B vent to secondary system	
	f. Place the following H.S. 1425X, 1426X, and 1427X in the bypass position	
	g. verify Open CV-3-6278A, B, or C	
	<u>IF</u> blowdown activity is within release limits	
	<u>THEN</u> open LCV-3-6265B to discharge canal	
	<u>IF NOT</u>, consult TSC staff for blowdown lineup to waste holdup tank or the condenser.	
10	Control RCS Charging And Letdown To Maintain PRZ Level:	
	a. PRZ level - GREATER THAN 23% [50%]	a. Increase RCS makeup flow as necessary. Go to Step 11.
	b. PRZ level - LESS THAN 71% [50%]	b. Decrease RCS makeup flow to control level and decrease RCS pressure. Go to Step 12.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

The upper head region may void during RCS depressurization if RCPs are not running. This may result in a rapidly increasing PRZ level.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Depressurize RCS To Minimize RCS-To-Secondary Leakage:	
	a. Use normal PRZ spray	a. IF letdown is in service, THEN use auxiliary spray. IF NOT, THEN use one PRZ PORV.
	b. Turn on PRZ heaters as necessary	
	c. Maintain RCS pressure at ruptured S/G(s) pressure	
	d. Maintain RCS subcooling based on core exit TCs - GREATER THAN 30°F [45%]	
12	Check If RCPs Must Be Stopped:	
	a. Check the following: • NUMBER 1 SEAL DIFFERENTIAL PRESSURE - LESS THAN 200 PSID OR • NUMBER 1 SEAL LEAKOFF FLOW - LESS THAN 0.7 GPM	a. Go to Step 13.
	b. Stop affected RCP(s)	
13	Check If RHR System Can Be Placed In Service:	
	a. Check the following: • RCS temperature - LESS THAN 324°F [324°F] • RCS pressure - LESS THAN 450 PSIG [110 PSIG]	a. Return to Step 8.
	b. Place RHR System in service using 3-OP-050, RESIDUAL HEAT REMOVAL SYSTEM	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Continue RCS Cooldown To Cold Shutdown:	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Use RHR system	
	c. Dump steam from intact S/G(s) to condenser	c. Manually dump steam from intact S/G(s) using steam dump to atmosphere valves. IF no intact S/G available and RHR system NOT in service, THEN perform the following: • Use faulted S/G. OR • Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
15	Check RCS Temperatures - LESS THAN 200°F	Return to Step 8.
16	Evaluate Long Term Plant Status:	
	a. Maintain cold shutdown conditions	
	b. Consult TSC staff	

END OF TEXT

FOLDOUT FOR E-3 SERIES PROCEDURES

1 SI REINITIATION CRITERIA

Manually operate SI pumps as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1, if EITHER condition listed below occurs:

- RCS SUBCOOLING BASED ON CORE EXIT TCs - LESS THAN 30°F [45°F]
- PRZ LEVEL - CANNOT BE MAINTAINED GREATER THAN 12% [50%]

2. RED PATH SUMMARY

a. SUBCRITICALITY - Nuclear power GREATER THAN 5%

b. CORE COOLING - Core exit TCs GREATER THAN 1200°F

c. HEAT SINK - Narrow range level in all S/Gs LESS THAN 32% AND total feedwater flow LESS THAN 130 GPM per S/G

d. INTEGRITY - Cold leg temperature decrease GREATER THAN 317°F

e. CONTAINMENT - Containment pressure GREATER THAN 59 PSIG

3. SECONDARY INTEGRITY CRITERIA

Go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1, if any S/G pressure is decreasing in an uncontrolled manner or has completely depressurized, and has not been isolated, unless needed for RCS cooldown.

4. COLD LEG RECIRCULATION SWITCHOVER CRITERIA

Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1, if RWST level decreases to LESS THAN 115,000 gallons.

5. CST MAKEUP WATER CRITERIA

Makeup water sources for the CST will be necessary if level decreases to LESS THAN 10%.

6. HYDROGEN ANALYZER START CRITERIA

Hydrogen analyzers should be placed in service per Attachment A of E-0 within 30 minutes of a valid Safety Injection signal.

7. ADVERSE CONTAINMENT CONDITIONS

Adverse Containment conditions are defined as either a Containment Atmosphere temperature of 180°F or Containment radiation levels equal to or greater than 1.3 x 10^5 R/hr. Under these conditions the setpoint values in brackets, [ ], are required to be used.

If the Containment temperature subsequently falls below 180°F, the normal setpoint values may be used. If the Containment radiation level subsequently falls below 1.3 x 10^5 R/hr, the adverse Containment setpoints are required to be used until permission is granted by the Technical Support Staff to use normal setpoints.

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ES-3.3 (Sheet 1 of 1)

EOP Title: Post SGTR Cooldown Using Steam Dump

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
13b	13b	7	Step 13b provides the plant specific procedure for placing the RHR System in service. See attached procedure.
Caution prior to Step 4	Caution prior to Step 4	2	The caution prior to Step 4 provides plant specific level criteria for condensate storage tank makeup.
Note prior to Step 5	Note prior to Step 5	2	The note prior to Step 5 provides plant specific information relating to Reactor Coolant System cooldown.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-ES-3.3

Title:

POST-SGTR COOLDOWN USING STEAM DUMP

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	86-191
Approved by Plant Manager-N:	7/27/86

RTS 86-1092P

* GAY'sr/dc

1.0 PURPOSE

This procedure provides actions to cool down and depressurize the plant to cold shutdown conditions following a steam generator tube rupture. This recovery method depressurizes the ruptured S/G(s) by dumping steam.

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 This procedure is entered from:

2.1.1 E-3, STEAM GENERATOR TUBE RUPTURE, Step 38, if plant staff selects steam dump method.

2.1.2 ES-3.2, POST-SGTR COOLDOWN USING BLOWDOWN, Step 9, when blowdown is not available and plant staff selects steam dump method.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *Steam should not be released from any ruptured S/G if water may exist in its steamline.*
- *An offsite dose evaluation should be completed prior to using this procedure.*

NOTE

Foldout page should be open.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Turn On PRZ Heaters As Necessary To Saturate PRZ Water At Ruptured S/G(s) Pressure	
2	Check If SI Accumulators Should Be Isolated:	
	a. Check the following: • RCS SUBCOOLING BASED ON CORE EXIT TCs - GREATER THAN 30°F [45°F] • PRZ LEVEL - GREATER THAN 12% [50%]	a. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	b. Check power to isolation valves - AVAILABLE	b. Restore power to isolation valves.
	c. Close all SI accumulator isolation valves	c. Vent any unisolated accumulators.
3	Verify Adequate Shutdown Margin	
	a. Sample ruptured S/G(s)	
	b. Sample RCS	
	c. Shutdown margin - ADEQUATE	c. Borate as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

Makeup water sources for CST will be necessary if level decreases to less than 10%.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Check Intact S/G Levels:	
	a. Narrow range level - GREATER THAN 6% [32%]	a. Maintain total feed flow greater than 130 GPM per S/G until narrow range level greater than 6% [32%] in at least one S/G.
	b. Control feed flow to maintain narrow range level between 6% [32%] and 50%	b. <u>IF</u> narrow range level in any intact S/G continues to increase in an uncontrolled manner, <u>THEN</u> go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

NOTE

Ambient heat losses or small steam leaks may continue to depressurize the ruptured S/G to less than the minimum RCS pressure necessary for continued RCP operation. In this case, a cooldown to cold shutdown should be completed as quickly as possible, not to exceed 100°F/hr.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Initiate RCS Cooldown To 324°F [324°F]	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Dump steam to condenser from intact S/G(s)	b. Manually or locally dump steam from intact S/G(s) using steam dump to atmosphere valves <u>IF</u> no intact S/G available, <u>THEN</u> perform the following: • Use faulted S/G. <u>OR</u> • Go to ECA-3.1, SGTR WITH LOSS OF RECTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.

GAY/sr/dc

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

RCS and ruptured S/G(s) pressures must be maintained less than the ruptured S/G(s) steam dump to atmosphere setpoint.

6 Control RCS Pressure And Makeup Flow To Minimize RCS-To-Secondary Leakage:

a. Perform appropriate action(s) from table:

PRZ level ↓	RUPTURED S/G(s) LEVEL		
	INCREASING	DECREASING	OFFSCALE HIGH
LESS THAN 23% [50%]	• Increase RCS Charging Flow • Depressurize RCS Using Step 6b	Increase RCS Charging Flow	• Increase RCS Charging Flow • Maintain RCS And Ruptured S/G(s) Pressures Equal
BETWEEN 23% [50%] and 50%	Depressurize RCS Using Step 6b	Turn On PRZ Heaters	Maintain RCS And Ruptured S/G(s) Pressures Equal
BETWEEN 50% and 71% [50%]	• Depressurize RCS Using Step 6b • Decrease RCS Makeup Flow	Turn On PRZ Heaters	Maintain RCS And Ruptured S/G(s) Pressures Equal
GREATER THAN 71% [50%]	Decrease RCS Makeup Flow	Turn On PRZ Heaters	Maintain RCS And Ruptured S/G(s) Pressures Equal

b. Use normal PRZ spray per step 6a

Response not obtained: b. IF letdown in service, THEN use auxiliary. IF NOT, THEN use one PRZ PORV.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Check If RCS Cooldown Should Be Stopped:	
	a. RCS temperatures - LESS THAN 324°F [324°F]	a. Return to Step 3.
	b. Stop RCS cooldown	
8	Check Ruptured S/G(s) Narrow Range Level - GREATER THAN 6% [32%]	Refill ruptured S/G to 80% [53%] using feed flow. <u>IF</u> either of the following conditions occurs, <u>THEN</u> stop feed flow to the ruptured S/G: • Ruptured S/G pressure decreases in an uncontrolled manner. <u>OR</u> • Ruptured S/G pressure increases to 1035 psig.

<u>*CAUTION*</u>

Ruptured S/G(s) pressure may decrease rapidly when steam is released.

<u>*NOTE*</u>

Steam release from ruptured S/G(s) may be stopped when RHR system is in service.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Dump Steam From Ruptured S/G(s) To Condenser	Dump steam using ruptured S/G(s) steam dump to atmosphere valve.
10	Control RCS Charging And Letdown To Maintain PRZ Level:	
	a. PRZ level - GREATER THAN 23% [50%]	a. Increase RCS makeup flow as necessary. Go to Step 11.
	b. PRZ level - LESS THAN 71% [50%]	b. Decrease RCS makeup flow to control level and decrease RCS pressure. Go to Step 12.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

The upper head region may void during RCS depressurization if RCPs are not running. This may result in a rapidly increasing PRZ level.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Depressurize RCS To Minimize RCS-To-Secondary Leakage:	
	a. Use normal PRZ spray	IF letdown is in service, THEN use auxiliary spray. IF NOT, THEN use one PRZ PORV.
	b. Turn on PRZ heaters as necessary	
	c. Maintain RCS pressure at ruptured S/G(s) pressure	
	d. Maintain RCS subcooling based on core exit TCs - GREATER THAN 30°F [45%]	
12	Check If RCPs Must Be Stopped:	
	a. Check the following: • NUMBER 1 SEAL DIFFERENTIAL PRESSURE - LESS THAN 200 PSID OR • NUMBER 1 SEAL LEAKOFF FLOW - LESS THAN 0.7 GPM	a. Go to Step 13.
	b. Stop affected RCP(s)	
13	Check If RHR System Can Be Placed In Service:	
	a. Check the following: • RCS TEMPERATURE - LESS THAN 324°F [324°F] • RCS PRESSURE - LESS THAN 450 PSIG [110 PSIG]	a. Return to Step 8.
	b. Place RHR System in service using 3-OP-050, RESIDUAL HEAT REMOVAL SYSTEM	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Continue RCS Cooldown To Cold Shutdown:	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Use RHR system	
	c. Dump steam to condenser from intact S/G(s)	c. Manually dump steam from intact S/G(s) using steam dump to atmosphere valves <u>IF</u> no intact S/G available and RHR System <u>NOT</u> in service, <u>THEN</u> perform the following: • Use faulted S/G. <u>OR</u> • Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
15	Check RCS Temperatures - LESS THAN 200°F	Return to Step 8.
16	Evaluate Long Term Plant Status:	
	a. Maintain cold shutdown conditions	
	b. Consult TSC staff	

END OF TEXT

FOLDOUT FOR E-3 SERIES PROCEDURE

1. SI REINITIATION CRITERIA

Manually operate SI pumps as necessary and go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1, if EITHER condition listed below occurs:

- RCS SUBCOOLIJNG BASED ON CORE EXIT TCs - LESS THAN 30°F [45°F]
- PRZ LEVEL - CANNOT BE MAINTAINED GREATER THAN 12% [50%]

2. RED PATH SUMMARY

a. SUBCRITICALITY - Nuclear power GREATER THAN 5%

b. CORE COOLING - Core exit TCs GREATER THAN 1200°F

c. HEAT SINK - Narrow range level in all S/Gs LESS THAN 32% AND total feedwater flow LESS THAN 130 GPM per S/G.

d. INTEGRITY - Cold leg temperature decrease GREATER THAN 317°F

e. CONTAINMENT - Containment pressure GREATER THAN 59 PSIG

3. SECONDARY INTEGRITY CRITERIA

Go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1, if any S/G pressure is decreasing in an uncontrolled manner or has completely depressurized, and has not been isolated, unless needed for RCS cooldown.

4. COLD LEG RECIRCULATION SWITCHOVER CRITERIA

Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1, if RWST level decreases to LESS THAN 115,000 gallons.

5. CST MAKEUP WATER CRITERIA

Makeup water sources for the CST will be necessary if level decreases to LESS THAN 10%.

6. HYDROGEN ANALYZER START CRITERIA

Hydrogen Analyzers should be placed in service per Attachment A of E-0 within 30 minutes of a valid Safety Injection Signal.

7. ADVERSE CONTAINMENT CONDITIONS

Adverse Containment conditions are defined as either a Containment Atmosphere temperature of 180°F or Containment radiation levels equal to or greater than 1.3×10^5 R/hr. Under these conditions the setpoint values in brackets, [ ], are required to be used.

If the Containment temperature subsequently falls below 180°F, the normal setpoint values may be used. If the Containment radiation level subsequently falls below 1.3×10^5 R/hr, the adverse Containment setpoints are required to be used until permission is granted by the Technical Support Staff to use normal setpoints.

FINAL PAGE

*/GAY/sr/dc

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ECA-0.0

EOP Title: Loss of All AC Power

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
6	5	2	Step 5 provides a plant specific list of equipment placed in the pull to lock or off position prior to power restoration of the 4KV Bus. See attached procedure.
Caution 1 prior to Step 6	Caution 1 prior to Step 5	2	The first caution prior to Step 6 has been moved prior to Step 5 to ensure proper procedure sequencing prior to power restoration of the 4KV Bus. See attached procedure.
Caution 2 prior to Step 6	Caution 2 prior to Step 5	2	The second caution prior to Step 6 has been moved prior to Step 5 to ensure manual loading of equipment to the 4KV Bus can take place, if required. See attached procedure
Caution 3 prior to Step 6		2	The third caution prior to Step 6 has been deleted due to plant specific design which has a self contained Emergency Diesel Generator Cooling System. See attached procedure.
5	6	2	Step 6 provides plant specific means for restoring power to the 4KV Buses. See attached procedure.
7	7	2	Step 7 has been changed to "Continue to next step" to maintain proper procedure sequencing. See attached procedure.
9	9	2	Step 9 closes motor operated valves on the reactor coolant pump and replaces CST/Hotwell isolation due to plant specific design which does not include a hotwell supply from the CST. See attached procedure.
14	14	7	Step 14 provides plant means of checking DC Bus loads. See attached procedure.
26	26	2	Step 26 reads "Continue to next step" due to the Turkey Point design which does not require service water for diesel cooling or safe plant shutdown. See attached procedure.

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ECA-0.0

EOP Title: Loss of All AC Power

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
	Attachment A	7	Attachment A provides plant specific means for manually starting a diesel generator. See attached procedure.
	Attachment B	7	Attachment B provides plant specific means for energizing a 4KV Bus utilizing Unit 4 startup transformer. See attached procedure.
	Attachment C	7	Attachment C provides plant specific means for energizing the 4KV Bus utilizing the cranking diesels. See attached procedure.
	Attachment D	7	Attachment D provides plant specific means for shedding non-essential 125V DC loads.
	2	2	Step 2 provides plant specific means for verifying turbine trip.
	Caution prior to Step 4	2	The caution prior to Step 4 provides plant specific auxiliary feedwater pump flow requirements when in natural circulation.
	4c RNO	7	Step 4c RNO provides plant specific means for restoring power to the standby steam generator feedwater pump for supplying feedwater to the steam generator.
8	8	2	Step 8 provides plant specific reactor coolant pump valves closed locally.
11	11	2	Step 11 provides plant specific steps for isolating faulted steam generators.
12	12	2	Step 12 provides plant specific steps for isolating faulted steam generators.
	Caution prior to Step 13	2	The caution prior to Step 13 provides plant specific means to ensure a steam supply to Auxiliary Feedwater Pump B.
13b RNO	13b RNO	2	Step 13b RNO provides plant specific means for isolating ruptured steam generators.
15 RNO		2	Step 15 RNO has been deleted due to plant specific design which does not include an alternate auxiliary feedwater supply.
16b and e RNO		2	Step 16b and e RNO have been deleted due to plant specific design.

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ECA-0.0

EOP Title: Loss of All AC Power

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
20	20b and c	2	Step 20b and c provide plant specific means of verifying containment ventilation isolation.
23a RNO	23a RNO	7	Step 23a RNO provides plant specific means to control auxiliary boration and spent fuel cooling.
24a RNO		2	Step 24a RNO has been deleted due to plant specific design.
Caution prior to Step 25	Caution prior to Step 25	2	The caution prior to Step 25 provides plant specific emergency diesel generator load criteria.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-ECA-0.0

Title:

LOSS OF ALL AC POWER

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	87-103
Approved by Plant Manager-N:	4/16/87

RTSs 86-1092P, 86-1198, 86-1832P, 87-0742

*/HEB/eckb

LIST OF EFFECTIVE PAGES

Page	Revision Date
1	04/16/87
2	04/16/87
3	01/07/87
4	01/07/87
5	01/07/87
6	01/07/87
7	01/07/87
8	01/07/87
9	01/07/87
10	01/07/87
11	01/07/87
12	01/07/87
13	01/07/87
14	01/07/87
15	01/07/87
16	01/07/87
17	01/07/87
18	01/07/87
19	01/07/87
20	04/16/87
21	01/07/87

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1.0 PURPOSE

This procedure provides actions to respond to a loss of all ac power.

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 The symptom of a loss of all ac power is the indication that all 4KV buses are deenergized.

2.2 This procedure is entered from E-O, REACTOR TRIP OR SAFETY INJECTION, Step 3, on the indication that all 4KV buses are deenergized.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

- *Steps 1 through 4 are IMMEDIATE ACTION steps.*
- *CSF Status Trees should be monitored for information only. FRPs should not be implemented.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Verify Reactor Trip:	Manually trip reactor.
	• Rod bottom lights - ON	
	• Reactor trip and bypass breakers - OPEN	
	• Rod position indicators - AT ZERO	
	• Neutron flux - DECREASING	
2	Verify Turbine Trip:	
	a. All turbine stop valves - CLOSED	a. Manually trip turbine.
	b. Generator Breaker - OPEN (Normally 30 second delay)	a. Manually trip turbine.

NOTE

If trip occurred while timing in the reheater, manual isolation of the timing valves is required.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	c. CLOSE - Reheat steam supply MOVs	c. Manually isolate.
3	Check if RCS is Isolated:	
	a. PRZ PORVs - CLOSED	a. <u>IF</u> PRZ pressure less than 2335 psig, <u>THEN</u> manually close PORVs.
	b. Letdown isolation valves - CLOSED	b. Manually close valves.
	c. Excess letdown isolation valves - CLOSED	c. Manually close valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

In the event that both Units require AFW under Natural Circulation conditions and Train 1 of AFW is inoperable, within 3 minutes the AFW flow controllers should be placed in manual and adjusted to 300 GPM per Unit rather than the 130 GPM per S/G value given in Step 4.

4 Verify AFW Flow - GREATER THAN 130 GPM per S/G

Perform the following

a. Verify AFW pump running IF NOT THEN manually open steam supply valves

b. Verify proper alignment of AFW valves, IF NOT, THEN manually align valves as necessary.

c. If AFW cannot be established, THEN refer to Attachment C to restore power to Bus 3C in order to repower standby SGFP while continuing with Step 5.

CAUTION

- *When power is restored to any 4KV bus, recovery actions should continue starting with Step 23.*
- *IF an SI signal exists or IF an SI signal is actuated during this procedure, it should be reset to permit manual loading of equipment on the 4KV bus.*

5 Place Following Equipment Switches in PULL-TO-LOCK or OFF Position:

a. High-head SI pumps

b. RHR pumps

c. Containment spray pumps

d. CCW pumps

e. Emergency containment filter and cooler fans

f. Intake cooling water pumps

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	Try to Restore Power to the 4KV Buses	
	a. Start diesel generator	a. Emergency start diesel generators by performing steps of Attachment A.
	b. Energize the 4KV buses by manually closing the A(B) D/G output breaker	b. Go to Attachment B, energizing the 3A 4KV Bus Utilizing the Unit 4 Startup Transformer.
	c. Verify 4KV Buses - AT LEAST ONE ENERGIZED	c. Go to Step 8
	d. Go to Step 23	
7	Continue to Next Step	
8	Dispatch Personnel To Locally Close The Following Isolation Valves:	
	a. 3-297A RCP-A Seal Injection Manual Isolation Valve b. 3-297B RCP-B Seal Injection Manual Isolation Valve c. 3-297C RCP-C Seal Injection Manual Isolation Valve d. MOV-3-381 RCP seal return isolation valve e. FCV-3-626 RCP thermal barrier CCW return isolation valve	
9	Place The Following MOV Switches In The CLOSED Position:	
	a. MOV-3-381 RCP seal return isolation valve	
	b. FCV-3-626 RCP thermal barrier CCW return isolation valve	
10	Check S/G Status:	Manually close valves. <u>IF</u> valves can <u>NOT</u> be manually closed, <u>THEN</u> locally close valves.
	a. Main steamline isolation and bypass valves -CLOSED	
	b. Main FW control and bypass valves - CLOSED	
	c. S/G Blowdown isolation valves - CLOSED	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

A faulted or ruptured S/G that is isolated should remain isolated. Steam supply to the AFW pump must be maintained from at least one S/G.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Check If S/Gs Are Not Faulted:	
	a. Check pressures in all S/Gs - • NO S/G PRESSURE DECREASING IN AN UNCONTROLLED MANNER • NO S/G COMPLETELY DEPRESSURIZED	a. Isolate faulted S/G(s): • Isolate AFW flow. • Reset SI <u>IF</u> necessary • Place S/G feedwater pump cntrl sw to off. • Close steam supply valve from faulted S/G to AFW pump. • Verify S/G steam dump to atmosphere. closed. <u>IF</u> <u>NOT</u>, <u>THEN</u> manually close.
12	Check If S/G Tubes Are Not Ruptured: • Condenser air ejector radiation- NORMAL • S/G blowdown radiation - NORMAL	Try to identify ruptured S/G(s). Continue with Step 13. <u>WHEN</u> ruptured S/G(s) identified, <u>THEN</u> isolate ruptured S/G(s): • Reset SI is necessary • Place S/G feedwater pump cntrl sw to OFF • Isolate AFW flow, to the affected S/G. • Close steam supply valve from ruptured S/G to AFW pump. • <u>WHEN</u> S/G pressure less than 1060 PSIG, <u>THEN</u> verify S/G steam dump to atmosphere closed <u>IF</u> <u>NOT</u>, <u>THEN</u> manually close.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

In the event that S/G A is ruptured valve 3-006 and 3-007 will require repositioning to provide steam supply to the B AFW pump.

13 Check Intact S/G Levels:

a. Narrow range level - GREATER THAN 6% [32%]

   RNO: a. Maintain maximum AFW flow until narrow range level greater than 6% [32%]

b. Control AFW flow to maintain narrow range level between 6% [32%] and 50%

   RNO: b. IF narrow range level in any S/G continues to increase in an uncontrolled manner, THEN isolate ruptured S/G:

   - Reset SI if necessary
   - Place S/G feedwater pump cntrl sw to OFF
   - Isolate AFW flow.
   - Close steam supply valve from ruptured S/G to AFW pump.
   - WHEN S/G pressure less than 1035 PSIG, THEN verify S/G steam dump to atmosphere valves closed. IF NOT, THEN manually close.

14 Check DC Bus Loads:

a. Shed all large non-essential DC loads:

   1) Perform steps of Attachment D while continuing with procedure

b. Dispatch personnel to locally monitor DC power supply.

15 Check CST Level - GREATER THAN 10%

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

S/G pressures should not be decreased to less than 215 PSIG to prevent injection of accumulator nitrogen into the RCS.

NOTE

- *The S/Gs should be depressurized at maximum rate to minimize RCS inventory loss.*
- *PRZ level may be lost and reactor vessel upper head voiding may occur due to depressurization of S/Gs. Depressurization should not be stopped to prevent these occurrences.*

16. Depressurize Intact S/Gs To 315 PSIG:

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
a. Check S/G narrow range levels - GREATER THAN 6% [32%] in at least one S/G	a. Perform the following: 1) Maintain maximum AFW flow until narrow range level greater than 6% [32%] in at least one S/G. 2) Continue with step 17. <u>WHEN</u> narrow range level greater than 6% [32%] in at least one S/G, <u>THEN</u> do Steps 16b, c,d and e.
b. Manually dump steam at maximum rate using S/G steam dump to atmosphere valves	
c. Check RCS cold leg temperatures - GREATER THAN 346°F [347°F]	c. Perform the following: 1) Control S/G steam dump to atmosphere valves to stop S/G depressurization. 2) Continue with Step 17.
d. Check S/G pressures -LESS THAN 315 PSIG	d. Continue with Step 17. <u>WHEN</u> S/G pressures decreased to less than 315 PSIG, <u>THEN</u> do Step 16e.
e. Manually control S/G steam dump to atmosphere to maintain S/G pressures at 315 PSIG	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	Check Reactor Subcritical: • INTERMEDIATE RANGE CHANNELS - ZERO OR NEGATIVE STARTUP RATE • SOURCE RANGE CHANNELS - ZERO OR NEGATIVE STARTUP RATE	Control S/G Steam Dump to Atmosphere valves to stop S/G depressurization and allow RCS to heat up.

NOTE

Depressurization of S/Gs will result in SI actuation. SI should be reset to permit manual loading of equipment on 4KV bus.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Check SI Signal Status:	
	a. SI - HAS BEEN ACTUATED	a. Go to Step 22. WHEN SI actuated, THEN do Steps 18b, 19, 20 and 21.
	b. Reset SI if necessary	
19	Verify Containment Isolation Phase A:	
	a. Phase A - ACTUATED	a. Manually actuate Phase A.
	b. Phase A valves - CLOSED	b. Manually close valves. IF valves can NOT be manually closed, THEN locally close valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20	Verify Containment Ventilation Isolation:	
	a. Containment purge and supply fans OFF	a. Place control switch in OFF position.
	b Purge valves - CLOSED	b. Manually close purge valves. IF purge valves can NOT be manually closed, THEN locally close purge valves.
	c. Instrument air bleed valves - CLOSED	c. Manually close valves.
21	Check Containment Pressure - HAS REMAINED LESS THAN 20 PSIG	Perform the following:
		a. Verify containment spray signal actuated. IF NOT, THEN manually actuate.
		b. Verify containment isolation Phase B valves closed. IF NOT, THEN manually close valves. IF valves can not be manually closed, THEN locally close valves.
		c. Reset containment spray signal.
22	Check Containment Radiation -LESS THAN CONTAINMENT Ventilation Isolation Setpoint.	Manually close containment isolation valves as necessary. IF valves can NOT be manually closed, THEN locally close valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23	Check If 4KV Bus Power Is Restored:	
	a. Check 4KV buses - AT LEAST ONE ENERGIZED	a. Continue to control RCS conditions and monitor plant status: 1) Check status of local actions: • 4 KV Bus power restoration • RCP seal isolation • DC power supply 2) Check status of auxiliary boration systems: IF • BAST temperature is less than 155°F THEN consult TSC staff for possible boric acid concentration reduction or drainage of the BASTs 3) Check status of spent fuel cooling: • Spent fuel pit low level alarm cleared (H1/1) IF low level alarm is ON THEN dispatch personnel to initiate makeup to the spent fuel pit: Per ONOP-033.1, SPENT FUEL PIT EMERGENCY COOLING 4) Return to Step 15.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24	Stabilize S/G Pressures:	
	a. Manually control S/G steam dump to atmosphere Valves.	

CAUTION

Loading on the EDG should not exceed the Orange mark (2000 hour rating of 2850 KW). However, loads placed on the energized 4 KV buses (the power source) may approach the Red mark (168 hour rating) on the wattmeter for short periods.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25	Verify Following Equipment Loaded On 4KV Bus	Manually load equipment as necessary.
	a. 480 Volt Load Centers - ENERGIZED	a. Manually close load control center breakers as necessary.
	b. <u>IF</u> A and B 4KV buses ENERGIZED <u>THEN</u> verify proper battery charger and inverter operation.	
26	Continue to Next Step	
27	Select Recovery Guideline:	
	a. Check RCS subcooling based on core exit TCs - GREATER THAN 30°F [45%]	a. Go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.
	b. Check PRZ level - GREATER THAN 12% [50%]	b. Go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.
	c. Check if SI HAS BEEN ACTUATED	c. Go to ECA-0.1, LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED, Step 1.
	d. <u>IF</u> SI actuated, <u>THEN</u> go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.	

END OF TEXT

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

ATTACHMENT A

MANUAL START OF DIESEL GENERATOR

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	Verify All Breakers On The Affected 4KV 3A(3B) Buses Are In The OPEN Position	1 Manually trip breakers
2.	Place the LOCAL/NORMAL selector switch to OFF.	
3.	Verify That The Following Conditions Exist At The local Diesel Generator A (B) Alarm Panel	3. Take required action.
	a. Low fuel light is OFF	a. Gravity feed fuel using local pushbutton.
	b. Low air light OFF	b. Valve in isolated air tank.
	c. Power light is OFF	c. Refer to DG breaker alignment as per 0-OP-023, EMERGENCY DIESEL GENERATOR
	d. Verify overspeed trip light OFF	d. Reset overspeed trip relay.
	e. Verify hot engine light - OFF	e. Position key switch to BYPASS
	f. Verify crank case pressure light OFF	f. Position key switch to BYPASS
	g. Verify low water light OFF	g. Position key switch to BYPASS
	h. Verify oil pressure light OFF	h. Position key switch to BYPASS
	i. Verify oil TEMP light OFF	i. Position key switch to BYPASS
	j. Verify start failure light OFF	j. Push the ALARM RESET and STOP pushbutton.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

ATTACHMENT A (Cont'd)

MANUAL START OF DIESEL GENERATORS

3. Cont'd.

k. Verify the following D/G relay status:

1) D/G lockout relay - No Trip Target
2) Voltage Relay Flag - No Flag
3) Reverse Power flag - No Flag
4) Overcurrent Phase A - No Flag
5) Overcurrent Phase B - No Flag
6) Overcurrent Phase C - No Flag
7) Differential Phase A - No Flag
8) Differential Phase B - No Flag
9) Differential Phase C - No Flag

RESPONSE NOT OBTAINED: IF D/G lockout relay target is present and any of the 8 relays flags are present THEN go to the other Diesel A(B) and Step 2 of Attachment A IF relay flags exist on both diesel generators, Go to Attachment B, ENERGIZING 3A 4KV BUS USING THE UNIT 4 STARTUP TRANSFORMER.

4. Verify The Diesel Generator Lockout Relay Is Reset

RESPONSE NOT OBTAINED: 4. Push the Alarm Reset and Stop pushbutton and Reset the D/G lockout relay.

5. Verify The Diesel Generator Trouble Key Switch Is In The BYPASS Position.

RESPONSE NOT OBTAINED: 5. Place the Key Switch in the BYPASS position.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

ATTACHMENT A (Cont'd)

MANUAL START OF DIESEL GENERATORS

CAUTION

Depressing the "Alarm Reset and Stop" Pushbutton while diesel is in operation will stop the diesel.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6.	Push The "Alarm Reset And Stop" Pushbutton On The Diesel Panel	

NOTE

IF the emergency start signal still exists, the EDG should start on actions of Step 7.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7.	Place the LOCAL/NORMAL selector switch to normal and verify diesel starts.	7. Notify Control Room that EDG is ready for remote start attempt and operation.
8.	Verify With Control Room That Remote Diesel Operation Is Satisfactory	8 Go to Step 10.
9.	Go To Step 6b Of ECA-0.0, LOSS OF ALL AC POWER	
10.	IF Instructed To Operate Diesel Locally THEN Go To Step 11	
11.	Place The LOCAL/NORMAL Switch To Local	
12.	Push The D/G Start Button And Verify The DG Starts	12 Go to other D/G (A) (B) and perform steps of Attachment A steps 1 through 12, IF other D/G (A) (B) will not start THEN go to Attachment B.
13.	Verify Diesel Generator Reaches 900 RPM	13 Adjust Diesel RPM to 900.
14.	Verify Diesel Generator Frequency Is At 60 HZ	14 Adjust Diesel frequency to 60 HZ.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

ATTACHMENT A (Cont'd)

MANUAL START OF DIESEL GENERATORS

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15.	Verify Diesel Generator Voltage And Frequency With Control Room RCO	
16.	Place Synchronizing Key Into Switch And Turn To "ON"	
17.	Close Diesel Generator Output Breaker To 4KV (3A) (3B) Bus	17 Go to other Diesel (A), (B) and perform steps of Attachment A steps 1 through 16. <u>IF</u> other diesel breaker will not close to 4KV bus. <u>THEN</u> Go to Attachment <u>B</u>.
18.	Verify Droop On Diesel Generator Is At Zero	18 Adjust Droop to zero
19.	Go To Step 6c Of ECA-0.0 LOSS OF ALL AC POWER	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

ATTACHMENT B

ENERGIZING THE 3A 4KV BUS UTILIZING THE UNIT 4 SU TRANSFORMER

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	Verify That All Breakers On The 3A 4KV Bus Are In The OPEN Position	1. Manually open all breakers
2.	Verify Potential On The Unit 4 Start Up Transformer (white light above frequency recorder)	2. Go to Attachment C, Energizing the 3A 4KV bus utilizing the unit 1 and 2 cranking diesels.
3.	Verify That 3A 4KV Bus Lockout Has Not Occurred	3. Reset lockout relay.
4.	Unlock feeder Breaker 3AA22, Unit 4 Start Up Transformer To The 3A 4KV Bus	4. Go to Attachment C
5.	Rack In Breaker 3AA22, Unit 4 Start Up Transformer To The 3A 4KV Bus	5. Go to Attachment C
6.	Close Breaker 3AA22, Unit 4 Start Up Transformer To The 3A 4KV Bus	6. Go to Attachment C
7.	Verify 4160V On 3A 4KV Bus	7. Go to Attachment C
8.	Go To ECA-0.0, LOSS OF ALL AC POWER Step 23	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

ATTACHMENT C

ENERGIZING THE 4KV BUS UTILIZING THE UNIT 1 AND 2 CRANKING DIESELS

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1.	Unlock And Rack In The Following Breakers a 1W134-Cranking diesel tie to 4KV bus b 3AC03-C bus tie to cranking diesels c 4AC03-Unit 4 C bus tie to cranking diesels d 3AC13-3C bus supply breaker to 3A and 3B 4KV bus	
2.	Verify All Breakers On The 3C 4KV Bus In The OPEN Position	2. Manually open breakers.
3.	Request Unit 1 And 2 Watch Engineer To Start Any Two Cranking Diesels	
4.	CLOSE Breaker 1W134, Cranking Diesel Tie To 4KV C Bus	4. Manually close breaker.
5.	CLOSE Breaker 3AC03, C Bus Tie To Cranking Diesels	5. Go to ECA-0.0, LOSS OF ALL AC POWER, Step 8.
6.	Verify 4160V On Bus 3C	6. Go to ECA-0.0, LOSS OF ALL AC POWER, Step 8.
7.	Verify All Breakers On The 3A 4KV Bus In The OPEN Position	7. Manually open all breakers.
8.	Verify That 3A 4KV Bus Lockout Has Not Occurred	8. Reset lockout relay.

STEP	ACTION EXPECTED RESPONSE	RESPONSE NOT OBTAINED

ATTACHMENT C (Cont'd)

ENERGIZING THE 4160V 4KV BUS UTILIZING THE UNIT 1 AND 2 CRANKING DIESELS

CAUTION

The load on the tie line from the Cranking Diesels is limited to 5000 KW. Maintaining equal to or less than 630 AMPS total on the Cranking Diesel Ammeter is required.

STEP	ACTION EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9.	CLOSE Bus Tie Breaker 3AC13, 3C Bus Supply Breaker To 3A And 3B 4KV Bus	9. Manually close breaker.
10.	Rack In And Close Bus Tie Breaker 3AA09, 3C Bus Supply Breaker To 3A 4KV Bus	10. Manually close breaker.
11.	Verify 4160V On 3A 4KV Bus	11. IF 4160V cannot be verified on the 3A 4KV bus, energize the 3B 4KV bus by closing Breaker 3AB22. IF 3B 4KV bus cannot be energized THEN go to ECA-0.0, LOSS OF ALL AC POWER Step 8.
12.	Go to ECA-0.0, LOSS OF ALL AC POWER, Step 23	

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

ATTACHMENT D

125V DC BUS SHEDDING

1 Dispatch Operator to 125V DC Bus 3A (3DO1) and place the following Breakers in the OFF position.

- a. 3D01-2 GEN 3 Excitation SWGR
- b. 3D01-10 Gas Stripper Panel 3C30
- c. 3D01-11 Main Transformer 3(3X01)
- d. 3D01-12 Radwaste Building DISTR Panel DP-65
- e. 3D01-13 Unit AUX Transformer (3X02)
- f. 3D01-17 Water Treatment Panel C22
- g. 3D01-30 CRD MG set 3A Flashing and Breaker Control
- h. 3D01-34 CRD MG set 3A Flashing and Breaker Control
- i. 3D01-38 Rx Trip SWGR Rx Trip BKR A and Bypass BKR B (3C35)
- j. 3D01-40 Rx Protection Relay Racks 3QR32, 3QR33, 3QR34, 3QR35 and 3QR36.
- k. 3D01-49 Supply to Rod Position Inverter 3Y03

2 When visual Inspection reveals that the turbine is not rotating place the Emergency Bearing Oil Pump control switch in the PULL-TO-LOCK position.

3 Dispatch operator to 125V DC Bus 3D31 and place the following breakers in the OFF position.

- a. 3D31-26 Air Side Seal Oil Backup Pump
- b. 3D31-27 Emergency Bearing Oil Pump

4 Dispatch operator to begin a CO_2 purge of the main generator.

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ECA-0.1 (Sheet 1 of 2)

EOP Title: Loss of All AC Power Recovery Without SI Required

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
	Caution 2 prior to Step 1	7	The second caution prior to Step 1 provides plant specific direction for performing Attachment C of ES-0.1. See attached procedure.
3	3	7	Step 3 provides plant specific equipment manually loaded to the 4KV Bus. See attached procedure.
4	4	7	Step 4 provides plant specific means for establishing Charging Flow. See attached procedure.
Caution 2 prior to Step 7			Caution 2 prior to Step 7 has been deleted due to plant specific design which does not include Motor Driven Auxiliary Feedwater Pumps. See attached procedure.
Note prior to Step 7			The note prior to Step 7 has been deleted due to plant specific design which does not include Motor Driven Auxiliary Feedwater Pumps. See attached procedure.
10	10	7	Step 10 provides plant specific means of establishing Reactor Coolant Pump Seal Cooling. See attached procedure.
11	11	7	Step 11 provides plant specific means for establishing Reactor Coolant Pump Seal Return Flow. See attached procedure.
12	12	7	Step 12 provides plant specific means for establishing Letdown. See attached procedure.
20	20	7	Step 20 provides plant specific means for Offsite Power Restoration. See attached procedure.
21	21	7	Step 21 provides plant specific means for determining if Natural Circulation Cooldown is required. See attached procedure.
Caution 1 prior to Step 1	Caution 1 prior to Step 1	7	The first caution prior to Step 1 provides plant specific Emergency Diesel Generator Loading Criteria. See attached procedure.

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ECA-0.1

EOP Title: Loss of All AC Power Recovery Without SI Required

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
1	1a RNO	7	Step 1a RNO provides plant specific means for Checking Charging Pump status.
2b RNO		2	Step 2b RNO has been deleted and is verified available in Step 3c. Instrument Air is not isolated during Phase A actuation.
Caution 1 prior to Step 7	Caution prior to Step 7	7	The caution prior to Step 7 provides plant specific level criteria for making up to the Condensate Storage Tank.
7a RNO	7a RNO	2	Step 7a RNO "Start MD AFW Pumps as Necessary" has been deleted due to Turkey Points lack of Motor Driven Auxiliary Feedwater Pumps.
8c	8c	2	Step 8c has been deleted due to Turkey Points lack of a Local/Remote control capability on the Steam Dump to Atmosphere Valves.
9	9	7	Step 9 provides plant specific equipment aligned in the automatic position to restore standby status. "Check BAT Temperature - Greater than ( )°F" and the response not obtained for this step have been deleted due to plant specific design.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-ECA-0.1

Title:

LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	86-192
Approved by Plant Manager-N:	7/28/86

RTS 86-1092P

GY/sr/ec

1.0 PURPOSE

This procedure provides actions to use normal operational systems to stabilize plant conditions following restoration of 4 KV power.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from ECA-0.0, LOSS OF ALL AC POWER, Step 27, when 4 KV power is restored and SI is not required.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *Loading on the EDG should not exceed the Orange mark (2000 hour rating of 2850 KW). However, loads placed on the energized 4 KV buses (the power source) may approach the Red mark (168 hour rating) on the wattmeter for short periods.*
- *In the event a loss of offsite power has occurred concurrent with a SI on Unit 4 and only one 4 KV bus is energized by the EDG, perform steps of Attachment C of ES-0.1. Performance of Attachment C supercedes steps of this procedure that could potentially overload the EDG.*

NOTE

CSF status trees should be monitored for information only. FRPs should not be implemented prior to completion of Step 9.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Check RCP Seal Isolation Status:	
	a. RCP seal injection isolation valves outside containment - CLOSED	a. IF valves open or position not known, THEN check charging pump status: 1) IF pump running, THEN go to Step 2. 2) IF pump NOT running, THEN manually close the following RCP seal injection isolation valves before starting charging pump: a) 3-297A b) 3-297B c) 3-297C
	b. RCP thermal barrier CCW return isolation valve FCV-3-626 outside containment - CLOSED	b. IF valve open or position not known, THEN check CCW pump status: 1) IF pump running, THEN go to Step 2. 2) IF pump NOT running, THEN manually close valve.
2	Check Containment Isolation Phase A - NOT ACTUATED	Perform the following: a. Reset containment isolation Phase A and Phase B.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Manually Load The Following Equipment On The 4 KV Bus:	
	a. One ICW pump	
	b. One CCW pump	
	THEN	
	c. Check instrument air - AVAILABLE	c. Start all available diesel powered air compressors
	d. Verify VCT makeup controls set for auto.	
	e. OPEN CV-3-310A	
	f. OPEN HCV-3-121	
	g. If offsite power is not available, verify adequate diesel capacity (refer to E-0, Attachment D), THEN place the following equipment in service:	
	1) Start one charging pump	
	2) Energize PRZ backup heater groups as necessary per Attachment A	
	3) Start 2 normal containment fan coolers	
	4) Computer Room Chiller B	
	5) Start 1 control rod drive cooler	
4	Establish 21 GPM Charging Flow:	
	a. Adjust charging pump speed to desired flow	
5	Verify SI Flow Not Required:	
	a. RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]	a. Go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.
	b. PRZ level - GREATER THAN 12% [50%]	b. Control charging flow to maintain PRZ level. IF PRZ level can NOT be maintained, THEN go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.
6	Check PRZ Level - GREATER THAN 23% [50%]	Control charging flow as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

Makeup water sources for CST will be necessary if level decreases to less than 10%.

7	Check Intact S/G Levels	
	a. Narrow range level - GREATER THAN 6% [32%]	a. Maintain AFW flow greater than 130 GPM per S/G until narrow range level greater than 6% [32%] in at least one S/G. <u>IF</u> AFW flow <u>NOT</u> greater than 130 GPM per S/G, <u>THEN</u>: • Establish required AFW valve alignment <u>AND</u> verify operability.
	b. Control AFW flow to maintain narrow range level between 6% [32%] and 50%	
8	Establish S/G Pressure Control:	
	a. Set each S/G steam dump valve to atmosphere controller to maintain existing S/G pressure	
	b. Place each S/G steam dump valve to atmosphere controller in automatic mode	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

9 Place Following Control Switches in Automatic:

- HIGH-HEAD SI PUMP
- RHR PUMP
- CONTAINMENT SPRAY PUMP
- EMERGENCY CONTAINMENT COOLER FANS
- EMERGENCY CONTAINMENT FILTER FANS

CAUTION

- *RCP thermal barrier cooling should be established slowly to minimize potential introduction of steam into the CCW system.*
- *RCP seal injection should be established slowly to minimize RCP thermal stresses and potential seal failures.*
- *As part of subsequent recovery actions, RCPs should not be started prior to a status evaluation.*

NOTE

FRPs may now be implemented as necessary.

10 Establish RCP Seal Cooling:

a. Establish CCW flow to RCP thermal barriers:

1) Dispatch personnel to manually open FCV-3-626 - SLOWLY

b. Establish seal injection flow to RCPs:

1) Open valves 297A, B, C until 2 GPM is indicated on FI-124, 127, 130.

2) Over a one hour period, return number one seal leakoff temperature to normal and seal injection flow to each RCP to approximately 8 GPM.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Check If RCP Seal Return Flow Should Be Established:	
	a. Verify CCW pump RUNNING AND CCW surge tank level NORMAL	a. Go to Step 12.
	b. Establish flow: 1) Verify OPEN MOV-3-381 2) OPEN MOV-3-6386	b. Locally open valves.
12	Establish Letdown:	Establish excess letdown:
	a. Verify CCW flow to the non-regenerative letdown heat exchanger	1) Verify OPEN FC-3-739, excess letdown heat exchanger CCW outlet valve
	b. Verify letdown orifice isolation valves - CLOSED	2) Verify HCV-3-137, excess letdown heat exchanger outlet valve - CLOSED
	c. Open letdown containment isolation valve CV-3-204	3) Verify CV-3-389 excess letdown heat exchanger divert valve is at the desired position: a) DIVERT to RCDT b) NORMAL to VCT
	d. Open letdown line isolation valve LCV-3-460	4) OPEN CV-3-387, excess letdown heat exchanger inlet valve
	e. Open letdown orifice isolation valve as appropriate	5) OPEN HCV-3-137, excess letdown heat exchanger outlet valve
		6) Verify delta T across the excess letdown heat exchanger
13	Control Charging And Letdown Flow To Maintain PRZ Level Between 23% [50%] And 50%	
14	Establish PRZ Pressure Control:	
	a. Check letdown - IN SERVICE	a Use PRZ heaters and one PRZ PORV to maintain RCS pressure. Go to Step 15.
	b. Use PRZ heaters and auxiliary spray to maintain RCS pressure	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

On natural circulation, RTD bypass temperatures and associated interlocks will be inaccurate.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	Verify Natural Circulation:	Increase dumping steam from intact S/Gs.
	• RCS SUBCOOLING BASED ON CORE EXIT TCs - GREATER THAN 30°F [45°F]	
	• S/G PRESSURES - STABLE OR DECREASING	
	• RCS HOT LEG TEMPERATURES - STABLE OR DECREASING	
	• CORE EXIT TCs - STABLE OR DECREASING	
	• RCS COLD LEG TEMPERATURES - AT SATURATION TEMPERATURE FOR S/G PRESSURE	
16	Check If Source Range Detectors Should Be Energized:	
	a. Check intermediate range flux - LESS THAN 10^{-10} AMPS	a. Continue with Step 17. <u>WHEN</u> flux less than 10^{-10} <u>THEN</u> do Steps 16b and c.
	b. Verify source range detectors - ENERGIZED	b. Manually energize source range detectors.
	c. Transfer nuclear recorders to source range scale	
17	Verify Adequate Shutdown Margin:	
	a. Sample RCS	
	b. Shutdown margin - ADEQUATE	b. Borate as necessary.
18	Maintain Plant Conditions - STABLE	
	• RCS PRESSURE	
	• PRZ LEVEL	
	• RCS TEMPERATURES	
	• INTACT S/G LEVELS	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	Verify SI Flow Not Required:	
	a. RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]	a. Go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1
	b. PRZ level - GREATER THAN 12% [50%]	b. Control charging flow to maintain PRZ level. <u>IF</u> PRZ level can <u>NOT</u> be maintained, <u>THEN</u> go to ECA-0.2, LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED, Step 1.
20	Try To Restore Offsite Power To All 4KV Buses:	Maintain plant conditions stable using 4KV emergency diesel generators.
	a. Contact system dispatcher for instructions to restore AC power when system power is stable.	
21	Determine If Natural Circulation Cooldown Required:	
	a. Consult Plant Supervisor - Nuclear to determine if natural circulation cooldown is required	a. Go to appropriate plant procedure as determined by the Plant Supervisor - Nuclear.
	b. Go to ES-0.2, NATURAL CIRCULATION COOLDOWN, Step 1	

END OF TEXT

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

ATTACHMENT A

RE-ENERGIZATION OF PRESSURIZER BACKUP HEATERS

CAUTION

Loading on the EDG should not exceed the Orange mark (2000 hour rating of 2850 KW). However, loads placed on the energized 4 KV buses (the power source) may approach the Red mark (168 hour rating) on the wattmeter for short periods.

a. 4KV Buses - ALL ENERGIZED

- IF EDG A is available, go to Step b.
- IF EDG B is available, to to Step g.

b. Verify EDG A Load is LESS THAN 2300KW

b. Dispatch personnel to cabinet 3B12 to OPEN all nine (9) breakers.

1. Reset heater Group A lockout relay in the penetration room.
2. Place control switch for Group A to the ON position.
3. CLOSE 3 individual heater breakers one at a time.

   AND

   Verify between each closure A diesel load DOES NOT exceed the capacity of the power source.
4. Return to procedure and Step in effect.

c. Reset lockout relay in penetration room for backup Group A

d. Place control switch for Group A to the ON position

e. Verify EDG A load DOES NOT exceed the capacity of the power source

f. Return to procedure and Step in effect

g. Place control switch for Group B backup heaters to "OFF"

h. Place the keylock switch for breaker 0408 in the EMERGENCY position

i. Dispatch personnel to cabinet 3B13 to OPEN all nine (9) breakers

j. Place console control switch to the ON position

k. CLOSE 3 individual heater breakers one at a time

AND

Verify between each closure B diesel load DOES NOT exceed the capacity of the power source

l. Return to procedure and Step in effect

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ECA-0.2 (Sheet 1 of 2)

EOP Title: Loss of All AC Power Recovery With SI Required

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
	Caution 2 prior to Step 1	2	Caution 2 prior to Step 1 provides plant specific information based upon Emergency Diesel Generator Capacity and subsequent procedural steps relating to potential Diesel Loading Limits. See attached procedure.
1	1a RNO	7	Step 1a RNO provides the plant specific procedure for establishing Cold Leg Recirculation. See attached procedure.
Caution prior to Step 2		2	The caution prior to Step 2 has been deleted due to plant specific design which does not include automatic transfer capability and provides a normal safety injection suction alignment from the RWST. See attached procedure.
2	2	2	Step 2 provides plant specific means for determining proper safety injection valve alignment which precludes manual alignment of safety injection pumps to the Boric Acid tank which is not Plant Turkey Point design. See attached procedure.
4	4	7	Step 4 provides plant specific equipment loaded to associated 4KV Buses. See attached procedure.
Caution 2 prior to Step 5		2	Caution 2 prior to Step 5 has been deleted due to plant specific design which does not include Motor Driven Auxiliary Feedwater Pumps. See attached procedure.
Note prior to Step 5		2	The note prior to Step 5 has been deleted due to plant specific design which does not include Motor Driven Auxiliary Feedwater Pumps. See attached procedure.
8	8	7	Step 8 provides plant specific means for establishing Thermal Barrier Cooling. See attached procedure.
Caution 1 prior to Step 1	Caution 1 prior to Step 1	7	The first caution prior to Step 1 provides plant specific Emergency Diesel Generator Loading criteria. See attached procedure.

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ECA-0.2 (Sheet 2 of 2)

EOP Title: Loss of All AC Power Recovery With SI Required

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
Caution 1 prior to Step 5	Caution prior to Step 5	7	The caution prior to Step 5 provides plant specific Condensate Storage Tank level information.
5a	5a	2	Step 5a guideline "Start MD AFW Pumps as necessary" has been deleted due to Turkey Points lack of Motor Driven Auxiliary Feedwater Pumps.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-ECA-0.2

Title:

LOSS OF ALL AC POWER RECOVERY WITH SI REQUIRED

Safety Related Procedure

Responsible Department:	Operations
Reviewed by PNSC:	87-009
Approved by Plant Manager-N:	1/7/87

RTSs 86-1092P, 86-1832P

•/GAY/dt/dj

LIST OF EFFECTIVE PAGES

Page	Revision Date
1	01/07/87
2	01/07/87
3	01/07/87
4	01/07/87
5	01/07/87
6	01/07/87

1.0 PURPOSE

This procedure provides actions to use engineered safeguards systems to recover plant conditions following 4KV bus power restoration.

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 This procedure is entered from:

1. ECA-0.0, LOSS OF ALL AC POWER, Step 27, when 4KV bus power is restored and SI is required.
2. ECA-0.1, LOSS OF ALL AC POWER RECOVERY WITHOUT SI REQUIRED, Steps 5 and 19, if SI is required.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *Loading on the EDG should not exceed the Orange mark (2000 hour rating of 2850 KW). However, loads placed on the energized 4 KV buses (the power source) may approach the Red mark (168 hour rating) on the wattmeter for short periods.*
- *In the event a loss of offsite power has occurred concurrent with a SI on Unit 4 and only one 4 KV bus is energized by the EDG, perform steps of Attachment C of E.0. Performance of Attachment C supercedes steps of this procedure that could potentially overload the EDG.*

NOTE

CSF status trees should be monitored for information only. FRPs should not be implemented prior to completion of Step 7.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Check RWST Level - GREATER THAN 115,000 GALLONS	Establish cold leg recirculation a. Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION b. Go to Step 3.
2	Verify Valves That Receive A SI Signal Have Assumed Their Required Position As Indicated By Bright Amber Lights On VPB	
3	Check RCP Thermal Barrier CCW Isolation Status:	
	a. CCW return isolation valve outside containment - CLOSED	a. Manually isolate CCW to RCP thermal barriers • Close CCW return isolation valve outside containment. OR • Close CCW return manual isolation valve outside containment.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Manually Load Following Safeguards Equipment On Their Associated Busses: a. One Intake cooling water pump per bus b. One CCW pump per bus c. RHR pump d. At least two High-head SI pumps e. Two emergency containment cooler fans f. Two emergency containment filter fans	

CAUTION

Makeup water sources for CST will be necessary if level decreases to less than 10%.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Check Intact S/G Levels:	
	a. Narrow range level - GREATER THAN 6% [32%]	a. Maintain AFW flow greater than 130 GPM per S/G until narrow range level is greater than 6% [32%] in at least one S/G. IF AFW flow is NOT greater than 130 GPM per S/G, THEN verify required AFW valve alignment.
	b. Control AFW flow to maintain narrow range level between 6% [32%] and 50%	
6	Place Containment Spray Pump Switches In Standby	
7	Check RCP Seal Isolation Status:	
	a. RCP seal injection isolation valves outside containment - CLOSED	a. Locally close valves before starting charging pump.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *RCP thermal barrier cooling should be established slowly to minimize potential introduction of steam into the CCW system. RCP thermal barrier cooling should not be established to an RCP with excessive seal leakage.*
- *RCP seal injection should be established slowly to minimize RCP thermal stresses and potential seal failures.*
- *As part of subsequent recovery actions, RCPs should not be started prior to a status evaluation.*

NOTE

FRPs may now be implemented as necessary.

8 Establish RCP Thermal Barrier Cooling:

a. Establish CCW flow to RCP thermal barriers:

- OPEN MOV-3-716A and MOV-3-716B
- Dispatch personnel to manually open FCV-3-626 slowly

9 Go To E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1

END OF TEXT

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ECA-1.1 (Sheet 1 of 1)

EOP Title: Loss of Emergency Coolant Recirculation

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
2	2	7	Step 2 provides plant specific means of adding makeup to the RWST. See attached procedure.
7	7	2	Step 7 has been changed to "Continue to Next Step" due to Containment Spray Recirculation plant specific capability being aligned in ES-1.3, Cold Leg Recirculation. See attached procedure.
6	6	6	Step 6 Table for determining the number of containment spray pumps has been modified for the use of only one containment spray pump due to plant specific design limitations.
10	10	2	Step 10 has been changed to "Continue to Next Step" the Cold Leg Recirculation procedure recirculation alignment prevents backflow to the RWST. See attached procedure.
16	16	7	Step 16 provides plant specific means for adding makeup to the RCS. See attached procedure.
Figure ECA 11-1	Figure ECA 11-1	7	Figure ECA 11-1 provides plant specific means for determining minimum safety injection flow rates to dissipate decay heat.
11c	11c	2	Step 11c provides plant specific means for establishing minimum safety injection flow due to local discharge valve throttling capability.
22b	22b	7	Step 22b provides plant specific procedure for placing the Residual Heat Removal System in service.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-ECA-1.1

<u>Title:</u>

LOSS OF EMERGENCY COOLANT RECIRCULATION

<u>Safety Related Procedure</u>

Responsible Department:	Operations
Reviewed by PNSC:	87-009
Approved by Plant Manager-N:	1/7/87

RTS 86-1832P

LIST OF EFFECTIVE PAGES

Page	Revision Date
1	01/07/87
2	01/07/87
3	01/07/87
4	01/07/87
5	01/07/87
6	01/07/87
7	01/07/87
8	01/07/87
9	01/07/87
10	01/07/87
11	01/07/87

1.0 PURPOSE

This procedure provides actions to restore emergency coolant recirculation capability, to delay depletion of the RWST by adding makeup and reducing outflow, and to depressurize the RCS to minimize break flow.

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 This procedure is entered from:

1. E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 17, when cold leg recirculation capability cannot be verified.
2. ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 4, when at least one flow path from the sump cannot be established or maintained.
3. ECA-1.2, LOCA OUTSIDE CONTAINMENT, Step 4, when a LOCA outside containment cannot be isolated.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *If emergency coolant recirculation capability is restored during this procedure, further recovery actions should continue by returning to procedure and step in effect.*
- *If suction source is lost to any SI or spray pump, the pump should be stopped.*

1 Try To Restore Emergency Coolant Recirculation Equipment

2 Add Makeup To RWST As Necessary:

a. Determine quantity of boron and water to be supplied to blender to provide a boron concentration greater than 1950 PPM per boron change table, Sect. 3 of the Plant Curve Book

b. Close FCV-3-113B and 114B

c. Open valves 365A and 365B

d. Verify MOV-3-350 - CLOSED.

e Verify valve-356 - CLOSED

f. Place reactor makeup selector in borate

g Place FCV-3-113A and 114A auto-manual stations in MANUAL

h Place control switch for FCV-3-113A in AUTO

i Place control switch for FCV-3-114A in OPEN

j. Adjust boric acid and primary water batch integrators

k. Place boric acid pump selector switch in AUTO

l. Place reactor makeup control in start and adjust boron and primary water flow by manually controlling FCV-3-113A and 114A

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

Shutdown margin should be monitored during RCS cooldown.

3	Initiate RCS Cooldown To Cold Shutdown:	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Dump steam to condenser from intact S/G(s)	b. Manually dump steam from intact S/G(s) using steam dump to atmosphere valves IF no intact S/G available, THEN use faulted S/G.
4	Verify Emergency And Normal Containment Coolers Running	IF 4KV buses are energized by EDG, verify adequate diesel capacity THEN manually start normal containment coolers.
5	Check RWST Level GREATER THAN 60,000 GAL.	Go to Step 15

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

6 Determine Containment Spray Requirements (Suction From RWST):

a. Spray pump suction - ALIGNED TO RWST

a. IF spray pump suction aligned to RHR pump, THEN go to Step 8.

b. Determine number of spray pumps required from table:

RWST LEVEL	CONTAINMENT PRESSURE	EMERGENCY COOLER FANS RUNNING	SPRAY PUMPS REQUIRED
GREATER THAN 115,000 GAL.	GREATER THAN 59 PSIG	—	2
	BETWEEN 14 PSIG AND 59 PSIG	0	2
		2	1
		3	0
	LESS THAN 14 PSIG	—	0
BETWEEN 60,000 AND 115,000 GAL.	GREATER THAN 59 PSIG	—	2
	BETWEEN 14 PSIG AND 59 PSIG	2	1
		3	0
	LESS THAN 14 PSIG	—	0
LESS THAN 60,000 GALS.	—	—	0

c. Spray pumps running - EQUAL TO NUMBER REQUIRED

c. Manually operate spray pumps as necessary.

7 Continue To Next Step

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

If offsite power is lost after SI reset, manual action may be required to restore safeguards equipment to desired status.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Reset SI If Necessary	
9	Check RWST Level - LESS THAN 115,000 GAL.	Go to Step 12.
10	Continue To Next Step	
11	Establish Minimum SI Flow To Remove Decay Heat (RWST Level Less Than 115,000 GAL.):	
	a. Suction of one high-head SI pump - ALIGNED TO RWST	a. Align suction of one high-head SI pump to RWST.
	b. Determine minimum SI flow required from Figure ECA11-1	
	c. Establish minimum SI flow by throttling the SI pump discharge valve if area is accessible	c. Maintain decay heat flow rate by starting and stopping the SI pumps as necessary
	d. Go to Step 13	
12	Establish One Train Of SI Flow (RWST Level Greater Than 115,000 GAL):	
	a. High-head SI pump - ONLY ONE RUNNING	a. Operate high-head SI pumps as necessary.
	b. RCS pressure - LESS THAN 225 PSIG [630 PSIG]	b. Stop RHR pumps. Go to Step 13.
	c. RHR pump - ONLY ONE RUNNING	c. Operate RHR pumps as necessary.
13	Verify Adequate SI Flow:	
	a. RVLMS (QSPDS) Plenum range indication GREATER THAN 0%	a. Increase SI flow to maintain RVLMS (QSPDS) Plenum range indication greater than 0%.
	b. Core exit TCs - STABLE OR DECREASING	b. Increase SI flow to maintain TCs stable or decreasing.
14	Check RWST Level - LESS THAN 60,000 GAL.	Return to Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	Stop Pumps Taking Suction From RWST And Place Switches In PULL-TO-LOCK Position: • RHR PUMPS • HIGH-HEAD SI PUMPS • CONTAINMENT SPRAY PUMPS	
16	Try To Add Makeup To RCS From Alternate Source:	
	a. Verify that the reactor coolant system makeup controls are in AUTO	a. Place controls in AUTO.
	b. Verify level in VCT greater than 11%	b. Return to Step 16a.
	c. Verify OPEN HCV-3-121	c. OPEN HCV-3-121.
	d. Place any charging pump in service on minimum speed.	
	e. Increase charging pump speed until charging flow to the RCS equals the makeup flow to the VCT (indicated by a constant level in the VCT).	
17	Depressurize All Intact S/Gs To 685 PSIG At Maximum Rate:	
	a. Dump steam to condenser at maximum rate	a. Manually or locally dump stem at maximum rate from intact S/G(s) using steam dump to atmosphere valves.
	b. Check S/G pressures - LESS THAN 685 PSIG	b. Return to Step 17a.
	c. Stop S/G depressurization	
18	Depressurize All Intact S/Gs To Inject Accumulators As Necessary:	
	a. Dump steam to condenser as necessary to maintain RVLMS (QSPDS) Plenum indication at GREATER THAN 0%	a. Manually or locally dump steam from intact S/G(s) as necessary to maintain RVLMS (QSPDS) Plenum indication at GREATER THAN 0%: • Use steam dump to atmosphere.
	b. Check S/G pressures - LESS THAN 215 PSIG	b. Return to Step 18a.
	c. Stop S/G depressurization	

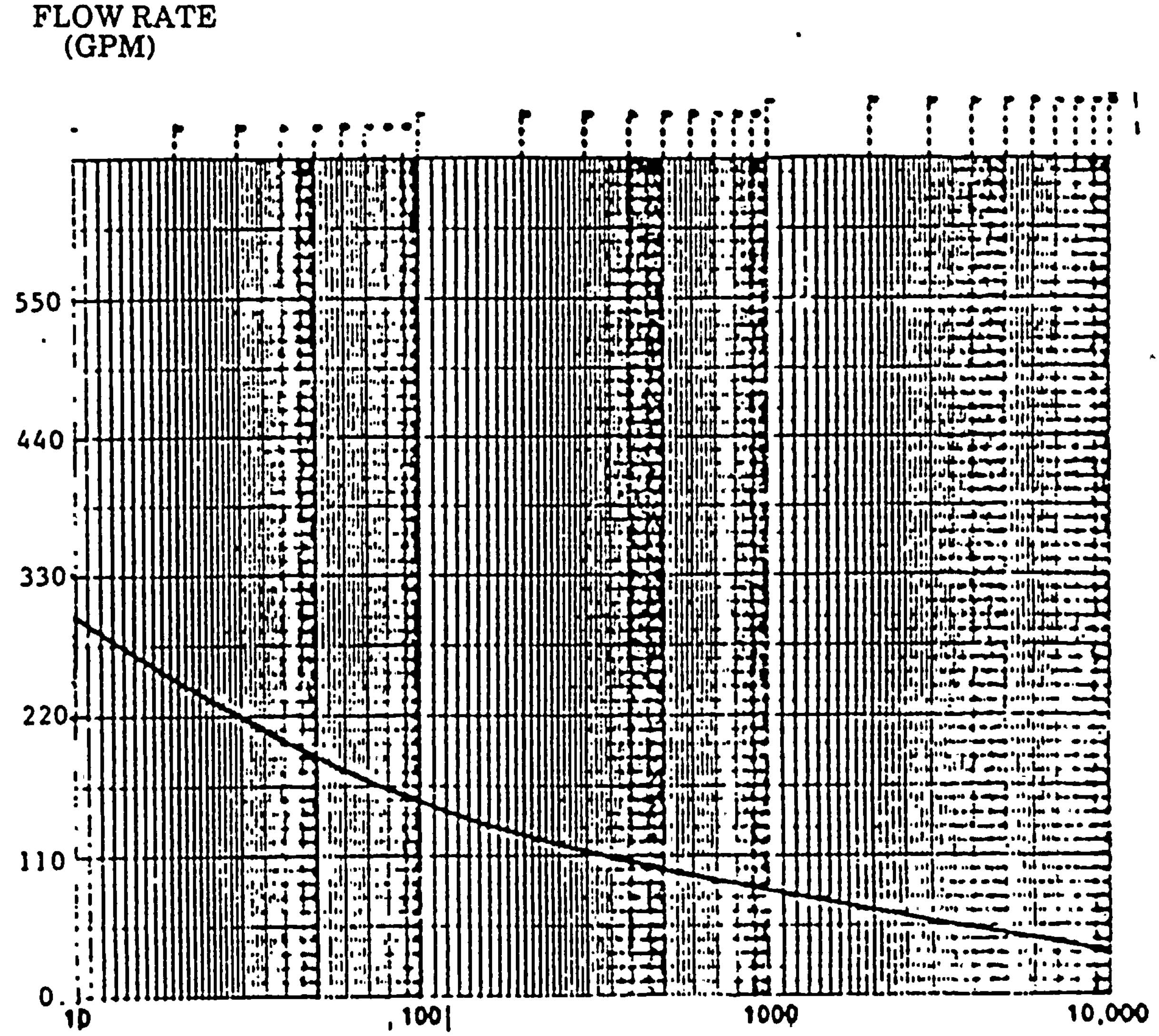
STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	Isolate All SI Accumulators:	
	a. Check power to isolation valves - AVAILABLE	a. Restore power to isolation valves.
	b. Close all SI accumulator isolation valves	b. Vent any unisolated accumulator.
20	Check If RCPs Must Be Stopped:	
	a. Check the following: • NUMBER 1 SEAL DIFFERENTIAL PRESSURE - LESS THAN 200 PSID <u>OR</u> • NUMBER 1 SEAL LEAKOFF FLOW - LESS THAN 0.7 GPM	a. Go to Step 21.
	b. Stop affected RCP(s)	
21	Depressurize All Intact S/Gs To Atmospheric Pressure:	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Dump steam to condenser	b. Manually or locally dump steam from intact S/G(s) using steam dump to atmosphere.
22	Check If RHR System Should Be Placed In Service:	
	a. Check the following: • RCS PRESSURE - LESS THAN 324°F [324°F] • RCS PRESSURE - LESS THAN 450 PSIG [110 PSIG]	a. Return to Step 21.
	b. Consult TSC staff to determine if RHR System should be placed in service. <u>IF SO</u>, place the RHR System in service per OP-50, <u>THEN</u> go to step 23	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23	Maintain RCS Heat Removal:	
	a. Use RHR System if in service	
	b. Dump steam to condenser from intact S/Gs	b. Manually or locally dump steam from intact S/Gs using steam dump to atmosphere valves. __IF__ no intact S/G available and RHR System __NOT__ in service, __THEN__ use faulted S/G.
24	Consult TSC Engineering Staff	

END OF TEXT

FIGURE ECA-11-1

MINIMUM SI FLOW RATE VERSUS TIME AFTER TRIP



FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ECA-1.2 (Sheet 1 of 1)

EOP Title: LOCA Outside Containment

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
1	1	7	Step 1 provides plant specific means for verifying proper valve alignment of Hot Leg Injection Valves. See attached procedure.
2	2	7	Step 2 provides plant specific means for identifying and isolating a LOCA Outside Containment. See attached procedure.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-ECA-1.2

Title:

LOCA OUTSIDE CONTAINMENT

<u>Safety Related Procedure</u>

Responsible Department:	Operations
Reviewed by PNSC:	86-085
Approved by Plant Manager-N:	3/31/86

HEB dt

1.0 PURPOSE

This procedure provides actions to identify and isolate a LOCA outside containment.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from E-0, REACTOR TRIP OR SAFETY INJECTION, Step 31, on abnormal radiation in the auxiliary building due to a loss of RCS inventory outside containment.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Verify Proper Valve Alignment:	Manually close valves. <u>IF</u> valves can <u>NOT</u> be manually closed, <u>THEN</u> locally close valves.
	a. Valves in RHR pump suction from RCS - CLOSED	
	1) MOV-3-750	
	2) MOV-3-751	
	b. SI pump hot leg injection valve - CLOSED	
	1) MOV-3-869	
2	Try To Identify And Isolate Break:	
	a. Simultaneously CLOSE and OPEN the following valves and monitor for an RCS pressure increase:	
	1) RHR pump cold leg injection valves	
	a) MOV-3-744A	
	b) MOV-3-744B	
	2) SI pump cold leg injection valves	
	a) MOV-3-843A	
	b) MOV-3-843B	
	b. Contact H.P. Department for survey of auxiliary building to determine source of high radiation	
3	Check If Break Is Isolated:	
	a. RCS pressure - INCREASING	a. Go to ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, Step 1.
	b. Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1	

END OF TEXT

FINAL PAGE

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PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ECA-2.1

EOP Title: Uncontrolled Depressurization of All Steam Generators

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
Caution 3 prior to Step 6		2	The third caution prior to Step 6 has been deleted due to plant specific design which does not include automatic transfer capability. See attached procedure.
7	7	7	Step 7 provides plant specific means of placing containment spray pumps in standby. See attached procedure.
Caution 2 prior to Step 9		2	The second caution prior to Step 9 has been deleted due to plant specific design which does not include automatic transfer capability. See attached procedure.
13	13	7	Step 13 provides plant specific means for establishing charging flow. See attached procedure.
15	15	7	Step 15 verifies the plant specific High Head Safety Injection Pump Suction Alignment. See attached procedure.
21	21	7	Step 21 provides plant specific means for establishing letdown and excess letdown. See attached procedure.
24	24	7	Step 24 provides plant specific means for establishing Reactor Coolant Pump Seal Return Flow. See attached procedure.
26 RNO	26 RNO	7	Step 26 RNO provides the plant specific procedure for establishing Normal Reactor Coolant Pump Cooling. See attached procedure.
27 RNO	27 RNO	7	Step 27 RNO provides plant specific means for manually loading equipment on the 4KV Bus. See attached procedure.
28 RNO	28 RNO	7	Step 28 RNO provides plant specific means for establishing conditions for starting a reactor coolant pump. See attached procedure.

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ECA-2.1

EOP Title: Uncontrolled Depressurization of All Steam Generators

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
37b	37b	7	Step 37b stipulates the plant specific procedure for placing the RHR System in service.
27	Attachment B	7	Attachment B provides plant specific means for manually loading pressurizer backup heaters on the 4KV Bus. See attached Attachment B.
4 RNO	4 RNO	7	Step 4 RNO provides plant specific means for restoring condensate storage tank level.
11 RNO	11 RNO	7	Step 11 RNO provides a plant specific response for establishing instrument air to containment.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-ECA-2.1

Title:

UNCONTROLLED DEPRESSURIZATION OF ALL STEAM GENERATORS

Safety Related Procedure

Responsible Department:	Operations
Reviewed by PNSC:	87-009
Approved by Plant Manager-N:	1/7/87

RTS 86-1092P, 86-1832P

LIST OF EFFECTIVE PAGES

Page	Revision Date
1	01/07/87
2	01/07/87
3	01/07/87
4	01/07/87
5	01/07/87
6	01/07/87
7	01/07/87
8	01/07/87
9	01/07/87
10	01/07/87
11	01/07/87
12	01/07/87
13	01/07/87
14	01/07/87
15	01/07/87

1.0 PURPOSE

This procedure provides actions for a loss of secondary coolant which affects all steam generators.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from E-2, FAULTED STEAM GENERATOR ISOLATION, Step 2, when an uncontrolled depressurization of all steam generators occurs.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *If any S/G pressure increases at any time during this procedure, E-2, FAULTED STEAM GENERATOR ISOLATION, should be performed.*
- *FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, should be implemented only if a total feed flow capability of 130 GPM per S/G is not available at any time during this procedure.*
- *Since the AFW pump is the only available source of feed flow, steam supply to the AFW pump must be maintained from one S/G.*

NOTE

Foldout page should be open.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Check Secondary Pressure Boundary: • MAIN STEAMLINE ISOLATION AND BYPASS VALVES - CLOSED • FW CONTROL AND BYPASS VALVES - CLOSED • FW ISOLATION VALVES - CLOSED • S/G BLOWDOWN ISOLATION VALVES - CLOSED • STEAM SUPPLY VALVES TO THE AFW PUMPS - CLOSED	Manually close valves. IF valves can NOT be closed, THEN dispatch operator to locally close valves, one loop at a time.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

A minimum feed flow of 25 gpm must be maintained to each S/G with a narrow range level less than 6% [32%].

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	Control Feed Flow To Minimize RCS Cooldown:	
	a. Check cooldown rate in RCS cold legs - LESS THAN 100°F/HR	a. Decrease feed flow to 25 GPM to each S/G. Go to Step 2c.
	b. Check narrow range level in all S/Gs - LESS THAN 50%	b. Control feed flow to maintain narrow range level less than 50% in all S/Gs.
	c. Check RCS hot leg temperatures - STABLE OR DECREASING	c. Control feed flow or dump steam to stabilize RCS hot leg temperatures.
	d. Emergency borate the RCS to cold shutdown conditions as necessary	
3	Check If RCPs Should Be Stopped:	
	a. High-head SI pumps - AT LEAST ONE RUNNING	a. Go to Step 4.
	b. RCS subcooling - LESS THAN 25°F [65°F]	b. Go to Step 4.
	c. Stop all RCPs	
4	Check CST Level - GREATER THAN 10%	For CST makeup, refer to OP-018.1, Condensate Storage Tank.

CAUTION

If any PRZ PORV opens because of high PRZ pressure, Step 5b should be repeated after pressure decreases to less than PORV setpoint.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Check PRZ PORVs And Block Valves:	
	a. Power to block valves - AVAILABLE	a. Restore power to block valves.
	b. PORVs - CLOSED	b. <u>IF</u> PRZ pressure less than 2335 PSIG, <u>THEN</u> manually close PORVs. <u>IF</u> any valve can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve.
	c. Block valves - AT LEAST ONE OPEN	c. Open one block valve unless it was closed to isolate an open PORV.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.*
- *RCS pressure should be monitored. If RCS pressure decreases to less than 225 PSIG [630 PSIG] RHR pumps must be manually restarted to supply water to the RCS.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	Check If RHR Pumps Should Be Stopped:	
	a. Check RCS pressure:	
	1) Pressure - GREATER THAN 225 PSIG [630 PSIG]	1) Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	2) Pressure - STABLE OR INCREASING	2) Go to Step 7.
	b. Reset SI if necessary	
	c. Stop RHR pumps and place in standby	
7	Check If Containment Spray Should Be Stopped:	
	a. Containment spray pumps - RUNNING	a. Go to Step 8.
	b. Containment pressure - LESS THAN 14 PSIG	b. Continue with Step 8. <u>WHEN</u> containment pressure less than 14 PSIG, <u>THEN</u> do Steps 7c and d.
	c. Reset containment spray signal	
	d. Stop containment spray pumps and place in Standby: • PLACE CONTAINMENT SPRAY PUMPS IN THE AUTO POSITION • CLOSE DISCHARGE VALVE, MOV-3-880A AND 880B	
8	Check RWST Level - GREATER THAN 115,000 GALS	Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

IF offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Reset SI	
10	Reset Containment Isolation Phase A And Phase B	
11	Verify Instrument Air To Containment	Start all diesel powered air compressors.
12	Check Power Supply To Charging Pumps - OFFSITE POWER AVAILABLE	Verify adequate diesel capacity to run charging pumps. If necessary, shed sufficient non-essential loads.
13	Establish Charging Flow:	
	a. Charging pumps - AT LEAST ONE RUNNING	a. Perform the following: 1) IF CCW flow to RCP thermal barrier is lost, THEN isolate seal injection to affected RCP(s) 2) IF offsite power is not available verify adequate diesel capacity to run charging pumps IF necessary shed non-essential loads. (Refer to E-0, Attachment D for component KW load rating.) 3) Start charging pumps as necessary.
	b. Establish flow as necessary: 1) Adjust HCV-3-121 as necessary	
14	Check If SI Should Be Terminated:	
	a. RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]	a. DO NOT STOP SI PUMPS. Return to Step 2.
	b. Check RCS pressure: • PRESSURE - GREATER THAN 1588 PSIG [1993 PSIG] • PRESSURE - STABLE OR INCREASING	b. DO NOT STOP SI PUMPS. Return to Step 2.
	c. PRZ level - GREATER THAN 12% [50%]	c. DO NOT STOP SI PUMPS. Try to stabilize RCS pressure with normal PRZ spray. Return to Step 14a.
15	Verify Alignment Of High-Head SI Pump Suction to RWST:	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	Stop SI Pumps And Place In Standby: • RHR PUMPS • HIGH-HEAD SI PUMPS	
17	Verify SI Flow Not Required:	
	a. RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]	a. Manually operate SI pumps as necessary. Return to Step 2.
	b. PRZ level - GREATER THAN 12% [50%]	b. Control charging flow to maintain PRZ level. <u>IF</u> PRZ level can <u>NOT</u> be maintained, <u>THEN</u> manually operate SI pumps as necessary. Return to Step 2.
18	Check RCS Hot Leg Temperatures - STABLE OR DECREASING	Control feed flow or dump steam to stabilize RCS hot leg temperatures.
19	Check Narrow Range Level In All S/Gs - LESS THAN 50%	Control feed flow to maintain narrow range level less than 50% in all S/Gs.
20	Check PRZ Level - GREATER THAN 23% [50%]	Control charging as necessary.
21	Establish Letdown:	Establish Excess Letdown
	a. Verify CCW flow to the non-regenerative letdown heat exchanger.	1. Verify OPEN FC-3-739, excess letdown heat exchanger CCW outlet valve.
	b. Verify letdown orifice isolation valves - Closed	2. Verify HCV-3-137, excess letdown heat exchanger outlet valve - CLOSED.
	c. Open letdown containment isolation valve, CV-3-204	3. Verify CV-3-389, excess letdown heat exchanger divert valve is at the desired position: a. DIVERT to RCDT b. NORMAL to VCT
	d. Open letdown line isolation valve LCV-3-460	4. OPEN CV-3-387, excess letdown heat exchanger inlet valve.
	e. Open letdown orifice isolation valve as appropriate	5. OPEN HCV-3-137, excess letdown heat exchanger outlet valve.
		6. Verify a delta T across the excess letdown heat exchanger.
22	Check VCT Makeup Control System:	Adjust controls as necessary.
	a. Makeup set for GREATER THAN RCS boron concentration	
	b. Makeup set for Automatic Control	
23	Check Charging Pump Suction - ALIGNED TO VCT	Align suction to VCT.

•/GY/dt/dj

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24	Check If RCP Seal Return Flow Should Be Established:	
	a. CCW available	a. Go to Step 25.
	b. OPEN the following Seal Return Isolation Valves: 1) MOV-3-6386 2) MOV-3-381	b. Locally OPEN valves
	c. Adjust HCV-3-121 to maintain a ΔP GREATER THAN 15 inches of water across the thermal barrier	
25	Control PRZ Pressure:	
	a. Turn on heaters and operate normal spray as necessary to maintain pressure stable	a. IF normal spray NOT available and letdown is in service, THEN use auxiliary spray. IF NOT, THEN use one PRZ PORV.
26	Check RCP Cooling - NORMAL	Establish normal cooling to RCPs. Refer to OP-030, COMPONENT COOLING WATER SYSTEM, and OP-047, CVCS CHARGING AND LETDOWN.
27	Check All 4KV Busses - ENERGIZED BY OFFSITE POWER	Try to restore offsite power. IF necessary, THEN manually load the following equipment on the 4 KV busses: 1) Verify adequate diesel capacity to place in service the following equipment, IF necessary shed non-essential loads. (Refer to E-0, Attachment D for component KW load rating.) a. PRZ heaters per Attachment B

STEP	ACTION/EXPECTED RESPONSE	...RESPONSE NOT OBTAINED

CAUTION

- *If RCP seal cooling had previously been lost, the affected RCP(s) should not be started prior to a status evaluation.*
- *On natural circulation, RTD bypass temperatures and associated interlocks will be inaccurate.*

NOTE

RCPs should be run in order of priority to provide normal PRZ spray.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
28	Check RCP Status - AT LEAST ONE RUNNING	Try to start one RCP: a. Establish conditions for starting an RCP: 1) Verify off-site power available to the 4KV buses. IF off-site power is not available THEN go to step 29. 2) Start the oil lift pump. 3) Verify that the number 1 seal leakoff valve is OPEN and seal flow is established. 4) Verify the seal injection water flow to be approximately 8 to 12 GPM (refer to Enclosure 1 of OP-041.1, REACTOR COOLANT PUMP OPERATION) 5) Verify ΔP across the thermal barrier to be 15 inches of water. 6) Verify GREATER THAN 200 PSID across the number 1 seal. 7) Verify that the oil lift pump has been running for two minutes and the oil pressure interlock light is ON. b. Start one RCP. IF an RCP can NOT be started, THEN refer to ATTACHMENT A to verify natural circulation. IF natural circulation NOT verified, THEN increase feed flow or dumping steam.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
29	Check If Source Range Detectors Should Be Energized:	
	a. Check intermediate range flux - LESS THAN 10^{-10} AMPS	a. Continue with Step 30. <u>WHEN</u> flux less than 10^{-10} AMPS, <u>THEN</u> do Steps 29b and c.
	b. Verify source range detectors - ENERGIZED	b. Manually energize source range detectors.
	c. Transfer nuclear recorders to source range scale	
30	Check If Diesel Generators Should Be Stopped	
	a. Verify 4 KV busses - ENERGIZED BY OFFSITE POWER	a. Try to restore offsite power to 4KV busses.
	b. Stop any unloaded diesel generator and place in standby	
31	Shut Down Unnecessary Plant Equipment Not Required To Maintain Hot Standby Conditions	
32	Maintain Plant Conditions - STABLE • PRZ PRESSURE • PRZ LEVEL • RCS TEMPERATURES	
33	Verify SI Flow Not Required:	
	a. RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]	a. Manually operate SI pumps as necessary. Return to Step 2.
	b. PRZ level - GREATER THAN 12% [50%]	b. Control charging flow to maintain PRZ level. <u>IF</u> PRZ level can <u>NOT</u> be maintained, <u>THEN</u> manually operate SI pumps as necessary. Return to Step 2.
34	Check If SI Accumulators Should Be Isolated:	
	a. Check the following: • RCS subcooling based on core exit TCs - GREATER THAN 30°F [45%] • PRZ level - GREATER THAN 12% [50%]	a. Go to Step 35.
	b. Check power to isolation valves - AVAILABLE	b. Restore power to isolation valves.
	c. Close all SI accumulator isolation valves	c. Vent any unisolated accumulators.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
35	Check RCS Hot Leg Temperatures - LESS THAN 324°F [324°F]	Control feed flow and dump steam to establish an RCS cooldown rate less than 100°F/HR in RCS cold legs.
36	Check RCS Pressure - LESS THAN 450 PSIG [110 PSIG]	Use normal PRZ spray. IF normal spray NOT available and letdown is in service, THEN use auxiliary spray. IF NOT, THEN use one PRZ PORV.
37	Check If RHR System Can Be Placed In Service:	
	a. Check the following: • RCS TEMPERATURE - LESS THAN 324°F [324°F] • RCS PRESSURE - LESS THAN 450 PSIG [110 PSIG]	a. Return to Step 33.
	b. Place RHR System in service using OP-050, RESIDUAL HEAT REMOVAL SYSTEM	
38	Continue Cooldown To Cold Shutdown:	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Check narrow range level in all S/Gs - LESS THAN 50%	b. Control feed flow to maintain narrow range level less than 50% in all S/Gs.
39	Check RCS Temperatures - LESS THAN 200°F	Return to Step 38.
40	Evaluate Long Term Plant Status:	
	a. Maintain cold shutdown conditions	
	b. Consult TSC Engineering staff	

END OF TEXT

ATTACHMENT A

The following conditions support or indicate natural circulation flow:

- RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]
- S/G pressures - STABLE OR DECREASING
- RCS hot leg temperatures - STABLE OR DECREASING
- Core exit TCs - STABLE OR DECREASING
- RCS cold leg temperatures - AT SATURATION TEMPERATURE FOR S/G PRESSURE

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

ATTACHMENT B

RE-ENERGIZATION OF PRESSURIZER HEATERS

CAUTION

Loading on the EDG should not exceed the Orange mark (2000 hour rating of 2850 KW). However, loads placed on the energized 4 KV buses (the power source) may approach the Red mark (168 hour rating) on the wattmeter for short periods.

a. 4KV Buses - ALL ENERGIZED

- IF EDG A is available, go to Step b.
- IF EDG B is available, go to Step g.

b. Verify EDG A Load is LESS THAN 2300KW

b. Dispatch personnel to cabinet 3812 to OPEN all nine (9) breakers.

1. Reset heater Group A lockout relay in the penetration room.
2. Place control switch for Group A to the ON position.
3. CLOSE 3 individual heater breakers one at a time.

   AND

   Verify between each closure A diesel load DOES NOT exceed the capacity of the power source.
4. Return to procedure and Step in effect.

c. Reset lockout relay in penetration room for backup Group A

d. Place control switch for Group A to the ON position

e. Verify EDG A load DOES NOT exceed the capacity of the power source

f. Return to procedure and Step in effect

g. Place control switch for Group B backup heaters to "OFF"

h. Place the keylock switch for breaker 0408 in the EMERGENCY position

i. Dispatch personnel to cabinet 4813 to OPEN all nine (9) breakers

j. Place console control switch to the ON position

k. CLOSE 3 individual heater breakers one at a time

AND

Verify between each closure B diesel load DOES NOT exceed the capacity of the power source

l. Return to procedure and Step in effect

FOLDOUT FOR ECA-2.1 PROCEDURE

1. SI REINITIATION CRITERIA

Manually operate SI pumps as necessary if EITHER condition listed below occurs:

- RCS SUBCOOLING BASED ON CORE EXIT TCs - LESS THAN 30°F [45°F]
- PRZ LEVEL - CANNOT BE MAINTAINED GREATER THAN 12% [50%]

2. RED PATH SUMMARY

a. SUBCRITICALITY - Nuclear power GREATER THAN 5%

b. CORE COOLING - Core exit TCs GREATER THAN 1200°F

c. HEAT SINK - Total AVAILABLE feedwater flow capability less than 130 GPM per S/G

d. INTEGRITY - Cold leg temperature decrease GREATER THAN 100°F in last 60 minutes AND RCS cold leg temperature LESS THAN 317°F

e. CONTAINMENT - Containment pressure GREATER THAN 59 PSIG

3. E-2 TRANSITION CRITERIA

Go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1, if any S/G pressure increases at any time.

4. COLD LEG RECIRCULATION SWITCHOVER CRITERIA

Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1, if RWST level decreases to LESS THAN 115,000 gallons.

5. CST MAKEUP WATER CRITERIA

Makeup water sources for the CST will be necessary if level decreases to LESS THAN 10%.

6. ADVERSE CONTAINMENT CONDITIONS

Adverse Containment conditions are defined as either a Containment Atmosphere temperature of 180°F or Containment radiation levels equal to or greater than 1.3×10^5 R/hr. Under these conditions the setpoint values in brackets, [ ], are required to be used.

If the Containment temperature subsequently falls below 180°F, the normal setpoint values may be used. If the Containment radiation level subsequently falls below 1.3×10^5 R/hr, the adverse Containment setpoints are required to be used until permission is granted by the Technical Support Staff to use normal setpoints.

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ECA-3.1

EOP Title: SGTR With Loss of Reactor Coolant Subcooled Recovery Desired

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
Caution 3 prior to Step 1		2	The third caution prior to Step 1 has been deleted due to plant specific design which does not include automatic transfer capability. See attached procedure.
4a RNO	4a RNO	7	Step 4a RNO provides specific loads added to the 4KV Buses. See attached procedure.
7	7	7	Step 7 provides plant specific means of evaluating plant status. See attached procedure.
8	8	7	Step 8 provides plant specific means for establishing charging flow. See attached procedure..
3 RNO	3 RNO	7	Step 3 RNO provides a plant specific response for establishing instrument air to containment. See attached procedure.
17	17d	7	Step 17d provides plant specific means for establishing reactor coolant pump start conditions. See attached procedure.
20a RNO	20a RNO	7	Step 20a RNO provides plant specific means for establishing reactor coolant pump start conditions. See attached procedure.
26	26	7	Step 26 provides plant specific means of minimizing secondary system contamination. See attached procedure.
27	27 RNO	7	Step 27 RNO stipulates the plant specific procedure for establishing reactor coolant pump normal cooling. See attached procedure.
28	28	7	Step 28 provides plant specific means of establishing reactor coolant pump seal return flow. See attached procedure.
4	Attachment B	7	Attachment B provides plant specific means for re-energizing pressurizer backup heaters. See attached procedure.
5d	5e	7	Step 5e provides plant specific means for placing containment spray pumps in auto. See attached procedure.

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ECA-3.1 (Sheet 2 of 2)

EOP Title: SGTR With Loss of Reactor Coolant Subcooled Recovery Desired

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
Note 2 prior to Step 11	Note 2 prior to Step 11	7	The second note prior to Step 11 provides plant specific safety injection block information.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-ECA-3.1

Title:

SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED

Safety Related Procedure

Responsible Department:	Operations
Reviewed by PNSC:	87-158
Approved by Plant Manager-N	6/16/87

RTS 86-1092P, 87-1088P *PCM 87-194*

LIST OF EFFECTIVE PAGES

Page	Revision Date
1	06/16/87
2	06/16/87
3	06/16/87
4	06/16/87
5	06/16/87
6	06/16/87
7	06/16/87
8	06/16/87
9	06/16/87
10	06/16/87
11	06/16/87
12	06/16/87
13	06/16/87
14	06/16/87
15	06/16/87
16	06/16/87
17	06/16/87
18	06/16/87
19	06/16/87

1.0 PURPOSE

This procedure provides actions to cool down and depressurize the RCS to cold shutdown conditions while minimizing loss of inventory and voiding in the RCS.

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 This procedure is entered from:

1. E-3, STEAM GENERATOR TUBE RUPTURE, Step 3, if a ruptured S/G can not be isolated from any intact S/G.
2. E-3, STEAM GENERATOR TUBE RUPTURE, Step 5, if PRZ PORV can not be isolated by closing its block valve.
3. E-3, STEAM GENERATOR TUBE RUPTURE, Step 13, if a ruptured S/G pressure is less than the low steamline pressure SI setpoint..
4. E-3, STEAM GENERATOR TUBE RUPTURE, Step 14, if no intact S/G is available for RCS cooldown.
5. E-3, STEAM GENERATOR TUBE RUPTURE, Step 16, if a ruptured S/G pressure continues to decrease following RCS cooldown.
6. E-3, STEAM GENERATOR TUBE RUPTURE, Step 17, if RCS subcooling is less than required.
7. E-3, STEAM GENERATOR TUBE RUPTURE, Step 20, if RCS pressure does not increase after closing PRZ PORV and block valve.
8. E-3, STEAM GENERATOR TUBE RUPTURE, Step 21, and ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, Step 7, if SI can not be terminated.
9. E-3, STEAM GENERATOR TUBE RUPTURE, Step 25, and ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, Step 10, if SI is reinitiated after termination.
10. ES-3.1, POST-SGTR COOLDOWN USING BACKFILL, Step 2, ES-3.2, POST-SGTR COOLDOWN USING BLOWDOWN, Step 2, and ES-3.3, POST-SGTR COOLDOWN USING STEAM DUMP, Step 2, if SI accumulators should not be isolated.
11. ES-3.1, POST-SGTR COOLDOWN USING BACKFILL, Step 5, ES-3.2, POST-SGTR COOLDOWN USING BLOWDOWN, Step 5, and Step 14, and ES-3.3, POST-SGTR COOLDOWN USING STEAM DUMP, Step 5 and Step 14, if a non-ruptured S/G is not available for RCS cooldown.
12. ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL, Step 21, if RCS pressure is less than technical specification for the maximum SI accumulator nitrogen pressure.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *If RWST level decreases to less than 155,000 gallons, the SI System should be aligned for cold leg recirculation using ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.*
- *If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.*

NOTE

Foldout page should be open.

1 Reset SI

2 Reset Containment Isolation Phase A And Phase B

3 Verify Instrument Air To Containment

Start all diesel powered air compressors

4 Verify All 4KV Buses - ENERGIZED BY OFFSITE POWER

Try to restore offsite power. IF necessary, THEN perform the following:

a. Verify adequate diesel capacity to load the following equipment on their respective busses. IF necessary, shed non-essential loads. (Refer to E-0, Attachment D for component KW load rating.)

1) PRZ Backup Heaters per Attachment B

2) Charging Pumps

5 Check If Containment Spray Should Be Stopped:

a. Spray pumps - RUNNING

a. Go to Step 6

b. Containment pressure - LESS THAN 14 PSIG

b. Continue with Step 6. WHEN containment pressure is less than 14 PSIG, THEN do Steps 5c, d

c. Reset containment spray signal

d. Perform the following:

1) Place one CSP in the pull-to-lock position.

2) Stop the second CSP and place in the AUTO position.

3) Close the discharge MOVs

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

RCS pressure should be monitored. If RCS pressure decreases to less than 225 PSIG [630 PSIG], the RHR pumps must be manually restarted to supply water to the RCS.

6 Check If RHR Pumps Should Be Stopped:

a Check RCS pressure:

1) Pressure GREATER THAN 225 PSIG [630 PSIG]

2) Pressure - STABLE OR INCREASING

Response not obtained: a Go to Step 7

b Stop RHR pumps and place in standby

7 Initiate Evaluation Of Plant Status:

a Check auxiliary building radiation - NORMAL

Response not obtained: a Try to identify and isolate leakage

1) Verify normal radiation readings on auxiliary building process, area and vent stack monitors

b Obtain samples:

1) Request steam generator samples

2) Request a RCS boron sample

c Evaluate plant equipment

d Start additional plant equipment to assist in recovery

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Establish Charging Flow:	
	a Charging pumps - AT LEAST ONE RUNNING	a Perform the following: 1) IF CCW flow to RCP(s) thermal barrier is lost, THEN isolate seal injection flow to affected RCP(s) before starting charging pumps 2) Verify adequate diesel capacity to run charging pumps. IF necessary, shed non-essential loads (Refer to E-0, Attachment D for component KW load rating) a Start charging pumps as necessary
	b Align charging pump suction to RWST	
	c Establish maximum flow: • ADJUST HCV-3-121 AS NECESSARY	
9	Check If S/Gs Are Not Faulted:	
	a Check pressures in all S/Gs - • NO S/G PRESSURE DECREASING IN AN UNCONTROLLED MANNER • NO S/G COMPLETELY DEPRESSURIZED	a Verify all faulted S/Gs isolated unless needed for RCS cooldown. • Steamlines • Feedlines IF NOT, THEN go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1

CAUTION

Makeup water sources for CST will be necessary if level decreases to less than 10%

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Check Intact S/G Levels:	
	a Narrow range level - GREATER THAN 6% [32%]	a Maintain total feed flow greater than 130 GPM per S/G until narrow range level greater than 6% [32%] in at least one S/G

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

- *Shutdown margin should be monitored during RCS cooldown.*
- *High Steam Flow with Low Steam Generator pressure or Low TAVG SI signal should be blocked prior to cooldown. When PRZ pressure decreases to less than 2000 PSIG, the low PRZ pressure SI should be blocked.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Initiate RCS Cooldown To Cold Shutdown:	
	a Maintain cooldown rate in RCS cold legs - LESS THAN 100 F/HR	
	b Use RHR System if in service	
	c Dump steam to condenser from intact S/G(s)	c Manually dump steam from intact S/G(s) using the steam dump to atmosphere valves IF no intact S/G available, THEN perform the following • Use faulted S/G. OR • IF RHR System NOT in service, THEN use ruptured S/G
12	Check RCS Subcooling Based On Core Exit TCs - GREATER THAN 30°F [45°F]	Go to Step 23
13	Check If Subcooled Recovery Is Appropriate:	
	a. Check RWST Level - GREATER THAN 190,000 Gallons	a Refer to Figure ECA31-1 to determine expected containment sump level (equal to or greater than) depleted RWST level. IF containment sump level less than expected, THEN go to ECA-3.2, SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED, Step 1
	b. Check Ruptured S/G Narrow Range Level - LESS THAN 92% [72%]	b Consult TSC staff to determine if recovery should be completed using ECA-3.2, SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Check High-Head SI Pumps - ANY RUNNING	Go to Step 19
15	Place All PRZ Heater Switches In OFF Position	

CAUTION

Voiding may occur in the RCS during RCS depressurization. This will result in a rapidly increasing PRZ level.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	Depressurize RCS To Refill PRZ:	
	a Use normal PRZ spray	a Use one PRZ PORV. IF no PORV available, THEN use auxiliary spray
	b PRZ level - GREATER THAN 23% [50%]	b Continue with Step 17. WHEN level greater than 23% [50%], THEN do Step 16c.
	c Stop RCS depressurization	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *If seal cooling had previously been lost; the affected RCP(s) should not be started prior to a status evaluation.*
- *On natural circulation, RTD bypass temperatures and associated interlocks will be inaccurate.*

NOTE

RCPs should be run in order of priority to provide normal PRZ spray.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	Check If An RCP Should Be Started:	
	a All RCPs - STOPPED	a Stop all but one RCP. Go to Step 18
	b RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]	b Go to Step 23
	c PRZ level - GREATER THAN 23% [50%]	c Return to Step 16
	d Try to start an RCP:	
	1) Establish conditions for starting an RCP	1) Go to step 18
	(a) Verify off-site power available to the 4KV buses	
	(b) Start the oil lift pump	
	(c) Verify that the number 1 seal leakoff valve is OPEN and seal flow is established	
	(d) Verify the seal injection water flow to be approximately 8 to 12 GPM (refer to Enclosure 1 of OP-041.1, REACTOR COOLANT PUMP OPERATION)	
	(e) Verify ΔP across the thermal barrier to be 15 inches of water	
	(f) Verify GREATER THAN 200 PSID across the number 1 seal	
	(g) Verify that the oil lift pump has been running for two minutes and the oil pressure interlock light is ON	
	2) Start one RCP	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

After stopping any high-head SI pump, RCS pressure should be allowed to stabilize before stopping another SI pump.

18 Check If One High-Head SI Pump Should Be Stopped:

a Determine required RCS subcooling from table:

CHARGING PUMP STATUS	RCS SUBCOOLING (°F)			
	ANY RCP RUNNING		NO RCP RUNNING	
	ONE HIGH-HEAD PUMP RUNNING	TWO HIGH-HEAD PUMPS RUNNING	ONE HIGH-HEAD PUMP RUNNING	TWO HIGH-HEAD PUMPS RUNNING
NONE RUNNING	DO NOT STOP HIGH-HEAD SI PUMP	59° F [235°F]	DO NOT STOP HIGH-HEAD SI PUMP	70° F [226°F]
ONE RUNNING	248° F [493°F]	55° F [261°F]	247° F [481°F]	66° F [261°F]
TWO RUNNING	232° F [221°F]	52° F [232°F]	215° F [210°F]	62° F [225°F]
THREE RUNNING	199° F [244°F]	49° F [254°F]	212° F [244°F]	58° F [253°F]

b RCS subcooling based on core exit TCs - GREATER THAN REQUIRED SUBCOOLING

b. DO NOT STOP HIGH-HEAD SI PUMP. Go to Step 23

c PRZ level - GREATER THAN 25% [50%]

c DO NOT STOP HIGH-HEAD SI PUMP. Return to Step 16

d Stop one additional high-head SI pump

e Go to Step 23

19 Control Charging Flow To Maintain PRZ Level

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *If seal cooling had previously been lost, the affected RCP(s) should not be started prior to a status evaluation.*
- *On natural circulation, RTD bypass temperatures and associated interlocks will be inaccurate.*

NOTE

RCPs should be run in order of priority to provide normal PRZ spray.

20 Check RCP Status:

a RCPs - AT LEAST ONE RUNNING

a Try to start one RCP

1) Establish conditions for starting an RCP:

(a) Verify off-site power available to the 4KV buses. IF off-site power is not available THEN refer to Attachment A to verify natural circulation. IF natural circulation NOT verified, THEN increase dumping steam and go to Step 21

(b) Start the oil lift pump

(c) Verify that the number 1 seal leakoff valve is OPEN and seal flow is established

(d) Verify the seal injection water flow to be approximately 8 to 12 GPM (refer to Enclosure 1 of OP-041.1, REACTOR COOLANT PUMP OPERATION)

(e) Verify ΔP across the thermal barrier to be 15 inches of water

(f) Verify GREATER THAN 200 PSID across the number 1 seal

(g) Verify that the oil lift pump has been running for two minutes and the oil pressure interlock light is ON

2) Start one RCP. IF an RCP can NOT be started, THEN refer to Attachment A to verify natural circulation. IF natural circulation NOT verified, THEN increase dumping steam

b Stop all but one RCP

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

Voiding may occur in the RCS during RCS depressurization. This will result in a rapidly increasing PRZ level.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21	Depressurize RCS To Minimize RCS Subcooling:	
	a Use normal PRZ spray	a Use one PRZ PORV. IF no PORV available, THEN use auxiliary spray
	b Turn on PRZ heaters as necessary	
	c Depressurize RCS until EITHER of the following conditions satisfied:	
	• PRZ LEVEL - GREATER THAN 71% [50%]	
	OR	
	• RCS SUBCOOLING BASED ON CORE EXIT TCs - LESS THAN 30°F [45°F]	
22	Verify Adequate Shutdown Margin:	
	a Sample ruptured S/G(s)	
	b Sample RCS	
	c Shutdown margin - ADEQUATE	c Borate as necessary
23	Verify SI Flow Not Required:	
	a RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]	a Manually operate SI pumps as necessary. Go to Step 24
	b PRZ level - GREATER THAN 12% [50%]	b Manually operate SI pumps as necessary. Return to Step 16
24	Check If SI Accumulators Should Be Isolated:	
	a RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]	a IF RCS hot leg temperatures greater than 400°F, THEN go to Step 25. IF NOT, THEN do Steps 24b and c
	b Check power to isolation valves - AVAILABLE	b Restore power to isolation valves
	c Close all SI accumulator isolation valves	c Vent any unisolated accumulators

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25	Check If Diesel Generators Should Be Stopped:	
	a Verify 4KV buses ENERGIZED BY OFFSITE POWER	a Try to restore offsite power to 4KV buses
	b Stop any unloaded diesel generator and place in standby	
26	Minimize Secondary System Contamination:	
	a Verify CV-1500 condensate dump back to DWST - CLOSED	
	b Check ruptured S/G(s) steam dump to atmosphere valves - CLOSED	b <u>WHEN</u> ruptured S/G pressure less than <u>1060 PSIG</u>, <u>THEN</u> verify S/G steam dump to atmosphere closed. <u>IF NOT</u> closed, <u>THEN</u> place steam dump to atmosphere controller in manual and close the steam dump to atmosphere. <u>IF</u> steam dump to atmosphere can <u>NOT</u> be closed, <u>THEN</u> locally isolate steam dump to atmosphere
	c CLOSE steam supply valves from ruptured S/G(s) to AFW pump	c Manually close valves
	d Verify blowdown isolation valve(s) from ruptured S/G(s) - CLOSED	d Manually close valve(s)
27	Check RCP Cooling - NORMAL • RCP CCW SYSTEM FLOW • RCP SEAL INJECTION FLOW	Establish normal cooling to RCPs. Refer to OP-030, COMPONENT COOLING WATER, for normal valve alignment
28	Check If RCP Seal Return Flow Should Be Established:	
	a Verify CCW pump RUNNING	a Go to Step 29.
	<u>AND</u>	b Locally open valves
	b Establish Flow: 1) Verify OPEN MOV-3-381 2) OPEN MOV-3-6386	
29	Check If Source Range Detectors Should Be Energized:	
	a Check intermediate-range flux - LESS THAN 10^{-10} AMPS	a Continue with Step 30. <u>WHEN</u> flux less than 10^{-10} amps, <u>THEN</u> do Steps 29b and c
	b Verify source range detectors - ENERGIZED	b Manually energize source range detectors
	c Transfer nuclear recorders to source range scale	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
30	**Shut Down Unnecessary Plant Equipment Not Required To Maintain Hot Standby Conditions.**	

CAUTION

Feed flow should not be established to any ruptured S/G which is also faulted unless needed for RCS cooldown.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
31	Check Ruptured S/G(s) Narrow Range Level - GREATER THAN 6% [32%]	Refill ruptured S/G to 80% [53%] using feed flow. <u>IF</u> either of the following conditions occurs, <u>THEN</u> stop feed flow to the ruptured S/G unless needed for RCS cooldown. • Ruptured S/G pressure decreases in an uncontrolled manner <u>OR</u> • Ruptured S/G pressure increases to 1035 PSIG
32	Check If RCPs Must Be Stopped:	
	a. Check the following: • NUMBER 1 SEAL DIFFERENTIAL PRESSURE - LESS THAN 200 PSID <u>OR</u> • NUMBER 1 SEAL LEAKOFF FLOW - LESS THAN 0.7 GPM	a. Go to Step 33
	b. Stop affected RCP(s)	
33	Check If RHR System Can Be Placed In Service:	
	a. Check the following: • RCS temperature - LESS THAN 324°F [324°F] • RCS pressure - LESS THAN 450 PSIG [11[illegible] PSIG]	a. Go to Step 34
	b. Consult TSC engineering staff to determine if RHR System should be placed in service	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
34	Check RCS Temperatures - LESS THAN 200°F	Return to Step 10
35	Evaluate Long Term Plant Status:	
	a Maintain cold shutdown conditions	
	b Consult TSC engineering staff	

END OF TEXT

ATTACHMENT A

The following conditions support or indicate natural circulation flow under saturated conditions:

- RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]
- S/G pressures - STABLE OR DECREASING
- RCS hot leg temperatures - STABLE OR DECREASING
- Core exit TCs - STABLE OR DECREASING
- RCS cold leg temperatures - AT SATURATION TEMPERATURE FOR S/G PRESSURE

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

ATTACHMENT B

RE-ENERGIZATION OF PRESSURIZER BACKUP HEATERS

CAUTION

Loading on the EDG should not exceed the Orange mark (2000 hour rating of 2850 KW). However, loads placed on the energized 4 KV buses (the power source) may approach the Red mark (168 hour rating) on the wattmeter for short periods.

a 4KV Buses - ALL ENERGIZED

- IF EDG A is available, go to Step b
- IF EDG B is available, go to Step g

b Verify EDG A Load is LESS THAN 2300KW

b Dispatch personnel to cabinet 3B12 to OPEN all nine (9) breakers

1 Reset heater Group A lockout relay in the penetration room

2 Place control switch for Group A to the ON position

3 CLOSE 3 individual heater breakers one at a time

AND

Verify between each closure A diesel load DOES NOT exceed the capacity of the power source

4 Return to procedure and Step in effect

c. Reset lockout relay in penetration room for backup Group A

d Place control switch for Group A to the ON position

e Verify EDG A load DOES NOT exceed the capacity of the power source

f Return to procedure and Step in effect

g Place control switch for Group B backup heaters to "OFF"

h Place the keylock switch for breaker 0408 in the EMERGENCY position

i Dispatch personnel to cabinet 3B13 to OPEN all nine (9) breakers

j. Place console control switch to the ON position

k CLOSE 3 individual heater breakers one at a time

AND

Verify between each closure B diesel load DOES NOT exceed the capacity of the power source

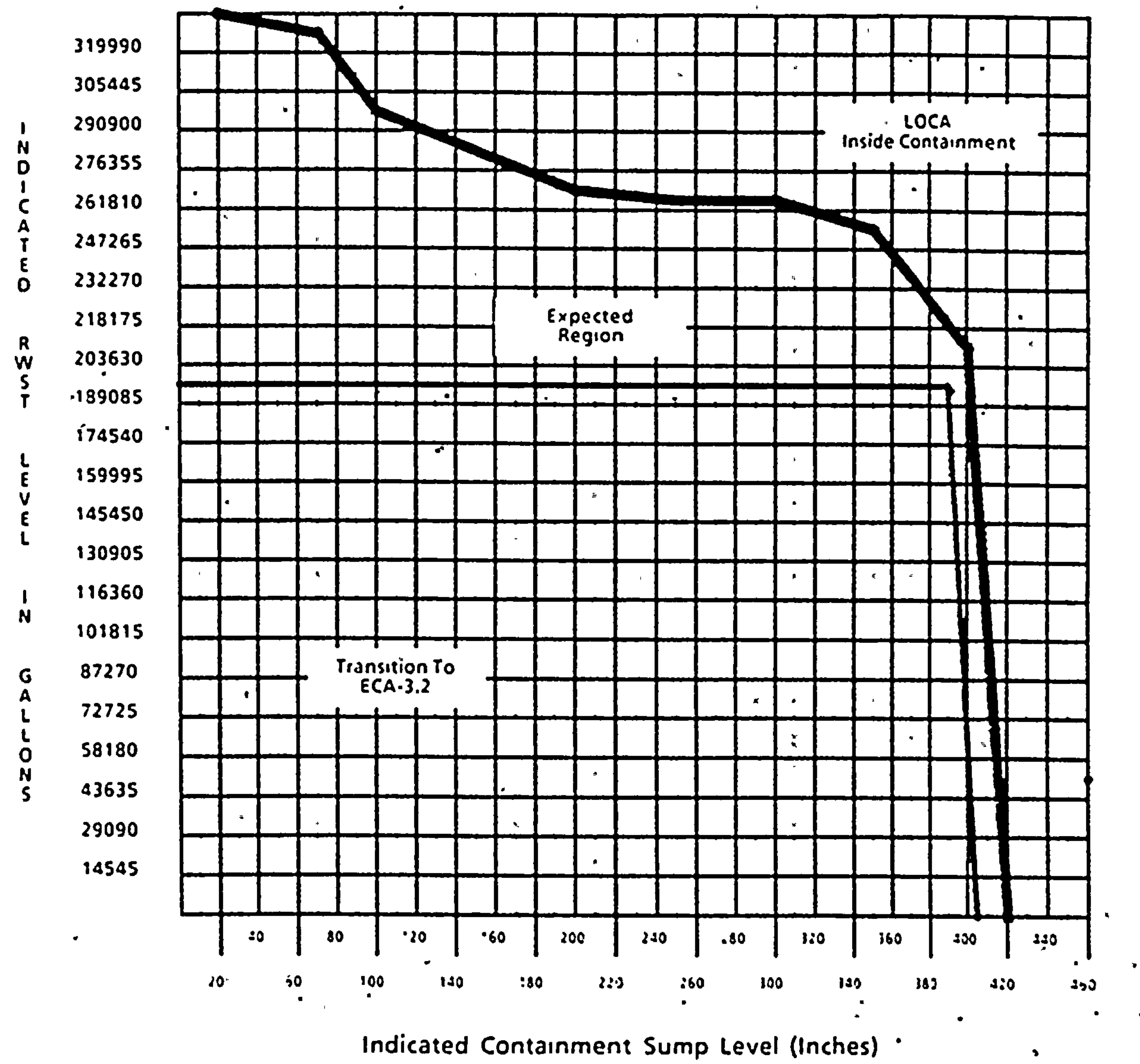
l Return to procedure and Step in effect

- END OF TEXT -

Procedure No.	Procedure Title	Page
3-EOP-ECA-3.1	SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED	18
		Approval Date 6/16/87

FIGURE ECA 31-1

CONTAINMENT SUMP LEVEL vs. RWST LEVEL



FOLDOUT FOR ECA-3.1 PROCEDURE

1 **SI REINITIATION CRITERIA**

Manually operate SI pumps as necessary if EITHER condition listed below occurs:

- RCS SUBCOOLING BASED ON CORE EXIT TCs - LESS THAN 30°F [45°F]
- PRZ LEVEL - CANNOT BE MAINTAINED GREATER THAN 12% [50%]

2. **RED PATH SUMMARY**

a SUBCRITICALITY - Nuclear power GREATER THAN 5%

b CORE COOLING - Core exit TCs GREATER THAN 1200°F

c HEAT SINK - Narrow range level in all S/Gs LESS THAN 32% AND total feedwater flow LESS THAN 130 GPM per S/G

d. INTEGRITY - Cold leg temperature decrease GREATER THAN 100°F in last 60 minutes AND RCS cold leg temperature LESS THAN 317°F

e. CONTAINMENT - Containment pressure GREATER THAN 59 PSIG

3. **SECONDARY INTEGRITY CRITERIA**

Go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1, if any S/G pressure is decreasing in an uncontrolled manner or has completely depressurized, and has not been isolated, unless needed for RCS cooldown

4. **COLD LEG RECIRCULATION SWITCHOVER CRITERIA**

Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1, if RWST level decreases to LESS THAN 155,000 gallons.

5. **CST MAKEUP WATER CRITERIA**

Makeup water sources for the CST will be necessary if level decreases to LESS THAN 10%

6 **ADVERSE CONTAINMENT CONDITIONS**

Adverse Containment conditions are defined as either a Containment Atmosphere temperature of ≥180°F or Containment radiation levels equal to or greater than 1.3 x 10^5 R/hr. Under these conditions the setpoint values in brackets, [ ], are required to be used.

If the Containment temperature subsequently falls below 180°F, the normal setpoint values may be used. If the Containment radiation level subsequently falls below 1.3 x 10^5 R/hr, the adverse Containment setpoints are required to be used until permission is granted by the Technical Support Staff to use normal setpoints.

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ECA-3.2 (Sheet 1 of 1)

EOP Title: SGTR With Loss of Reactor Coolant - Saturated Recovery Desired

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
1	1	7	Step 1 provides plant specific means for adding makeup to the refueling water storage tank. See attached procedure.
10d	10d	7	Step 10d provides plant specific conditions for starting a reactor coolant pump. See attached procedure.
12	12	2	Step 12 has been modified to include vendor supplied reactor vessel level monitor equipment which is not RCP flow dependent. See attached procedure.
13a	13a RNO	7	Step 13a RNO provides plant specific means for establishing reactor coolant pump start conditions. See attached procedure.
16	16	2	Step 16 has been modified to include vendor supplied reactor vessel level monitor system which is not reactor coolant pump flow dependent. See attached procedure.
19	19	7	Step 19 provides plant specific method for minimizing secondary system contamination. See attached procedure.
20	20 RNO	7	Step 20 stipulates the plant specific procendure for establishing normal reactor coolant pump cooling. See attached procedure.
21	21	7	Step 21 provides the plant specific method for establishing reactor coolant pump seal return flow. See attached procedure.
	Caution prior to Step 3	7	The caution prior to Step 3 provides plant specific information on providing a steam supply to the B Auxilary Feedwater Pump, assuming Steam Generator A is faulted.
Note 2 prior to Step 5	Note 2 prior to Step 5	7	The second note prior to Step 5 provides plant specific safety injection block information.
26	26b	7	Step 26b provides the plant specific procedure for placing the Residual Heat Removal System in service.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-ECA-3.2

Title:

SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	87-009
Approved by Plant Manager-N:	1/7/87

RTSs 86-1092P, 86-1832P

LIST OF EFFECTIVE PAGES

Page	Revision Date
1	01/07/87
2	01/07/87
3	01/07/87
4	01/07/87
5	01/07/87
6	01/07/87
7	01/07/87
8	01/07/87
9	01/07/87
10	01/07/87
11	01/07/87
12	01/07/87
13	01/07/87
14	01/07/87
15	01/07/87

1.0 PURPOSE

This procedure provides actions to cool down and depressurize the RCS to cold shutdown conditions while minimizing loss of RCS inventory.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from:

1) ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 13, when RWST level is low without a corresponding increase in containment sump level.

2) ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 13, when the ruptured S/G level is high and plant staff selects saturated recovery method.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *If RWST level decreases to less than 115,000 gallons the SI system should be aligned for cold leg recirculation using ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.*
- *RCS pressure should be monitored. If RCS pressure decreases to less than 225 PSIG [630 PSIG] the RHR pumps must be manually restarted to supply water to the RCS.*

NOTE

- *The first thirteen steps of ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, should be performed before continuing with this procedure.*
- *Foldout page should be open.*

1 Add Makeup To RWST As Necessary:

a. Determine quantity of boron and water to be supplied to blender to provide a boron concentration greater than 1950 ppm per boron change table, Section 3 of the Plant Curve Book

b. CLOSE FCV-3-113B and 114B

c. OPEN valves 3-365A and 3-365B

d. Verify MOV-3-350 CLOSED

e. Verify valve 356 CLOSED

f. Place reactor makeup selector in borate position

g. Place FCV-3-113A and 114A AUTO-MANUAL stations in manual

h. Place control switch for FCV-3-113A in AUTO

i. Place control switch for FCV-3-114A in OPEN

j. Adjust boric acid and primary water batch integrators

k. Place boric acid pump selector switch in AUTO position

l. Place reactor makeup control in start and adjust boron and primary water flow by manually controlling FCV-3-113A and 114A

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	Check If RHR Pumps Should Be Stopped:	
	a. Check RCS pressure: 1) Pressure - GREATER THAN 225 PSIG [630 PSIG] 2) Pressure - STABLE OR INCREASING	a. Go to Step 3
	b. Stop RHR pumps and place in standby	

CAUTION

In the event that S/G A is faulted, valves 3-006 and 3-007 will require repositioning to provide steam supply to the B AFW pump.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Check If S/Gs Are Not Faulted:	
	a. Check pressures in all S/Gs - • NO S/G PRESSURE DECREASING IN AN UNCONTROLLED MANNER • NO S/G COMPLETELY DEPRESSURIZED	a. Verify all faulted S/Gs isolated unless needed for RCS cooldown: • Steamlines • Feedlines IF NOT, THEN go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.

CAUTION

Makeup water sources for CST will be necessary if level decreases to less than 10%.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Check Intact S/G Levels:	
	a. Narrow range level - GREATER THAN 6% [32%]	a. Maintain total feed flow greater than 130 GPM per S/G until narrow range level greater than 6% [32%].
	b. Control feed flow to maintain narrow range level between 6% [32%] and 50%	b. IF narrow range level in any intact S/G continues to increase in an uncontrolled manner, THEN go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

- *Shutdown margin should be monitored during RCS cooldown.*
- *High Steam Flow with Low Steam Generator pressure or Low TAVG SI signal should be blocked prior to cooldown. When PRZ pressure decreases to less than 2000 PSIG, the low PRZ pressure SI should be blocked.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Initiate RCS Cooldown To Cold Shutdown:	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Use RHR system if in service	
	c. Dump steam to condenser from intact S/G(s)	c. Manually dump steam from intact S/G(s) using steam dump to atmosphere valves IF no intact S/G available, THEN perform the following: • Use faulted S/G. OR • IF RHR system NOT in service, THEN use ruptured S/G.
6	Check RCS Subcooling Based On Core Exit TCs - GREATER THAN 30°F [45°F]	Go to Step 16.
7	Check High-Head SI Pumps - ANY RUNNING	Go to Step 12.
8	Place All PRZ Heater Switches In OFF Position	

CAUTION

Voiding may occur in the RCS during RCS depressurization. This will result in a rapidly increasing PRZ level.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Depressurize RCS To Refill PRZ:	
	a. Use normal PRZ spray	a. Use one PRZ PORV. IF no PORV available, THEN use auxiliary spray.
	b. PRZ level - GREATER THAN 12% [50%]	b. Continue with Step 10. WHEN level greater than 12% [50%] THEN do Step 9c.
	c. Stop RCS depressurization	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *If seal cooling had previously been lost, the affected RCP(s) should not be started prior to a status evaluation.*
- *On natural circulation, RTD bypass temperatures and associated interlocks will be inaccurate.*

NOTE

RCPs should be run in order of priority to provide normal PRZ spray.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Check If An RCP Should Be Started:	
	a. All RCPs - STOPPED	a. Stop all but one RCP. Go to Step 11.
	b. RCS subcooling based on core exit TCs - GREATER THAN 30°F [45%]	b. Go to Step 16.
	c. PRZ level - GREATER THAN 12% [50%]	c. Return to Step 9.
	d. Try to start an RCP:	
	1) Establish conditions for starting an RCP:	1) Go to step 11
	a) Verify off-site power available to the 4 KV buses	
	b) Start the oil lift pump	
	c) Verify that the number 1 seal leakoff valve is OPEN and seal flow is established	
	d) Verify the seal injection water flow to be approximately 8 to 12 GPM (refer to Enclosure 1 of OP-041.1, REACTOR COOLANT PUMP OPERATION)	
	e) Verify ΔP across the thermal barrier to be 15 inches of water	
	f) Verify GREATER THAN 200 PSID across the number 1 seal	
	g) Verify that the oil lift pump has been running for two minutes and the oil pressure interlock light is ON.	
	2) Start one RCP	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

After stopping any high-head SI pump, RCS pressure should be allowed to stabilize before stopping another SI pump.

11 Check If One High-Head SI Pump Should Be Stopped:

a. Determine required RCS subcooling from table:

CHARGING PUMP STATUS	RCS SUBCOOLING (°F)	
	ONE HIGH-HEAD PUMP RUNNING	TWO HIGH-HEAD PUMPS RUNNING
NONE RUNNING	DO NOT STOP HIGH-HEAD SI PUMP	50 °F [235°F]
ONE RUNNING	250°F [380°F]	48 °F [233°F]
TWO RUNNING	188 °F [221°F]	50 °F [233°F]
THREE RUNNING	130 °F [190°F]	48 °F [231°F]

b. RCS subcooling based on core exit TCs - GREATER THAN REQUIRED SUBCOOLING

Response not obtained: b. DO NOT STOP HIGH-HEAD SI PUMP. Go to Step 16.

c. PRZ level - GREATER THAN 12% [50%]

Response not obtained: c. DO NOT STOP HIGH-HEAD SI PUMP. Return to Step 9.

d. Stop one additional high-head SI pump

e. Go to Step 16

12 Control Charging Flow To Maintain Reactor Coolant Inventory:

- RVLMS GREATER THAN 40%

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *If seal cooling had previously been lost, the affected RCP(s) should not be started prior to a status evaluation.*
- *On natural circulation, RTD bypass temperatures and associated interlocks will be inaccurate.*

NOTE

RCPs should be run in order of priority to provide normal PRZ spray.

13 Check RCP Status:

a. RCPs - AT LEAST ONE RUNNING

Response not obtained:

a. Try to start one RCP:

1) Establish conditions for starting an RCP:

a) Verify off-site power available to the 4 KV buses, IF off-site power is not available THEN go to step 14.

b) Start the oil lift pump

c) Verify that the number 1 seal leakoff valve is OPEN and seal flow is established.

d) Verify the seal injection water flow to be approximately 8 to 12 GPM (refer to Enclosure 1 of OP-041.1, REACTOR COOLANT PUMP OPERATION).

e) Verify ΔP across the thermal barrier to be 15 inches of water.

f) Verify GREATER THAN 200 PSID across the number 1 seal.

g) Verify that the oil lift pump has been running for two minutes and the oil pressure interlock light is ON.

2) Start one RCP. IF an RCP can NOT be started, THEN refer to ATTACHMENT A to verify natural circulation. IF natural circulation NOT verified, THEN increase dumping steam.

b. Stop all but one RCP

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

Voiding may occur in the RCS during RCS depressurization. This will result in a rapidly increasing PRZ level.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Depressurize RCS To Saturation At Core Exit:	
	a. Determine saturation pressure for core exit TCs	
	b. Use normal PRZ spray	b. Use one PRZ PORV. IF no PORV available, THEN use auxiliary spray.
	c. Turn on PRZ heaters as necessary	
	d. Depressurize RCS until EITHER of the following conditions satisfied: • PRZ LEVEL - GREATER THAN 71% [50%] OR • RCS PRESSURE - AT SATURATION FROM STEP 14A	
15	Verify Adequate Shutdown Margin:	
	a. Sample ruptured S/G(s)	
	b. Sample RCS	
	c. Shutdown margin - ADEQUATE	c. Borate as necessary.
16	Verify SI Flow Not Required:	
	a. Core exit TCs - DECREASING	a. Increase dumping steam. IF core exit TCs do NOT decrease, THEN manually operate SI pumps as necessary.
	b. Check RVLMS indication - GREATER THAN 40%	b. Manually operate SI pumps as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	Check If SI Accumulators Should Be Isolated:	
	a. RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]	a. IF RCS hot leg temperatures greater than 400°F, THEN go to Step 18. IF NOT, THEN do Steps 17b and c.
	b. Check power to isolation valves - AVAILABLE	b. Restore power to isolation valves.
	c. Close all SI accumulator isolation valves	c. Vent any unisolated accumulators.
18	Check If Diesel Generators Should Be Stopped:	
	a. Verify 4 KV buses - ENERGIZED BY OFFSITE POWER	a. Try to restore offsite power to 4 KV buses.
	b. Stop any unloaded diesel generator and place in standby	
19	Minimize Secondary System Contamination:	
	a. Verify closed CV-3-1500 condensate dump back to DWST	a. Manually isolate valve.
20	Check RCP Cooling - NORMAL • VERIFY CCW FLOW TO THE SEAL WATER HEAT EXCHANGER • RCP SEAL INJECTION FLOW	Establish normal cooling to RCPs. Refer to OP-030, COMPONENT COOLING WATER, while continuing with this procedure.
21	Check If RCP Seal Return Flow Should Be Established:	
	a. Verify CCW pump RUNNING AND CCW surge tank level NORMAL	a. Go to Step 22.
	b. Establish flow 1) Verify open MOV-3-381 2) OPEN MOV-3-6386	b. Locally OPEN valves

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22	Check If Source Range Detectors Should Be Energized:	
	a. Check intermediate range flux - LESS THAN 10^{-10} amps	a. Continue with Step 23. WHEN flux less than 10^{-10} amps THEN do Steps 22b and c.
	b. Verify source range detectors - ENERGIZED	b. Manually energize source range detectors.
	c. Transfer nuclear recorders to source range scale.	
23	Shut Down Unnecessary Plant Equipment Not Required To Maintain Hot Standby Conditions	

CAUTION

Feed flow should not be initiated to any ruptured S/G if it is faulted unless needed for RCS cooldown.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24	Check Ruptured S/G(s) Narrow Range Level - GREATER THAN 6% [32%]	Refill ruptured S/G to 80% [53%] using feed flow. IF either of the following conditions occurs, THEN stop feed flow to the ruptured S/G unless needed for RCS cooldown: • Ruptured S/G pressure decreases in an uncontrolled manner. OR • Ruptured S/G pressure increases to 1035 psig.
25	Check If RCPs Must Be Stopped:	
	a. Check the following: • NUMBER 1 SEAL DIFFERENTIAL PRESSURE - LESS THAN 200 PSIG OR • NUMBER 1 SEAL LEAKOFF FLOW - LESS THAN 0.7 GPM	a. Go to Step 26.
	b. Stop affected RCP(s)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26	Check If RHR System Can Be Placed In Service:	
	a. Check the following: • RCS TEMPERATURE - LESS THAN 324°F [324°F] • RCS PRESSURE - LESS THAN 450 PSIG [110 PSIG]	a. Go to Step 27.
	b. Consult TSC staff to determine if RHR system should be placed in service. If so, refer to OP-050, RESIDUAL HEAT REMOVAL SYSTEM	
27	Check RCS Temperatures - LESS THAN 200°F	Return to Step 4.
28	Evaluate Long Term Plant Status:	
	a. Maintain cold shutdown conditions	
	b. Consult TSC staff	

END OF TEXT

ATTACHMENT A

The following conditions support or indicate natural circulation flow under saturated conditions:

- S/G pressures - STABLE OR DECREASING
- RCS hot leg temperatures - STABLE OR DECREASING
- Core exit TCs - STABLE OR DECREASING
- RCS cold leg temperatures - AT SATURATION TEMPERATURE FOR S/G PRESSURE

FOLDOUT FOR ECA-3.2 PROCEDURE

1. SI REINITIATION CRITERIA

Manually operate SI pumps as necessary if EITHER condition listed below occurs:

- CORE EXIT TCs - INCREASING
- RVLMS - PLENUM LESS THAN 40%

2. RED PATH SUMMARY

a. SUBCRITICALITY - Nuclear power GREATER THAN 5%

b. CORE COOLING - Core exit TCs GREATER THAN 1200°F

c. HEAT SINK - Narrow range level in all S/Gs LESS THAN 32% AND total feedwater flow LESS THAN 130 GPM per S/G.

d. INTEGRITY - Cold leg temperature decrease GREATER THAN 100°F in last 60 minutes AND RCS cold leg temperature LESS THAN 317°F

e. CONTAINMENT - Containment pressure GREATER THAN 59 PSIG

3. SECONDARY INTEGRITY CRITERIA

Go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1, if any S/G pressure is decreasing in an uncontrolled manner or has completely depressurized, and has not been isolated, unless needed for RCS cooldown.

4. COLD LEG RECIRCULATION SWITCHOVER CRITERIA

Go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1, if RWST level decreases to LESS THAN 115,000 gallons.

5. CST MAKEUP WATER CRITERIA

Makeup water sources for the CST will be necessary if level decreases to LESS THAN 10%.

6. ADVERSE CONTAINMENT CONDITIONS

Adverse Containment conditions are defined as either a Containment Atmosphere temperature of 180°F or Containment radiation levels equal to or greater than 1.3×10^5 R/hr. Under these conditions the setpoint values in brackets, [ ], are required to be used.

If the Containment temperature subsequently falls below 180°F, the normal setpoint values may be used. If the Containment radiation level subsequently falls below 1.3×10^5 R/hr, the adverse Containment setpoints are required to be used until permission is granted by the Technical Support Staff to use normal setpoints.

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-ECA-3.3

EOP Title: SGTR Without Pressurizer Pressure Control

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
2a RNO	2a RNO	7	Step 2a RNO provides plant specific conditions for starting an RCP. See attached procedure.
3	3.a.1	7	Step 3.a.1 provides plant specific means required to establish conditions for opening a pressurizer power operated relief valve. See attached procedure.
9b	9b	7	Step 9b provides plant specific means for establishing charging flow. See attached procedure.
12	12	7	Step 12 provides plant specific means for establishing letdown flow and excess letdown flow. See attached procedure.
16	16	7	Step 16 provides plant specific means for minimizing secondary system contamination. See attached procedure.
17	17	7	Step 17 provides plant specific means for establishing RCP seal return flow. See attached procedure.
18	18	7	Step 18 refers to plant specific procedure for establishing normal cooling to the reactor coolant pumps. See attached procedure.
23	23	7	Step 23 provides plant specific means for maintaining reactor coolant pump seal injection flow. See attached procedure.
30c	30c	7	Step 30c stipulates the plant specific procedure for placing the residual heat removal system in service. See attached procedure.
Foldout 4	Foldout 4	2	AFW supply switchover criterion has been changed due to plant specific design. See attached procedure.
	Foldout 5	7	Foldout 5 defines adverse containment conditions and their use.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-ECA-3.3

Title:

SGTR WITHOUT PRESSURIZER PRESSURE CONTROL

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	86-191
Approved by Plant Manager-N:	7/27/86

RTS 86-1092P

*/GAY/ec

1.0 PURPOSE

This procedure provides actions for a SGTR with coincident loss of normal and auxiliary pressurizer sprays and pressurizer PORVs.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from E-3, STEAM GENERATOR TUBE RUPTURE, Step 19, when pressurizer pressure control is not available.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

Foldout page should be open.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Check Ruptured S/G(s) Narrow Range Level - LESS THAN 80% [53%]	Go to Step 7.
2	Try To Establish Normal PRZ Spray:	
	a. Check RCP status - AT LEAST ONE RUNNING IN LOOP WITH SPRAY LINE	a. Try to start one RCP in loop with spray line: 1) Establish conditions for starting an RCP: a) Verify off-site power available to the 4KV busses. <u>IF</u> off-site power is not available <u>THEN</u> go to Step 3. b) Start the oil lift pump. c) Verify that the number 1 seal leakoff valve is OPEN and seal flow is established. d) Verify the seal injection water flow to be approximately 8 to 12 GPM (refer to Enclosure 1 of OP-041.1, REACTOR COOLANT PUMP OPERATION). e) Verify ΔP across the thermal barrier to be 15 inches of water. f) Verify GREATER THAN 200 PSID across the number 1 seal. g) Verify that the oil lift pump has been running for two minutes and the oil pressure interlock light is ON. 2) Start one RCP. <u>IF</u> an RCP can <u>NOT</u> be started, <u>THEN</u> go to Step 3.
	b. Normal spray - AVAILABLE	b. Go to Step 3.
	c. Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 18	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	**Try To Restore PRZ PORV:**	
	a. Establish conditions for opening a PRZ PORV: 1) Investigate cause of PORV failure and repair	a. IF no PRZ PORV can be opened, THEN go to Step 4.
	b. Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 19	
4	**Try To Establish Auxiliary Spray:**	
	a. Establish auxiliary spray flow:	a. IF auxiliary spray can NOT be established, THEN go to Step 5.
	b. Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 18b	

CAUTION

Makeup water sources for CST will be necessary if level decreases to less than 10%.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	**Check Intact S/G Levels:**	
	a. Narrow range level - GREATER THAN 6% [32%]	a. Maintain total feed flow greater than 130 GPM per S/G until narrow range level greater than 6% [32%] in at least one S/G.
	b. Control feed flow to maintain narrow range level between 6% [32%] and 50%.	b. IF narrow range level in any intact S/G continues to increase in an uncontrolled manner, THEN go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.
6	**Check PRZ Level - GREATER THAN 12% [50%]**	Return to Step 1.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	**Check If SI Can Be Terminated:**	
	a. RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]	a. DO NOT STOP SI PUMPS. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT-SUBCOOLED RECOVERY DESIRED, Step 1.
	b. Secondary heat sink: • TOTAL FEED FLOW TO S/Gs - GREATER THAN 130 GPM per S/G AVAILABLE <u>OR</u> • NARROW RANGE LEVEL IN AT LEAST ONE INTACT S/G - GREATER THAN 6% [32%]	b. <u>IF</u> neither conditions satisfied, <u>THEN</u> DO NOT STOP SI PUMPS. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	c. RVLMS (QSPDS) plenum indication - GREATER THAN 0%	c. DO NOT STOP SI PUMPS. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	d. Any ruptured S/G narrow range level - INCREASING IN AN UNCONTROLLED MANNER OR OFFSCALE HIGH	d. DO NOT STOP SI PUMPS. Return to Step 2.
8	**Stop High-Head SI Pumps And Place In Standby**	
9	**Check If Charging Flow Has Been Established:**	
	a. Charging pumps - AT LEAST ONE RUNNING	a. Perform the following: 1) <u>IF</u> CCW flow to RCP(s) thermal barrier is lost, <u>THEN</u> isolate seal injection to affected RCP(s) before starting charging pumps. 2) Verify adequate diesel capacity to run Charging Pumps, if necessary shed non-essential loads. (Refer to E-0, Attachment D for component KW load rating.) 3) Start Charging Pumps as necessary.
	b. Establish flow as necessary: 1) Adjust HCV-3-121 to desired flow	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Verify SI Flow Not Required: • RCS SUBCOOLING BASED ON CORE EXIT TCs - GREATER THAN 30°F [45°F] • RVLMS (QSPDS) PLENUM INDICATION - GREATER THAN 0%	Manually operate SI pumps as necessary. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
11	Check VCT Makeup Control System: a. Makeup set for greater than RCS boron concentration b. Makeup set for automatic control	Adjust controls as necessary.
12	Establish Letdown: a. Verify CCW flow to the nonregenerative letdown heat exchanger b. Verify letdown orifice isolation valves - CLOSED c. OPEN the letdown containment isolation valve, CV-3-204 d. OPEN the letdown line isolation valve, LCV-3-460 e. OPEN the letdown orifice isolation valves as necessary	Establish excess letdown: 1) Verify OPEN FC-3-739, excess letdown heat exchanger CCW outlet valve 2) Verify HCV-3-137, excess letdown heat exchanger outlet valve - CLOSED 3) Verify CV-3-389 excess letdown heat exchanger divert valve is at the desired position: a) DIVERT to RCDT b) NORMAL to VCT 4) OPEN CV-3-387, excess letdown heat exchanger inlet valve 5) OPEN HCV-3-137, excess letdown heat exchanger outlet valve 6) Verify delta T across the excess letdown heat exchanger
13	Check Charging Pump Suction - ALIGNED TO VCT	Align suction to VCT.
14	Equalize Charging And Letdown Flows: a. Take manual control of charging and letdown b. Control charging and seal injection flows to equal letdown and seal leakoff flows	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	**Check If Diesel Generators Should Be Stopped:**	
	a. Verify 4KV busses - ENERGIZED BY OFFSITE POWER	a. Try to restore offsite power to 4KV busses.
	b. Stop any unloaded diesel generator and place in standby	
16	**Minimize Secondary System Contamination:**	
	a. Verify Closed CV-3-1500 condensate dump back to DWST	
17	**Check If RCP Seal Return Flow Should Be Established:**	
	a. Verify CCW pump RUNNING AND CCW surge tank level NORMAL	a. Go to Step 18.
	b. Establish flow: 1) Verify open MOV-3-381 2) OPEN MOV-3-6386	b. Locally open valves.
	c. Adjust HCV-3-121 to maintain a ΔP GREATER THAN 15 inches of water across the thermal barrier	
18	**Check RCP Cooling - NORMAL** • RCP CCW SYSTEM FLOW • RCP SEAL INJECTION FLOW	Establish normal cooling to RCPs. Refer to procedure OP-30, COMPONENT COOLING WATER SYSTEM.
19	**Check If Source Range Detectors Should Be Energized:**	
	a. Check intermediate range flux - LESS THAN 10^{-10} amps	a. Continue with Step 20. <u>WHEN</u> flux less than 10^{-10} amps, <u>THEN</u> do Steps 19b and c.
	b. Verify source range detectors - ENERGIZED	b. Manually energize source range detectors.
	c. Transfer nuclear recorders to source range scale	
20	**Shut Down Unnecessary Plant Equipment Not Required To Maintain Hot Standby Conditions**	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

TSC staff should decide whether to repair PRZ pressure control systems or continue with this procedure. If PRZ pressure control is established, further recovery should continue with E-3, STEAM GENERATOR TUBE RUPTURE, Step 29.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
21	Check If SI Accumulators Should Be Isolated:	
	a. Check RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]	a. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT - SUBCOOLED RECOVERY DESIRED, Step 1.
	b. Check power to isolation valves - AVAILABLE	b. Restore power to isolation valves.
	c. Close all SI accumulator isolation valves	c. Vent any unisolated accumulator.
22	Verify Adequate Shutdown Margin:	
	a. Sample ruptured S/G(s)	
	b. Sample RCS	
	c. Shutdown margin - ADEQUATE	c. Borate as necessary.
23	Maintain Required RCP Seal Injection Flow:	
	a. ΔP across the RCP thermal barrier GREATER THAN 15" water	
24	Initiate RCS Cooldown To 324°F [324°F]	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Dump steam to condenser from intact S/G(s)	b. Manually dump steam from intact S/G(s) using Steam Dump To Atmosphere Valves IF No intact S/G available, THEN use faulted S/G.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

RCS and ruptured S/G(s) pressures must be maintained less than the ruptured S/G(s) steam dump to atmosphere valve setpoint.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25	Control Charging Flow To Maintain RCS Subcooling:	
	a. RCS subcooling based on core exit TCs - GREATER THAN 25°F [65°F]	a. Increase charging flow to maintain subcooling greater than 30°F [45°F]. Go to Step 26.
	b. Any ruptured S/G narrow range level - LESS THAN 90% [72%]	b. Control charging flow to maintain RCS pressure at ruptured S/G(s) pressure. Go to Step 26.
	c. Ruptured S/G(s) narrow range level - STABLE OR DECREASING	c. Decrease charging flow to stabilize level. Maintain RCS subcooling greater than 30°F [45°F]
26	Check If RCS Cooldown Should Be Stopped:	
	a. RCS temperatures - LESS THAN 324°F [324°F]	a. Return to Step 22.
	b. Stop RCS cooldown	
27	Check RCS Pressure - GREATER THAN 450 PSIG [110 PSIG]	Go to Step 30.
28	Check Ruptured S/G(s) Narrow Range Level - GREATER THAN 6% [32%]	Refill ruptured S/G to 80% [53%] using feed flow. <u>IF</u> either of the following conditions occurs, <u>THEN</u> stop feed flow to ruptured S/G: • Ruptured S/G pressure decreases in an uncontrolled manner. <u>OR</u> • Ruptured S/G pressure increases to 1035 PSIG.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *Steam should not be released from a ruptured S/G if water may exist in its steamline.*
- *Ruptured S/G pressure may decrease rapidly when steam is released.*

NOTE

The upper head region may void during RCS depressurization if RCPs are not running. This may result in a rapidly increasing PRZ level.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
29	Depressurize RCS And Ruptured S/G(s) To 450 PSIG [110 PSIG]	
	a. Perform the following: • DECREASE CHARGING AND INCREASE LETDOWN TO INITIATE BACKFILL OR • INITIATE BLOWDOWN FROM RUPTURED S/G(s) OR • DUMP STEAM FROM RUPTURED S/G(s)	
	b. Check RCS pressure - LESS THAN 450 PSIG [110 PSIG]	b. Return to Step 28.
	c. Stop RCS depressurization	
30	Check If RHR System Can Be Placed In Service:	
	a. RCS temperature - LESS THAN 324°F [324°F]	a. Return to Step 24.
	b. RCS pressure - LESS THAN 450 PSIG [110 PSIG]	b. Return to Step 28.
	c. Place RHR System in service using OP-50, RHR SYSTEM	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
31	Verify Adequate Shutdown Margin:	
	a. Sample ruptured S/G(s)	
	b. Sample RCS	
	c. Shutdown margin - ADEQUATE	c. Borate as necessary.
32	Initiate RCS Cooldown To Cold Shutdown:	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Use RHR System	
	c. Dump steam to condenser from intact S/G(s)	Manually or locally dump steam from intact S/G(s) using steam dump to atmosphere valves. IF no intact S/G available and RHR System NOT in service, THEN use faulted S/G.
33	Control Charging Flow To Maintain RCS Subcooling:	
	a. RCS subcooling based on core exit TCs - GREATER THAN 25°F [65°F]	a. Increase charging flow to maintain subcooling greater than 25°F [65°F]. Go to Step 34.
	b. Any ruptured S/G narrow range level - LESS THAN 90% [72%]	b. Control charging flow to maintain RCS pressure equal to ruptured S/G(s) pressure. Go to Step 34.
	c. Ruptured S/G(s) narrow range level - STABLE OR DECREASING	c. Decrease charging flow to stabilize level. Maintain RCS subcooling greater than 25°F [65°F].
34	Check If RCPs Must Be Stopped:	
	a. Check the following: • NUMBER 1 SEAL DIFFERENTIAL PRESSURE - LESS THAN 200 PSID OR • NUMBER 1 SEAL LEAKOFF FLOW - LESS THAN 0.7 GPM	a. Go to Step 35.
	b. Stop affected RCP(s)	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
35	Check RCS Temperatures - LESS THAN 200°F	Return to Step 31.
36	Evaluate Long Term Plant Status: a. Maintain cold shutdown conditions b. Consult TSC staff	

END OF TEXT

*/GAY/ec

FOLDOUT FOR ECA-3.3 PROCEDURE

1. SI REINITIATION CRITERIA

Manually operate SI pumps as necessary if EITHER condition listed below occurs:

- RCS SUBCOOLING BASED ON CORE EXIT TCs - LESS THAN 30°F [45°F]
- RVLMS (QSPDS) PLENUM INDICATION - LESS THAN 0%

2. RED PATH SUMMARY

a. SUBCRITICALITY - Nuclear power GREATER THAN 5%

b. CORE COOLING - Core exit TCs GREATER THAN 1200°F

c. HEAT SINK - Narrow range level in all S/Gs LESS THAN 32% AND total feedwater flow LESS THAN 130 GPM per S/G

d. INTEGRITY - Cold leg temperature decrease GREATER THAN 100°F in last 60 minutes AND RCS cold leg temperature LESS THAN 317°F

e. CONTAINMENT - Containment pressure GREATER THAN 59 PSIG

3. SECONDARY INTEGRITY CRITERIA

Go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1, if any S/G pressure is decreasing in an uncontrolled manner or has completely depressurized, and has not been isolated, unless needed for RCS cooldown.

4. CST MAKEUP WATER CRITERIA

Makeup water sources for the CST will be necessary if level decreases to LESS THAN 10%.

5. ADVERSE CONTAINMENT CONDITIONS

Adverse Containment conditions are defined as either a Containment Atmosphere temperature of 180°F or Containment radiation levels equal to or greater than 1.3×10^5 R/hr. Under these conditions the setpoint values in brackets, [ ], are required to be used.

If the Containment temperature subsequently falls below 180°F, the normal setpoint values may be used. If the Containment radiation level subsequently falls below 1.3×10^5 R/hr, the adverse Containment setpoints are required to be used until permission is granted by the Technical Support Staff to use normal setpoints.

FINAL PAGE

*/GAY/rc

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-F-0, ENC. F-0.2 (Sheet 1 of 1)

EOP Title: Critical Safety Function Status Trees

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
F-0.2	F-0.2	4	RVLIS Full Range Level and RVLIS Dynamic Head Range Status Tree blocks have been deleted due to Turkey Points vendor supplied Reactor Vessel Level Monitor System which is not reactor coolant pump flow dependent. Entry to function responses to critical challenges have been structured to be in the most conservative response. See attached procedure.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-F-0

Title:

CRITICAL SAFETY FUNCTION STATUS TREES

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	87-009
Approved by Plant Manager-N:	1/7/87

RTS 86-1092P, 86-1832P

LIST OF EFFECTIVE PAGES

Page	Revision Date
1	01/07/87
2	01/07/87
3	01/07/87
4	01/07/87
5	01/07/87
6	01/07/87
7	01/07/87
8	01/07/87
9	01/07/87
10	01/07/87
11	01/07/87

1.0 PURPOSE

1.1 The Critical Function Status Tree provides direction to identify the status of critical safety functions independent of the event scenario.

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 This procedure shall be monitored when the symptoms at the emergency transient result in a transition from E-0.

2.2 This procedure will be monitored after entering Emergency. Operating Procedure E-0 Step 28 and thereafter until exit from emergency conditions.

2.3 When status trees are being monitored, the following rules of usage will apply.

1. Status trees should continuously be monitored in order of critical safety function priority.

2. If an extreme challenge (RED PATH) is diagnosed, the operator should immediately stop optimal recovery and initiate functional restoration to restore the critical safety function under extreme challenge.

3. If a severe challenge (ORANGE PATH) is diagnosed, the operator should continue to check the status of all critical safety functions. The operator should then stop optimal recovery and initiate functional restoration to restore the highest priority critical safety function under severe challenge.

4. If a not satisfied condition (YELLOW PATH) is diagnosed, the operator should continue monitoring the Critical Safety Function Status Trees. It is the operator's option to continue optimal recovery or to initiate functional restoration of the affected critical safety function challenge.

5. During function restoration to address an extreme or severe challenge, if a higher priority challenge is diagnosed, the operator should terminate the ongoing response and initiate function restoration to address the higher priority critical safety function challenge.

6. The Critical Safety Function Status Trees will be entered in the following priority:

   a. Subcriticality F-0.1

   b. Core Cooling F-0.2

   c. Heat Sink F-0.3

   d. Integrity F-0.4

   e. Containment F-0.5

   f. Inventory F-0.6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

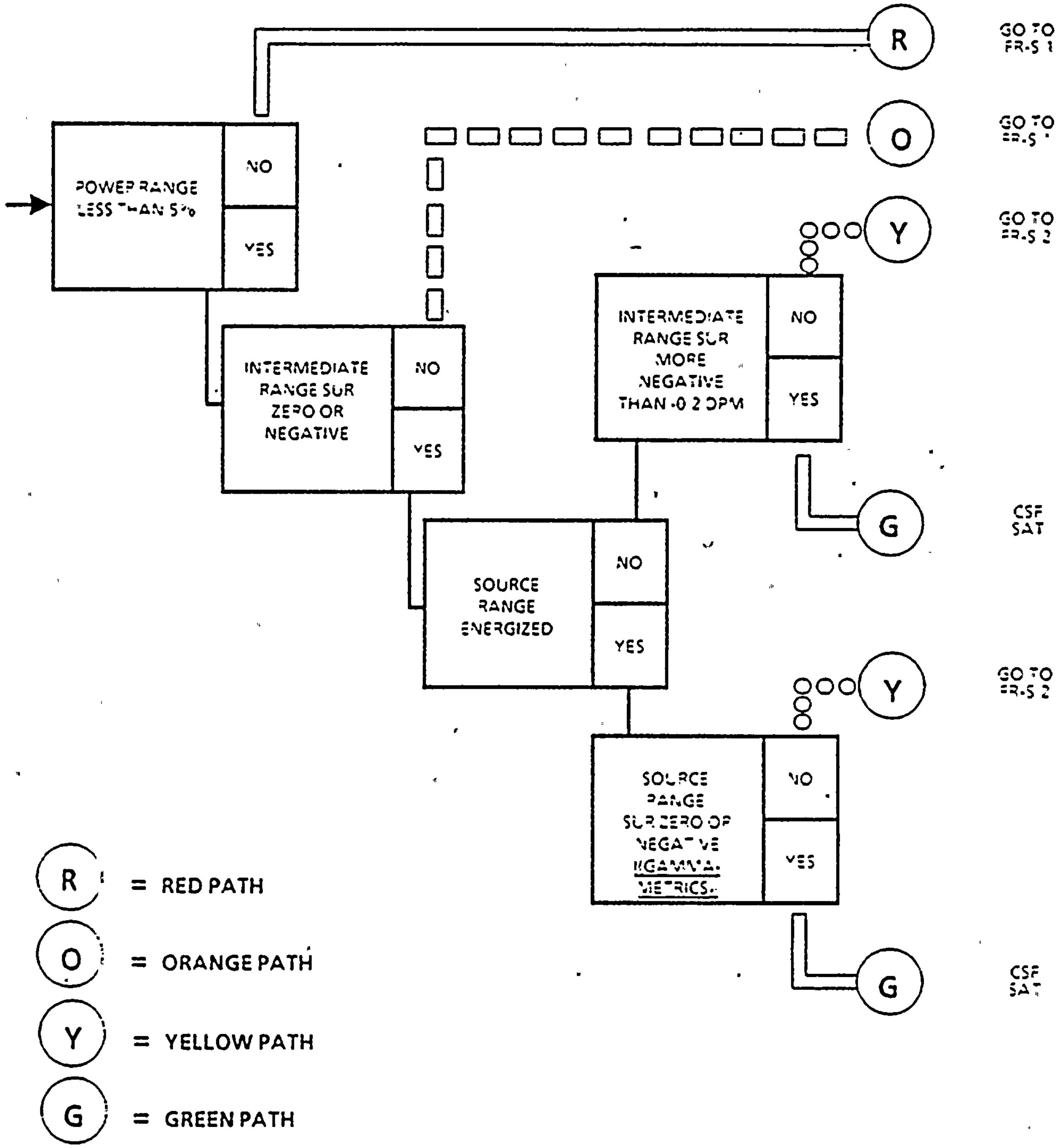
Critical Safety Function Status Trees should be monitored continuously if any Orange or Red conditions are found to exist; if no condition more serious than yellow is encountered, monitoring frequency may be reduced to 10 to 20 minutes.

1	Monitor Critical Safety Function using Enclosures 1 through 6	

END OF TEXT

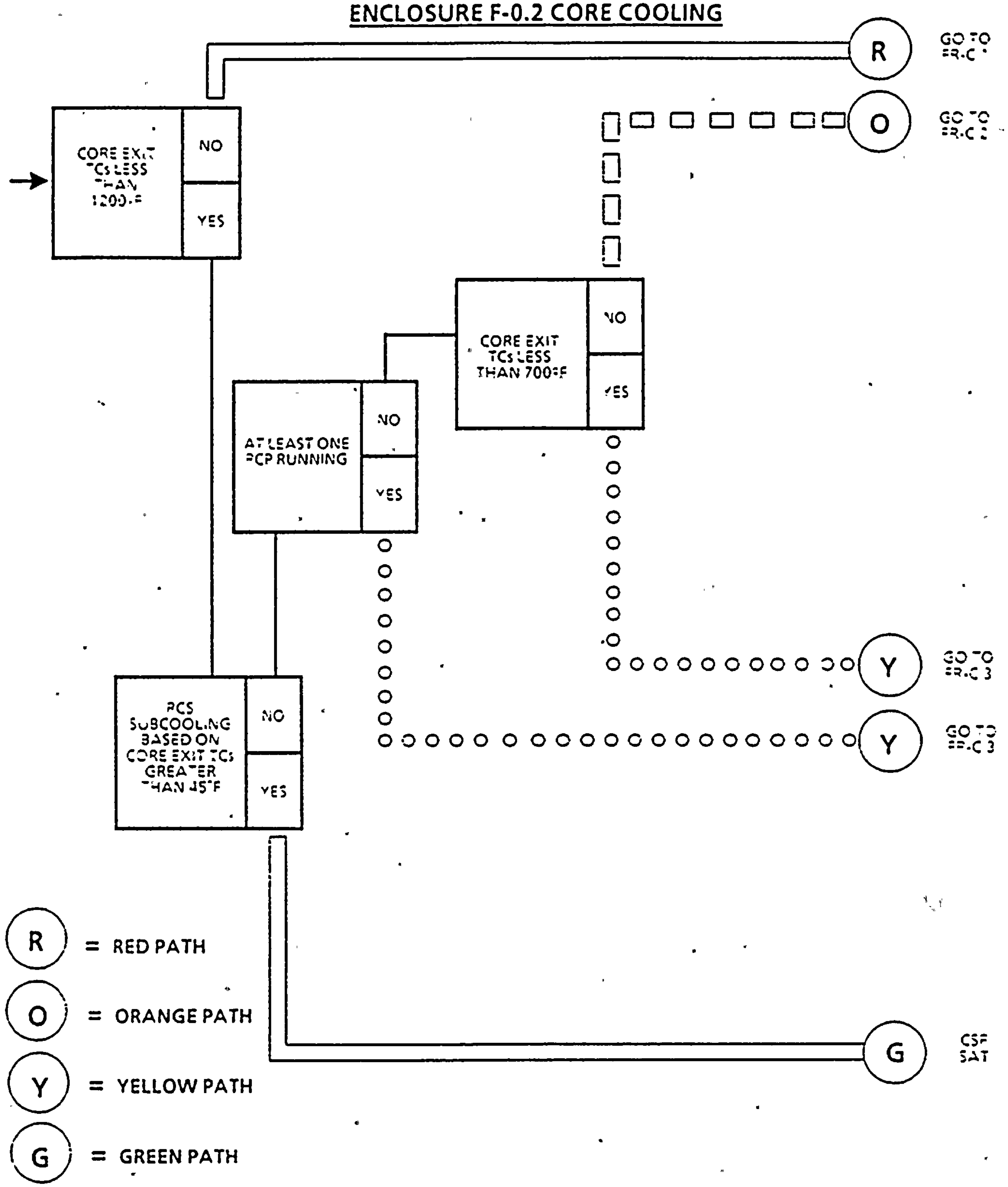
Procedure No.:	Procedure Title:	Page
3-EOP-F-0	CRITICAL SAFETY FUNCTION STATUS TREES	5
		Approval Date: 1/7/87

ENCLOSURE F-0.1 SUBCRITICALITY



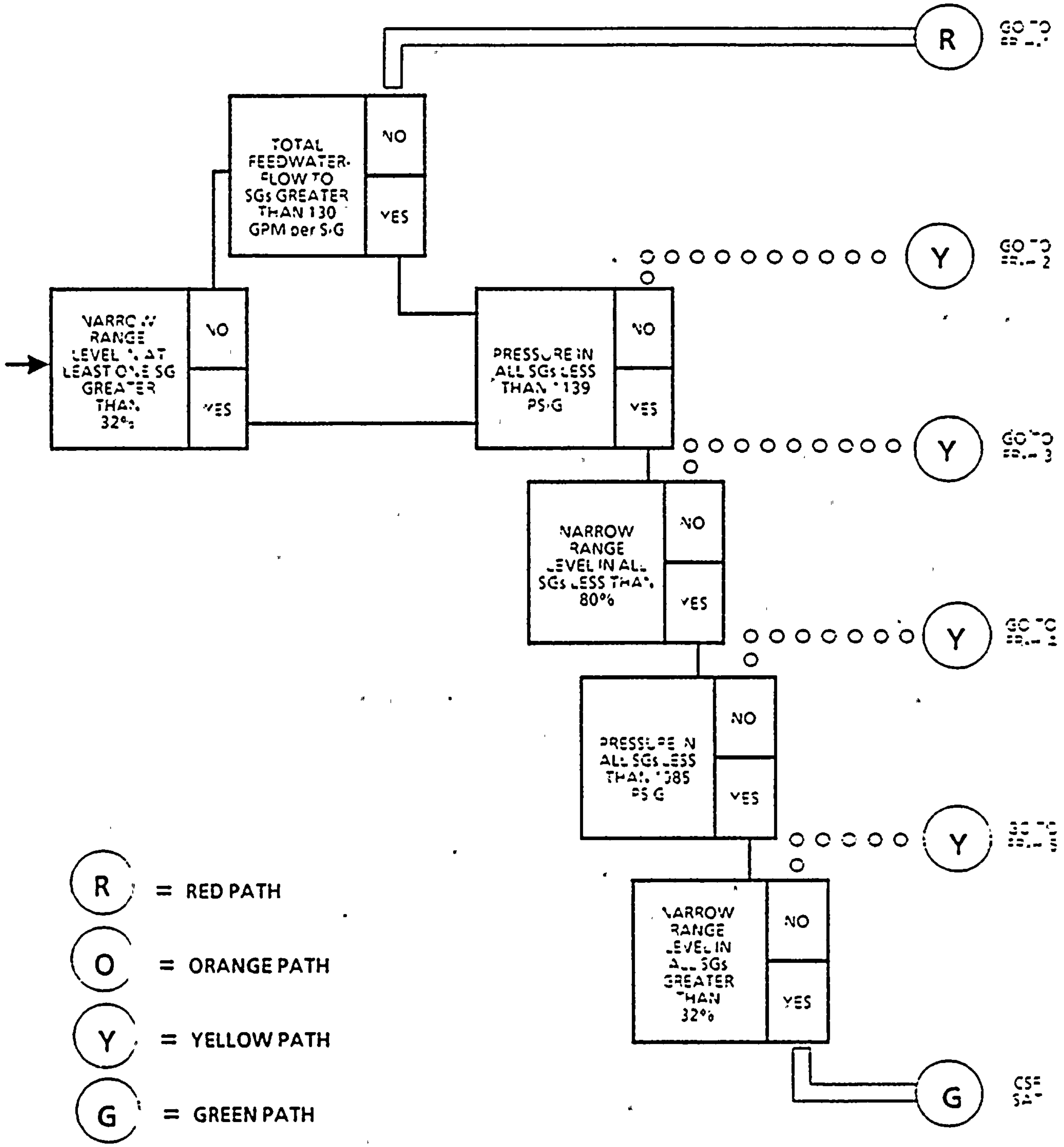
Procedure No	Procedure Title	Page 6
3-EOP-F-0	CRITICAL SAFETY FUNCTION STATUS TREES	Approval Date 1/7/87

ENCLOSURE F-0.2 CORE COOLING



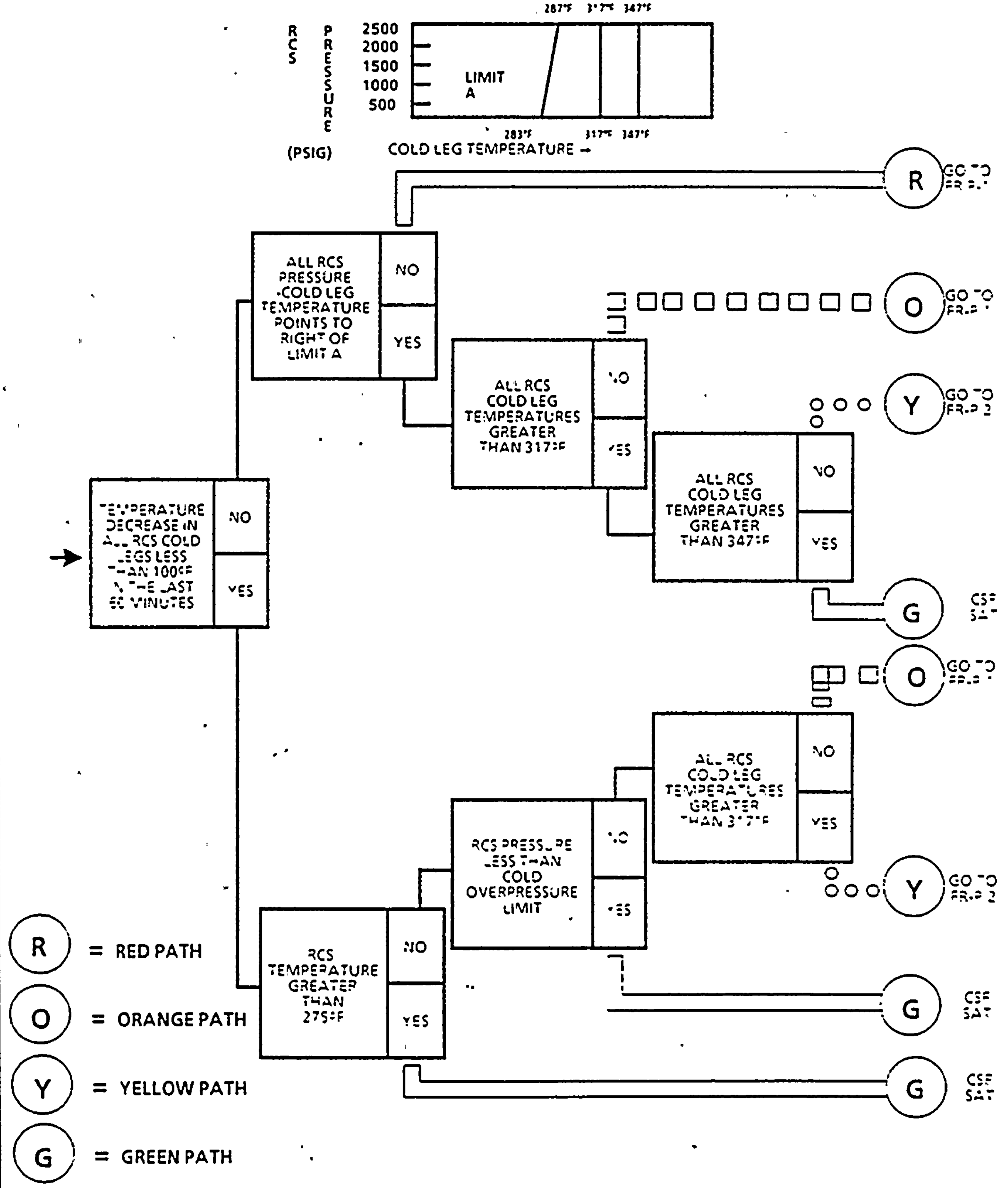
Procedure No.:	Procedure Title:	Page: 7
3-EOP-F-0	CRITICAL SAFETY FUNCTION STATUS TREES	Approval Date: 1/7/87

ENCLOSURE F-0.3 HEAT SINK

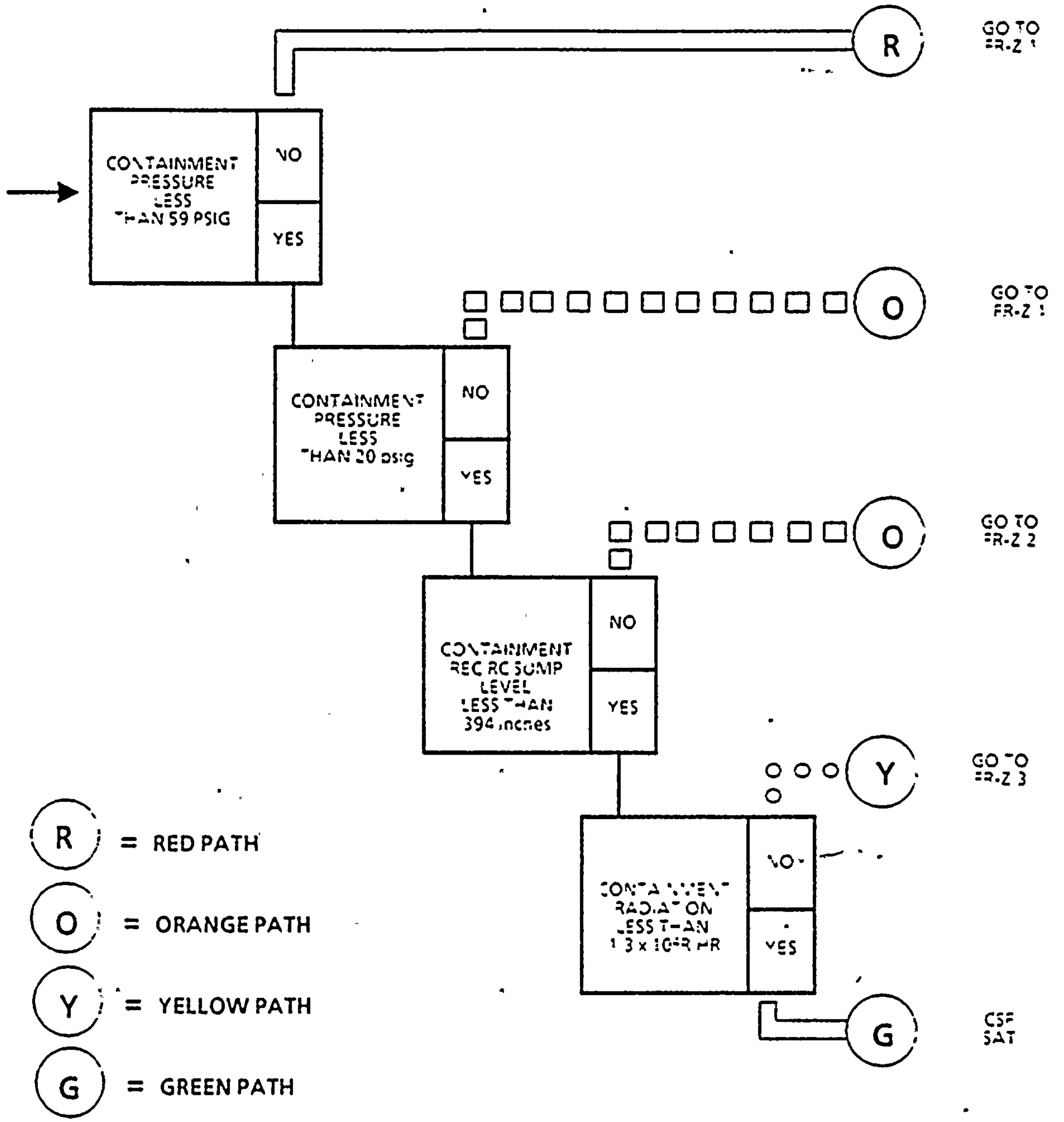


Procedure No.	Procedure Title.	Page 8
3-EOP-F-0	CRITICAL SAFETY FUNCTION STATUS TREES	Approval Date: 1/7/87

ENCLOSURE F-0.4 INTEGRITY



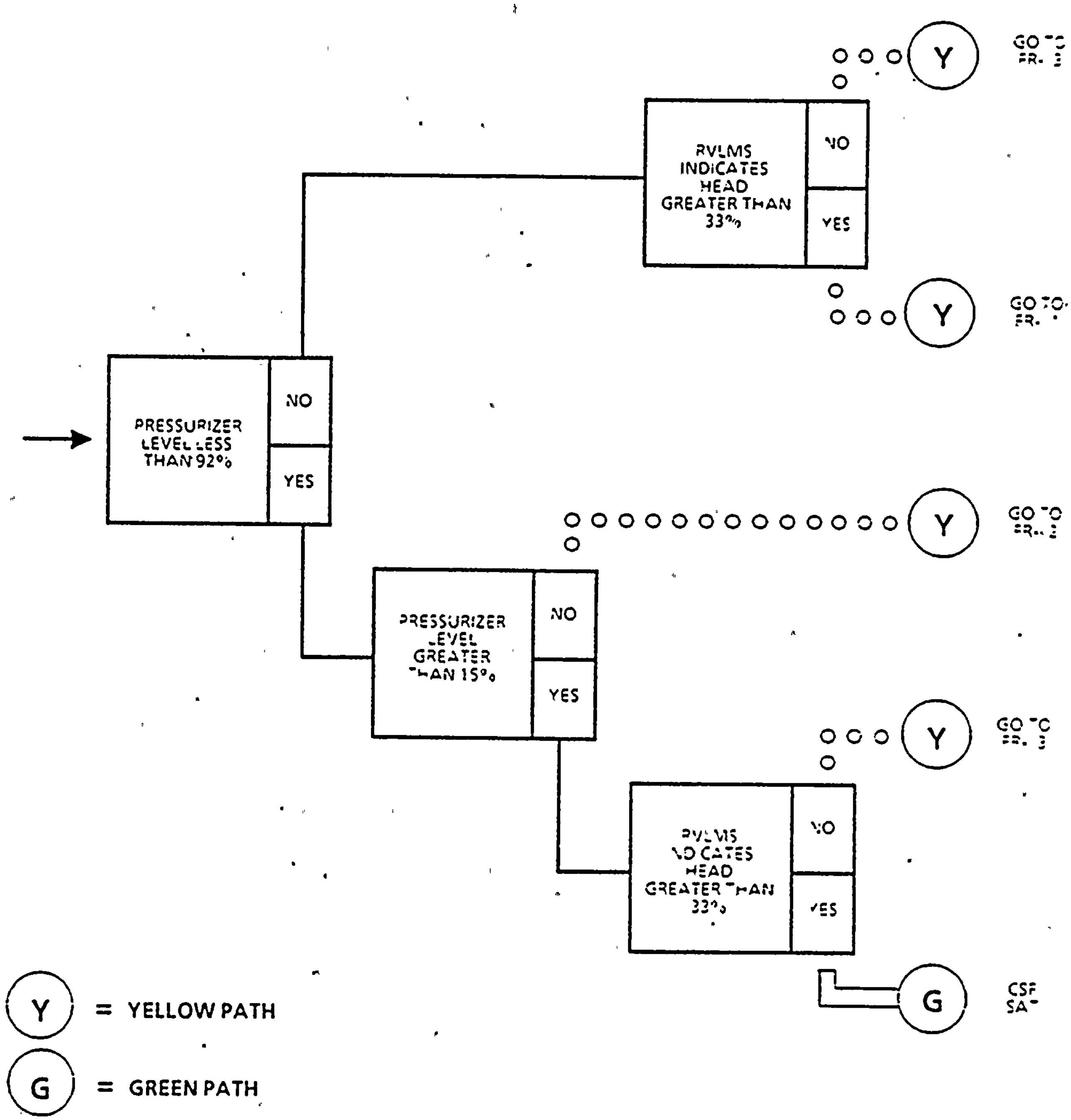
ENCLOSURE F-0.5 CONTAINMENT



Procedure No:	Procedure Title:	Page: 10
3-EOP-F-0	CRITICAL SAFETY FUNCTION STATUS TREES	Approval Date 1/7/87

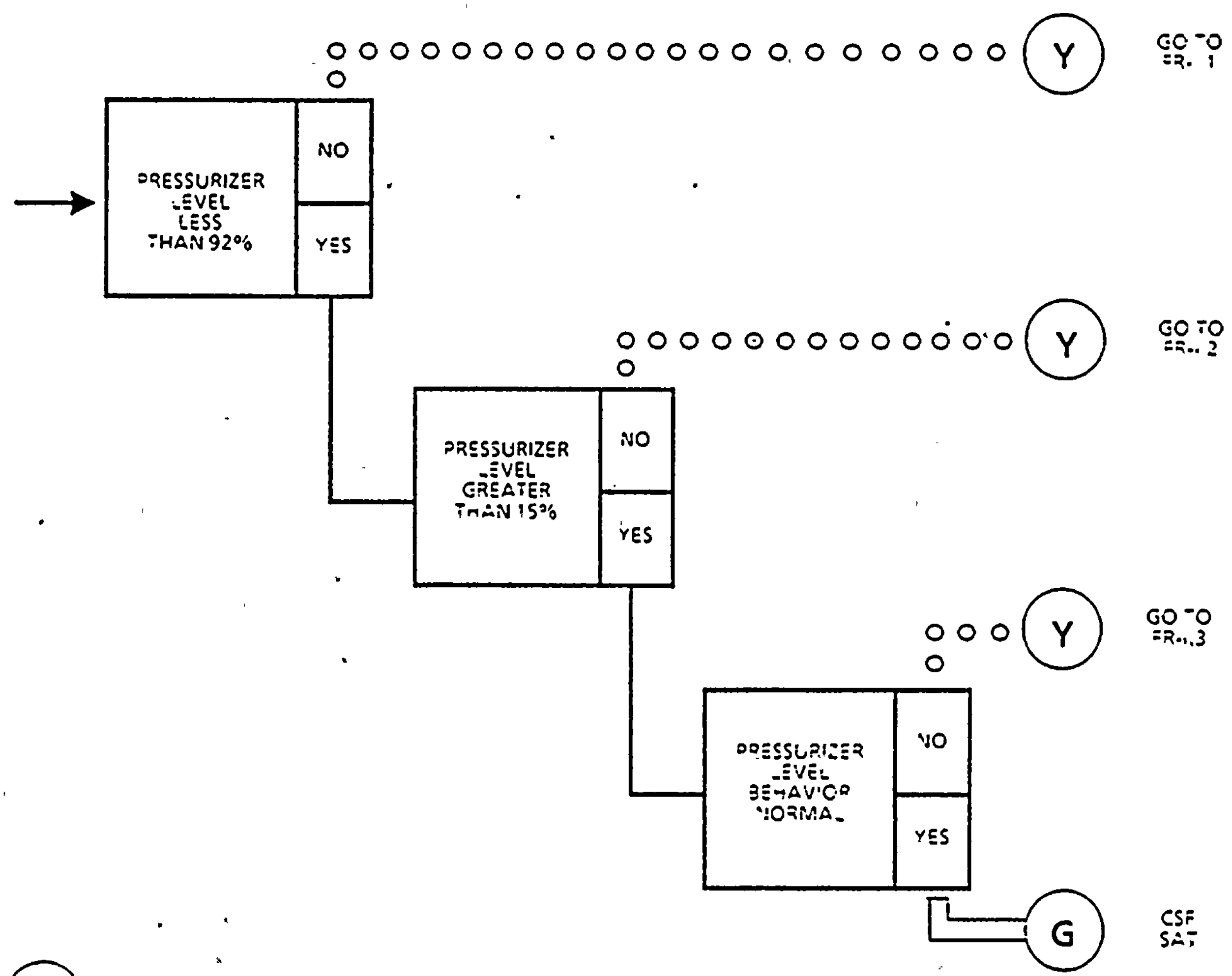
ENCLOSURE F-0.6 INVENTORY

(WITH RVLMS)



ENCLOSURE F-0.6 INVENTORY

(WITHOUT RVLMS)



Y = YELLOW PATH

G = GREEN PATH

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-FR-S.1 (Sheet 1 of 1)

EOP Title: Response to Nuclear Power Generation/ATWS

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
4b and c	4b and c	7	Steps 4b and c provide plant specific means for aligning a boration path and a charging flow path. See attached procedure.
5 RNO	5 RNO	7	Step 5a RNO provides plant specific means for locally tripping the reactor and locally tripping the turbine. See attached procedure.
7	7	7	Step 7 provides plant specific means for isolation of all dilution paths. See attached procedure.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-FR-S.1

Title:

RESPONSE TO NUCLEAR POWER GENERATION/ATWS

Safety Related Procedure

Responsible Department:	Operations
Reviewed by PNSC:	87-009
Approved by Plant Manager-N:	1/7/87

RTS 86-1832P

LIST OF EFFECTIVE PAGES

Page	Revision Date
1	01/07/87
2	01/07/87
3	01/07/87
4	01/07/87
5	01/07/87
6	01/07/87
7	01/07/87

1.0 PURPOSE

This procedure provides actions to add negative reactivity to a core which is observed to be critical when expected to be shutdown.

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 This procedure is entered from:

1) E-0, REACTOR TRIP OR SAFETY INJECTION, Step 1, when reactor trip is not verified and manual trip is not effective.

2) F-0.1, SUBCRITICALITY Critical Safety Function Status Tree on either a RED or ORANGE condition.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

Steps 1 through 4 are IMMEDIATE ACTION steps.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Verify Reactor Trip: • ROD BOTTOM LIGHTS - ON • REACTOR TRIP AND BYPASS BREAKERS - OPEN • ROD POSITION INDICATORS - AT ZERO • NEUTRON FLUX - DECREASING	Manually trip reactor. IF reactor will NOT trip, THEN manually insert control rods.
2	Verify Turbine Trip: a. All turbine stop valves - CLOSED	a. Manually trip turbine. IF turbine will NOT trip, THEN manually run back turbine. IF turbine can NOT be run back, THEN close main steamline isolation and bypass valves.
3	Check AFW Pumps Running: a. AFW pumps - RUNNING	a. Manually open steam supply valves.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Initiate Emergency Boration Of RCS:	
	a. Start charging pumps	
	b. Align boration path	
	1) Place mode selector in BORATE	1) OPEN boric acid to blender FCV-3-113A.
	2) OPEN emergency boration valve MOV-3-350	2) OPEN manual emergency boration valve 3-356.
	3) START boric acid pump 3A or 3B	
	c. Align charging flow path	
	1) OPEN VCT outlet isolation valve LCV-3-115C	
	2)OPEN charging line HCV-3-121	
	d. Check PRZ pressure - LESS THAN 2335 PSIG	d. Perform the following: 1) Verify PRZ PORVs and block valves open. <u>IF NOT</u>, <u>THEN</u> open PRZ PORVs and block valves as necessary until PRZ pressure less than 2135.PSIG. 2) Verify containment ventilation Isolation. <u>IF</u> dampers <u>NOT</u> closed, <u>THEN</u> manually close dampers.
5	Check If The Following Trips Have Occurred:	
	a. Reactor trip	a. Dispatch operator to locally trip reactor: • Open MG set breakers and/or reactor trip breakers A and B in MCC Room 3. • Locally in 480V Load Center. Open MG set breakers.
	b. Turbine trip	b. Dispatch operator to locally trip turbine at turbine front standard.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6.	Verify AFW Flow - GREATER THAN 750 GPM	Manually start pumps and align valves as necessary.
7	Verify All Dilution Paths - ISOLATED	Manually isolate dilution paths.
	a. Primary Water to Blender	
	b. Primary Water to Chemical Addition Tank	
8	Check For Reactivity Insertion From Uncontrolled RCS Cooldown:	<u>IF</u> uncontrolled cooldown <u>NOT</u> in progress, <u>THEN</u> go to Step 12.
	• RCS TEMPERATURES - DECREASING IN AN UNCONTROLLED MANNER	
	<u>OR</u>	
	• ANY S/G PRESSURE - DECREASING IN AN UNCONTROLLED MANNER	
9	Check Main Steamline Isolation And Bypass Valves - CLOSED	Manually close valves.
10	Identify Faulted S/G(s):	
	a. Check pressures in all S/Gs -	a. Go to Step 12.
	• ANY S/G PRESSURE DECREASING IN AN UNCONTROLLED MANNER	
	<u>OR</u>	
	• ANY S/G COMPLETELY DEPRESSURIZED	
11	Isolate Faulted S/G(s):	Manually close valves. <u>IF</u> valves can <u>NOT</u> be closed, <u>THEN</u> dispatch operator to locally close valves or block valves
	• ISOLATE MAIN FEEDLINE	
	• RESET SI	
	• PLACE SG FEEDWATER PUMP CNTRL SW TO OFF	
	• ISOLATE AFW FLOW	
	• CLOSE STEAM SUPPLY VALVE(S) TO AFW PUMP	
	• VERIFY STEAM DUMP VALVES TO ATMOSPHERE - CLOSED	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Verify Reactor Subcritical: a. Power range channels - LESS THAN 5% b. Intermediate range channels - NEGATIVE STARTUP RATE	Continue to borate. IF boration <u>NOT</u> available, <u>THEN</u> allow RCS to heat up. Perform actions of other Function Restoration Procedures in effect which do not cool down or otherwise add positive reactivity to the core. Return to Step 4.

NOTE

Boration should continue to obtain adequate shutdown margin during subsequent actions.

13	Return To Procedure And Step In Effect	

END OF TEXT

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-FR-C.1 (Sheet 1 of 1)

EOP Title: Response to Inadequate Core Cooling

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
2	2	7	Step 2 RNO provides plant specific means of establishing high pressure injection. See attached procedure.
3	3	7	Step 3 provides plant specific means for providing RCP support conditions. See attached procedure.
8c RNO	8c RNO	2	Step 8c RNO informs the technical support center staff of hydrogen concentrations that would result in the use of the portable recombiner system. See attached procedure.
10	10	7	Step 10 provides plant specific RCS vents. See attached procedure.
15 RNO	15 RNO	7	Step 15 RNO provides plant specific means for establishing high pressure injection. See attached procedure.
22 RNO	22 RNO	7	Step 22 RNO provides plant specific means for establishing high pressure injection. See attached procedure.
1	1	7	Step 1 provides plant specific means for verifying safety injection valve alignment. See attached procedure.
Caution 1 prior to Step 9	Caution 1 prior to Step 9	2	The first caution prior to Step 9 provides plant specific level criteria for condensate storage tank makeup.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-FR-C.1

<u>Title:</u>

RESPONSE TO INADEQUATE CORE COOLING

<u>Safety Related Procedure</u>	
Responsible Department:	Operations
Reviewed by PNSC:	86-085
Approved by Plant Manager-N:	3/31/86

GY/dt

1.0 PURPOSE

This procedure provides actions to restore core cooling.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from F-0.2, CORE COOLING Critical Safety Function Status Tree, on either RED condition.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *If RWST level decreases to less than 115,000 gallons, the SI System should be aligned for cold leg recirculation using ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.*
- *RHR pumps should not be run longer than 5 hours without CCW to the RHR heat exchangers.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Verify SI Valves That Receive A SI Signal have Assumed Their Required Position As Indicated By Bright Amber Lights On VPB	Manually align valves as necessary.
2	Verify SI Flow In All Trains: • HIGH-HEAD SI PUMP FLOW INDICATORS - CHECK FOR FLOW • RHR PUMP FLOW INDICATORS - CHECK FOR FLOW	Start pumps and align valves as necessary. Try to establish any other high pressure injection: • Reset SI signal. • Reset containment phase A isolation signal. • Verify adequate diesel capacity to run charging pumps, IF necessary shed non-essential loads (refer to E-0 Attachment D for component KW load rating). • Start charging pumps to deliver maximum flow.
3	Check RCP Support Conditions - AVAILABLE	Try to establish support conditions.
	1) RCP Seals - AVAILABLE	1) Reset containment phase A and B Isolation signal
	2) Verify COMP cooling to RCP Isol MOV-3-716A and MOV-3-716B - OPEN	2) Manually OPEN MOV-3-716A and MOV-3-716B
	3) Verify Bearing Clg Water Outlet CCW MOV-3-730 - OPEN	3) Manually OPEN MOV-3-730.
	4) Verify RCP Seal Clg Water Oulet FCV-3-626 - OPEN	4) Manually OPEN FCV-3-626
4	Check SI Accumulator Isolation Valve Status:	
	a. Power to isolation valves - AVAILABLE	a. Restore power to isolation valves.
	b. Isolation valves - OPEN	b. Open isolation valves unless closed after accumulator discharge.

* GY dt

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Check Core Exit TCs - LESS THAN 1200°F	Go to Step 8.
6	Check RVLMS (QSPDS) Plenum Indication:	
	a. Indication - GREATER THAN 0%	a. IF increasing, THEN return to step 1. IF NOT, THEN go to Step 7.
	b. Return to procedure and step in effect	
7	Check Core Exit TCs:	
	a. Temperature - LESS THAN 700°F	a. IF decreasing, THEN return to Step 1. IF NOT, THEN go to Step 8.
	b. Return to procedure and step in effect	

NOTE

This procedure should be continued while obtaining hydrogen sample in Step 8.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Check Containment Hydrogen Concentration:	
	a. Obtain a hydrogen concentration measurement:	
	b. Hydrogen concentration - LESS THAN 6.0% IN DRY AIR	b. Consult TSC staff for additional recovery actions. Go to Step 9.
	c. Hydrogen concentration - LESS THAN 0.5% IN DRY AIR	c. Inform TSC staff of hydrogen concentration.

CAUTION

- ***Makeup water sources for CST will be necessary if level decreases to less than 10%***
- ***A faulted or ruptured S/G should not be used in subsequent steps unless no intact S/G is available.***

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Check Intact S/G Levels:	
	a. Narrow range level - GREATER THAN 6% [32%]	a. Increase total feed flow to restore narrow range level greater than 6% [32%]. IF total feed flow less than 130 GPM per S/G, THEN go to Step 18. OBSERVE NOTE PRIOR TO STEP 18.
	b. Control feed flow to maintain narrow range level between 6% [32%] and 50%	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Check RCS Vent Paths:	
	a. Power to PRZ PORV Block valves - AVAILABLE	a. Restore power to block valves.
	b. PRZ PORVs - CLOSED	b. Manually close PRZ PORVs. IF any valve can NOT be closed, THEN manually close its block valve.
	c. Block valves - AT LEAST ONE OPEN	c. Open block valve unless it was closed to isolate an open PRZ PORV.
	d Head vent valves - CLOSED SV-3-6318A SV-3-6318B SV-3-6319A SV-3-6319B SV-3-6320A SV-3-6320B	d. Close any open head vent valves. SV-3-6318A SV-3-6318B SV-3-6319A SV-3-6319B SV-3-6320A SV-3-6320B

NOTE

Partial uncovering of S/G tubes is acceptable in the following steps.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Depressurize All Intact S/Gs To 215 PSIG:	
	a. Dump steam to condenser at maximum rate	a. Dump steam at maximum rate using steam dump to atmosphere valves.
	b. Check S/G pressures - LESS THAN 215 PSIG	b. IF S/G pressure decreasing, THEN return to Step 9. IF NOT, THEN go to Step 18. OBSERVE NOTE PRIOR TO STEP 18.
	c. Check RCS hot leg temperatures - AT LEAST TWO LESS THAN 400°F	c. IF RCS hot leg temperatures decreasing, THEN return to Step 9. IF NOT, THEN go to Step 18. OBSERVE NOTE PRIOR TO STEP 18.
	d. Stop S/G depressurization	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Check If SI Accumulators Should Be Isolated:	
	a. At least two RCS hot leg temperatures - LESS THAN 400°F	a. Go to Step 18. OBSERVE NOTE PRIOR TO STEP 18.
	b. Close all SI accumulator isolation valves	b. Vent any unisolated accumulator.
13	Stop All RCPs	
14	Depressurize All Intact S/Gs To Atmospheric Pressure:	
	a. Dump steam to condenser at maximum rate	a. Dump steam at maximum rate using steam dump to atmosphere valves
15	Verify SI Flow:	Continue efforts to establish SI flow
	• HIGH-HEAD SI PUMP FLOW INDICATORS - CHECK FOR FLOW OR • RHR PUMP FLOW INDICATORS - CHECK FOR FLOW	Try to establish any other high pressure injection: • Reset SI signal • Reset containment phase A isolation signal • IF offsite power is not available, verify adequate diesel capacity to run charging pumps, IF necessary shed non-essential loads (refer to E-0, Attachment D for component KW load rating). • Start charging pumps to deliver maximum flow. IF core exit TCs less than 1200°F, THEN return to Step 14. IF NOT, THEN go to Step 18. OBSERVE NOTE PRIOR TO STEP 18.
16	Check Core cooling:	
	a. Core exit TCs - LESS THAN 1200°F	a. Go to Step 18. OBSERVE NOTE PRIOR TO STEP 18.
	b. At least two RCS hot leg temperatures - LESS THAN 350°F	b. Return to Step 14.
	c. RVLMS (QSPDS) PLENUM INDICATION - GREATER THAN 0%	c. Return to Step 14.
17	Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 17	

•/GY'dt

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

Normal conditions are desired but not required for starting the RCPs.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Check Core Exit TCs - LESS THAN 1200°F	Start RCPs as necessary until core exit TCs less than 1200°F. IF core exit TCs greater than 1200°F and all available RCPs running, THEN open all PRZ PORVs and block valves. IF core exit TCs greater than 1200°F and all PRZ PORVs and block valves open, THEN open all other RCS vent paths to containment.
19	Try To Depressurize All Intact S/Gs To Atmospheric Pressure:	Use faulted or ruptured S/G.
	a. Use steam dump to atmosphere valve	
20	Check If SI Accumulators Should Be Isolated:	
	a. RHR pump flow indicators - AT LEAST INTERMITTENT FLOW	a. Return to Step 18.
	b. CLOSE all SI accumulator isolation valves	b. Vent any unisolated accumulator.
21	Check If RCPs Should Be Stopped:	
	a. At least two RCS hot leg temperatures - LESS THAN 350°F	a. Go to Step 22.
	b. Stop all RCPs	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22	Verify SI Flow: • HIGH-HEAD PUMP FLOW INDICATORS - CHECK FOR FLOW **OR** • RHR PUMP FLOW INDICATORS - CHECK FOR FLOW	Continue efforts to establish SI flow. Try to establish any other high pressure injection: • Reset SI signal. • Reset containment phase A isolation signal. • IF offsite power is not available. Verify adequate diesel capacity to run charging pumps, IF necessary shed non-essential loads. (Refer to E-0, Attachment D for component KW load rating). • Start charging pumps to deliver maximum flow. Return to Step 18.
23	Check Core Cooling: • RVLMS (QSPDS) PLENUM INDICATION - GREATER THAN 0% • AT LEAST TWO RCS HOT LEG TEMPERATURES - LESS THAN 350°F	Return to Step 18.
24	Go To E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 17	

END OF TEXT

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PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-FR-C.2 (Sheet 1 of 1)

EOP Title: Response to Degraded Core Cooling

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
2a RNO	2a RNO	7	Step 2a RNO provides plant specific means of establishing high pressure injection. See attached procedure.
3	3d	7	Step 3d provides plant specific RCS vent paths. See attached procedure.
4b	4b	7	Step 4b provides plant specific RCP support conditions. See attached procedure.
5	5	2	Step 5 has been revised to "Continue to Next Step" the vendor supplied Reactor Vessel Level Monitoring System used at Turkey Point is not reactor coolant pump flow dependent.
15	15 RNO	7	Step 15 RNO provides plant specific means of establishing other high pressure injection flow. See attached procedure.
1	1	7	Step 1 provides plant specific means for verifying safety injection valve alignment. See attached procedure.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-FR-C.2

Title:

RESPONSE TO DEGRADED CORE COOLING

Safety Related Procedure

Responsible Department:	Operations
Reviewed by PNSC:	86-085
Approved by Plant Manager-N:	3/31/86

*/GAY/dvdc

1.0 PURPOSE

This procedure provides actions to restore adequate core cooling.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from F-0.2, CORE COOLING Critical Safety Function Status Tree, on any ORANGE condition.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

If RWST level decreases to less than 115,000 gal, the SI System should be aligned for cold leg recirculation using ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Verify SI Valves That Receive A SI Signal Have Assumed Their Required Position As Indicated By Bright Amber Lights On VPB	Manually align valves as necessary.
2	Verify SI Flow In All Trains:	
	a. High-head SI pump flow indicators - CHECK FOR FLOW	a. Start pumps and align valves as necessary. Try to establish any other high pressure injection: 1) Reset SI signal. 2) Reset containment Phase A Isolation signal. 3) Verify adequate diesel capacity to run charging pumps, IF necessary shed non-essential loads (Refer to E-0, Attachment D, for component KW load rating) 4) Start charging pumps to deliver maximum flow.
	b RCS pressure - LESS THAN 225 PSIG [630 PSIG]	b. Go to Step 3.
	c. RHR pump flow indicators - CHECK FOR FLOW	c. Start pumps and align valves as necessary.
3	Check RCS Vent Paths:	
	a. Power to PRZ PORV block valves - AVAILABLE	a. Restore power to block valves.
	b PRZ PORVs - CLOSED	b. Manually close PRZ PORVs. IF any valve can NOT be closed, THEN manually close its block valve.
	c. Block valves - AT LEAST ONE OPEN	c. Open block valve unless it was closed to isolate an open PRZR PORV.
	d Head vent valves - CLOSED. SV-6318A SV-6318B SV-6319A SV-6319B SV-6320A SV-6320B	d. Close any open head vent valves. SV-6318A SV-6318B SV-6319A SV-6319B SV-6320A SV-6320B

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

Normal conditions for running RCPs are desired, but RCPs should not be tripped if normal conditions cannot be established or maintained.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Check RCP Status:	
	a At least one RCP - RUNNING	a. Go to Step 7.
	b. Support conditions for the operating RCP(s) - AVAILABLE	b. Try to establish conditions for the operating RCP(s).
	1) Verify CCW MOV-3-716B OPEN to RCP oil coolers and thermal barriers	1) Manually Open MOV-3-716B
	2) Verify CCW MOV-3-730 OPEN	2) Manually Open MOV-3-730
	3) Verify CCW FCV-3-626 OPEN	3) Manually Open FCV-3-626
5	Continue To Next Step	
6	Check If One RCP Should Be Stopped:	
	a. All RCPs - RUNNING	a. Go to Step 8.
	b Stop RCP in loop B or C	
	c. Go to Step 8	
7	Check Core Cooling:	
	a. RVLMS Plenum indication - GREATER THAN 0%	a <u>IF</u> increasing, <u>THEN</u> return to step 1. <u>IF NOT</u>, <u>THEN</u> go to Step 8.
	b. Core exit TCs - LESS THAN 700°F	b <u>IF NOT</u>, <u>THEN</u> go to Step 8.
	c Return to procedure and step in effect	
8	Check SI Accumulator Isolation Valve Status:	
	a Power to isolation valves - AVAILABLE	a. Restore power to isolation valves.
	b Isolation valves - OPEN	b. Open isolation valves unless closed after accumulator discharge.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *Makeup water sources for CST will be necessary if level decreases to less than 10%.*
- *A faulted or ruptured S/G should not be used in subsequent steps unless no intact S/G is available.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Check Intact S/G Levels:	
	a. Narrow range level - GREATER 6% [32%]	a. Increase total feed flow to restore narrow range level greater than 6% [32%] in at least one S/G.
	b. Control feed flow to maintain narrow range level between 6% [32%] and 50%	
10	Depressurize All Intact S/Gs To 215 PSIG:	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Dump steam to condenser	b. Manually or locally dump steam from S/Gs using steam dump to atmosphere valves.
	c. Check S/G pressures - LESS THAN 215 PSIG	c. Return to Step 9.
	d. Stop S/G depressurization	

CAUTION

RHR pumps should not be run longer than 5 hours without CCW to the RHR heat exchangers.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Check RHR Pumps - RUNNING	Start pumps as necessary.
12	Check If SI Accumulators Should Be Isolated:	
	a. At least two RCS hot leg temperatures - LESS THAN 400°F	a. Go to Step 14.
	b. Close all SI accumulator isolation valves	b. Vent any unisolated accumulator.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

Symptoms for FR-C.1, RESPONSE TO INADEQUATE CORE COOLING, should be closely monitored during subsequent steps.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13	Stop All RCPs	
14	Depressurize All Intact S/Gs To Atmospheric Pressure:	
	a. Maintain cooldown rate in RCS cold legs - LESS THAN 100°F/HR	
	b. Dump steam to condenser	b. Manually or locally dump steam from S/Gs using steam dump to atmosphere valves.
15	Verify SI Flow:	Continue efforts to establish SI flow. Try to establish any other high pressure injection:
	• HIGH-HEAD SI PUMP FLOW INDICATORS - CHECK FOR FLOW	a. Reset SI signal.
	<u>OR</u>	b. Reset containment Phase A Isolation signal.
	• RHR PUMP FLOW INDICATORS - CHECK FOR FLOW	c. <u>IF</u> offsite power is not available verify adequate diesel capacity to run charging pumps, <u>IF</u> necessary shed non-essential loads. (Refer to E-0, Attachment D for component KW load rating)
		d. Start charging pumps to deliver maximum flow.
		Return to Step 14.
16	Close All SI Accumulator Isolation Valves	Vent any unisolated accumulator.
17	Stop All RCPs	
18	Check Core Cooling:	Return to Step 14.
	• RVLMS PLENUM INDICATION - GREATER THAN 0%	
	• AT LEAST TWO RCS HOT LEG TEMPERATURES - LESS THAN 350°F	
19	Go To E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 17	

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PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-FR-C.3

EOP Title: Response to Saturated Core Cooling

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
3d	3d	7	Step 3d provides plant specific RCS Head Vents. See attached procedure.
1 RNO	1 RNO	7	Step 1 RNO provides the plant specific procedure for loss of residual heat removal.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-FR-C.3

Title:

RESPONSE TO SATURATED CORE COOLING

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	86-085
Approved by Plant Manager-N:	3/31/86

1.0 PURPOSE

This procedure provides actions to restore subcooled core cooling.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from F-0.2, CORE COOLING Critical Safety Function Status Tree, on either YELLOW condition.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

If RWST level decreases to less than 115,000 gallons, the SI System should be aligned for cold leg recirculation using ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.

NOTE

If ECA-3.2, SGTR WITH LOSS OF REACTOR COOLANT - SATURATED RECOVERY DESIRED, is in effect, this procedure should not be performed.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Check RHR System - HAS NOT BEEN PLACED IN SERVICE	Go to ONOP-050, LOSS OF RHR.
2	Verify SI Flow:	
	a. High-head SI pump flow indicators - CHECK FOR FLOW	a. Start pumps and align valves as necessary.
	b. RCS pressure LESS THAN 225 PSIG [630 PSIG]	b. Go to Step 3.
	c. RHR pump flow indicators - CHECK FOR FLOW	c. Start pumps and align valves as necessary.
3	Check RCS Vent Paths:	
	a. Power to PRZ PORV block valves - AVAILABLE	a. Restore power to block valves
	b. PRZR PORVs - CLOSED	b. Manually close PRZ PORVs. <u>IF</u> any valve can <u>NOT</u> be closed, <u>THEN</u> manually close its block valve.
	c. Block valves - AT LEAST ONE OPEN	c. Open block valve unless it was closed to isolate an open PRZ PORV.
	d. Verify RCS head vent valves - CLOSED SV-3-6318A SV-3-6318B SV-3-6319A SV-3-6319B SV-3-6320A SV-3-6320B	d. Close any open RCS head vent valves SV-3-6318A SV-3-6318B SV-3-6319A SV-3-6319B SV-3-6320A SV-3-6320B
4	Return To Procedure And Step In Effect	

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PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-FR-H.1 (Sheet 1 of 1)

EOP Title: Response to Loss of Secondary Heat Sink

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
Caution 1 prior to Step 1	Caution 1 prior to Step 1	2	The first caution prior to Step 1 provides cautionary information in the event total feedflow to each steam generator is less than 130 gpm due to a previous procedural requirement.
11	11	7	Step 11 provides plant specific means for verification that Unit 4 safety injection equipment is not required for operation on Unit 3 in the event of an emergency diesel generator failure.
13 RNO	13 RNO	7	Step 13 RNO provides a plant specific response for establishing instrument air to containment. See attached procedure.
19	19	7	Step 19 provides plant specific means for establishing a secondary heat sink.
2	2	2	Step 2 provides plant specific means of providing a feedwater supply to at least one steam generator by use of plant specific system design. See attached procedure.
4	4	2	Step 4 requested plant specific means for establishing main feedwater flow. Main feedwater flow was established in Step 4a and 4b. See attached procedure.
6d	6d	7	Step 6 provides plant specific means for establishing condensate flow. See attached procedure.
15	15a.1 RNO	7.	Step 15a.1 provides plant specific RCS Head Vents. See attached procedure.
17 RNO	17 RNO	2	Step 17 RNO provides plant specific reference to emergency diesel generator component kilowatt rating Attachment D contained in procedure E-0, Reactor Trip or Safety Injection.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-FR-H.1

Title:

RESPONSE TO LOSS OF SECONDARY HEAT SINK

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	87-009
Approved by Plant Manager-N:	1/7/87

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LIST OF EFFECTIVE PAGES

Page	Revision Date
1	01/07/87
2	01/07/87
3	01/07/87
4	01/07/87
5	01/07/87
6	01/07/87
7	01/07/87
8	01/07/87
9	01/07/87
10	01/07/87
11	01/07/87
12	01/07/87

1.0 PURPOSE

This procedure provides actions to respond to a loss of secondary heat sink in all steam generators.

2.0 SYMPTOMS OR ENTRY CONDITIONS

2.1 This procedure is entered from:

1. E-0, REACTOR TRIP OR SAFETY INJECTION, Step 16, when minimum AFW flow is not verified.

2. F-0.3, HEAT SINK Critical Safety Function Status Tree on a RED condition.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

- *If total feed flow is less than 130 GPM per S/G due to Procedural Guidance, this procedure should not be performed.*
- *If wide range level in any 2 S/Gs is less than 8% [32%] OR PRZ pressure is greater than or equal to 2335 PSIG due to loss of secondary heat sink, RCPs should be tripped and Steps 9 through 15 should be immediately initiated for bleed and feed.*
- *Feed flow should not be reestablished to any faulted S/G if a non-faulted S/G is available.*

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Check If Secondary Heat Sink Is Required:	
	a. RCS pressure - GREATER THAN ANY NON-FAULTED S/G PRESSURE	a. Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	b. RCS temperature - GREATER THAN 324°F [324°F]	b. Try to place RHR System in service while continuing in this procedure. Refer to OP-050, RESIDUAL HEAT REMOVAL SYSTEM, IF adequate cooling with RHR System established, THEN return to procedure and step in effect.
2	Try To Establish AFW Flow To At Least One S/G:	
	a. Check control room indications for cause of AFW failure: • CST LEVEL • AFW STEAM SUPPLY MOV POWER SUPPLY • AFW VALVE ALIGNMENT	
	b. Check total flow to S/G - GREATER THAN 130 GPM per S/G	b. Perform the following: 1) Reset SI IF necessary 2) Reset FW isolation. 3) OPEN the Unit 3 standby S/G FW pump manual isolation valve DWDS-012 4) START standby steam generator feedwater pump. A 5) OPEN feedwater bypass valves to desired flow. IF Feedwater cannot be established to at least one S/G THEN consult TSC staff for possible use of Unit 2 or 4 feedwater while continuing with step 3
	c. Return to procedure and step in effect	
3	Stop All RCPs	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Try To Establish Main FW Flow To At Least One S/G:	
	a. Check condensate system - IN SERVICE	a. Try to place condensate system in service. IF NOT, THEN go to Step 8.
	b. Open feedwater bypass valves to desired flow	b. Perform the following: 1) Reset SI if necessary. 2) Reset FW isolation. 3) Open feedwater bypass valves. 4) Start S/G feed pumps IF no feedwater bypass valve can be opened, THEN go to Step 8.
	c. Establish main FW flow	IF feedwater flow cannot be established THEN go to step 6.
5	Check S/G Levels:	
	a. Narrow range level in at least one S/G - GREATER THAN 6% [32%]	a. IF feed flow to at least one S/G verified, THEN maintain flow to restore narrow range level to greater than 6% [32%]. IF NOT verified, THEN go to Step 6.
	b. Return to procedure and step in effect	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

Following block of automatic SI actuation, manual SI actuation may be required if conditions degrade.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	Try To Establish Feed Flow From Condensate System:	
	a. Depressurize RCS to less than 1950 PSIG:	
	1) Check letdown - IN SERVICE	1) Use one PRZ PORV. IF NOT, THEN use auxiliary spray. Go to Step 6b.
	2) Use auxiliary spray	2) Use one PRZ PORV.
	b. Block SI signals:	
	• LOW PRESSURE SI	
	• HIGH S/G FLOW COINCIDENT WITH LOW S/G PRESSURE OR LOW TAVG SI	
	c. Depressurize at least one S/G to less than 430 PSIG:	
	1) Dump steam to condenser at maximum rate	1) Manually or locally dump steam from S/Gs using steam dump to atmosphere valves
	d. Establish condensate flow:	d. Go to Step 8.
	1) Start all available condensate pumps	
	2) Verify flow	
7	Check S/G Levels:	
	a. Narrow range level in at least one S/G - GREATER THAN 6% [32%]	a. IF feed flow to at least one S/G verified, THEN maintain flow to restore narrow range level to greater than 6% [32%]. IF NOT verified, THEN go to Step 8.
	b. Return to procedure and step in effect	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
8	Check For Loss Of Secondary Heat Sink:	
	a. Parameter - Wide range S/G level in any 2 S/Gs less than 8% [32%] OR PZR pressure greater than or equal to 2335 - EXCEEDED	a. Return to Step 1.

CAUTION

Steps 9 through 15 must be performed quickly in order to establish RCS heat removal by RCS bleed and feed.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9	Actuate SI	
10	Verify RCS Feed Path: a. Check high-head SI pumps - AT LEAST ONE RUNNING b. Check valve alignment for operating pumps - PROPER EMERGENCY ALIGNMENT (Amber Lights on VPB)	Manually start pumps and align valves as necessary to establish feed path. IF a feed path can NOT be established, THEN continue attempts to establish feed flow. Return to Step 2.
11	Reset SI:	
	a. Verify Unit 4 SI pumps - NOT REQUIRED	a. Perform the following: 1) OPEN the following SI pump manual suction intertie valves: a) 870A b) 870B 2) OPEN the following SI pump manual recirculation tie valves: a) 892A b) 892B 3) Unlock and rack in the following Unit 4 RWST outlet isolation valve breakers: a) 40712 b) 40605

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Reset SI: (Cont'd)	4) CLOSE the following Unit 4 RWST outlet isolation valves: a) MOV-4-864A b) MOV-4-864B 5) Remove the manual gag from valves and CLOSE the following Unit 4 SI test return to RWST valves: a) CV-4-856A b) CV-4-856B 6) Go to Step 12.
	b. Stop the Unit 4 SI pumps and place in standby	
	c. CLOSE the following SI pump discharge header isolation valves: 1) MOV-878A 2) MOV-878B	
12	Reset Containment Isolation Phase A And Phase B	
13	Verify Instrument Air To Containment	Start all diesel powered air compressors.
14	Establish RCS Bleed Path:	
	a. Verify power to PRZ PORV block valves - AVAILABLE	a. Restore power to block valves.
	b. Verify PRZ PORV block valves - ALL OPEN	b Open block valves.
	c. Open all PRZ PORVs	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

15 Verify Adequate RCS Bleed Path:

a. PRZ PORVs - BOTH OPEN

Response not obtained:

a. Perform the following:

1) Open all RCS head vents.

SV-3-6318A
SV-3-6318B
SV-3-6319A
SV-3-6319B
SV-3-6320A
SV-3-6320B

2) Depressurize at least one intact S/G to atmospheric pressure using S/G steam dump to atmosphere valves.

3) Align any available low pressure water source to the depressurized S/G(s).

CAUTION

The RCS bleed path must be maintained even if RCS pressure remains greater than high-head SI pump shutoff head.

16 Maintain RCS Heat Removal:

- MAINTAIN SI FLOW
- MAINTAIN PRZ PORVs-BOTH OPEN

17 Check Power Supply To Charging Pumps - OFFSITE POWER AVAILABLE

Response not obtained: Verify adequate diesel capacity to run charging pumps. IF necessary, shed sufficient nonessential loads. (Refer to E-0, Attachment D for component KW load rating)

18 Check If Charging Flow Has Been Established:

a. Charging pumps - AT LEAST ONE RUNNING

Response not obtained:

a. Perform the following:

1) IF CCW flow to RCP(s) thermal barrier is lost, THEN isolate seal injection to affected RCP(s) before starting charging pumps.

2) Start charging pumps.

b. Establish maximum charging flow:

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

If RWST level decreases to less than 115,000 GAL, the SI system should be aligned for cold leg recirculation using ES-1.3, TRANSFER TO COLD LEG RECIRCULATION.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	Continue Attempts To Establish Secondary Heat Sink In At Least One S/G: • AFW FLOW • STANDBY S/G FEEDWATER PUMPS • MAIN FW FLOW • UNITS 2, OR 4 FEEDWATER FLOW • CONDENSATE FLOW	
20	Check For Adequate Secondary Heat Sink:	
	a. Narrow range level in at least one S/G - GREATER THAN 6% [32%]	a. Return to Step 19.
21	Check RCS Temperatures: • CORE EXIT TCs - DECREASING • RCS HOT LEG TEMPERATURES - DECREASING	Return to Step 19.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

After stopping any high-head SI pump, RCS pressure should be allowed to stabilize before stopping another SI pump.

22 Check If One High-Head SI Pump Should Be Stopped:

a. Any high-head SI pump - RUNNING — *RNO:* a. Go to Step 24.

b. Determine required RCS subcooling from table:

CHARGING PUMP STATUS	RCS SUBCOOLING (°F)	
	ONE HIGH-HEAD PUMP RUNNING	TWO HIGH-HEAD PUMPS RUNNING
NONE RUNNING	DO NOT STOP HIGH-HEAD SI PUMP	70°F [226°F]
ONE RUNNING	247°F [481°F]	66°F [260°F]
TWO RUNNING	215°F [210°F]	62°F [225°F]
THREE RUNNING	212°F [244°F]	58°F [253°F]

c. RCS subcooling based on core exit TCs - GREATER THAN REQUIRED SUBCOOLING — *RNO:* c. DO NOT STOP HIGH-HEAD SI PUMP. Go to Step 23.

d. PRZ level - GREATER THAN 12% [50%] — *RNO:* d. DO NOT STOP HIGH-HEAD SI PUMP. Go to Step 23.

e. Stop one additional high-head SI pump.

f. Return to Step 22a

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

After closing a PORV, it may be necessary to wait for RCS pressure to increase to permit stopping high-head SI pumps in Step 22.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23	Check PRZ PORV Status:	
	a. PRZ PORVs - ANY OPEN	a. Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	b. CLOSE one PRZ PORV	b. Close its PORV block valve. IF block valve can NOT be closed, THEN go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	c. Return to Step 22	
24	Check PRZ PORVs - ALL CLOSED	Close PRZ PORVs. IF any valve can NOT be closed, THEN manually close its block valve.
25	Control Charging Flow To Maintain PRZ Level	
26	Go To ES-1.1, SI TERMINATION, Step 7	

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FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-FR-P.1 (Sheet 1 of 1)

EOP Title: Response to Imminent Pressurized Thermal Shock Condition

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
5 RNO	5 RNO	7	Step 5 RNO provides plant specific means for starting one reactor coolant pump. See attached procedure.
10	10	2	Step 10 reads "Continue to Next Step" due to the plant specific design which aligns the safety injection pump suction to the RWST as a normal alignment. No boric acid tank alignment is specified in the plant specific design. See attached procedure.
11b	11b	7	Step 11b provides plant specific means for establishing charging flow. See attached procedure.
12	12 RNO	7	Step 12 provides plant specific means for starting one reactor coolant pump. See attached procedure.
18	18	7	Step 18 provides plant specific means for establishing letdown and excess letdown flow. See attached procedure.
8 RNO	8 RNO	2	Step 8 RNO provides a plant specific response for establishing instrument air to containment. See attached procedure.
23b.5	23b.5	7	Step 23b.5 provides the plant specific means for determining limits of pressure and temperature. See attached procedure.
1c	1c RNO	2	Step 1c RNO provides plant specific means for isolating faulted S/Gs.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-FR-P.1

<u>Title</u>:

RESPONSE TO IMMINENT PRESSURIZED THERMAL SHOCK CONDITION

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	86-085
Approved by Plant Manager-N:	3/31/86

GY d: dc

1.0 PURPOSE

This procedure provides actions to avoid, or limit, thermal shock or pressurized thermal shock to the reactor pressure vessel, or overpressure conditions at low temperature.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from F-0.4, INTEGRITY Critical Safety Function Status Tree on a RED or either ORANGE condition.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

1 Check RCS Cold Leg Temperatures - STABLE OR INCREASING

RESPONSE NOT OBTAINED:

Try to stop RCS cooldown:

a. Verify S/G steam dump to atmosphere valves closed.

b. Verify steam dump to condenser valves closed.

c. IF any S/G pressure decreasing in an uncontrolled manner or any S/G completely depressurized, THEN isolate faulted S/G(s):

- Isolate all feedwater unless necessary for RCS temperature control.
- Verify main steamline isolation and bypass valves closed.
- Place S/G Feedwater pump cntrl sw to off.
- Close steam supply valves from the faulted S/G to the AFW pump.
- Isolate blowdown from faulted S/G.

d. Control feed flow to non-faulted S/G(s) to stop RCS cooldown Maintain total feed flow greater than 130 GPM per S/G until narrow range level greater than 6% [32%] in at least one non-faulted S/G.

e. IF a faulted S/G is necessary for RCS temperature control, THEN control feed flow at 25 GPM to that S/G.

f. IF all S/Gs faulted, THEN control feed flow at 25 GPM to each S/G.

g. IF RHR system in service, THEN stop any cooldown from RHR system.

2 Check PRZ PORV Block Valves:

a. Power to block valves - AVAILABLE

b. Block valves - AT LEAST ONE OPEN

RESPONSE NOT OBTAINED:

a. Restore power to block valves.

b. Open one block valve unless it was closed to isolate an open PORV.

*/GY/dt/dc

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

If any PRZ PORV opens because of high pressure, Step 3B should be repeated after pressure decreases to less than the setpoint.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Check If PRZ PORVs Should Be Closed:	
	a. Check the following: • PRZ PRESSURE - LESS THAN 2335 PSIG IF COLD OVERPRESSURE MITIGATING SYSTEM NOT IN SERVICE OR • RCS PRESSURE - LESS THAN COLD OVERPRESSURE LIMIT IF COLD OVERPRESSURE MITIGATING SYSTEM IN SERVICE	a. Verify at least one PRZ PORV open. Continue with Step 4. WHEN pressure less than setpoint, THEN do Step 3B.
	b. PRZ PORVs - CLOSED	b. Manually close PORV. IF any valve can NOT be closed, THEN manually close its block valve
4	Check High-Head SI Pumps - ANY RUNNING	Go to Step 12.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Check If SI Can Be Terminated: • RCS SUBCOOLING BASED ON CORE EXIT TCs - GREATER THAN 30°F [45°F] • RVLMS (QSPDS) PLENUM INDICATION - GREATER THAN 0%	DO NOT STOP SI PUMPS. Perform the following: 1) <u>IF</u> no RCP running, <u>THEN</u> perform the following. a) Verify off-site power available to the 4KV buses, <u>IF</u> off-site power is not available <u>THEN</u> go to step 6. b) Start the oil lift pump. c) Verify that the number 1 seal leakoff valve is OPEN and seal flow is established. d) Verify the seal injection water flow to be approximately 8 to 12 GPM (refer to Enclosure 1 of OP-041.1, REACTOR COOLANT PUMP OPERATION) e) Verify ΔP across the thermal barrier to be 15 inches of water. f) Verify GREATER THAN 200 PSID across the number 1 seal. g) Verify that the oil lift pump has been running for two minutes and the oil pressure interlock light is ON. 2) Start one RCP. 3) Go to Step 23.

CAUTION

If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	Reset SI	
7	Reset Containment Isolation Phase A And Phase B	
8	Establish Instrument Air To Containment	Start all diesel powered air compressors.
9	Stop SI Pumps And Place In Standby: • RHR PUMPS • HIGH-HEAD SI PUMPS	
10	Continue To Next Step	

•/GY/dt/dc

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11	Establish Charging Flow:	
	a Charging pumps - AT LEAST ONE RUNNING	a. Perform the following: 1) IF CCW flow to RCP thermal barriers is lost, THEN isolate seal injection to affected RCP(s). IF offsite power is not available verify adequate diesel capacity to power the charging pumps,' IF necessary shed non-essential loads (refer to E-0, Attachment D for component KW load rating) 2) Start one charging pump.
	b. Establish 21 GPM charging flow' 1) Open HCV-3-121 to desired flow	
12	Verify SI Flow Not Required: • RCS SUBCOOLING BASED ON CORE EXIT TCs - GREATER THAN 30°F [45°F] • RVLMS (QSPDS) PLENUM INDICATION - GREATER THAN 0%	Manually operate SI pumps as necessary. 1) IF no RCP running, THEN perform the following. a) Verify off-site power available to the 4 KV buses. IF offsite power is not available THEN go to Step 13. b) Start the oil lift pump. c) Verify that the number 1 seal leakoff valve is OPEN and seal flow is established. d) Verify the seal injection water flow to be approximately 8 to 12 GPM (refer to Enclosure 1 of OP-041.1, REACTOR COOLANT PUMP OPERATION). e) Verify ΔP across the thermal barrier to be 15 inches of water. f) Verify GREATER THAN 200 PSID across the number 1 seal. g) Verify that the oil lift pump has been running for two minutes and the oil pressure interlock light is ON. 2) Start one RCP. 3) Go to Step 23.
13	Check RCS Hot Leg Temperatures - STABLE	IF increasing, THEN control feed flow and steam dump as necessary to establish stable RCS hot leg temperatures IF decreasing, THEN verify actions of Step 1 have been performed before continuing with this procedure.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Isolate All SI Accumulators:	
	a Check power to isolation valves - AVAILABLE	a. Restore power to isolation valves.
	b Close all SI accumulator isolation valves	b. Vent any unisolated accumulator.
15	Depressurize RCS To Decrease RCS Subcooling:	
	a. Use normal PRZ spray	a. <u>IF</u> normal spray <u>NOT</u> available, <u>THEN</u> use one PRZ PORV. If necessary, manually operate SI pumps to maintain RCS subcooling greater than 30°F [45°F]. <u>IF</u> RCS can <u>NOT</u> be depressurized using any PRZ PORV, <u>THEN</u> use auxiliary spray.
	b. Depressurize RCS until either of the following conditions satisfied: • RCS SUBCOOLING BASED ON CORE EXIT TCs - LESS THAN 30°F [45°F] <u>OR</u> • PRZ LEVEL - GREATER THAN 92% [31%]	
	c. Stop RCS depressurization	

<u>CAUTION</u>

An increase in RCS pressure may result in excessive reactor vessel stress. RCS pressure and temperature should be maintained stable while performing subsequent steps in this procedure.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	Check PRZ Level - GREATER THAN 23% [50%]	Try to restore level with charging while maintaining stable RCS pressure. <u>IF</u> level can <u>NOT</u> be restored, <u>THEN</u> go to Step 22.
17	Check VCT Makeup Control System:	Adjust controls as necessary.
	a. Makeup set for greater than RCS boron concentration	
	b Makeup set for automatic control	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
18	Establish Letdown:	Establish excess letdown:
	a. Verify CCW flow to the non-regenerative letdown heat exchanger	1) Verify OPEN FC-3-739, excess letdown heat exchanger CCW outlet valve.
	b. Verify letdown orifice isolation valves - CLOSED -	2) Verify HCV-3-137, excess letdown heat exchanger outlet valve - CLOSED.
	c. OPEN letdown containment isolation valve CV-3-204	3) Verify CV-3-389, excess letdown heat exchanger divert valve is at the desired position: a. NORMAL - to VCT b. DIVERT - to RCDT
	d. OPEN letdown line isolation valve LCV-3-460	4) OPEN CV-3-387, excess letdown heat exchanger inlet valve.
	e. OPEN letdown orifice isolation valve as appropriate	5) OPEN HCV-3-137, excess letdown heat exchanger outlet valve.
		6. Verify a delta T across the excess letdown heat exchanger.
19	Check Charging Pump Suction - ALIGNED TO VCT	Align suction to VCT.
20	Check PRZ Level - LESS THAN 92% [31%]	Control charging and letdown as necessary. <u>IF</u> necessary establish excess letdown.
21	Control PRZ Pressure:	
	a. Turn on PRZ heaters and operate normal PRZ spray as necessary to maintain pressure stable	a. <u>IF</u> normal spray <u>NOT</u> available and letdown is in service, <u>THEN</u> use auxiliary spray. <u>IF NOT</u>, <u>THEN</u> use one PRZ PORV.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22	Check RCS Subcooling Based On Core Exit TCs - AT 30°F [45°F]	Return to Step 15.
23	Determine If RCS Temperature Soak is Required:	
	a Cooldown rate in RCS cold legs - GREATER THAN 100°F IN ANY 60 MINUTE PERIOD	a. Go to Step 24
	b. Perform all of the following:	
	1) Do not cool down RCS until temperature has been stable for 1 hour	
	2) Do not increase RCS pressure during that time	
	3) Perform actions of other procedure in effect which do not cool down or increase RCS pressure until the RCS temperature soak has been completed	
	4) RCS cooldown is permitted after 1 hour	
	5) Maintain RCS pressure and cold leg temperatures within the limits of pressure and temperature curve (P T Curve Book)	
	6) Maintain cooldown rate in RCS cold legs less than 50°F in any 60 minute period	
24	Return To Procedure And Step In Effect	

END OF TEXT

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-FR-P.2 (Sheet 1 of 1)

EOP Title: Response to Anticipated Pressurized Thermal Shock Condition

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
4b.1	4b.1	7	Step 4b.1 provides the plant specific means for determining limits of pressure and temperature. See attached procedure.
	1c RNO	2	Step 1c RNO provides plant specific means for isolating faulted S/G(s).

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-FR-P.2

Title:

RESPONSE TO ANTICIPATED PRESSURIZED THERMAL SHOCK CONDITION

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	86-085
Approved by Plant Manager-N:	3/31/86

GAY/sr/dt

1.0 PURPOSE

This procedure provides actions to respond to a limited overcooling condition or to an overpressure condition at low temperature.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from F-0.4, INTEGRITY Critical Safety Function Status Tree, on either YELLOW condition.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Check RCS Cold Leg Temperatures - STABLE OR INCREASING	Try to stop RCS cooldown: a. Verify S/G steam dump to atmosphere valves are closed b. Verify steam dump to condenser valves closed. c. <u>IF</u> any S/G pressure decreasing in an uncontrolled manner or any S/G completely depressurized, <u>THEN</u> isolate faulted S/G(s): • Isolate all feedwater unless necessary for RCS temperature control. • Verify main steamline isolation and bypass valves closed. • Reset SI <u>IF</u> necessary. • Place S/G feedwater pump CNTRL - OFF. • Close steam supply valve from the faulted S/G to AFW pump. • Isolate blowdown from faulted S/G d. Control feed flow to non-faulted S/G(s) to stop RCS cooldown. Maintain total feed flow greater than 130 GPM per S/G until narrow range level greater than 6[illegible] [32%] in at least one non-faulted S/G. e. <u>IF</u> a faulted S/G is necessary for RCS temperature control, <u>THEN</u> control feed flow at 25 GPM to that S/G. f. <u>IF</u> all S/Gs faulted, <u>THEN</u> control feed flow at 25 GPM to each S/G. g. <u>IF</u> RHR System in service, <u>THEN</u> stop any cooldown from RHR System.
2	Check If SI Has Been Terminated: a. High-head SI pumps - ALL STOPPED	 a. Go to Step 5

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Check RCS Pressure - WITHIN TECH SPEC PRESSURE - TEMPERATURE LIMITS P.T. CURVE BOOK FOR 100°F/HR COOLDOWN RATE	Decrease RCS pressure to within tech spec limits using normal PRZ spray. IF normal spray NOT available and letdown is in service, THEN use auxiliary spray IF NOT, THEN use one PRZ PORV.
4	Determine If Additional RCS Cooldown Restrictions Are Required:	
	a. Cooldown rate in RCS cold legs - GREATER THAN 100°F IN ANY 60 MINUTE PERIOD	a. Additional cooldown restrictions are not required. Go to Step 5.
	b. RCS cooldown is permitted with the following restrictions:	
	1) Maintain RCS pressure and cold leg temperatures within the limits of pressure temperature curve (P.T. Curve Book)	
	2) Maintain cooldown rate in RCS cold legs less than 100°F in any 60 minute period	
5	Return to Procedure And Step In Effect	

END OF TEXT

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-FR-Z.1 (Sheet 1 of 1)

EOP Title: Response to High Containment Pressure

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
3c	3c	7	Step 3c provides plant specific alignment for the containment spray system. See attached procedure.
7	7a RNO	7	Step 7a RNO provides plant specific means for obtaining hydrogen measurements. See attached procedure.
2	2	2	Step 2 provides plant specific means for verifying containment ventilation isolation.
6b	6b	2	Step 6b provides plant specific means for isolating feedflow to affected steam generators.
10	10	7	Step 10 provides plant specific means for determining the status of the hydrogen recombiner use.
4	4	2	Step 4 provides plant specific containment cooling equipment information.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-FR-Z.1

Title:

RESPONSE TO HIGH CONTAINMENT PRESSURE

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	86-085
Approved by Plant Manager-N:	3/31/86

* HEB:sr.ot

1.0 PURPOSE

This procedure provides actions to respond to a high containment pressure.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from F-0.5, CONTAINMENT Critical Safety Function Status Tree on a RED or ORANGE condition.

1	Verify Containment Isolation Phase A Valves - CLOSED	IF flow path NOT necessary, THEN close valves.
2	Verify Containment Ventilation Isolation:	
	a Containment purge and supply fans - OFF	a. Manually trip fans.
	b. Purge valves - CLOSED	b. Manually close purge valves.
	c. Instrument air bleed valves - CLOSED	c. Manually close valves.

CAUTION

If ECA-1.1, LOSS OF EMERGENCY COOLANT RECIRCULATION, is in effect, containment spray should be operated as directed in ECA-1.1 rather than step 3 below.

3	Check If Containment Spray Is Required:	
	a. Containment pressure - HAS INCREASED TO GREATER THAN 20 PSIG	a. Go to Step 4.
	b. Verify spray pumps - RUNNING	b. Start spray pumps.
	c. Verify spray system valve alignment - PROPER EMERGENCY ALIGNMENT	c. Manually align valves as necessary.
	1) Cont spray pp disch MOV-3-880A	
	2) Cont spray pp disch MOV-3-880B	
	d. Verify containment isolation phase B valves - CLOSED	d. Manually close valves.
4	Verify 2 of 3 Emergency Containment Fan Coolers and Emergency Filter Fans - RUNNING	Manually start emergency containment fan coolers and emergency filter fans. IF Containment Spray is in operation and failure of an emergency filter fan occurs, verify that the automatic borated water spray system is actuated.
5	Verify Main Steamline Isolation And Bypass Valves - CLOSED	Manually close valves.

*/HEB/sr/dt

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

At least one S/G must be maintained available for cooldown.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	Check If Feed Flow Should Be Isolated To Any S/G:	
	a. Check pressures in all S/Gs - • ANY S/G PRESSURE DECREASING IN AN UNCONTROLLED MANNER OR • ANY S/G COMPLETELY DEPRESSURIZED	a. Go to Step 7.
	b. Isolate feed flow to affected S/G(s): • MAIN FW • RESET SI SIGNAL • PLACE S/G FEEDWATER PUMP CONTROL SW TO OFF • AFW	b. Go to Step 7.
7	Check Hydrogen Concentration:	
	a. Current hydrogen concentration measurement - AVAILABLE	a. Obtain a hydrogen concentration measurement: 1) Contact Chemistry department for a sample of containment hydrogen concentration. Continue with Step 11. WHEN hydrogen concentration measurement available, THEN do Step 7b.
	b. Hydrogen concentration - LESS THAN 6.0% IN DRY AIR	b. Go to Step 8.
	c. Hydrogen concentration - LESS THAN 0.5% IN DRY AIR	c. Go to Step 8.
	d. Go to Step 11	
8	Notify TSC Staff Of Hydrogen Concentration Inside Containment	
9	Periodically Obtain A Hydrogen Concentration Measurement	

*/HEB/sr/dt

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Consult With TSC Staff On Status Of Hydrogen Recombiner	
	a Hydrogen concentration - GREATER THAN 0 5% IN DRY AIR	a. Go to Step 11.
	b Notify TSC staff of hydrogen concentration inside containment	
11	Return To Procedure And Step In Effect	

END OF TEXT

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-FR-Z.2

EOP Title: Response to Containment Flooding

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
1	1	7	Step 1 provides plant specific sources of unidentified water in the containment sump. See attached procedure.
2	2	2	Step 2 provides plant specific means used to check sump activity levels. See attached procedure.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-FR-Z.2

Title:

RESPONSE TO CONTAINMENT FLOODING

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	86-085
Approved by Plant Manager-N:	3/31/86

1.0 PURPOSE

This procedure provides actions to respond to containment flooding.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from F-0.5, CONTAINMENT Critical Safety Function Status Tree on an ORANGE condition.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Try To Identify Unexpected Source Of Water To Sump: • COMPONENT COOLING WATER • PRIMARY MAKEUP WATER	
2	Check Containment Sump Activity Level: • Contact the Nuclear Checmistry department to sample the containment sump	
3	Notify TSC Staff Of Sump Level And Activity Level To Obtain Recommended Action	
4	Return to Procedure And Step In Effect	

END OF TEXT

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-FR-Z.3 (Sheet 1 of 1)

EOP Title: Response to High Containment Radiation Level

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
2	2	7	Step 2a and b provide plant specific means to determine the need for containment emergency filtration and the subsequent placing of the system in service.
1	1	2	Step 1 provides plant specific means for verifying containment ventilation isolation.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-FR-Z.3

Title:

RESPONSE TO HIGH CONTAINMENT RADIATION LEVEL

Safety Related Procedure

Responsible Department:	Operations
Reviewed by PNSC:	86-085
Approved by Plant Manager-N:	3/31/86

*/HEB/dt

1.0 PURPOSE

This procedure provides actions to respond to high containment radiation level.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from F-0.5, CONTAINMENT Critical Safety Function Status-Tree on a YELLOW condition.

*:HEB/dt

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Verify Containment Ventilation Isolation:	
	a. Purge valves - CLOSED	a. Manually close purge valves
	b. Purge supply and exhaust fans-OFF	b. Manually trip purge supply and exhaust fans.
	c. Instrument air bleed valves - CLOSED	c. Manually close instrument air bleed valves.
	d. Verify control room isolation	d. Manually place control room HVAC in emergency recirculation mode.
2	Determine If Containment Emergency Filtration System Should Be Placed in Service:	
	a. Rad monitors R-11 or R-12 GREATER THAN alarm setpoint	a. Go to Step 3.
	b. Place containment atmosphere filtration system in service	
	1) Place 2 of 3 emergency containment filter fans in ON position	
3	Notify TSC Staff Of Containment Radiation Level To Obtain Recommended Action	
4	Return To Procedure And Step In Effect	

END OF TEXT

FINAL PAGE

HEB/dt

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 4

4-EOP-FR-Z.2

Title:

RESPONSE TO CONTAINMENT FLOODING

Safety Related Procedure

Responsible Department:	Operations
Reviewed by PNSC:	86-085
Approved by Plant Manager-N:	3/31/86

*.GY/dt

1.0 PURPOSE

This procedure provides actions to respond to containment flooding.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from F-0.5, CONTAINMENT Critical Safety Function Status Tree on an ORANGE condition.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Try To Identify Unexpected Source Of Water To Sump: • COMPONENT COOLING WATER • PRIMARY MAKEUP WATER	
2	Check Containment Sump Activity Level: • Contact the Nuclear Checmistry department to sample the containment sump	
3	Notify TSC Staff Of Sump Level And Activity Level To Obtain Recommended Action	
4	Return to Procedure And Step In Effect	

END OF TEXT

FINAL PAGE

*/GY/dt/dc

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-FR-I.1 (Sheet 1 of 1)

EOP Title: Response to High Pressurizer Level

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
2 RNO	2 RNO	7	Step 2 RNO provides plant specific means for establishing charging and excess letdown. See attached procedure.
3 RNO	3 RNO	7	Step 3 RNO provides plant specific means for establishing letdown and excess letdown.
4a and b	4a and b	7	Step 4a and b provides plant specific means for establishing RCP seal return flow.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-FR-I.1

Title:

RESPONSE TO HIGH PRESSURIZER LEVEL

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	86-085
Approved by Plant Manager-N:	3/31/86

1.0 PURPOSE

This procedure provides actions to respond to a high pressurizer level.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from F-0.6, INVENTORY Critical Safety Function Status Tree on a YELLOW condition.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Check If SI Has Been Terminated:	
	a High-head SI pumps - ALL STOPPED	a. Return to procedure and step in effect

CAUTION

Charging and letdown flows should be carefully controlled to avoid sudden RCS pressure changes since the PRZR may be water solid.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	Check If Charging Flow Has Been Established:	
	a Charging pump - AT LEAST ONE RUNNING	a. Perform the following: 1) Reset SI signal IF necessary. 2) IF CCW flow to RCP thermal barriers is lost, THEN isolate seal injection to affected RCP. Verify adequate diesel capcacity to power charging pumps, IF necessary shed non-essential loads (refer to E-0, Attachment D for component KW load rating) 3) Start one charging pump.
	b Instrument air to containment - ESTABLISHED	b. Start all diesel powered air compressors.
	c Charging flow - ESTABLISHED	c. Establish 21 GPM charging flow: 1) Open HCV-121. IF 21 GPM charging can NOT be established, THEN establish excess letdown: a) Verify OPEN FC-3-739, excess letdown heat exchanger CCW outlet valve b) Verify HCV-3-137, excess letdown heat exchanger outlet valve - CLOSED c) Verify CV-3-389 excess letdown heat exchanger divert valve is at the desired position: 1) DIVERT to RCDT 2) NORMAL to VCT d) OPEN CV-3-387, excess letdown heat exchanger inlet valve

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2	Check If Charging Flow Has Been Established: (Cont'd)	e) OPEN HCV-3-137, excess letdown heat exchanger outlet valve f) Verify ΔT across the excess letdown heat exchanger Go to Step 5
3	Check Letdown - IN SERVICE	Establish letdown: 1) Verify letdown orifice isolation valves CLOSED. 2) Open the letdown isolation valve CV-3-204. 3) Open the high pressure letdown control valve LCV-3-460. 4) Open the letdown orifice isolation valves as necessary. <u>IF</u> letdown can <u>NOT</u> be established, <u>THEN</u> establish excess letdown: 1) Verify OPEN FC-3-739, excess letdown heat exchanger CCW outlet valve 2) Verify HCV-3-137, excess letdown heat exchanger outlet valve - CLOSED 3) Verify CV-3-389 excess letdown heat exchanger divert valve is at the desired position: a) DIVERT to RCDT b) NORMAL to VCT 4) OPEN CV-3-387, excess letdown heat exchanger inlet valve 5) OPEN HCV-3-137, excess letdown heat exchanger outlet valve 6) Verify ΔT across the excess letdown heat exchanger
4	Check If RCP Seal Return Flow Should Be Established:	
	a. Verify CCW pump RUNNING <u>AND</u> CCW surge tank level NORMAL	a. Go to Step 5.
	b. Establish Flow 1) Verify open MOV-3-381 2) OPEN MOV-3-6386	b. Locally open valves

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Check PRZ Pressure:	
	a Pressure - LESS THAN 2335 PSIG	a Verify at least one PRZ PORV and block valve open. IF NOT, THEN open one PORV and block valve as necessary until pressure less than 2335 PSIG.
	b. Pressure - LESS THAN 2260 PSIG	b Control charging and letdown flow as necessary to decrease PRZ pressure to less than 2260 PSIG.
6	Verify PRZR PORVs - CLOSED	Manually close PORVs IF any valve can NOT be closed, THEN manually close its block valve.
7	Turn On PRZ Heaters	
8	Check PRZ Spray Valves:	
	a Normal spray valves - CLOSED	a. Manually close spray valves IF any valve can NOT be closed, THEN stop RCP(s) supplying failed spray valve(s)
	b. Auxiliary spray valve - CLOSED	b. Manually close auxiliary spray valve IF valve can NOT be closed, THEN isolate auxiliary spray line.
9	Control Charging And Letdown Flow As Necessary To Maintain RCS Pressure Stable	
10	Check PRZ Level - LESS THAN 92%	Return to Step 9
11	Return To Procedure And Step In Effect	

END OF TEXT

FINAL PAGE

PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-FR-I.2

EOP Title: Response to Low Pressurizer Level

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
3 RNO	3 RNO	7	Step 3 RNO provides plant specific means for establishing charging flow. See attached procedure.
4 RNO	4 RNO	7	Step 4 RNO initiates safety injection in the event that pressurizer flow can not be restored with maximum charging flow. The transition to E-0 ensures proper diagnostic steps are taken.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-FR-I.2

<u>Title:</u>

RESPONSE TO LOW PRESSURIZER LEVEL

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	86-085
Approved by Plant Manager-N:	3/31/86

•/GY/sr/dt

1.0 PURPOSE

This procedure provides actions to respond to a low pressurizer level.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from F-0.6, INVENTORY Critical Safety Function Status Tree on a YELLOW condition.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Check If SI Has Been Terminated:	
	a. High-head SI pumps - ALL STOPPED	a. Return to procedure and step in effect.
2	Verify Letdown - ISOLATED	Manually isolate letdown.
3	Check If Charging Flow Has Been Established:	
	a. Charging pump - AT LEAST ONE RUNNING	a. Perform the following: 1) Reset SI signal IF necessary. 2) IF CCW flow to RCP thermal barriers is lost, THEN isolate seal injection to affected RCP. Verify adequate diesel capacity to power charging pumps, IF necessary shed non-essential loads (refer to E-0 Attachment D for component KW load rating). 3) Start one charging pump.
	b. Instrument air to containment - ESTABLISHED	b. Start all diesel powered air compressors.
	c. Charging flow - ESTABLISHED	c. Establish 21 GPM charging flow by opening HCV-121
4	Increase Charging Flow To Restore PRZ Level	IF charging flow at maximum, AND PRZ level can NOT be restored, THEN initiate SI and go to E-0, REACTOR TRIP OR SAFETY INJECTION, Step 1.
5	Check PRZ Level:	
	a. Level - INCREASING	a. Return to Step 4.
	b. Level - GREATER THAN 15%	b. Return to Step 5a.
6	Turn On PRZ Heaters As Necessary	
7	Return To Procedure And Step In Effect	

END OF TEXT

FINAL PAGE

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PLANT SPECIFIC DEVIATION DOCUMENTATION SHEET

EOP Number: 3-EOP-FR-I.3

EOP Title: Response to Voids in Reactor Vessel

GENERIC EOP GUIDELINE STEP NO.	PLANT SPECIFIC EOP STEP NO.	DEVIATION TYPE	DESCRIPTION OF DEVIATION AND JUSTIFICATION OF DIFFERENCES
2	2	7	Step 2 RNO provides plant specific methods and equipment for establishing charging flow and excess letdown, and instrument air. See attached procedure.
3	3	7	Step 3 RNO provides plant specific methods and equipment for establishing letdown, and excess letdown. See attached procedure.
4b RNO	4b RNO	7	Step 4b RNO provides plant specific means for use of pressurizer heaters if offsite power is unavailable. See attached procedure.
9	9	7	Step 9 provides plant specific prerequisites for reactor coolant pump start in Step 9c. See attached procedure.
12	12	7	Step 12 provides plant specific method for obtaining containment hydrogen concentration measurements. See attached procedure.
15b RNO	15b RNO	7	Step 15b RNO provides plant specific means for use of pressurizer heaters if offsite power is unavailable. See attached procedure.
16	16	7	Step 16 provides plant specific preparation steps for reactor vessel venting. See attached procedure.
17a	17a	7	Step 17a RNO provides plant specific method for a containment hydrogen concentration greater than 3 percent. Notification to the TSC staff will provide information for TSC staff to direct installation of the hydrogen recombiner. See attached procedure.
19a	19a	2	Step 19a provides plant specific reactor vessel vent paths. See attached procedure.
Figure FR 13-1	Figure 13-1	7	Figure 13-1 provides plant specific hydrogen flow rate versus RCS pressure figures.

Florida Power & Light Company

Turkey Point Nuclear Plant

Unit 3

3-EOP-FR-I.3

Title:

RESPONSE TO VOIDS IN REACTOR VESSEL

Safety Related Procedure	
Responsible Department:	Operations
Reviewed by PNSC:	86-085
Approved by Plant Manager-N:	3/31/86

HE3.ec dc

1.0 PURPOSE

This procedure provides actions to respond to voids in the reactor vessel head.

2.0 SYMPTOMS OR ENTRY CONDITIONS

This procedure is entered from F-0.6, INVENTORY Critical Safety Function Status Tree on a YELLOW condition.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

If a controlled natural circulation cooldown is in progress and a void in the reactor vessel upper head is expected, this procedure should not be performed.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
1	Check If SI Has Been Terminated:	
	a. High-head SI pumps - ALL STOPPED	Return to procedure and step in effect.
2	Check If Charging Flow Has Been Established:	
	a. Charging pump - AT LEAST ONE RUNNING	a. Perform the following: 1) Reset SI signal <u>IF</u> necessary. 2) <u>IF</u> CCW flow to RCP thermal barriers is lost, <u>THEN</u> isolate seal injection to affected RCP. Verify adequate diesel capacity to run charging pumps, <u>IF</u> necessary shed non-essential loads (refer to E-0, Attachment D for component KW local rating). 3) Start one charging pump.
	b. Instrument air to containment - ESTABLISHED	b. Start all diesel powered air compressors.
	c. Charging flow - ESTABLISHED	c. Establish 21 GPM charging flow by opening HCV-3-121. <u>IF</u> 21 GPM charging can <u>NOT</u> be established, <u>THEN</u> establish excess letdown: 1) Verify OPEN FC-3-739, excess letdown heat exchanger CCW outlet valve 2) Verify HCV-3-137, excess letdown heat exchanger outlet valve - CLOSED. 3) Verify CV-3-389, excess letdown heat exchanger divert valve is at the desired position: a) DIVERT - to RCDT b) NORMAL - to VCT 4) OPEN CV-3-387, excess letdown heat exchanger inlet valve. 5) OPEN HCV-3-137, excess letdown heat exchanger outlet valve. 6) Verify a ΔT across the excess letdown heat exchanger Go to Step 4.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3	Check Letdown - IN SERVICE	Establish letdown: 1) Verify letdown orifice isolation valves closed. 2) Open the letdown containment isolation valve CV-3-204. 3) Open the letdown line isolation valve LCV-3-460. 4) Open the letdown orifice for desired flow. IF letdown can NOT be established, THEN establish excess letdown: 1) Verify OPEN FC-3-739, excess letdown heat exchanger CCW outlet valve 2) Verify HCV-3-137, excess letdown heat exchanger outlet valve - CLOSED. 3) Verify CV-3-389, excess letdown heat exchanger divert valve is at the desired position: a) DIVERT - to RCDT b) NORMAL - to VCT 4) OPEN CV-3-387, excess letdown heat exchanger inlet valve. 5) OPEN HCV-3-137, excess letdown heat exchanger outlet valve. 6) Verify a ΔT across the excess letdown heat exchanger

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Establish Stable RCS Conditions:	
	a. PRZ level - STABLE AND BETWEEN 40% and 60%	a Control charging and letdown as necessary.
	b. RCS pressure - STABLE	b. IF offsite power is not available verify adequate diesel capacity to run-the PRZ heaters. IF necessary shed non-essential loads (refer to E-0, Attachment D for component KW load rating). THEN turn on PRZ Heaters and use normal PRZ spray as necessary. IF normal spray NOT available and letdown in service, THEN use auxiliary spray.
	c. RCS hot leg temperatures - STABLE	c. Dump steam as necessary.
5	Check RCP's - ALL STOPPED	Go to Step 12.
6	Check If RCS Pressure Should Be Increased:	
	a. Pressure - AT LEAST 100 PSI LESS THAN TECH SPEC LIMIT	a. Go to Step 9.
	b. Pressure - LESS THAN 1083 PSIG [1488 PSIG]	b. Go to Step 9.
	c. Turn on PRZ heaters to increase RCS Pressure 50 PSI	
7	Control Charging And Letdown As Necessary To Maintain PRZ Level Greater Than 23% [50%]	
8	Check RVLMS (QSPDS) Head Indication:	
	a. Indication - INCREASING	a. Go to Step 9.
	b. Indication - GREATER THAN 33%	b. Return to Step 6.
	c. Turn off PRZ Heaters as necessary to stabilize RCS pressure	
	d. Return to procedure and step in effect	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

If seal cooling had previously been lost, the affected RCP(s) should not be started prior to a status evaluation.

NOTE

RCPs should be run in order of priority to provide normal PRZ spray.

9 Try to Start One RCP:

a. Establish the following conditions prior to RCP start:

- PRZ LEVEL - GREATER THAN 68% [90%]
- RCS SUBCOOLING BASED ON CORE EXIT TCs - 55°F [78°F]

Response not obtained: a. IF conditions can NOT be established, THEN go to Step 12.

b. Establish conditions for starting an RCP:

1) Verify off-site power available to the 4KV buses
2) Start the oil lift pump
3) Verify that the number 1 seal leakoff valve is OPEN and seal flow is established
4) Verify the seal injection water flow to be approximately 8 to 12 GPM (refer to Enclosure #1 of OP-041.1, REACTOR COOLANT PUMP OPERATION)
5) Verify ΔP across the thermal barrier to be 15 inches of water
6) Verify GREATER THAN 200 PSID across the number 1 seal
7) Verify that the oil lift pump has been running for two minutes and the oil pressure interlock light is ON.

Response not obtained: b. Go to step 10.

c. Start one RCP

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Check RVLMS (QSPDS) - INDICATES HEAD FULL	Go to Step 12.
11	Go To Step 21	
12	Obtain Containment Hydrogen Concentration Measurement:	
	a Contact Chemical Department and request a containment hydrogen concentration reading.	

CAUTION

Following block of automatic SI actuation manual SI actuation may be required if conditions degrade.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
13	Check If Low PRZ Pressure SI Can Be Blocked:	
	a. PRZ pressure - LESS THAN 1950 PSIG	a. Decrease PRZ pressure to less than 1950 PSIG using normal PRZ spray. IF normal spray NOT available and letdown in service, THEN use auxiliary spray IF NOT, THEN use one PRZ PORV
	b Block Low PRZ Pressure SI	
14	Record RCS Pressure	
15	Establish Following RCS Conditions:	
	a PRZ level - STABLE AND BETWEEN 40% and 60%	a. Control charging and letdown as necessary.
	b. RCS pressure - STABLE	b. IF offsite power is not available verify adequate diesel capacity to run the PRZ Heaters, IF necessary shed non-essential loads (refer to E-0, Attachment D for component KW load rating). THEN turn on PRZ Heaters and use normal PRZ spray as necessary. IF normal spray NOT available and letdown in service, THEN use auxiliary spray.
	c. RCS subcooling based on core exit TCs - GREATER THAN 30°F [45°F]	c. Dump steam as necessary
	d RCS hot leg temperatures - STABLE	d. Dump steam as necessary.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
16	Prepare Containment For Reactor Vessel Venting:	
	a. Isolate containment:	
	1) Source check radiation monitor R-11 or R-12 and verify containment ventilation isolation occurs, by the following indications.	1) If source check of R-11 or R-12 does not produce a containment ventilation isolation on high radiation remove the fuses on one of the channels to initiate the signal.
	a) CV-3-2819 containment Instrument air bleed-CLOSED	
	b) CV-3-2826 containment Instrument air bleed-CLOSED	
	c) POV-3-2600 containment purge supply Isolation-CLOSED	
	d) POV-3-2601 containment purge supply isolation-CLOSED	
	e) POV-3-2602 containment purge exhaust isolation-CLOSED	
	f) POV-3-2603 containment purge exhaust Isolation-CLOSED	
	g) Containment purge supply fan - OFF	
	h) Containment purge exhaust fan - OFF	
	b. Start containment air circulation equipment	
	1) IF offsite power is not available verify adequate diesel capacity to run the following equipment. IF necessary shed non-essential loads (refer to E-0, Attachment D for component KW load rating).	
	2) Start all operable normal containment coolers	
	3) Start all operable emergency containment coolers	
	4) Start all operable emergency containment filters	
	5) Start all operable CRDM coolers	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	Determine Maximum Allowable Venting Time:	
	a Containment hydrogen concentration - LESS THAN 3% IN DRY AIR	a Notify TSC of hydrogen concentration inside containment.
	b Refer to ATTACHMENT A to determine maximum venting time	
18	Review Reactor Vessel Venting Termination Criteria:	
	• RCS SUBCOOLING BASED ON CORE EXIT TCs - LESS THAN 30°F [45°F]	
	OR	
	• PRZ LEVEL - LESS THAN 23% [50%]	
	OR	
	• RCS PRESSURE - DECREASES BY 200 PSI	
	OR	
	• VENTING TIME - GREATER THAN MAXIMUM TIME CALCULATED IN STEP 17	
	OR	
	• RVLMS (QSPDS) INDICATES UPPER HEAD FULL	

CAUTION

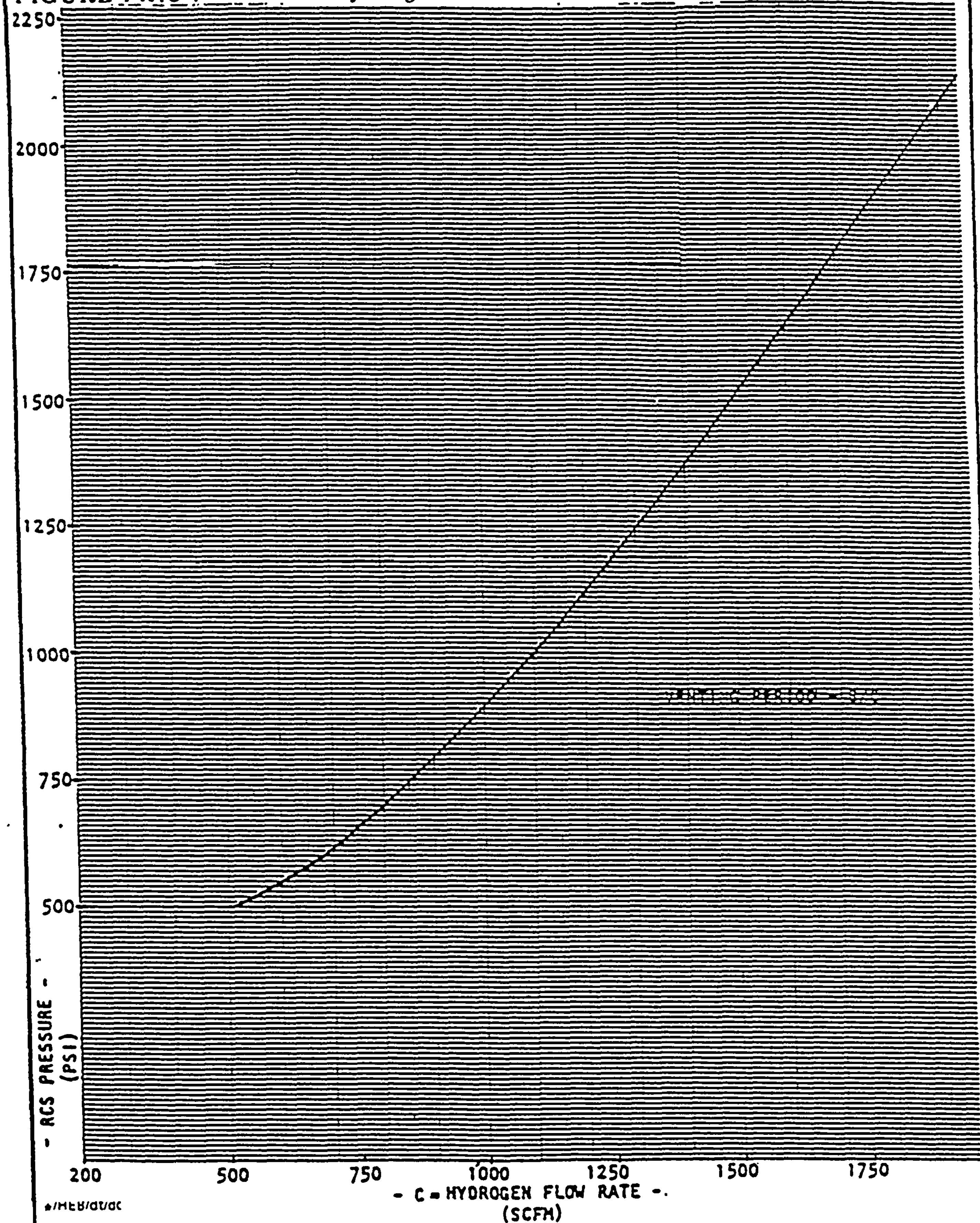
Venting should be stopped if any venting termination criterion in Step 18 is exceeded.

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	Vent Reactor Vessel:	
	a. OPEN both valves in one vent path	a. IF either valve fails to open in one vent path, THEN close both valves and open valves in second path
	1) Vent valves to PRT	
	OR	
	2) Vent valves to containment	
	b. Any venting termination criterion - EXCEEDED	b. Continue venting. WHEN any venting termination criterion is exceeded, THEN do Steps 19c, 20, 21, 22
	c. CLOSE all vent valves	

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
20	Check RVLMS (QSPDS) - INDICATES HEAD FULL	Increase RCS pressure to value recorded in Step 14 Return to Step 15
21	Check PRZ Level - STABLE	Control charging and letdown as necessary
22	Return to Procedure And Step In Effect	

END OF TEXT

FIGURE FR13-1 Hydrogen Flow Rate Versus RCS Pressure



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ATTACHMENT A

INSTRUCTIONS FOR DETERMINING VENTING TIME

1. Determine Containment Volume at STP = A

$$A = 1{,}550{,}000 \times \frac{(\text{Containment pressure*})}{14.7 \text{ psia}} \times \frac{492°R}{(\text{Containment temperature °F} + 460)}$$

2. Determine Maximum Hydrogen volume that can be vented = B

$$B = \frac{(3.0\% - \text{Containment Hydrogen Concentration}) \times A}{100\%}$$

3. Determine Hydrogen flow rate as a function of RCS pressure = C

   a. Check RCS pressure.

   b. Using Figure FR13-1, read hydrogen flow rate.

4. Calculate maximum venting time:

$$\text{Maximum venting time} = \frac{B}{C}$$

* If pressure less than 14.7 psia, input actual valve
If pressure greater than 14.7 psia, input 14.7 psia, for conservatism