PROCEDURES GENERATION PACKAGE
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

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REACTOR OPERATIONS SUPERINTENDENT

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I. Introduction

A. Purpose

This document has been prepared to describe the Emergency Operating Procedures (EOPs) development for the South Texas Project Electric Generating Station (STPEGS). Both units are Westinghouse designed four loop PWRs with the XLR fuel design.

B. Scope

This document has been prepared in response to NUREG - 0737, "Requirements for Emergency Capability", Supplement 1, Item 7.2.b.

C. Organization

Each of the four sections (II-V) describe the approach taken at STPEGS for the development, confirmation, and implementation of the EOPs for STPEGS, Units 1 and 2.

II. Plant Specific Technical Guidelines

A. General

Due to the similarity between STPEGS and the generic plant for which the Westinghouse Owners Group (WOG) Emergency Response Guidelines (ERGS) were prepared, the STPEGS EOPs were modeled after the WOG ERGS.

Recognized differences between the generic plant and STPEGS were factored into the plant specific procedures using a method specified in the writer's guide.

B. Mechanics of Conversion

When preparing the plant specific EOPs, the writers used the following sources of information when needed.

1. WOG ERGs (Rev. 1)
2. STP FSAR
3. Vendor manuals and system descriptions
4. Plant Technical Support Division
5. Writer's Guide
6. Plant Electrical Drawings

7. Plant Instrument List

8. Plant Piping and Instrumentation Drawings

9 Vendor Bulletins and Memos

Administrative Memos, Orders, and Procedures

Contained within the plant procedure "Emergency Procedures Writer's Guide and Verification" are instructional steps for for the actual conversion process.

As the procedure writer prepared the EOP, deviations between the WOG ERGS and the plant specific procedure caused by plant design or preferred due to control board layout were documented on form (4) of the writer's guide. Reasons for deviations were also documented on the same form.

Items such as plant specific format, instructions for obtaining set points and calculated values, the review and comment process and interfacing with other plant divisions are provided within the writer's guide.

III. EOP Writer's Guide

A. General

The plant specific writer's guide, prepared by the plant staff, provides a means for ensuring that all EOPs are prepared in a consistent manner, regardless of the number of writers involved. The guide provides the writer with good human factors principles and direction for converting the WOG ERGs into plant specific EOPs.

Preparation of the writer's guide was based upon practices outlined in INPO Document 82-017,"Emergency Operating Procedures Writing Guidelines", the Westinghouse Writer's Guide, and NUREG - 0899, "Guideline for the Preparation of Emergency Operating Procedures."

The writer's guide will be revised, as necessary, based on feedback from operators training, experience and validation.

B. Writer's Guide Description

The STPEGS EOP Writer's Guide addresses the following major areas:

1. WOG Guideline Conversion

2. Format

3. Organization

4. Numbering

5. Mechanics of Style

6. Identification of Instrumentation and Controls

7. EOP Verification

8. Review and Comment Process

The STPEGS Writer's Guide is Attachment 1 for reference.

IV. EOP Verification and Validation

A. General

Emergency Operating Procedures are verified in two processes, one accomplished using the writer's guide. This process involves review by Shift Supervisors and other Operations Supervisors, focusing on operational accuracy. The second process outlined in the plant procedure, "EOP Preparation, Approval, and Implementation", involves the Quality Assurance, Engineering, and Training Divisions. This process focuses on technical accuracy and additional operational review.

Validation of the EOPs will be accomplished using methods outlined in INPO Document 83-006 "Emergency Operating Procedures Validation Guidelines". Incorporated within the plant procedure preparation process are two comment resolution cycles, one during the verification and the other after the validation cycle.

B. Objectives

In evaluating each of the objectives, consideration must be given to the human factors aspects. The verification/validation process will address all of the following questions:

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

2. Are the EOPs written correctly, i.e., do they accurately reflect the plant-specific writer's guide?

3. Are the EOPs usable, i.e., can they be understood and followed without confusion, delays, and errors?

4. Do the procedures correspond to thecontrol room/plant hardware, i.e., control equipment/indications that are referenced are available (inside and outside of the control room), use the same designation, use the same units of measurement, and operate as specified in the procedures?

5. Are the language and level of information presented in the EOPs compatible with the minimum number, qualifications, training, and experience of the operating staff?

6. Is there a high level of assurance that the procedures will work, i.e., will the procedures correctly guide the operator in mitigating transients and accidents?

C. Responsibilities

1. The Plant Manager has the overall responsibility for the preparation, approval and implementation of the plant EOPs.

2. The Technical Support Superintendent is responsible for providing the needed technical support to confirm the expected plant response and the plant specific set points and calculated values.

3. The Reactor Operations Superintendent has the responsibility for the verification and validation of the plant EOPs. He is also responsible for the approval of comment resolutions for each EOP.

4. The Nuclear Training Department is responsible for the training of those personnel involved in the validation process and providing the facilities for the validation of the EOPs.

D. Method of Verification/Validation (V&V)

It should be noted that to initially establish the validity of the EOPs, to meet the above objectives, the personnel chosen to write the EOPs will be familiar with plant equipment, operations, technical requirements, operator knowledge level, the writer's guide and the technical guideline. This is considered as a factor in the V&V process. Secondly, the generic guidelines were validated on a simulator to determine the effectiveness of the procedure network including technical content, procedure interrelationships, usability, human factor considerations, etc. The generic simulator validation was accomplished by the WOG at a training facility that was of the generic plant, using the WOG Guidelines adapted to plant specific procedures.

The means by which additional V&V will be performed to meet each objective is as follow:

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

   a. The objective will be met by performing a step-by-step tabletop review of the EOP. The reviewer(s) shall be familiar with plant equipment, operations, technical requirements, operator knowledge level, and the technical guidelines. Additionally, the reviewer shall not be the writer of the EOP. Using the source documents, the reviewer(s) shall address the following concerns:

      1) Do the writer's guide Step Deviation forms clearly show why the plant specific procedure deviates from the WOG ERGs?

      2) Is correct plant-specific information incorporated into the EOPs, such as valve numbers, numerical values and operator tasks?

      3) Have calculated values been verified?

2. Are EOPs written correctly, i.e., do they accurately reflect the plant EOP writer's guide?

   This objective can be met by performing a table-top review of the EOP. The review will be a direct comparison between the writer's guide and the EOP. The reviewer shall be a person familiar with the STP Writer's Guide for EOPs and shall not be the writer of the EOP.

3. Are EOPs usable, i.e., can they be understood and followed without confusion, delays and errors?

   The EOPs will be checked on the plant specific simulator or control board mockup by STP Operations personnel to identify, as much as possible, problems that could exist. Errors of omission, commission, and sequencing, along with user uncertainty, will be considered. The simulator Operating crew and observer(s) will attempt to identify problems where the user:

   a. Allows a limit to be exceeded.

   b. Fails to detect a key signal or parameter.

c. Does not perform an action or step. This also includes action required to take place at some time later based on continuous monitoring of a parameter.

d. Performs an action not in the procedure.

e. Selects the wrong procedure.

f. Performs an action out of sequence.

g. Has to re-read procedure steps (readability).

h. Takes excessive time to complete an action. This also includes action required to take place at some time later based on continuous monitoring of a parameter.

i. Fails to perform actions at the required time.

j. Fails to observe cautions or notes.

k. Has difficulty making transitions from one procedure to the next.

l. Is confused or afraid to perform an action.

m. Has problems interfacing with other operators and/or Supervisors.

Feedback received during EOP operator training will be used to improve EOP usability.

4. Is there a parallel between the procedures and the control room/plant hardware?

This objective can be met performing a control room, simulator or mockup walk-through. The reviewer(s) shall be familiar with STP equipment and operations. The reviewer(s) should verify the following for plant equipment specified in the EOP:

a. Equipment is available for operator use.

b. Equipment is identified properly.

c. Actual units of measure and the range of indicators/recorders correspond to values specified in the EOP.

d. Locations specified in the procedure are correct and are consistent with the task involved.

5. Are the language and level of information presented in the EOP compatible with the minimum number, qualifications, training, and experience of the operating staff?

   This objective can be satisfied by having STP Operations personnel write the EOPs, since they are familiar with the above. The validation effort will be used to provide feedback to clarify language problems.

6. Is there a high level of assurance that the procedures will work, i.e., do the procedures guide the operator in mitigating transients and accidents?

   The generic guidelines are backed up with computer analysis and, as stated earlier, were verified on a simulator. Additionally, the training and validation will complete the testing of the EOPs.

E. Discrepancy Detection

The purpose of the V&V program is to detect discrepancies. A reviewer or review team will be assigned to address each objective listed above. It will be the responsibility of the reviewer or review team to ensure that the criteria of the objective are met and discrepancies are documented. Identified discrepancies will be documented on either the Writer's Guide Discrepancy form or the Validation Test Discrepancy form.

F. Discrepancy Resolution

When a discrepancy is identified, a resolution will be developed to correct the discrepancy. The solution to some discrepancies may involve correcting the procedure, while others may be addressed by increasing the level of operator training. The resolution will be written on the EOP Discrepancy form used. The verification of the EOP is not complete until the discrepancies have been resolved.

G. Documentation

The EOP preparation & validation package will be entered in the Nuclear Plant Operations Department Document Control Center.

V. EOP Training Program

As part of the pre-implementation process, the license operator candidates at STPEGS will receive training on all the plant-specific EOPs generated from the WOG Emergency Response Guidelines. To maximize the effectiveness of the procedure training, the training will be conducted in two separate phases. Phase I will be classroom instruction. Initial training is tentatively scheduled to begin during the First Quarter, 1986. Shortly after completion of STPEGS simulator, Phase II of the EOP training will begin. In the event the simulator is not available, these sessions will be conducted by walk-throughs of the procedures on the Main Control Panels or the Control Board Mockup.

A. Phase I - Initial Training

A series of classroom sessions will be conducted during the candidate's initial training of emergency procedures.

Classroom Training

1. The emergency procedures will be grouped, as much as possible, by the interrelationships with one another to ensure a smooth transition between each procedure.

2. As a minimum, the following information will be discussed in each procedure:

   a) The logic behind the development of the emergency procedure will be explained to ensure that the licensed operators understand the scope of the procedure and the plant conditions that would require use of the procedure.

   b) A flowchart describing each step in the emergency procedure will be used to provide an understanding of the process used to develop each procedure.

   c) The objectives of the procedures will be stressed. Understanding of the objectives of each emergency procedure will provide the operators with the knowledge to better cope with situations that deviate from the initial assumptions for which the procedure was written.

d) Each step of the emergency procedure will be discussed. As each step is presented, the Westinghouse Emergency Response Guideline background document and the EOP Step Justification/Verification form will be used to explain, if required, the technical bases for each step. In discussing the steps, the instructor can verify the operator's ability to perform the steps. If a problem is noted with the procedure, an EOP Discrepancy Comment Form will be used for documentation of problem area.

B. Phase II - Simulator Training

A series of classroom and simulator sessions will be conducted to train operators on the new emergency procedures.

1. Classroom Session

A classroom session will be held to brief the operators on the evolutions which will be conducted on the simulator and to review the basic steps of the procedures which have not been previously used by them on the simulator.

2. Simulator Session

With the use of scenarios, operators will be given symptoms or events which will allow them to use the procedures that were previously discussed during the classroom session, as well as procedures which have previously been used on the simulator. The operators and instructors will again be given the opportunity to provide constructive feedback in validating the procedures.

C. Long-Term Training

The annual requalification program will incorporate the use of the emergency procedures during annual simulator training. Additionally, significant modifications to the emergency procedures will be discussed in the requalification program to ensure that licensed operators are kept current with latest revisions. (Minor change via routing night order book, etc.)