



BOSTON **Edison** COMPANY

NUCLEAR OPERATIONS DEPARTMENT

PILGRIM NUCLEAR POWER STATION

VALIDATION PROCEDURE
FOR
EMERGENCY OPERATING PROCEDURES

Approved

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ORC Chairman

Date

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1. INTRODUCTION

1.1 PURPOSE

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

1.2 SCOPE

This procedure identifies the aspects of the validation program process and gives guidance that encompasses three validation methods - table-top, walk-through, and simulator. Specific guidance for each method is presented in its appropriate checklists (see Attachments 1 and 2).

1.3 APPLICABILITY

This procedure applies to EOP validation prior to implementation and validation subsequent to implementation for Pilgrim Nuclear Power Station.

2. REFERENCES

- Emergency Operating Procedures Validation Guideline (INPO 83-006)
- BWR Owner's Group Emergency Operating Procedures Guidelines, Revision 2
- Appendix A, BWR EPGs, Revision 1
- FSAR
- NRC Inspection Findings, Resolutions
- Results of EOP verification

3. DEFINITIONS

Control Room Simulator - a device that dynamically models the plant functions as presented in the control room.

Emergency Operating Procedures (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.

Emergency Operating Procedure Guidelines (EPGs) - Guidelines that provide technical bases for the development of EOPs.

EOP Source Documents - Documents or records upon which EOPs are based.

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

Mock-Up - Static device (e.g., models, photos, drawings) that portrays control room hardware and configuration.

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

Simulator Validation - Method of validation whereby control room operators perform actual control functions on simulated equipment during a scenario for an observer/review team.

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

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. RESPONSIBILITIES

4.1 Operations Review Committee

The Operations Review Committee shall approve all EOPs and revisions.

4.2 Nuclear Training Manager

The Nuclear Training Manager shall be responsible for the following:

- managing the validation program and ensuring its smooth coordination with the training program
- coordinating for rotating operating crews through the training/validation sessions
- scheduling simulator training time for validation purposes as appropriate
- reviewing discrepancies and resolutions forwarded to him by observer/review personnel
- forwarding recommended resolutions and procedure changes to the Nuclear Operations Manager for approval; the Nuclear Training Manager will devise a system to track the recommended changes.

5. PROCESS FOR EOP VALIDATION

Regardless of the validation method, the EOP validation process can be described by the three phases of: (1) preparation, (2) assessment, and (3) resolution.

5.1 Preparation

Each validation method will involve the preparation of scenarios using the appropriate scenario forms:

Table-Top/Walk-Through Scenario Form
Simulator Scenario Form

Attachment 1 gives specific guidance for the preparation of a Table-Top/Walk-Through Validation.

Attachment 2 gives specific guidance for the preparation of Simulator Validation.

5.2 Assessment

The assessment phase of each validation type is described in the applicable Attachment 1 or 2.

5.3 Resolution

Resolution will be accomplished by reviewing discrepancies and comments presented on the Procedure Discrepancy Sheet. The observer/reviewer will propose solutions, if needed, and forward to the Nuclear Training Manager for approval, with the other designated documentation.

6. DOCUMENTATION

The documented items needed to provide a history of the validation program are specified on each validation method checklist (Attachments 1 and 2). These items will be maintained as a validation package in the document control storage area.

ATTACHMENTS

ATTACHMENT 1

CHECKLIST FOR TABLE-TOP/
WALK-THROUGH METHODS OF VALIDATION

1. PURPOSE

The purpose of this checklist is to provide guidance for the table-top and walk-through methods of validating EOPs.

2. VALIDATION PROCESS

EOP validation will be conducted in three parts: preparation, assessment, and resolution.

2.1 PREPARATION

The designated instructor will be responsible for the following:

- using and completing the EOP Validation Form
- developing or modifying scenarios to support the scope of validation and filling out the Table-Top/Walk-Through following the attached example
- modifying/selecting the developed evaluation criteria to support the scope of validation

To do this, fill out the following checklist:

- ___ Obtain copy of the EOP Validation Form
- ___ Fill in the Procedure to be validated: name, number, and revision
- ___ Fill in the purpose of validation (choose 1):
 - ___ transition between procedures
 - ___ use of single procedure
 - ___ transition into attachments
 - ___ ability to perform concurrent actions
 - ___ use of multiple procedures
- ___ Fill in validation method (choose 1):
 - ___ Walk-through
 - ___ Table-top
 - ___ Simulator
- ___ Fill in Instructor/Observer
- ___ Obtain copy of Table-Top/Walk-Through Scenario Form
 - ___ fill in lines 1-4
 - ___ fill in scenario description and initial plant condition
 - ___ fill in the bottom section

List the progression through the steps of the procedure in the first column.

List the symptoms which could cause transition.

List where the transition should take the operator.
- ___ See example on page #9 to check your work.

SAMPLE

TABLE-TOP/WALK-THROUGH SCENARIO FORM

PROCEDURE NO: EOP-01

TITLE: REACTOR TRIP OR SAFETY INJECTION

DATE: June 1, 19XX

PURPOSE: To evaluate transition from EOP-01 to EOP-02
via step 27 of EOP-01.

SCENARIO DESCRIPTION: A reactor trip is initiated by a faulty
relay on RCP No. 1. Rapid action of the pump anti-rotation
device causes the pump coupling to fail, resulting in the
failure of the pumps seal packages

INITIAL PLANT CONDITIONS: 100% on line

PROCEDURE STEP DESCRIPTION	PLANT PARAMETER/ SYMPTOM TO CAUSE TRANSITION	TRANSITION TO (PROCEDURE, STEP)
Step 1-26 are normal responses to a reactor trip	None	N/A
Step 27 addresses containment Parameters	High containment Pressure or Contain- ment Radiation	EOP-02, Step 1

2.2 ASSESSMENT

The designated instructor will perform the following duties:

- brief the operators on the scope of validation and how the assessment will be conducted
- 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
- stop the talk-through or walk-through assessment for discussion of any identified discrepancies.
- conduct a debriefing with the operators as soon as possible after each walk-through assessment, using the following sequence:
 - brief the participants on the purpose and objectives for debriefing
 - using the Table-Top/Walk-Through evaluation form:
 - a. have operators present problems and discrepancies which they had identified during assessment
 - b. have operators provide possible reasons for problems
 - c. present other problems and discrepancies identified during assessment
 - d. have operators describe possible reasons for the other problems
 - e. summarize the findings of the debriefing for the operators.
- record discrepancies and comments on Procedure Discrepancy Sheets (PDS).

2.3 RESOLUTION

The designated instructor will perform the following duties:

- review comments and discrepancies
- propose resolutions on PDS for the Nuclear Training Manager
- submit the validation package to the Nuclear Training Manager.

The Nuclear Training Manager will perform the following duties:

- review proposed resolutions with appropriate staff
- select resolutions for incorporation in the EOPs
- present the revised EOPs to the Nuclear Operations Manager for approval.

3. DOCUMENTATION

The following documentation will be submitted as a validation package:

- completed EOP Validation Form
- Table-Top/Walk-Through Scenario Forms
- PDS Forms used
- Table-Top/Walk-Through Evaluation Forms

ATTACHMENT 2
CHECKLIST FOR SIMULATOR
METHOD OF VALIDATION

1. PURPOSE

The purpose of this checklist is to provide guidance for the simulator method of validating EOPs.

2. VALIDATION PROCESS

EOP validation will be conducted in three parts: preparation, assessment, and resolution.

2.1 PREPARATION

The designated observer/reviewer will be responsible for the following:

- using and completing the EOP Validation Form
- developing or modifying scenario runs to support the scope of validation
- completing the upper portion of the Simulator Scenario following the attached example and forwarding to the simulator instructor

To do this, fill out the following checklist:

- ___ Obtain copy of the EOP Validation Form
- ___ Fill in Procedure to be validated: name, number and revision
- ___ Fill in purpose of Validation; choose 1:
 - ___ transition between procedures
 - ___ use of single procedure
 - ___ transition into attachments
 - ___ ability to perform concurrent actions
 - ___ use of multiple procedures
- ___ Fill in validation method (choose 1):
 - Walk-Through
 - Table-Top
 - Simulator
- ___ Fill in Instructor/Observer
- ___ Obtain copy of form 2
 - ___ Fill in lines 1-4
 - ___ Fill in scenario description and initial plant condition

— Fill in the bottom section

List the progression through the steps of the procedure column.

List the symptoms which could cause transition.

List where the transition should take the operator.

— See example on page #14 to check your work.

SAMPLE
SIMULATOR SCENARIO FORM

PROCEDURE NO.: EOP-01 REVISION: 01

TITLE: REACTOR TRIP OR SAFETY INJECTION

DATE: June 1, 19XX

PURPOSE: To evaluate transition from EOP-01 to EOP-02 via
step 27 of EOP-01

SCENARIO DESCRIPTION: A reactor trip is initiated by a faulty relay
on RCP No. 01. RCP seal packages fail.

INITIAL PLANT CONDITIONS: 100% on line

SIMULATOR SEQUENCE (to be completed by the simulator supervisor):

EVENT NO.	TIME HR:MIN:SEC	I/O OVERRIDE	MAJFUNCTION DESCRIPTION	INTENT
1	00:10:00	MAL No. 46	RCP 1 Trip	Reactor Trip
2	00:10:30	MAL No. 48	RCP Shaft Flow Loop 1	Hi Reverse
3	00:11:00	MAL No. 52A	Seal Fails in 5 min.	70 GPM Flow

2.2 ASSESSMENT

The designated instructor will perform the following duties:

- brief the operating crew on the scope of the validation and how the assessment will be conducted
- brief the operating crew on initial plant conditions for each scenario run
- conduct a debriefing with the operators as soon as possible after each scenario run using the following sequence:
 - brief the participants on the purpose and objectives for debriefing
 - using the Simulator Evaluation Form:
 - a. have operators present problems and discrepancies which they have identified during assessment
 - b. have operators provide possible reasons for problems
 - c. present other problems and discrepancies identified during assessment
 - d. have operators describe possible reasons for the other problems
 - e. summarize the findings of the debriefing for the operators
- record discrepancies and comments on the Procedure Discrepancy Sheet (PDS).

2.3 RESOLUTION

The designated observer/reviewer will perform the following duties:

- review comments and discrepancies
- propose resolutions on PDS for the Nuclear Training Manager
- submit the validation package to the Nuclear Training Manager.

The Nuclear Training Manager will perform the following duties:

- review proposed resolutions with appropriate staff
- select resolutions for incorporation into the EOPs
- present the revised EOPs to the Nuclear Operations Manager for approval.

3. DOCUMENTATION

The following documentation will be submitted with the validation package:

- completed EOP Validation Forms
- Simulator Scenario Forms
- PDS forms used
- Simulator Evaluation Forms

FOR INFORMATION
ONLY

FORMS

EOP VALIDATION FORM

Page ____ of ____

EOP Title: _____

EOP Number: _____ Revision: _____

Scope of Validation: _____

Validation Method or Methods to be Used: _____

- Designated Observer/Reviewer(s):

Preparation Completed on _____ by: _____

Assessment Completed on _____ by: _____

Operator(s) Involved: _____ Qualification: (SRO, RO, STA)

Resolution Completed on _____ by: _____

Documentation Package Forwarded on _____ by: _____

TABLE-TOP/WALK-THROUGH EVALUATION FORM

I. USABILITY

Y N

A. LEVEL OF DETAIL

1. Is there sufficient information to perform the specified actions at each step?
2. Are the alternatives adequately described at each decision point?
3. Are the labeling, abbreviations, and location information as provided in the EOP sufficient to enable the operator to find the needed equipment?
4. Is the EOP missing information needed to manage the emergency condition?
5. Are the contingency actions sufficient to address the symptoms?
6. Are the titles and numbers sufficiently descriptive to enable the operator to find referenced and branched procedures?

B. UNDERSTANDABILITY

1. Is the EOP easy to read?
2. Are the figures and tables easy to read with accuracy?
3. Can the values on figures and charts be easily determined?
4. Are caution and note statements readily understandable?
5. Are the EOP steps readily understandable?

II. OPERATIONAL CORRECTNESS

A. PLANT COMPATIBILITY

1. Can the actions specified in the procedure be performed in the designated sequence?
2. Are there alternate success paths that are not included in the EOPs?
3. Can the information from the plant instrumentation be obtained, as specified in the EOP?
4. Is information or equipment not specified in the EOP required to accomplish the task?

TABLE-TOP/WALK-THROUGH
SCENARIO FORM

PROCEDURE NO.: _____

TITLE: _____

DATE: _____

PURPOSE: _____

SCENARIO DESCRIPTION: _____

INITIAL PLANT CONDITIONS: _____

<u>PROCEDURE STEP DESCRIPTION</u>	<u>PLANT PARAMETER SYMPTOM TO CAUSE TRANSITION</u>	<u>TRANSITION TO (PROCEDURE, STEP)</u>
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TABLE-TOP/WALK-THROUGH EVALUATION FORM
(continued)

Y N

5. Are the instrument readings and tolerances stated in the EOP consistent with the instrument values displayed on the instruments?
6. 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)?
7. Are the instrument readings and tolerances specified by the EOP for remotely located instruments accurate?

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?
2. Can the procedure action steps be performed by the operating shift?
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?
4. Can the operating shift follow the designated action step sequences?
5. Can the particular steps or sets of steps be readily located when required?
6. Can procedure exit point be returned to without omitting steps when required?
7. Can procedure branches be entered at the correct point?
8. Are EOP exit points specified adequately?

SIMULATOR SCENARIO FORM

PROCEDURE NO.: _____ REVISION: _____

TITLE: _____

DATE: _____

PURPOSE: _____

SCENARIO DESCRIPTION: _____

INITIAL PLANT CONDITIONS: _____

EVENT NO.	TIME HR:MIN:SEC	I/O OVERRIDE	MALFUNCTION DESCRIPTION	INTENT
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*For additional space, use back.

SIMULATOR EVALUATION FORM

I. USABILITY

Y N

A. LEVEL OF DETAIL

1. Is there sufficient information to perform the specified actions at each step?
2. Are the alternatives adequately described at each decision point?
3. Are the labeling, abbreviations, and location information as provided in the EOP sufficient to enable the operator to find the needed equipment?
4. Is the EOP missing information needed to manage the emergency condition?
5. Are the contingency actions sufficient to address the symptoms?
6. Are the titles and numbers sufficiently descriptive to enable the operator to find referenced and branched procedures?

B. UNDERSTANDABILITY

1. Is the EOP easy to read?
2. Are the figures and tables easy to read with accuracy?
3. Can the values on figures and charts be easily determined?
4. Are caution and note statements readily understandable?
5. Are the EOP steps readily understandable?

II. OPERATIONAL CORRECTNESS

A. PLANT COMPATIBILITY

1. Can the actions specified in the procedure be performed in the designated sequence?
2. Are there alternate success paths that are not included in the EOPs?
3. Can the information from the plant instrumentation be obtained, as specified in the EOP?
4. Are the plant symptoms specified by the EOP adequate to enable the operator to select the applicable EOP?
5. Are the EOP entry conditions appropriate for the plant symptoms displayed to the operator?

SIMULATOR EVALUATION FORM
(continued)

Y N

- | | | |
|-------|-------|--|
| _____ | _____ | 6. Is information or equipment not specified in the EOP required to accomplish the task? |
| _____ | _____ | 7. Do the plant responses agree with the EOP basis? |
| _____ | _____ | 8. Are the instrument readings and tolerances stated in the EOP consistent with the instrument values displayed on the instruments? |
| _____ | _____ | 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)? |

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? |
| _____ | _____ | 2. Can the procedure action steps be performed by the operating shift? |
| _____ | _____ | 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? |
| _____ | _____ | 4. Can the operating shift follow the designated action step sequences? |
| _____ | _____ | 5. Can the particular steps or sets of steps be readily located when required? |
| _____ | _____ | 6. Can procedure exit point be returned to without omitting steps when required? |
| _____ | _____ | 7. Can procedure branches be entered at the correct point? |
| _____ | _____ | 8. Are EOP exit points specified adequately? |

PROCEDURE DISCREPANCY SHEET

EOP: _____ REVISION: _____ STEP NO.: _____

DISCREPANCY: (attach a copy of the page where the discrepancy occurs)

EVALUATOR: _____ DATE: _____

RESOLUTION:

SUPERVISOR: _____ DATE: _____

APPROVED: YES NO (circle one)

NUCLEAR TRAINING MANAGER: _____ DATE: _____

RESOLUTION INCORPORATED BY: _____ DATE: _____