AFW

Corrective

Actions

Book 3

A/17

STATE CHANGE HISTORY

Initiate → by RICHARD FLESSNER

Assign Work 2/5/2002 4.05 16 PM Owner RICK WOOD

Assign → by RICK WOOD

Conduct Work 6/5/2002 5 02.45 PM Owner RICK WOOD

Work Complete → by RICK WOOD

Review & Approval 7/2/2002 1:51.58 PM Owner RICK WOOD

Approved → by RICK WOOD

Quality Check 7/2/2002 2.32 59 PM Owner PBNP CAP Admin

Complete and Close → by MARYBETH ARNOLD

Done 7/10/2002 12.07.37 PM Owner (None)

SECTION 1

Activity Request Id:	CA003704		
Activity Type:	Corrective Action	**Submit Date:**	2/5/2002 4:05:16 PM
Site/Unit:	Point Beach - Common		
Activity Requested:	Evaluate if an Engineering Supplemental Guideline is the appropriate procedural method for controlling PRA updates, or if a higher tier document such as a Nuclear Procedure (NP) should be used considering the interfaces involving other departments. Initiate any procedure changes resulting from that evaluation.		
CATPR:	N	**Initiator:**	FLESSNER, RICHARD
Initiator Department:	EX Engineering Processes PB	**Responsible Group Code:**	EPP Engineering Programs PRA PB
Responsible Department:	Engineering	**Activity Supervisor:**	RICK WOOD
Activity Performer:	RICK WOOD		

SECTION 2

Priority:	3	**Due Date:**	7/3/2002
Mode Change Restraint:	(None)	**Management Exception From PI?:**	N
QA/Nuclear Oversight?:	N	**Licensing Review?:**	N
NRC Commitment?:	N	**NRC Commitment Date:**	

SECTION 3

Activity Completed:

1/18/2002 12:52PM - LARRY PETERSON:
Due date extended as requested and approved by F. Cayia in prior update. Retruned to R. flessner for completion.

1/18/2002 12:54PM - LARRY PETERSON.
Reassigned to R. Flessner for completion following extension.

6/5/2002 5:02:45 PM - RICK WOOD:
The NP is in draft. Additional comments from technical reviewer need to be incorporated.

6/19/2002 10:00:52 AM - RICK WOOD·
Additional comments from the reviewers need to be incorporated. The expected issue date of

the procedure is 7/26/2002. The Eng Director has approved the extension

7/2/2002 1:51:58 PM - RICK WOOD:
NP 7.7.20 Probabilistic Risk Assessment was issued 6/26/2002. This procedure includes the interface requirements.

7/10/2002 12.07:37 PM - MARYBETH ARNOLD:
NP 7.7.20, Revision 0 was issued on 06/26/02. The Purpose notes this CA and the Bases contains this CA as to why the procedure was created. CLOSED.

SECTION 4

QA Supervisor:	(None)	**Licensing Supervisor:**	(None)

SECTION 5

Project:	CAP Activities & Actions		
State:	Done	**Active/Inactive:**	Inactive
Owner:	(None)	**AR Type:**	Daughter
Submitter:	RICHARD FLESSNER	**Assigned Date:**	6/5/2002
Last Modified Date:	7/10/2002 12.07:37 PM	**Last Modifier:**	MARYBETH ARNOLD
Last State Change Date:	7/10/2002 12:07:37 PM	**Last State Changer:**	MARYBETH ARNOLD
Close Date:	7/10/2002 12:07:37 PM		
One Line Description:	Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW		
NUTRK ID:	CR 01-3595		
Child Number:	1		
References:	CR 01-2278 RCE 01-069 GOOD CATCH NP 7.7.20, Revision 0		
Update:			
Import Memo Field:			
CAP Admin:	PBNP CAP Admin	**Site:**	Point Beach
OLD_ACTION_NUM:			
Cartridge and Frame:			

ATTACHMENTS AND PARENT/CHILD LINKS

ACE000314: Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW

CAP001415: Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW

CE000316: PRA information would improve training (tracking)

ESG 5.1

PRA MAINTENANCE AND UPDATE GUIDELINE

DOCUMENT TYPE:	Administrative
REVISION:	2
EFFECTIVE DATE:	September 20, 2002
APPROVAL AUTHORITY:	Department Manager
PROCEDURE OWNER (title):	Nuclear Safety Analysis
OWNER GROUP:	Engineering

1.0 PURPOSE

1.1 This document provides overall guidance for updating the Probabilistic Risk Assessment (PRA) model on an on-going and routine basis.

1.2 This guideline applies to any updates to the controlled PRA documents and models. This guideline does NOT apply to Safety Monitor database changes that conform to the documented PRA model and notebooks. Documents and models within the scope of this procedure include:

1.2.1 PRA Notebooks

1.2.2 WinNupra Fault Trees and Data Files identified in the PRA Notebooks

1.3 The PRA model may be used to support evaluation of proposed procedure changes, technical specification, surveillance interval changes, system configuration changes, and evaluation of nuclear safety issues. However, such analyses are NOT considered as updates unless changes to the models or databases are actually implemented.

NOTE: **The intent of this guideline is to provide a framework for accomplishing changes to the PRA model starting with the 1999 PRA Update effort. Closeout steps in Sections 4.3.3 and 4.3.4 will be preformed following completion of the initial model changes for this update effort (PRA Update Phase I) and for all model changes thereafter.**

2.0 DISCUSSION

2.1 Regulatory requirements have been established for each licensee to perform a PRA for their respective plants. The purpose of this is for the licensee to develop an appreciation of severe accident behavior, to understand the most likely severe accident sequences that could occur at its plants, to gain a quantitative and qualitative understanding of the overall probability of core damage and radioactive material release, and to reduce the overall probabilities of core damage and radioactive material release by modifying, where appropriate, hardware and procedures that would help prevent or mitigate severe accidents.

2.2 An Individual Plant Examination (IPE) has been performed for Point Beach to meet the regulatory requirements found in Generic Letter 88-20. The initial PRA models for each of the units was created in support of the IPE. PRA models continue to be used. The model is used as the basis for the risk monitoring program (Safety Monitor). In addition, the model is used in support of many activities including the following list. With the many uses of the PRA model, it is important to maintain an updated PRA model for the plant.

- On-Line Maintenance Risk Evaluations
- Modification Prioritization

- Significant Event Assessment
- Issue Management
- Maintenance Rule Assessments
- Severe Accident Management
- Shutdown Risk Evaluations

3.0 RESPONSIBILITIES

3.1 Nuclear Safety Analysis (NSA) Supervisor - The NSA Supervisor is the person who has line responsibility for the NSA group. The NSA Supervisor (or designee) has the authority to sign as the approver on the document update form.

Responsible to ensure analyst and reviewer are qualified to perform the task

3.2 PRA Analyst - The PRA Analyst is responsible for performing the following:

3.2.1 Evaluation of changes identified on the PRA Facility Change Impact Form to determine the potential impact of the change on the PRA model and determine the acceptable time frame for documentation and model update that may result.

3.2.2 Analysis of plant changes using the latest update of the PRA model and making modifications to the PRA model and documentation using the PRA software.

3.2.3 Review of changes made to the PRA model and documentation.

3.2.4 Tracking pending changes to the PRA model and documentation.

4.0 GUIDELINE

4.1 PRA Model Review and Change Form

4.1.1 Any plant personnel can initiate a PRA model Review and Change Form. PBF-1626 can also be initiated as directed in Design Engineering Procedure D6-P03.

4.1.2 Section 1 of the form should be filled out by the initiator fully describing the plant change and providing references to any documentation that would be useful in evaluating the change. (Modification numbers, Procedure numbers, etc.) Form can also be initiated to suggest potential enhancements not related to an actual facility change.

4.1.3 The initiator should send the form to a PRA Analyst or NSA supervisor.

4.1.4 The PRA analyst should provide an initial evaluation of the change and determine appropriate disposition using industry guidance. (i.e., EPRI TR-105396, "PSA Applications Guide," August 1995)

a. No Impact - Should be marked for those issues that do not require a PRA model or document change.

b. Immediate Change - Should be marked when the change could have a significant impact on the use of the model for PRA applications. Change should be implemented within the next 90 days of just prior to the completion of the actual plant change - whichever is later.

c. Minor Impact (Change within the next 3 years) - Should be marked when the change has only minor impact on use of the model for PRA applications.

4.1.5 After completion of the disposition (no impact or model change implemented), the form should be routed to NIM for filing as a plant record.

4.2 PRA Data Analysis Periodic Update

4.2.1 Periodic data analysis will be performed on the PRA model approximately every 3 years.

4.2.2 The periodic update will include:

a. Updating Basic Event data resulting form current plant equipment availability and reliability data.

b. Updating Initiating Event frequencies considering plant history for these initiating events.

c. Reviewing plant procedures that may impact Human Error Probability (HEPs) used to support the PRA analysis.

d. Reviewing Operating Experience associated with the PRA systems and documenting any changes performed as a result of this review in the appropriate system or data analysis notebook.

e. Reviewing changes to Technical Specifications and Design Basis Calculations that may affect assumptions used in the PRA model. Any changes identified should be documented in the appropriate system or data analysis notebook.

4.2.3 Periodic Update Process

a. Data Collection Phase - During this phase, data sources will be identified and pertinent data extracted.

- Calculations that are the basis for the PRA assumptions will be reviewed for changes.
- Operating procedures used as input into the HRA analysis.
- Equipment performance data will be extracted.
- Surveillance Test Procedures will be reviewed for changes in test frequency.
- Key personnel, such as Maintenance Rule Owner, Operations personnel, and System Engineers may be contacted as necessary.
- Operating Experience associated with PRA systems should be collected.

b. Data Screening and Analysis Phase - The PRA Analyst will screen the data to determine if model changes are warranted and data analysis should be performed.

c. Any changes identified by the Periodic Update will be performed per the guidance contained in Section 4.3.

4.3 PRA Model and Documentation Update

4.3.1 The PRA model and documentation will be updated as necessary due to changes identified by the PRA Facility Change Impact Forms, changes identified by the Periodic Data Analysis, or any other changes identified by a PRA Analyst.

4.3.2 PBF-0026a should be used to document the review and approval of changes made to the PRA notebooks. Since this is a generic form for document review and approval, there are some sections that do not apply to the PRA notebook updates. Questions in Section III associated with validation and safety evaluations should be marked as follows:

- Validations required: marked NO
- Changes pre-screened: marked YES

- Screening Complete: marked NA
- Training or Briefing Required: marked as appropriate
- Training assistance desired: marked as appropriate
- QR/MSS Review NOT Required should be marked

4.3.3 Prior to the Release for Distribution the following should be performed:

a. Revise any other PRA Notebooks affected by the change

b. Update the Safety Monitor Database with any related changes

c. Revise the CDF baseline, if necessary, for use in trending.

d. Inform Safety Monitor users of any model changes that will significantly affect results or will impact how Safety Monitor can be used (e.g., addition of a new surveillance test effect). Initiate a Training Request, PBF-6101, if formal training is appropriate.

4.3.4 Following the Release for Distribution, these steps should be performed:

a. Review the impact of the change on the overall PRA model and determine if new vulnerabilities should be addressed. GL 88-20 and NEI 91-04 can be used as a guide. New vulnerabilities which need to be addressed should be documented in the Corrective Action Program.

b. Perform the additional actions specified in NP 7.7.20, Probabilistic Risk Assessment, to inform the plant staff of new PRA results and to determine any impact on programs that utilize those results.

5.0 REFERENCES

5.1 Generic Letter 88-20, "Individual Plant Examination for Severe Accident Vulnerabilities," November 23, 1988

5.2 EPRI TR-105396, "PSA Applications Guide," August 1995

5.3 NEI 91-04, "Severe Accident Issue Closure Guidelines," Revision 1, December 1994

5.4 PRA Notebooks

5.5 NP 7.7.20, Probabilistic Risk Assessment

6.0 BASES

None

NP 7.7.20

PROBABILISTIC RISK ASSESSMENT

DOCUMENT TYPE:	Administrative
REVISION:	0
EFFECTIVE DATE:	June 26, 2002
APPROVAL AUTHORITY:	Department Manager
PROCEDURE OWNER (title):	Group Head
OWNER GROUP:	Engineering

TABLE OF CONTENTS

SECTION	TITLE	PAGE
1.0	PURPOSE	3
2.0	RESPONSIBILITIES	3
3.0	DISCUSSION	3
4.0	PROCEDURE	3
5.0	REFERENCES	5
6.0	BASES	5

1.0 PURPOSE

The procedure establishes interface requirements between Programs Engineering - PRA and Training, Licensing and Operations.(B-1)

2.0 RESPONSIBILITIES

2.1 PRA staff: Ensure that the appropriate memos are developed following update of the PRA model. Identify risk significant Human Interactions and forward to Operations and Training as they are identified.

2.2 Supervisor PRA: Review the memo and information sent to applicable groups.

2.3 Operations Training Supervisor: Incorporate information from PRA into Licensed Operator Training.

2.4 Operations Procedures Supervisor: Review information from PRA and identify procedure changes

3.0 DISCUSSION

3.1 The update of the PRA model is controlled via ESG 5.1 PRA Maintenance and Update Guideline.

3.2 Human Interactions are classified as three types: Type A are interactions occurring before the initiating event; Type B are interactions associated with the initiating event; Type C are interactions associated with response to the initiating event. The focus of this procedure is Type C Human Interactions.

3.3 The EOP Verification and Validation Matrix was developed with a cutoff of an Initiating Event frequency greater than 1 E-3 /year and a Core Damage Frequency of 1 E-6/year.

4.0 PROCEDURE

4.1 Following periodic update of the PRA model, notify the Training Group of significant changes to:

4.1.1 System Importance

4.1.2 Initiating Event frequency

4.1.3 Human Error Probabilities and Importance

4.1.4 EOP Verification and Validation Matrix (OM 4.3.2, Reference 5.3).

4.2 Send a memo to the Training Manager documenting these changes. Simulator training should focus on the important Human Error Probabilities. Scenarios should be developed to ensure that these specific items are taught and practiced. Training should compare new results with those contained in TRPR 33.0 Appendix D and G (Reference 5.4).

4.3 Copy the Operations Manager and supervisor in charge of Operations procedures on the memo.

4.4 Copy the Maintenance Rule Coordinator on the memo and notify of any changes that may affect the list of risk significant systems of list of components that should be considered risk significant.

4.5 If Human Reliability Analysis suggests that an important procedure can be improved to significantly reduce the human error probability, then submit a PBF-0026p. Document Feedback, to process the recommended changes. (B-2)

4.6 If training on particular human interaction would significantly improve the performance of the action, then submit a PBF-6101, Training Request. (B-2)

4.7 Review PRA model changes for impact on other PRA applications and risk informed programs.

4.8 Submit PBF-6101, Training Request, to provide training on changes to the PRA model which had significant changes in overall results or risk significant rankings as a minimum, to the following personnel:

- Senior Plant Management
- Operations Control Room Staff
- Shift Technical Advisors
- Maintenance Rule Coordinator
- Work Week Supervisors
- System Engineering

5.0 REFERENCES

5.1 ESG 5.1, PRA Maintenance and Update Guideline

5.2 RCE 01-069, Increased CDF in AFW PRA Model due to Procedural Inadequacies related to Loss of Instrument Air, May 14, 2002

5.3 OM 4.3.2, EOP/AOP Verification/Validation Process

5.4 TRPR 33.0, Licensed Operator Requalification Training Program.

6.0 BASES

B-1 CA003704, Probabilistic Risk Assessment PRA for Auxiliary Feedwater AFW (Procedures)

B-2 CA003705, Probabilistic Risk Assessment PRA for Auxiliary Feedwater AFW (Forms)

STATE CHANGE HISTORY

Initiate → by RICHARD FLESSNER

Assign Work 2/5/2002 4 09 18 PM Owner RICK WOOD

Assign → by RICK WOOD

Conduct Work 6/5/2002 5 04 19 PM Owner RICK WOOD

Work Complete → by RICK WOOD

Review & Approval 7/2/2002 1.54 50 PM Owner RICK WOOD

Approved → by RICK WOOD

Quality Check 7/2/2002 2 33.21 PM Owner PBNP CAP Admin

Complete and Close → by MARYBETH ARNOLD

Done 7/10/2002 12.14 10 PM Owner (None)

SECTION 1

Activity Request Id:	CA003705		
Activity Type:	Corrective Action	**Submit Date:**	2/5/2002 4:09:18 PM
Site/Unit:	Point Beach - Common		
Activity Requested:	Revise the procedure governing PRA updates to include identification of the formal methods to be used for providing information to other groups. Use of existing processes, such as training work requests and procedure feedback forms, should be used whenever possible.		
CATPR:	N	**Initiator:**	FLESSNER, RICHARD
Initiator Department:	EX Engineering Processes PB	**Responsible Group Code:**	EPP Engineering Programs PRA PB
Responsible Department:	Engineering	**Activity Supervisor:**	RICK WOOD
Activity Performer:	RICK WOOD		

SECTION 2

Priority:	3	**Due Date:**	7/3/2002
Mode Change Restraint:	(None)	**Management Exception From PI?:**	N
QA/Nuclear Oversight?:	N	**Licensing Review?:**	N
NRC Commitment?:	N	**NRC Commitment Date:**	

SECTION 3

Activity Completed:

1/18/2002 12:52PM - LARRY PETERSON:
Due date extended as requested and approved by F. Cayia in prior update. Retruned to R. flessner for completion.

1/18/2002 12:54PM - LARRY PETERSON:
Reassigned to R. Flessner for completion following extension.

6/5/2002 5:04:19 PM - RICK WOOD.
New NP is in draft. Comments from technical reviewer will be incorporated

6/19/2002 10:03.13 AM - RICK WOOD.
The procedure is in typing following incorporation of reviewrs' comments. The procedure is expected to be issued on 6/26/2002. The Engineering Director has apprved the 2 week

extension

7/2/2002 1:54:50 PM - RICK WOOD:
NP 7.7.20 Probabilistic Risk Assessment was issued on 6/26/2002. This procedure includes description of the existing processes for making changes to procedures and training

7/10/2002 12:14:10 PM - MARYBETH ARNOLD.
NP 7.7.20, Revision 0 was issued on 06/26/02 and Steps 4.5 and 4.6 specifically tie to this CA and the Bases include this CA as to why this procedure was written. CLOSED.

SECTION 4

QA Supervisor:	(None)	**Licensing Supervisor:**	(None)

SECTION 5

Project:	CAP Activities & Actions		
State:	Done	**Active/Inactive:**	Inactive
Owner:	(None)	**AR Type:**	Daughter
Submitter:	RICHARD FLESSNER	**Assigned Date:**	6/5/2002
Last Modified Date:	7/10/2002 12:14:10 PM	**Last Modifier:**	MARYBETH ARNOLD
Last State Change Date:	7/10/2002 12:14:10 PM	**Last State Changer:**	MARYBETH ARNOLD
Close Date:	7/10/2002 12:14:10 PM		
One Line Description:	Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW		
NUTRK ID:	CR 01-3595		
Child Number:	1		
References:	CR 01-2278 RCE 01-069 GOOD CATCH NP 7.7.20, Revision 0		
Update:			
Import Memo Field:			
CAP Admin:	PBNP CAP Admin	**Site:**	Point Beach
OLD_ACTION_NUM:			
Cartridge and Frame:			

ATTACHMENTS AND PARENT/CHILD LINKS

ACE000314· Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW

CAP001415 Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW

NP 7.7.20

PROBABILISTIC RISK ASSESSMENT

DOCUMENT TYPE:	Administrative
REVISION:	0
EFFECTIVE DATE:	June 26, 2002
APPROVAL AUTHORITY:	Department Manager
PROCEDURE OWNER (title):	Group Head
OWNER GROUP:	Engineering

TABLE OF CONTENTS

SECTION	TITLE	PAGE
1.0	PURPOSE	3
2.0	RESPONSIBILITIES	3
3.0	DISCUSSION	3
4.0	PROCEDURE	3
5.0	REFERENCES	5
6.0	BASES	5

1.0 PURPOSE

The procedure establishes interface requirements between Programs Engineering - PRA and Training, Licensing and Operations.(B-1)

2.0 RESPONSIBILITIES

2.1 PRA staff: Ensure that the appropriate memos are developed following update of the PRA model. Identify risk significant Human Interactions and forward to Operations and Training as they are identified.

2.2 Supervisor PRA: Review the memo and information sent to applicable groups.

2.3 Operations Training Supervisor: Incorporate information from PRA into Licensed Operator Training.

2.4 Operations Procedures Supervisor: Review information from PRA and identify procedure changes

3.0 DISCUSSION

3.1 The update of the PRA model is controlled via ESG 5.1 PRA Maintenance and Update Guideline.

3.2 Human Interactions are classified as three types: Type A are interactions occurring before the initiating event; Type B are interactions associated with the initiating event; Type C are interactions associated with response to the initiating event. The focus of this procedure is Type C Human Interactions.

3.3 The EOP Verification and Validation Matrix was developed with a cutoff of an Initiating Event frequency greater than 1 E-3 /year and a Core Damage Frequency of 1 E-6/year.

4.0 PROCEDURE

4.1 Following periodic update of the PRA model, notify the Training Group of significant changes to:

4.1.1 System Importance

4.1.2 Initiating Event frequency

4.1.3 Human Error Probabilities and Importance

4.1.4 EOP Verification and Validation Matrix (OM 4.3.2, Reference 5.3).

4.2 Send a memo to the Training Manager documenting these changes. Simulator training should focus on the important Human Error Probabilities. Scenarios should be developed to ensure that these specific items are taught and practiced. Training should compare new results with those contained in TRPR 33.0 Appendix D and G (Reference 5.4).

4.3 Copy the Operations Manager and supervisor in charge of Operations procedures on the memo.

4.4 Copy the Maintenance Rule Coordinator on the memo and notify of any changes that may affect the list of risk significant systems of list of components that should be considered risk significant.

4.5 If Human Reliability Analysis suggests that an important procedure can be improved to significantly reduce the human error probability, then submit a PBF-0026p. Document Feedback, to process the recommended changes. (B-2)

4.6 If training on particular human interaction would significantly improve the performance of the action, then submit a PBF-6101, Training Request. (B-2)

4.7 Review PRA model changes for impact on other PRA applications and risk informed programs.

4.8 Submit PBF-6101, Training Request, to provide training on changes to the PRA model which had significant changes in overall results or risk significant rankings as a minimum, to the following personnel:

- Senior Plant Management
- Operations Control Room Staff
- Shift Technical Advisors
- Maintenance Rule Coordinator
- Work Week Supervisors
- System Engineering

5.0 REFERENCES

5.1 ESG 5.1, PRA Maintenance and Update Guideline

5.2 RCE 01-069, Increased CDF in AFW PRA Model due to Procedural Inadequacies related to Loss of Instrument Air, May 14, 2002

5.3 OM 4.3.2, EOP/AOP Verification/Validation Process

5.4 TRPR 33.0, Licensed Operator Requalification Training Program.

6.0 BASES

B-1 CA003704, Probabilistic Risk Assessment PRA for Auxiliary Feedwater AFW (Procedures)

B-2 CA003705, Probabilistic Risk Assessment PRA for Auxiliary Feedwater AFW (Forms)

STATE CHANGE HISTORY

Initiate → by JULIE KREIL

Assign Work 3/12/2002 9.32 54 AM Owner DENNIS HETTICK

Assign → by DENNIS HETTICK

Conduct Work 3/14/2002 12.07:58 PM Owner DON PETERSON

Work Complete → by DON PETERSON

Review & Approval 4/8/2002 3 28.02 PM Owner DENNIS HETTICK

Reject → by DENNIS HETTICK

Conduct Work 4/9/2002 7.43.27 AM Owner DON PETERSON

Work Complete → by DON PETERSON

Review & Approval 4/11/2002 11:54 50 AM Owner DENNIS HETTICK

Approved → by DENNIS HETTICK

Quality Check 4/12/2002 11.29 44 AM Owner PBNP CAP Admin

Complete and Close → by MARYBETH ARNOLD

Done 5/1/2002 11:31:52 AM Owner (None)

SECTION 1

Activity Request Id:	CA003982		
Activity Type:	Corrective Action	**Submit Date:**	3/12/2002 9:32:54 AM
Site/Unit:	Point Beach - Common		
Activity Requested:	Per CARB Meeting of 3/05/2002 (NPM 2002-0112), Review SEN 174 response (from RCE 01-069, which is ACE000314 in tTrack). This SEN is discussed on page 26 of RCE 01-069. Re-Open the OE items if questions about the procedures for ensuring adequate pump flow is maintained, are no fully addressed, including pumps other than AFPs.		
CATPR:	N	**Initiator:**	MASTERLARK, JAMES
Initiator Department:	EPN Engineering Programs Nuclear Safety Analysis PB	**Responsible Group Code:**	AP Performance Assessment PB
Responsible Department:	Assessment	**Activity Supervisor:**	DENNIS HETTICK
Activity Performer:	DON PETERSON		

SECTION 2

Priority:	3	**Due Date:**	4/25/2002
Mode Change Restraint:	(None)	**Management Exception From PI?:**	N
QA/Nuclear Oversight?:	N	**Licensing Review?:**	N
NRC Commitment?:	N	**NRC Commitment Date:**	
Significance Level:	A		

SECTION 3

Activity Completed: 3/17/2002 1:59PM - DON PETERSON:
SEN 174 has six completed actions directed at the need to develop procedures for off- mormal events, to restore power and recover equipment for non-vital 4160 & 480 V busses and associated MCCs. Action six was closed out to CR 98-0050 action item #43. Action #43 was closed to the issuance of AOP-18. Pump flow concerns were not directly identified in the action items for SEN 174.

4/8/2002 3:28PM - DON PETERSON:
The following documents were reviewed SEN 174 actions items, CR 97-1992, CR 98-0050, AOP-18, AOP-18A and RCE 01-069. Pump flow concerns were not directly identified in any of the above documentation. This concern was discussed with Mr. Mark Rinzel, Corrective Action Liaison for Operations, he was in atgreement, that an action in t-Track should be issued to Operations to revisit the issues of SEN 174 with special focus on adequate pump flows

4/8/2002 3:31PM - DON PETERSON:
Issue an action to Operations; Review SEN 174, focusing on "How does PBNP maintain adequate pump flow, under the conditions described in SEN 174. This action was discussed with Mr. Mark Rinzel, he has requested that it be sent to him.

4/11/2002 11:54AM - DON PETERSON:
CA004279 was created and sent to the Operations Group/ Mr. Duane Schoon.

5/1/2002 11:31AM - MARYBETH ARNOLD:
The response to SEN 174 was reviewed with one follow up action created (CA004279) for Operations to look at a specific item. CLOSED.

SECTION 4

QA Supervisor:	(None)	**Licensing Supervisor:**	(None)

SECTION 5

Project:	CAP Activities & Actions		
State:	Done	**Active/Inactive:**	Inactive
Owner:	(None)	**AR Type:**	Parent
Submitter:	JULIE KREIL	**Assigned Date:**	3/14/2002
Last Modified Date:	5/1/2002 11:31:52 AM	**Last Modifier:**	MARYBETH ARNOLD
Last State Change Date:	5/1/2002 11:31:52 AM	**Last State Changer:**	MARYBETH ARNOLD
Close Date:	5/1/2002 11:31:52 AM		
One Line Description:	Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW		
NUTRK ID:	CR 01-3595		
Child Number:	0		
References:	CR 01-2278 RCE 01-069 GOOD CATCH SEN 174 CR 98-005 AOP-18 CR 97-1992 CR 98-0050 AOP-18A NPM 2002-0112		
Update:	È\\(20011204 PB2171 JMK1) Operability Determination (OD) Part I, Revision 0, of CR 01-3595 was approved on 11/30/01. Operable But Degraded - or Operable But Nonconforming - meets the minimum required level of performances, compensatory measures ARE required. \\Operability Determination (OD) Part I, Revision 1 of CR 01-3595 was approved on 12/01/01. Operable But Degraded - or Operable But Nonconforming - meets the minimum required level of performances, compensatory measures ARE required.		

Accepted into group and assigned priority 3. This questions the adequacy of an SEN applicability determination and evaluation. Per NP 5.4.1, SEN are to be priority 3.

Import Memo Field:

CAP Admin: PBNP CAP Admin **Site:** Point Beach

OLD_ACTION_NUM:

Cartridge and Frame:

NOTES/COMMENTS

Note created during 'Reject' transition by DENNIS HETTICK (4/9/2002 7:43:27 AM)
Specify the action number that was created to perform the review discussed in the action section.

ATTACHMENTS AND PARENT/CHILD LINKS

Linked From CAP001415

CA004279: Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW

INPO SOERs, SERs, SENs, OEs
SEN 174

S ··· CLOSED UNIT: 0 SYSTEM: XX INITIATED: 11/10/97 CLOSED: 10/24/00 MSS #:
. ·R: HENRY JOYCE ADMINISTRATOR: JAMES PULVERMACHER ISSUE MANAGER: BRIAN OGRADY
NU JF OPEN ACTIONS : 0 NUMBER OF CLOSED ACTIONS : 6 TOTAL NUMBER OF ACTIONS : 6

LOSS OF NONVITAL BUS CAUSES DUAL UNIT SCRAM AND DEGRADED AUXILIARY FEEDWATER SYSTEM

DESCRIPTION:
******** SEE E-MAIL CONF "NP-INPO-NETWORK-IS" FOR FULL TEXT ********

Subject: SEN 174, Loss of Nonvital Bus Causes Dual Unit Scram and Degraded Auxiliary Feedwater System

November 10, 1997

Description

On September 6, 1997, both McGuire units automatically scrammed from 100 percent power when the alternate supply breaker to nonsafety-related 120- volt AC instrument and control power bus KXA opened, stripping control power to several important plant components in each unit. The loss of nonvital power caused Unit 1 main feedwater pumps to trip, resulting in a turbine trip and automatic reactor scram.The loss of nonvital power on Unit 2 caused the main steam isolation valves to close, resulting in an automatic reactor scram on high pressurizer pressure. Aboutan hour later, power was restored to bus KXA, and affected secondary systems were subsequently returned to service.

At the time of the event, bus KXA was energized from its alternate transformer power supply while the inverter battery was undergoing an equalizing charge.This alternate alignment is normally used only during this annual equalizing charge.The breaker supplying the bus that was feeding both units opened because a loose cable connection on the load sideof the breaker generated enough heat to actuate the thermal trip unit. No preventive maintenance had ever been performed on the breaker. Station personnel believe that the loose connection had existed since construction.

Power was lost to various equipment in each unit.The most significant effects were in Unit 1 and included the following:

oPower was lost to the solenoid-operated recirculation valves for all three auxiliary feedwater (AFW) pumps and to the main control board indication for these valves.To provide adequate pump cooling, the motor- driven AFW pumps require a minimum of 100 gallons per minute (gpm) flow, and the turbine driven AFW pump requires 200 gpm. As water level is recovered in the steam generators and the operator manually throttles back AFW flow, the recirculation valves are designed to open automatically to provide the minimum flow through each pump. However, these valves fail closed by design.With power lost to both the solenoid 'ves and their associated indicators on the main control board, the AFW pumps were operated for 20 to 60 minutes with both recirculation valves and main flow control valves closed. However, leakage through the flow control valves resulted in .roximately 12 gpm flow through each pump.Only because of this leakage and the limited period of operation was AFW pump damage caused by overheating precluded.

oPressurizer power-operated relief valve automatic control was lost, but manual operability was not affected.

oNormal and excess letdown flow capability was lost, potentially affecting the ability to prevent overfilling the pressurizer.

oCapability to perform normal containment air releases was lost, resulting in slight containment pressurization.

Significant aspects of this event include the following:

oAn installation deficiency on the alternate power supply breaker resulted in both units experiencing simultaneous automatic scrams and lost availability.

oThe design of the AFW power supply represents a common cause failure mechanism where a loss of power to the nonsafety-related bus resulted in both a loss of power to the AFW pump recirculation valve solenoids and the associated indication on the main control board.

oThere was no procedure specific to the loss of nonvital buses for the operators to use during the event. Consequently, with the loss of recirculation valve position indication, operators were not aware of the potential for damaging the AFW pumps.A list of loads supplied by the nonsafety-related bus was not readily available for operators.

oOperators had received classroom training on the effects of a loss of nonvital buses in initial licensed operator training.However, they had notreceived subsequent simulator training on a loss of nonvital buses during continuing training. The need for a procedure to help mitigate this transient had been identified, and a draft written, but a final procedure had not been issued.

oNo preventive maintenance activities had been established for the auxiliary control power system bus or associated breakers because both units would have to be shut down to deenergize the bus.On-line preventive maintenance was considered but not performed because of personnel safety issues.

oA similar event occurred at Unit 2, on September 6,1987, involving a lossof power to the other nonvital bus (KXB), resulting from an overcurrent fault in an instrument air compressor. However, the investigation into that event concentrated on venting similar compressor motor faults. An opportunity was missed to identify the risk of being in the alternative jnment and the need for preventive maintenance, operating procedures, and training.The potential for damage to the AFW pumps the common-causefailure was identified as a concern during station blackout (potential foreventual loss of battery power); however, operator actions for other nonvital bus failure scenarios were not addressed in abnormal operating procedures.

oDuring work preparation and planning activities, station personnel focused on minimizing risks to losing the alternate power supply during the maintenance activity. Placing the bus on its alternate power supply wasnot considered a significant risk

evolution and the prejob brief primarily emphasized protecting bus KXA from being bumped by station personnel.The prejob brief did not adequately inform the operators of the necessary contingency actions needed if bus KXA was lost.

The event described in this significant event notification (SEN) was screened significant by INPO.The documents referenced below are sufficiently detailed such that INPO does not intend to publish a separate significant event report (SER); therefore, ities should review this event

notification and implement corrective actions where necessary to avoid similar events.

References 1. NRC Licensee Event Report (LER) 369/97-09, "Reactor Trip on Both Units Due to an Equipment Failure and Operation Prohibited by Technical Specifications Due to Failure to Comply with Required Action Statement," October 6, 1997

2. NRC LER 370/87-16, revision 1, "Reactor Trip Due to Overcurrent Faults in an Instrument Air Compressor Motor - Caused Loss of Power to a Main Turbine Control System Relay," December 16, 1987

Plant Information Unit:McGuire Nuclear Station Unit 1 (Duke Power Company) Year Commercial: December 1, 1981 Reactor Type (Size): PWR (1,180 MWe) Reactor Manufacturer:Westinghouse Turbine Manufacturer:Westinghouse Plant Designer:Duke Power Company

Event Date:September 6, 1997

Equipment Information Name and Size: Two Motor-Driven Centrifugal Pumps (450 gpm capacity) One Steam-Driven Centrifugal Pump (900 gpm capacity

Event Criteria Unusual Plant Transient

Installation Deficiency Maintenance Deficiency Procedure Deficiency Training Deficiency Design Deficiency

Cause Categories Construction (improper installation) Work Organization/Planning (maintenance not scheduled/performed) Written Procedure (lack of procedure)

Training/Qualification (lack of training) Design Configuration (inappropriate layout of systems or subsystems)

Malfunctioning Systems The 240/120-volt AC auxiliary control power system was classified as A(1) due to failing the plant level performance criterion for reactor trips.

Attachments

This document is based on technical information provided by Duke Power Company (McGuire Nuclear Station Unit 1). Utilities and participants are requested to provide feedback on similar occurrences and solutions at theirplants or on their equipment to the information contact listed below.

Limited Distribution

Copyright 1997 by the Institute of Nuclear Power Operations. Not for sale nor for commercial use. Reproduction of this report without the prior written consent of INPO is expressly prohibited. Unauthorized reproduction is a violation of applicable law. Each INPO member and participant may reproduce this document for its business use. This document should not be

otherwise transferred or delivered to any third party, and its contents should not be made public, without the prior agreement of INPO. All other rights reserved.

Notice

This information was prepared in connection with work sponsored by the Institute of Nuclear Power Operations (INPO). Neither INPO, INPO members, INPO participants, nor any person acting on behalf of them: (a) makes any warranty or representation, expressed or implied, with respect to the accuracy, completeness, or usefulness of the information contained in this document, or that the use of any information, apparatus, method, or processdisclosed in this document may not infringe on privately owned rights; or (b) assumes any liabilities with respect to the use of, or for damages resulting from the use of any information, apparatus, method, or process disclosed in this document.

Keywords Auxiliary Feedwater System, Auxiliary Feedwater Pump, Loss of AC Power, Electrical Distribution System, Bus

Telecopy No.: (770) 644-8594 Information Contact: Brett Kruse, (770) 644-8729, kruseba@inponn.org

******** SEE E-MAIL CONF. "NP-INPO-NETWORK-IS" FOR FULL TEXT ********

STATUS UPDATE:

(20001024 WE1384 JRP1) Changes to plant Abnormal Operating Procedures have been submitted and will be tracked under the referenced Condition Reports.

SCREENED BY :	DATE:	COMMITMENT.....(Y/N): N
REGULATORY REPORTABLE.....(Y/N):	TS VIOLATION.....(Y/N):	10 CFR 21.....(Y/N):
TS LCO ENTRY .....(Y/N):	OPERABILITY IMPACT PER TS.(Y/N):	ACTION .....(A N P R W):
REVIEW REQUIRED .....(Y/N):	SIGNIFICANCE ..... (A B C D):	OPERABILITY DETERMINATION.(Y/N):

SUPPLEMENTING DETERMINATIONS:

REFERENCES: TWR 97-337 CR 97-1992 #2 CR 98-0050 #43 CR 98-0050

ACTION NUMBER 1
****

DU..		DUE DATE: 01/10/98	PRIORITY: -100		EXTENSIONS MADE: 0
CREATED : 11/10/97	OER	TOM SHELEY	RECEIVED: 11/14/97	EIS	TOM JESSESSKY
WORK DONE: 12/10/97		KELLY HOLT	APPROVED: 01/06/98		TOM JESSESSKY
VERIFIED : 01/07/98		HENRY JOYCE	CLOSED : 01/07/98		TODD COOPER

Evaluate for applicability to PBNP in accordance with NP 5.3.2. Identify and initiate any necessary corrective actions. coordinate response with Operations.

(11/12/97 TPS) Issued to Group: EIS
Per Conversatioin with Kelley Holt. Kelley will evaluate the McGuire station event aginst PBNP's configuratioin. Note action item has a 60 day due date.

(11/14/97 TJJ) Received Action into Group: EIS
Responsible Person: KJH:KELLY HOLT Due Date: 01/10/98

(12/10/97 KJH) Passed to TOM JESSESSKY for acceptance of work.

(01/06/98 TJJ) Passed to HENRY JOYCE for Verification.
Point beach has four safety-related instrument bus trains for each Unit, which are normally supplied from static inverters. These instrument busses are designed to be automatically transferred to a non safety-related backup supply upon an inverter failure. An 8-hour LCO is in effect whenever a safety related instrument bus is being supplied from the backup source. The backup source is designed to be used only to prevent the loss of power to an instrument bus in the event of an inverter failure. The backup source supplies power only until the affected busses are manually aligned to an inverter supply. Safety related alternate inverters are available to take the place of the normal inverters during routine maintenance or repair of the normal inverters. A swing safety-related battery is available to take the place of any of the normal safety-related batteries to allow for discharge testing or equalizing charges.

Point Beach has two non safty-related instrument busses for each unit. These busses are supplied from offsite power through transformers. One of these busses for each unit is supplied from a bus with a diesel backup supply.

Tabulations of the loads supplied from the safety-related and non safety-related busses are available to control room personnel. Operators receive training on the effects of the loss of power to these busses.

'l of the instrument bus breakers have been replaced within the last four years. Connections were torqued upon breaker lacement. A program is i n place to perform breaker testing every five years. An analysis to determin the effects of the ..s of power to many instrument bus loads was completed as part of the breaker replacement effort.

A detailed analysis of the effects of the loss of power to each instrument bus at Point Beach is not available to Operations personnel. A new action item could be initiated to complete this analysis and provide additional Operator training, if necessary. The PLA should review the operations evaluation to determine if Operations needs the detailed analysis.

This evalulation item is complete. No further actions required (with possible exception noted in paragraph above).

(01/07/98 HAJ) PLA Closure of Item.
see update field. Need for further action will be determined based on Operations response.

(10/22/98 TPS) After communicating with the new system engineer (J. Malloy), and Tom Garotit it was recognized that the initial response within action item #1 from the system engineer was adequate in identifying that no immediate corrective action was required outside of a non essential "recommendation" that a loss of instrument buss would be "beneficial" to the operators.

Both the new system engineer and the electrical crew DSS (Tom Garot) agree that a recommendation for a procedure to be developed to support the loss of an instrument buss is important but is not necessary to support closure of this SEN evaluation.

To generate the development of such a procedure a procedure feed back form has been generated by this evaluator to track the recommendation:

"Develop a procedure for operator response to a loss of instrument buss. Reference SEN 174 event."

ACTION NUMBER 2
****

DONE		DUE DATE: 01/10/98	PRIORITY: 3		EXTENSIONS MADE: 0
CREATED : 11/10/97	OER	JIM SCHWEITZER	RECEIVED: 12/05/97	OPS	JOHN ANDERSON
' ^NE: 08/17/98		THOMAS GAROT	APPROVED: 08/18/98		RICHARD MENDE
) : 10/02/98		TODD COOPER	CLOSED : 10/02/98		MICHAEL ROACH

Evaluate for applicability to PBNP in accordance with NP 5.3.2. Identify and initiate any necessary corrective actions. Coordinate response with Engineering.

(11/24/97 JGS) Issued to Group: EIS

Tom please assign this for evaluation. Information on the event is included in the parent document.

(12/05/97 KMY) Received Action into Group: EIS
Responsible Person: WAH:BILL HENNIG Due Date: 01/10/98

'10/97 WAH) Changed Responsible Person: From (WAH) to (HAJ)
.nged Responsible Group: From (EIS) To (OER).
Changed Responsible section: From (SEN) To (QAS).. Action item 2 is supposed to be assigned to Operations with the intention to coordinate with Engineering (Kelly Holt has been assigned action item 1). This is per direction of TJ Jessessky.

(12/11/97 FPH) Changed Responsible Person: From (HAJ) to (RGM)
Changed Responsible Group: From (OER) To (OPS).
Changed Responsible section: From (QAS) To (PRD)..

(12/15/97 TPS) Changed Responsible Person: From (RGM) to (TWG). Task assigned per "E" mail communication from engineering (K. Holt).

(05/15/98 SJN) Set Work Priority to 3. Significance level 3 assigned by the BST based on the guidance of NP 5.4.1,Attachment B. The reason for the assigned significance is that this item is an evaluation of a SEN.

(08/15/98 TWG) Have not seen evaluation on this issue. However, I recommend procedures be developed to restore power and recover equipment for the Non-vital 4160 + 480 volt busses and associated MCCs. We have AOPs in place for the vital busses and also for the DC system. The procedure upgrade project is developing System Operating Procedures for all the Vital and non-vital busses but these are designed for planned outages not off-normal events. The non-vital instrument busses 1+2 Y05 are powered from B-41s which are non-vital MCCs.

(08/17/98 TWG) Passed to RICHARD MENDE for acceptance of work.

(08/18/98 RGM) Passed to MICHAEL ROACH for Verification.
Completed review and provided recomendations.

(10/02/98 TAC) PLA Closure of Item.
Action #4 has been created and sent to OPS for the creation of the procedures discussed in this evaluation. No further actions were identified as being required. This action item may be closed.

ACTION NUMBER 3
****

DONE		DUE DATE: 01/10/98	PRIORITY: -100			EXTENSIONS MADE: 0
CREATED : 11/10/97	OER	HENRY JOYCE	RECEIVED: 11/13/97	TRPSA		LARRY EPSTEIN
WORK DONE: 01/06/98		MARK RINZEL	APPROVED: 01/06/98			MARK RINZEL
VERIFIED : 01/08/98		HENRY JOYCE	CLOSED : 01/08/98			HENRY JOYCE

evaluate "Prevent Events" section of this SEN for training applicability.

(11/13/97 LDE) Received Action into Group: TRPSA
Responsible Person: LDE:LARRY EPSTEIN Due Date: 01/10/98

(12/03/97 MDR) Changed Responsible Person: From (LDE) to (MDR).

(12/03/97 MDR) TWR 97-337 has been issued and actions 1 + 2 under the TWR will evaluate Training needs/enhancements in the Operations and ESP areas. Recommendations for action will be made based on these evaluations.

(01/06/98 MDR) Passed to LARRY EPSTEIN for acceptance of work.

(01/06/98 MDR) Passed to HENRY JOYCE for Verification.
This item was evaluated for applicable and potential inclusion into Training programs under TWR 97-337. The results of this evaluation show that there is some applicability to PBNP and it warrants inclusion into the group meetings for both SEN and NES. This will be accomplished at the February group meetings as part of the OE discussions. Therefore, it is recommended that an action item be issued to R. Bauer, with a due date of 3/31/98, to ensure that the Prevent Events of SEN 174 are included in the upcoming SEN and NES group meetings/discussions. No further action is needed for this item and it may be closed.

(01/08/98 HAJ) PLA Closure of Item.
see update field and NUTRK TWR 97-337

REFERENCES: TWR 97-337

ACTION NUMBER 4
****

			DUE DATE: 12/31/98	PRIORITY:	4		EXTENSIONS MADE: 0
	: 10/02/98	OER	TODD COOPER	RECEIVED:	10/22/98	OPS	BRIAN OGRADY
	NE: 06/24/99		STEPHEN GUCWA	APPROVED:	06/24/99		JOHN ANDERSON
VERIFIED	: 06/24/99		JOHN ANDERSON	CLOSED :	08/04/99		TODD COOPER

Based on the evaluation conducted in child records #1 + #2, develop procedures, for off-normal events, to restore power and recove equipment for non-vital 4160 + 480 V busses and associated MCCs. Document actions taken in response to this item.

(10/22/98 TPS) Received Action into Group: OPS
Responsible Person: TPS:TOM SHELEY Due Date: 12/31/98

(10/22/98 TPS) Set Work Priority to 4. INPO SEN for evaluation.

(10/22/98 TPS) After communicating with the new system engineer (J. Malloy), and Tom Garot it was recognized that the initial response within action item #1 from the system engineer was adequate in identifying that no immediate corrective action was required outside of a non essential "recommendation" that a loss of instrument buss and recovery procedure for non vital AC busses would be "beneficial" to the operators.

The differences between PBNP and the McGuire station is that PBNP safety related instrument busses are supplied by safeguards power and battery backup and McGuire's were not.

Although there is an alternative non safety related (non battery supported power supply to support instrument bus auto transfers, this system is not employed unless a safeguards inverter fails. If this transfer occurs a TS declaration of a LCO would be required.

(10/22/98 TPS) Passed to JOHN ANDERSON for acceptance of work.

(10/27/98 RGM) Returned to TOM SHELEY for additional work.

(10/27/98 RGM) I believe that ANSI requires procedures for these type of anticipated operational occurences and as such, this item should not be closed.

(10/28/98 TPS) Changed Responsible Person: From (TPS) to (SGG). Attempts to close this action to procedure feed back submitta (not required for SEN closure) was not accepted. This is a AOP issue and needs to be resolved or corrected by the EOP / AOP procedure group.

'24/99 CAW1) Passed to JOHN ANDERSON for acceptance of work.

(06/24/99 JRA1) Passed to JOHN ANDERSON for Verification.
See CR update for additional information that justifies that all SEN corrective actions have been completed.

SEN 174 action item #4 identified a need to develop a procedure for off- normal events to restore power and recover equipment for non vital 4160 and480 V busses and associated MCC's. This action came out of SEN 174 action item # 2. After discussing action item #2 closure with the responsible person (Tom Garot) he agreed that his recommendation was more of an operators opinion rather then an action that must be completed to address the SEN 174 event (MCGuire station loss of non safeguards / nor battery supply inverters and critical control perimeters were lost). Tom agreed that the submittal of a procedure feed back form would be adequate to support his recommendation.

A procedure feed back has been submitted to:

Develop an operations procedure for off-normal events to restore power and recover equipment for non vital 4160 and 480 V busses and associated MCC's.

This action can be closed.

ADDITIONAL INFORMATION:

Operations has evaluated this item and has determined that it is a long-term project that will take three years to complete.

It is recommended that this action item be closed and two more created. One action item will go to Operations for tracking purposes. The other action item should go to Engineering for support of this project.

(06/24/99 JRA1) Passed to TODD COOPER for Final Close Out.
Verified.

(08/04/99 TAC) PLA Closure of Item.
Additional child records opened as required by Issue Manager.

"CES: TWR 97-337

ACTION NUMBER 5
****

		DUE DATE: 12/31/99	PRIORITY:	4		EXTENSIONS MADE: 0
: 08/04/99	OER	TODD COOPER	RECEIVED:	08/06/99	OPS	BRIAN OGRADY
WORK DONE: 08/06/99		TOM SHELEY	APPROVED:	08/12/99		BRIAN OGRADY
VERIFIED : 08/12/99		BRIAN OGRADY	CLOSED :	08/13/99		TODD COOPER

LOSS OF NONVITAL BUS CAUSES DUAL UNIT SCRAM AND DEGRADED AUXILIARY FEEDWATER SYSTEM

Based on the decision of the Issue Manager in child record #4, develop procedures, for off-normal events, to restore power and recover equipment for non-vital 4160 + 480 V busses and associated MCCs. Document actions taken in response to this item.

(08/06/99 TPS) Received Action into Group: OPS
Responsible Person: TPS:TOM SHELEY Due Date: 12/31/1999

(08/06/99 TPS) Set Work Priority to 4. Action supports station and department goals.

(08/06/99 TPS) Passed to BRIAN OGRADY for acceptance of work.

(08/12/99 BJO1) Passed to BRIAN OGRADY for Verification.
Discussions with the new Operations Manager has identified that this there appears to be limited value in tracking an action item for developing procedures for recovery of non safety related busses if it has already beenidentified in action item #1#2 that no corrective action is required to support the SEN, and the action is only tracking a procedure feed back recommendation.

The recommendation for the development of recovery procedures for NON safety related buses is already being tracked in operations to support other concerns / investigations. Both CR 97-1992 #2 (no AOP for Seismic Events) priority #4, and CR 98-0050 #43 (loss of offsite power) priority #2. are targeting the need for such procedure development.

This action can be closed to both CR 97-1992 #2 and CR 98-0050 #43. An update has been placed in both CR's identifying a reference to SEN 174 #5 as a reference.

This item can be closed.

(08/12/99 BJO1) Passed to TODD COOPER for Final Close Out.
This item can be closed.

(08/13/99 TAC) PLA Closure of Item.
The needed procedure development will be tracked under CR 97-1992 #2 and CR98-0050 #43. No additional actions are required.

REFERENCES: TWR 97-337 CR 97-1992 #2 CR 98-0050 #43

ACTION NUMBER 6
****

DONE		DUE DATE: 09/15/00	PRIORITY:	4		EXTENSIONS MADE: 2
CREATED : 08/04/99	OER	TODD COOPER	RECEIVED:	08/05/99	SDE	MICHAEL ROSSEAU
WORK DONE:		MICHAEL ROSSEAU	APPROVED:	08/04/00		MICHAEL ROSSEAU
VERIFIED : 08/18/00		BRIAN OGRADY	CLOSED :	10/24/00		JAMES PULVERMACHER

LOSS OF NONVITAL BUS CAUSES DUAL UNIT SCRAM AND DEGRADED AUXILIARY FEEDWATER SYSTEM

Based on the decision of the Issue Manager in child record #4, assist Operation in the development of procedures, for off-normal events, to restore power and recover equipment for non-vital 4160 + 480 V busses and associated MCCs. Document actions taken in response to this item.

(08/05/99 LJA1) Received Action into Group: SDE No Priority Assigned
Responsible Person: KJN1:KEN NETZEL Due Date: 12/31/1999

(08/30/99 KJN1) Set Work Priority to 4.

(12/20/99 KJN1) Changed the Due Date from: 12/31/1999 to 04/01/2000
This item will not be worked in the near term. All electrical personnel are working on modifications or higher priority NUTRK items.

(03/31/00 KJN1) Changed the Due Date from: 04/01/2000 to 09/15/2000

(08/04/00 MJR1) Passed to BRIAN OGRADY for Verification.
This action item states to assist OPS in the developement of new AOPs for non-vital bus recovery. The OPS action item for SEN 174 was closed to CR 98-0050 #43. This action item may be closed with no further actions required as a NUTRK item is not necessary for one group to support another.

(08/18/00 BJO1) Passed to DAVID GARCIA for Final Close Out.
Close item

(10/24/00 JRP1) PLA Closure of Item.
Close to actions of the referenced Condition Report CR 98-0050.

REFERENCES: TWR 97-337 CR 98-0050 CR 98-0050 #43

STATE CHANGE HISTORY

Initiate → by DON PETERSON

Assign Work 4/11/2002 11:52.53 AM Owner DUANE SCHOON

Assign → by TOM SHELEY

Conduct Work 4/12/2002 6.40 15 AM Owner MARK RINZEL

Work Complete → by MARK RINZEL

Review & Approval 4/30/2002 4:37.57 PM Owner DUANE SCHOON

Approved → by DUANE SCHOON

Quality Check 5/13/2002 2.22:07 AM Owner PBNP CAP Admin

Complete and Close → by JULIE KREIL

Done 5/13/2002 2 04:47 PM Owner (None)

SECTION 1

Activity Request Id:	CA004279		
Activity Type:	Corrective Action	**Submit Date:**	4/11/2002 11:52:53 AM
Site/Unit:	Point Beach - Common		
Activity Requested:	Re-Open the evaluation of SEN 174, ensuring that questions about the procedures for ensuring adequate pump flow is maintained, are fully addressed, including pumps other than AFPs **** Action is out of CA 3982 where CARB (3/5/02) while reviewing RCE 01-69 / ACE 314 requested a reopening of SEN 174 to specifically adress a question if procedures for ensuring adequate pump flow is maintained (possibly this point was not adequatly documented in the SEN) and discuss other pumps other then AFP's. TPS		
CATPR:	N	**Initiator:**	MASTERLARK, JAMES
Initiator Department:	EPN Engineering Programs Nuclear Safety Analysis PB	**Responsible Group Code:**	PO PB Operations PB
Responsible Department:	Assessment	**Activity Supervisor:**	DUANE SCHOON
Activity Performer:	MARK RINZEL		

SECTION 2

Priority:	3	**Due Date:**	5/10/2002
Mode Change Restraint:	(None)	**Management Exception From PI?:**	N
QA/Nuclear Oversight?:	N	**Licensing Review?:**	N
NRC Commitment?:	N	**NRC Commitment Date:**	
Significance Level:	A		

SECTION 3

Activity Completed: 3/17/2002 1:59PM - DON PETERSON:
SEN 174 has six completed actions directed at the need to develop procedures for off- mormal events, to restore power and recover equipment for non-vital 4160 & 480 V busses and associated MCCs. Action six was closed out to CR 98-0050 action item #43. Action #43 was

closed to the issuance of AOP-18. Pump flow concerns were not directly identified in the action items for SEN 174.

4/8/2002 3:28PM - DON PETERSON:
The following documents were reviewed: SEN 174 actions items, CR 97-1992, CR 98-0050, AOP-18, AOP-18A and RCE 01-069. Pump flow concerns were not directly identified in any of the above documentation. This concern was discussed with Mr. Mark Rinzel, Corrective Action Liaison for Operations, he was in atgreement, that an action in t-Track should be issued to Operations to revisit the issues of SEN 174 with special focus on adequate pump flows.

4/8/2002 3:31PM - DON PETERSON.
Issue an action to Operations; Review SEN 174, focusing on "How does PBNP maintain adequate pump flow, under the conditions described in SEN 174 This action was discussed with Mr. Mark Rinzel, he has requested that it be sent to him.

4/30/2002 4:36PM - MARK RINZEL:
Corrective Action (CA) 4279 re-opened an evaluation of INPO SEN 174, "Loss of Non-Vital Bus Causes Dual unit SCRAM and degraded Auxiliary Feedwater System". The evaluation was re-opened based on a CARB request from 3/5/02 review of RCE 01-069, "Increased CDF in AFW PRA Model Due to Procedural Inadequacies Related to Loss of Instrument Air". The CARB requested this evaluation be re-opened to examine additional pumps, other than the AFW pumps, to ensure that adequate flow or recirculation flow would be maintained via procedures through these pumps to prevent damage.

To re-examine this issue, reviews of AOP-5B, "Loss of Instrument Air", EOP 0.1, "Reactor Trip Response" and EOP 1.3, "Transfer to Containment Sump Recirculation" were performed. In addition, conversation with three Licensed SROs were performed to identify where in the procedures adequate pump flows were addressed.

The re-examination focused on safety related pumps necessary for unit shutdown or to dissipate decay heat and maintain core cooling. It was discovered that the AFW pump recirculation valves are unique in the fact that their recirculation valves fail closed upon loss of instrument air. (This was an original plant design function to ensure all flow going to the steam generators, and has since been rectified with the addition of a backup nitrogen supply to ensure the valves ability to be opened and stay open. This was done via the modification process).

Safety Injection system recirculation valves are locked to the open position. This is stated in AOP-5B, Attachment D, Part 2, "System Response", which states:

"Test line valves SI-897A and SI-897B are fail open with IA isolated. This maintains a recirc flow path for the SI pumps."

Feed and Condensate pumps and valves are covered in AOP-5B Attachment T.

"CS-2180, CS-2188, Main Feed Pump mini-recirc valves fail open, if doesn't go open, instructed to use the manual gag override to open the valve"

"CS-2252, Condensate Pump mini-recirc valve fails open, instructed to use the manual gag override to open the valve if it doesn't go open."

RCP Thermal Barriers are covered in AOP-5B Attachment H, Component Cooling.

"RCP thermal barrier isolation valves fail open to maintain thermal barrier cooling"

AOP-5B, Attachment E covers the RHR system discharge and recirculation valves. These also fail open upon loss of instrument air. This will ensure adequate cooling to the pumps, however, creates a different issue. Due to the RH-624 and RH-625 (RHR Heat Exchanger Outlet valves) failing open, the potential exists for the RHR pumps to go into a runout condition when Containment Sump recirculation is put into operation. This is because of the supplies to and discharges from the Spray and SI pumps, as well as the RHR pumps, being maximized. This has been a known issue for some time and has been addressed within both the AOP-5B and EOP-1.3 procedures. To ensure that the RHR pumps do not go into a runout condition, the RH-624 and RH-625 outlet isolation valves, RH-716A and RH-716B are throttled to ensure a mixmum RHR flow of 2200 gpm. In addition, in EOP 1.3, the SI to RHR supply valve, SI-857 (either A or B depending on the RHR train being used/lined up for sump recirc) is throttled

to maintain RHR pump discharge pressure less than 130 psig Therefore, the AOPs and EOPs address the issues of RHR and SI pump having inadequate flow, as well as preventing pump runout conditions, to ensure no damage to the pumps.

Based on what was discovered through these reviews and conversations, it appears that the AFW pumps were in a unique situation, which has since been resolved. All other safety related/high profile pumps are protected from low or no flow damage, or pump runout, through steps built into the current EOPs and AOPs.

Based on this information, the SEN and CARB concerns are believed adequately addressed No further actions are recommended at this time, and this action item may be closed.

4/30/2002 4:37PM - MARK RINZEL:
Evaluation completed, see above update.

5/13/2002 2.22.07 AM - DUANE SCHOON:
Action complete. Closed.

5/13/2002 2.04:47 PM - JULIE KREIL:
SEN 174 evaluation was re-evaluated Based on what was discovered through these reviews and conversations, it appears that the AFW pumps were in a unique situation, which has since been resolved. All other safety related/high profile pumps are protected from low or no flow damage, or pump runout, through steps built into the current EOPs and AOPs. The SEN and CARB concerns are believed adequately addressed. No further actions are recommended. CLOSED CA004279 to completion of Requested Activity.

SECTION 4

QA Supervisor:	(None)	**Licensing Supervisor:**	(None)

SECTION 5

Project:	CAP Activities & Actions		
State:	Done	**Active/Inactive:**	Inactive
Owner:	(None)	**AR Type:**	Parent
Submitter:	DON PETERSON	**Assigned Date:**	4/12/2002
Last Modified Date:	5/13/2002 2:04:47 PM	**Last Modifier:**	JULIE KREIL
Last State Change Date:	5/13/2002 2:04.47 PM	**Last State Changer:**	JULIE KREIL
Close Date:	5/13/2002 2:04.47 PM		
One Line Description:	Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW		
NUTRK ID:	CR 01-3595		
Child Number:	0		
References:	CR 01-2278 RCE 01-069 GOOD CATCH SEN 174 CR 97-1992 CR 98-0050. AOP 18 AOP 18A EOP 0.1 EOP 1.3 AOP 5B		
Update:	È\\(20011204 PB2171 JMK1) Operability Determination (OD) Part I, Revision 0, of CR 01-3595 was approved on 11/30/01. Operable But Degraded - or Operable But Nonconforming -		

meets the minimum required level of performances, compensatory measures ARE required \\Operability Determination (OD) Part I, Revision 1 of CR 01-3595 was approved on 12/01/01. Operable But Degraded - or Operable But Nonconforming - meets the minimum required level of performances, compensatory measures ARE required.

Accepted into group and assigned priority 3. This questions the adequacy of an SEN applicability determination and evaluation. Per NP 5.4.1, SEN are to be priority 3.

....

Priority = This is a reflash question towards the adquacy of a SEN closure from engineering TPS.

Import Memo Field:

CAP Admin: PBNP CAP Admin **Site:** Point Beach

OLD_ACTION_NUM:

Cartridge and Frame:

ATTACHMENTS AND PARENT/CHILD LINKS

CA003982: Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW

CAP001415: Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW

STATE CHANGE HISTORY

Initiate by RICHARD FLESSNER → Assign Work 4/26/2002 11:06 25 AM Owner RICK WOOD → Assign by RICK WOOD → Conduct Work 4/30/2002 4:22 30 PM Owner RICK WOOD → Work Complete by RICK WOOD → Review & Approval 5/8/2002 11.14 03 AM Owner RICK WOOD → Approved by RICK WOOD → Quality Check 5/8/2002 11 14 26 AM Owner PBNP CAP Admin → Complete and Close by JULIE KREIL → Done 5/28/2002 2 18 57 PM Owner (None)

SECTION 1

Activity Request Id:	CA004388		
Activity Type:	Corrective Action	**Submit Date:**	4/26/2002 11:06:25 AM
Site/Unit:	Point Beach - Common		
Activity Requested:	Review operator action assumptions in PRA Model for validity for the top risk-significant systems prior to NRC regulatory conference on 4/29/2002.		
CATPR:	N	**Initiator:**	MASTERLARK, JAMES
Initiator Department:	EPN Engineering Programs Nuclear Safety Analysis PB	**Responsible Group Code:**	EPP Engineering Programs PRA PB
Responsible Department:	Engineering	**Activity Supervisor:**	RICK WOOD
Activity Performer:	RICK WOOD		

SECTION 2

Priority:	4	**Due Date:**	5/10/2002
Mode Change Restraint:	(None)	**Management Exception From PI?:**	N
QA/Nuclear Oversight?:	N	**Licensing Review?:**	N
NRC Commitment?:	N	**NRC Commitment Date:**	

SECTION 3

Activity Completed:

4/30/2002 4:14PM - RICK WOOD:
Operator actions assumed in the PRA model for the Component cooling water system, service water, aux feedwater, ECCS and the instrument air system were identified and forwarded to Operations. The risk rank of the actions and the probability that the action would be performed incorrectly was also included.

5/8/2002 11:02:22 AM - RICK WOOD.
Operations (T. Vandenbosch) identified the following problems with the HEP forwarded to them:
Listed below are the comments associated with the HEPs:

CCI-AOP9B-73.....We do not take credit for crosstie of U1 and U2 CCW pumps.

CCW-AOP9B-73....We do not take credit for crosstie of U1 and U2 CCW pumps.

HEP-SW-RE-C-0011....Should be P32B.

HEP-SW-RE-C-0012....Should be P32C.

HEP-SW-RE-C-0013....Should be P32D.

HEP-SW-RE-C-0014....Should be P32E.

HEP-SW-RE-C-0015....Should be P32F.

HEP-SW480AOP10C5....AOP 0.0 Step 6.1 does not align anything to B08/B09.

AF-HEP-START1TD ...Procedure guidance is given to start the TD AFW pump I'm not sure how this fits into the actions not accomplished by the Operators

AF-HEP-START2TD ...Procedure guidance is given to start the TD AFW pump I'm not sure how this fits into the actions not accomplished by the Operators.

Guidance is given for the following and I am not sure how this fits into the actions not accomplished by the operators:

RHR-ISO-RHRA
RHR-ISO-RHRB
RHR-OP-7A-01
SI-ACCUM-IS

5/8/2002 11:14:03 AM - RICK WOOD:
The review is complete. Correction of the HEPs is tracked via OTH004510.

5/28/2002 2.18:57 PM - JULIE KREIL:
Action completed as documented above. OTH004510 will track correction of the HEPs. CLOSED CA004388.

9/18/2002 6:06:49 PM - RICHARD FLESSNER:
Additional details on the HEP review are provided in attached document CA4388.doc.

SECTION 4

QA Supervisor:	(None)	**Licensing Supervisor:**	(None)

SECTION 5

Project:	CAP Activities & Actions		
State:	Done	**Active/Inactive:**	Inactive
Owner:	(None)	**AR Type:**	Parent
Submitter:	RICHARD FLESSNER	**Assigned Date:**	4/30/2002
Last Modified Date:	9/18/2002 6:06:49 PM	**Last Modifier:**	RICHARD FLESSNER
Last State Change Date:	5/28/2002 2.18:57 PM	**Last State Changer:**	JULIE KREIL
Close Date:	5/28/2002 2.18:57 PM		
One Line Description:	Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW		
NUTRK ID:	CR 01-3595		
Child Number:	0		
References:			

Update:

Import Memo Field:

CAP Admin: PBNP CAP Admin **Site:** Point Beach

OLD_ACTION_NUM:

Cartridge and Frame:

ATTACHMENTS AND PARENT/CHILD LINKS

ACE000314, Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW

Linked From CAP001415

Human Error Probabilities in PRA model (48640 bytes)

Linked from OTH004510: Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW

CA4388 doc (77824 bytes)

CA4388.doc

R. Flessner asked me to provide more detail regarding the review of HEPs performed by Operations and PRA. I provided the following list to Operations (T. Vandenbosch) in April 2002 to determine if the HEP was correctly described and if there are procedures directing the performance of the action.

Human Error Probabilities for top risk significant systems

Instrument Air

Event Name	HEP Value	F-V	Description
HEP-IA—FO-04748	1.00E-03	1.59%	Operator fails to reopen 3047 or 3048 to re-establish IA supply to containment following SI / containment isolation signal
HEP-IA—FO-START	6.90E-04	0.40%	Operator fails to restart IA or SA compressor following a loss of offsite power
HEP-IA--AOP5B-74	2.00E-02	0.15%	Operator fails to isolate IA header rupture (for the fraction of pipe breaks that can be isolated)
HEP-OCC-EOP01-04	1.50E-02	0.00%	Operator fails to control charging/letdown following a loss of IA
AF--HEP-MDP-FLOW	4.40E-02	3.54%	Failure to manually control MDAFW flow after a loss of IA
AF--HEP-RECIRC-1	4.30E-02	1.16%	Failure to manually control recirc flow on same unit TDP P-29 after a loss of IA
AF--HEP-RECIRC-2	4.30E-02	0.03%	Failure to manually control recirc flow on opposite unit TDP P-29 after a loss of IA
AF--HEP-RECIRC2F	2.84E-02	2.33%	Dependent failure to manually control 2 AFW pumps recirc flow after a loss of IA
AF--HEP-RECIRC3F	2.56E-02	12.20%	Dependent failure to manually control 3 AFW pumps recirc flow after a loss of IA
AF--HEP-RECIRC-A	4.30E-02	0.19%	Failure to manually control recirc flow on MDP P-38A after a loss of IA
AF--HEP-RECIRC-B	4.30E-02	0.21%	Failure to manually control recirc flow on MDP P-38B after a loss of IA

Component Cooling Water

Event Name	HEP Value	F-V	Description
CCI-AOP9B-73 (renamed HEP-CCI-AOP9B-73)	6.6E-2		Failure To Crosstie U1 & U2 CCW After Failure Of The U1 Pumps
CCI-AOP9B-74	5.0E-2		Failure To Isolate A Rupture In The CCW And Restore CCW To An Operable State
CCI-OI-71-42	1.5E-2	0.18%	Failure To Align Standby CCW Hx After Failure Of The Normal CCW Heat Removal System
CCW-AOP9B-73	6.9E-2		Failure To Crosstie U1 & U2 CCW During Another Accident
CCW-AOP9B-74	5.4E-2	0.31%	Failure To Isolate A Rupture In The CCW During Another Accident

Event Name	HEP Value	F-V	Description
CCW-EOP13-03	1.2E-4	0.04%	Failure To Start CCW Pumps After A Concurrent SI Signal & LOSP Or An SI Signal Followed By A LOSP (Prior To Resetting SI)
CCW-OI-71-42	3.0E-2		Failure To Align Standby CCW Hx After Failure Of The Normal CCW Heat Removal System During Another Accident

Service Water

Event Name	HEP Value	F-V	Description
HEP-SW--AOP9A-63	5.2E-2	2.21%	Operator fails to isolate SW header rupture
HEP-SW--EOP-0-9A	1.9E-02		Operator fails to isolate non-essential SW loads
HEP-SW-RE-C-0010			Failure to manually close SW P-32A isolation valve SW-10
HEP-SW-RE-C-0011			Failure to manually close SW P-32A isolation valve SW-11
HEP-SW-RE-C-0012			Failure to manually close SW P-32A isolation valve SW-12
HEP-SW-RE-C-0013			Failure to manually close SW P-32A isolation valve SW-13
HEP-SW-RE-C-0014			Failure to manually close SW P-32A isolation valve SW-14
HEP-SW-RE-C-0015			Failure to manually close SW P-32A isolation valve SW-15
HEP-SW480AOP10C5			Operator failure to align to B08/09 per AOP 0.0 Step 6.1
HEP-SWI-AOP9A-61	3.6E-04		Operator fails to start standby SW pumps

AFW

Event Name	HEP Value	F-V	Description
AF--HEP-CST-LOW-	3.90E-04	9.27%	This event estimates the probability that the operator will fail to respond to a low level CST alarm (Pc only), therefore failing the option for long-term auxiliary feedwater use.
AF--HEP-TDAFISOL	5.75E-03	0.20%	Failure of operator to isolate the Turbine-Driven Auxiliary Feed Water (TDAFW) pump from a faulted steam generator.
AF--HEP-MDP-FLOW	4.40E-02	3.54%	Failure to manually control Motor-Driven Auxiliary Feed Water (MDAFW) pump after a loss of IA.
AF--HEP-START-MD	1.1E-03		This event estimates the probability that the operator will fail to manually start the correct motor driven pump MDP P-38A or MDP P-38B after the pump's auto start logic fails.
AF--HEP-CST-FW--	1.10E-02	2.86%	This event estimates the probability that the operator will fail align firewater as an alternate feed source to the appropriate steam

Event Name	HEP Value	F-V	Description
			generators (Pe only).
AF--HEP-RECIRC-1	4.30E-02	1.16%	This event estimates the probability that the operator fails to initiate recirculation for 1P29 upon a loss of instrument air.
AF--HEP-RECIRC-2	4.30E-02	0.03%	This event estimates the probability that the operator fails to initiate recirculation for 2P29 upon a loss of instrument air.
AF--HEP-RECIRC-A	4.30E-02	0.19%	This event estimates the probability that the operator fails to initiate recirculation for P38A upon a loss of instrument air.
AF--HEP-RECIRC-B	4.30E-02	0.20%	This event estimates the probability that the operator fails to initiate recirculation for P38B upon a loss of instrument air.
AF--HEP-RECIRC2F	2.84E-02	2.33%	Dependent failure to manually control 2 AFW pumps recirc flow after a loss of IA
AF--HEP-RECIRC3F	2.56E-02	12.20%	Dependent failure to manually control 3 AFW pumps recirc flow after a loss of IA
AF--HEP-START1TD	1.1E-03		This event estimates the probability that the operator will fail to manually start TDP 1P-29 after the pump's auto start logic fails.
AF--HEP-START2TD	1.1E-03		This event estimates the probability that the operator will fail to manually start TDP 2P-29 after the pump's auto start logic fails.
AF--HEP-CST-SWTD	9.20E-03	0.07%	This event estimates the probability that the operator will fail to align service water to the turbine-driven pump as an alternate feed source to the appropriate steam generators (Pe only).
AF--HEP-CST-SWMD	1.50E-02	1.79%	This event estimates the probability that the operator will fail align service water to the motor-driven pump as an alternate feed source to the appropriate steam generators. (Pe only)

ECCS

Event Name	HEP Value	F-V	Description
HEP-RHR-EOP13-23	2.45E-02	11.60%	Failure to align SI for low containment sump recirculation
RHR-ISO-RHRA	6.0E-1		Failure to isolate a rupture in the A train of RHR (rupture caused by failure of RH-720 and subsequent overpressurization)
RHR-ISO-RHRB	5.4E-1		Failure to isolate a flow diversion from the B train of RHR to the RWST through a failed open MOV (RH-742)
RHR-OP-7A-01	8.8E-02		Failure to place the Residual Heat Removal system into operation per OP-7A
SI-ACCUM-IS (renamed HEP-SI-ACC-AISOL)	1.7E-01		Failure to isolate a ruptured accumulator by closing the isolation MOV

Event Name	HEP Value	F-V	Description
HHR-EOP-RECIRC	5.4E-03		Operator fails recirc switchover to high head

This list was compiled from an earlier listing of HEPs and a number of these events have been deleted from the current model. The deleted HEPs are:

Instrument Air

Event Name	HEP Value	F-V	Description
HEP-OCC-EOP01-04	1.50E-02	0.00%	Operator fails to control charging/letdown following a loss of IA
AF--HEP-RECIRC2F	2.84E-02	2.33%	Dependent failure to manually control 2 AFW pumps recirc flow after a loss of IA
AF--HEP-RECIRC3F	2.56E-02	12.20%	Dependent failure to manually control 3 AFW pumps recirc flow after a loss of IA

Component Cooling Water

Event Name	HEP Value	F-V	Description
CCI-OI-71-42	1.5E-2	0.18%	Failure To Align Standby CCW Hx After Failure Of The Normal CCW Heat Removal System
CCW-AOP9B-73	6.9E-2		Failure To Crosstie U1 & U2 CCW During Another Accident
CCW-AOP9B-74	5.4E-2	0.31%	Failure To Isolate A Rupture In The CCW During Another Accident

Service Water

Event Name	HEP Value	F-V	Description
HEP-SW-RE-C-0010			Failure to manually close SW P-32A isolation valve SW-10
HEP-SW-RE-C-0011			Failure to manually close SW P-32A isolation valve SW-11
HEP-SW-RE-C-0012			Failure to manually close SW P-32A isolation valve SW-12
HEP-SW-RE-C-0013			Failure to manually close SW P-32A isolation valve SW-13
HEP-SW-RE-C-0014			Failure to manually close SW P-32A isolation valve SW-14
HEP-SW-RE-C-0015			Failure to manually close SW P-32A isolation valve SW-15
HEP-SW480AOP10C5			Operator failure to align to B08/09 per AOP 0.0 Step 6.1

AFW

Event Name	HEP Value	F-V	Description
AF--HEP-RECIRC2F	2.84E-02	2.33%	Dependent failure to manually control 2 AFW pumps recirc flow after a loss of IA
AF--HEP-RECIRC3F	2.56E-02	12.20%	Dependent failure to manually control 3 AFW pumps recirc flow after a loss of IA

ECCS

Event Name	HEP Value	F-V	Description
RHR-ISO-RHRA	6.0E-1		Failure to isolate a rupture in the A train of RHR (rupture caused by failure of RH-720 and subsequent overpressurization)
RHR-ISO-RHRB	5.4E-1		Failure to isolate a flow diversion from the B train of RHR to the RWST through a failed open MOV (RH-742)
RHR-OP-7A-01	8.8E-02		Failure to place the Residual Heat Removal system into operation per OP-7A

T. Vandenbosch had comments on the following items that were not deleted from the model:
HEP-CCI-AOP9B-73 This item is not connected in the model and therefore has no effect on the model.
AF-HEP-START1TD and AF-HEP-START2TD have been produced using current Human Reliability Analysis techniques. These HEPs have been reviewed by a PRA engineer and by a reviewer with considerable Point Beach Operations experience.
HEP-SI-ACC-AISOL: The ruptured accumulator initiating event is not included in the model.

Items not included in the original Operations review and are in the current model are as follows:

Instrument Air

Event Name	HEP Value	F-V	Description
HEP-IA--RE-01207	5.0E-03		Operator fails to restore IA-01207 after T/M
HEP-IA--RE-01210	5.0E-03		Operator fails to restore IA-01210 after T/M

Service Water

Event Name	HEP Value	F-V	Description
HEP-RP--AOP9B-63	1.1E-4	2.06E-3	Operator fails to manually trip reactor (TCC/TSW)

AFW

Event Name	HEP Value	F-V	Description
AF--HEP-MINI-GAG	3.4E-3	2.25E-05	Failure to gag mini recirc valve >1hr into event
AF--HEP-RECIRC4F	5.06E-3	1.85E-05	MEX event fail to manually control 4 AFW pumps

ECCS

Event Name	HEP Value	F-V	Description
HEP-HHR-EOP13-23	1.25E-2	1.71E-01	Failure to align for high head recirculation
HEP—SI—SD--DRN	1.00E-0		Shutdown model HEP
HEP-ESF-EOP-0-04	3.25E-3	3.46E-04	Failure to manually initiate SI
HEP-RCS-CSPH1-12	2.36E-2	1.26E-01	Failure to establish Feed & Bleed (No SI)
HEP-RCS-CSPH1-13	2.05E-2	3.19E-02	Failure to establish Feed & Bleed (With SI)

The deleted HEPs have no impact on the current PRA model.

J. Masterlark and I have reviewed the list of added HEPs. The two instrument air HEPs are type A and are preinitiators. They are not associated with operator action or Operations procedures. The new SW HEP is associated with AOP 9A Service Water System Malfunction or AOP 9B Component Cooling Water System Malfunction. Both of these procedures direct the operator to trip on loss of SW or CCW. The new Auxiliary Feedwater HEPs have been recently created based on the latest Operations procedures. The importance of these two HEPs is low. The ECCS HEPs generally have high importance. All of these HEPs have procedures that specifically direct the performance of each of these activities. The Shutdown model HEP is not used since the shutdown model is not complete or being used.

The Human Error Probabilities (HEPs) identified in this corrective action item are no longer included in the PRA model except for AF—HEP-START1TD and AF—HEP-START2TD. These two items have been updated in the latest model and will be issued with the AFW system PRA notebook in the near future. These Human Error Probabilities estimate the probability that the operator fails to manually start the turbine driven auxiliary feedwater pumps after the pumps auto start fails to start the pump. The question identified in the original Action Request was that the Operations reviewer was not sure if PRA had credited the fact that there is procedure guidance to start the pump following an auto start failure.

The Human Reliability Analysis for these Auxiliary Feedwater system HEPs does factor in the procedure step directing start of the pump. It also recognizes the ability of the STA to diagnose lowering steam generator levels and prompt the operator to start the pump. The original question posed by the Operations reviewer has been answered for the HEPs remaining in the current PRA model. As the project to update the PRA model progresses, existing HEPs will be revised and new operator actions will be identified and HEPs for these actions calculated.

Draft

Appendix B

CALCULATION OF TYPE C HUMAN ERROR PROBABILITIES

AF--HEP-STARTXXX

REVISION: 4/17/2001

EVALUATOR: James Masterlark
REVIEWER: Paul Knoespel
OPERATIONAL REVIEW: John Sell

SCENARIO: Failure to manually start Auxiliary Feed Water (AFW) pump after auto-start fails.

INTERVIEWS: Interviews were conducted with Jim Fouse, Sr. Training Specialist.

BASIC EVENT(S): AF--HEP-START1TD, AF--HEP-START2TD, AF--HEP-START-MD
AF--HEP-START12T

DESCRIPTION: This HEP calculates the probability to fail to manually start an AFW pump after its associated auto-start fails. An average dependency is assumed to exist between the Unit 1 Turbine Driven Auxiliary Feed Water (TDAFW) pump and the Unit 2 TDAFW pump since separate control room operators would be controlling these pumps. Therefore, these two events in the same cut-set are replaced with the following formula:

AF--HEP-START1TD * AF--HEP-START2TD= (1+6*START1TD)/7*START2TD
= 2.57E-4 (AF--HEP-START12T)

(Same formula for Unit 2). A complete dependency is assumed to exist between the two Motor Driven Auxiliary Feed Water (MDAFW) pumps. Therefore, both use the same basic AF--HEP-START-MD).

RESULTS:

Pc:	5.40E-4	
Pe:	1.10E-3	
TOTAL:	1.64E-3	(AF--HEP-START1TD, AF--HEP-START2TD, AF--HEP-START-MD)

TIMING ANALYSIS: It is assumed that the initiation must take place within 30 minutes before the intact steam generator dries out. The start of the time window to perform the actions is assumed to be 10 minutes to allow time for diagnosis (part of automatic action verification upon a trip or SI). The action required (manually start pump) are also located in Attachment A to EOP-0. Therefore, this action will only take a few minutes (assumed less than 5 minutes) to perform. The STA is assumed to start monitoring the Critical Safety Function Status Trees at 15 minutes into the event. Therefore, recovery time by the STA is limited to 15 minutes (30 minutes - 15 minutes). Due to the short time needed to diagnosis and complete these actions, this scenario is not considered time limited when determining recovery probabilities.

SUCCESS CRITERIA: Success is upon manually starting an AFW pump.

INITIATING EVENT EFFECTS: These HEPs are used for most initiating events. Since AFW initiation is expected near the start of all of these events, the same assumptions would apply and same recoveries would apply.

PROCEDURES:

Pc:	EOP-0, Step A3, Rev 34 dated 10/30/2000
Pc Revovery:	CSP-H.5, Step 4, Rev 8 dated 6/9/1999
	EOP-0, Step 6a Response Not Obtained (RNO), Rev 34 dated 10/30/2000
Pe:	EOP-0, Step A3 RNO, Rev 34 dated 10/30/2000
Pe Recovery:	CSP-H-5, Step 5 RNO, Rev 8 dated 6/9/1999
	EOP-0, Step 6a RNO, Rev 34 dated 10/30/2000

ASSUMPTIONS:

Pc:

1. ERF Not credited for recovery due to the short length of time available (< 1 hour)

Pc Recovery:

1. Self Review - Self Review is not credited.

2. Extra Crew - Extra crew members will also be following EOP-0 and credited for recovery of Pc^c by verifying that the AFW pumps have started in Step 6a of EOP-0.

3. STA Review - The STA's will start CSFST review within 15 minutes of the event. By failing to initiate an AFW pump manually after automatic start fails, the steam generators will eventually reach a low level. At this point, the STA will identify this through the CSP's and enter CSP-H.5 for low level. This procedure contains a step (Step 4) to verify AFW flow of at least 50 gpm. Therefore, credit is taken for the STA to identify that the AFW pumps have not been started. Normally credit is not taken for the STA chance to recover from a missed procedure step (Pc^c) because they do not follow the same procedures. However, in this case credit could be taken since similar steps are included in the CSP's that would be involved if the EOP steps would be missed.

4. Pc^c - As described above, recovery is credited for Extra Crew and STA Review. Since multiple recoveries are included, an override value of 5E-1 * 1E-1 = 5E-2 is included. Due to potential dependencies within these recoveries, the screening values from Table 4-1 are used instead of the independent recovery HEP's.

Pe Recovery:

1. The STA's will start CSFST review within 15 minutes of the event. By failing to initiate an AFW pump manually after automatic start fails, the steam generators will eventually reach a low level. At this point, the STA will identify this through the CSP's and enter CSP-H.5 for low level. This procedure requires the initiation of AFW if flow is less than 50 gpm (step 4). Therefore, credit is taken for the STA to recover from a failed step in EOP-0.
2. Two separate operators will be performing EOP-0. One will be verifying automatic actions with Attachment A, and an additional operator will be performing the main body of the procedure. The main body contains additional steps to verify SG level and to manually start AFW if it has not automatically started. Since time is available for recovery, credit is taken for this additional operator to manually start AFW if the first operator failed to do so correctly. Due to the time frame available, a high dependency is assumed.

3. Since the STA has 15 minutes or less for recovery there is an assumed high dependency between the STA's reviews in the CSFST's operations use of the EOP's. Due to the limited time frame, the recovery is assumed to be 5E-1.

STATE CHANGE HISTORY

Initiate → Assign Work 5/8/2002 11:09 56 AM Owner. RICK WOOD by RICK WOOD → Assign → Conduct Work 7/24/2002 4.03.55 PM Owner: RICK WOOD by RICK WOOD

SECTION 1

Activity Request Id:	OTH004510		
Activity Type:	Other	**Submit Date:**	5/8/2002 11:09.56 AM
Site/Unit:	Point Beach - Common		
Activity Requested:	Correct the problems identified with the Point Beach HEPs. If the HEPs no longer exist in the model, then the description in our data base should be eliminated. George Baldwin - Kewaunee PRA will perform the work.		
CATPR:	N	**Initiator:**	MASTERLARK, JAMES
Initiator Department:	EPN Engineering Programs Nuclear Safety Analysis PB	**Responsible Group Code:**	EPP Engineering Programs PRA PB
Responsible Department:	Engineering	**Activity Supervisor:**	RICK WOOD
Activity Performer:	RICK WOOD		

SECTION 2

Priority:	4	**Due Date:**	12/20/2002
Mode Change Restraint:	(None)	**Management Exception From PI?:**	N
QA/Nuclear Oversight?:	N	**Licensing Review?:**	N
NRC Commitment?:	N	**NRC Commitment Date:**	

SECTION 3

Activity Completed:

4/30/2002 4:14PM - RICK WOOD:
Operator actions assumed in the PRA model for the Component cooling water system, service water, aux feedwater, ECCS and the instrument air system were identified and forwarded to Operations. The risk rank of the actions and the probability that the action would be performed incorrectly was also included.

5/8/2002 11:02.22 AM - RICK WOOD:
Operations (T. Vandenbosch) identified the following problems with the HEP forwarded to them:
Listed below are the comments associated with the HEPs·

CCI-AOP9B-73.....We do not take credit for crosstie of U1 and U2 CCW pumps.

CCW-AOP9B-73....We do not take credit for crosstie of U1 and U2 CCW pumps

HEP-SW-RE-C-0011....Should be P32B.

HEP-SW-RE-C-0012....Should be P32C.

HEP-SW-RE-C-0013....Should be P32D.

HEP-SW-RE-C-0014....Should be P32E.

HEP-SW-RE-C-0015....Should be P32F.

HEP-SW480AOP10C5....AOP 0.0 Step 6.1 does not align anything to B08/B09.

AF-HEP-START1TD....Procedure guidance is given to start the TD AFW pump. I'm not sure how this fits into the actions not accomplished by the Operators.

AF-HEP-START2TD....Procedure guidance is given to start the TD AFW pump. I'm not sure how this fits into the actions not accomplished by the Operators.

Guidance is given for the following and I am not sure how this fits into the actions not accomplished by the operators:

RHR-ISO-RHRA
RHR-ISO-RHRB
RHR-OP-7A-01
SI-ACCUM-IS

SECTION 4

QA Supervisor:	(None)	**Licensing Supervisor:**	(None)

SECTION 5

Project:	CAP Activities & Actions		
State:	Conduct Work	**Active/Inactive:**	Active
Owner:	RICK WOOD	**AR Type:**	Parent
Submitter:	RICK WOOD	**Assigned Date:**	7/24/2002
Last Modified Date:	7/24/2002 4:03:55 PM	**Last Modifier:**	RICK WOOD
Last State Change Date:	7/24/2002 4:03:55 PM	**Last State Changer:**	RICK WOOD
Close Date:			
One Line Description:	Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW		
NUTRK ID:	CR 01-3595		
Child Number:	0		
References:			
Update:			
Import Memo Field:			
CAP Admin:	SCOTT PFAFF	**Site:**	Point Beach
OLD_ACTION_NUM:			
Cartridge and Frame:			

ATTACHMENTS AND PARENT/CHILD LINKS

Linked From CAP001415

CHANGE HISTORY

5/8/2002 11:10:09 AM by admin

Last Modified Date Changed From 5/8/2002 11:09:56 AM To 5/8/2002 11:10 09 AM

Last Modifier Changed From RICK WOOD To admin

Attachment Added. Linked From CAP001415

7/24/2002 4:03:55 PM by RICK WOOD

Due Date Changed From 11/20/2002 To 12/20/2002

State Changed From Assign Work To Conduct Work Via Transition Assign

Assigned Date Changed From 4/30/2002 To 7/24/2002

Last Modified Date Changed From 5/8/2002 11:10.09 AM To 7/24/2002 4:03:55 PM

Last Modifier Changed From admin To RICK WOOD

Last State Change Date Changed From 5/8/2002 11:09 56 AM To 7/24/2002 4·03 55 PM

STATE CHANGE HISTORY

Initiate	Assign Work	Assign	Conduct Work	Work Complete	Review & Approval	Approved	Quality Check
by RICHARD FLESSNER	9/3/2002 6:36:35 PM Owner RICHARD FLESSNER	by RICHARD FLESSNER	9/3/2002 6 37:42 PM Owner RICHARD FLESSNER	by RICHARD FLESSNER	9/3/2002 6 45:08 PM Owner RICHARD FLESSNER	by RICHARD FLESSNER	9/3/2002 6:45 49 PM Owner PBNP CAP Admin

SECTION 1

Activity Request Id:	CA026223		
Activity Type:	Corrective Action	**Submit Date:**	9/3/2002 6.36:35 PM
Site/Unit:	Point Beach - Common		
Activity Requested:	CA#17: Update the PBNP simulator to model AFW pump failure due to less than required minimum recirculation flow.		
CATPR:	N	**Initiator:**	MASTERLARK, JAMES
Initiator Department:	EPN Engineering Programs Nuclear Safety Analysis PB	**Responsible Group Code:**	EXC Engineering Processes Continuous Improvement PB
Responsible Department:	Engineering	**Activity Supervisor:**	RICHARD FLESSNER
Activity Performer:	RICHARD FLESSNER		

SECTION 2

Priority:	3	**Due Date:**	9/3/2002
Mode Change Restraint:	(None)	**Management Exception From PI?:**	N
QA/Nuclear Oversight?:	N	**Licensing Review?:**	N
NRC Commitment?:	Y	**NRC Commitment Date:**	

SECTION 3

Activity Completed: 9/3/2002 6:45:08 PM - RICHARD FLESSNER:
Simulator Discrepancy Report SDR 02-0046 was initiated on 4/22/02 to "Install auto pump trips per plant direction". T. Kendall provided technical direction (documented in the SDR). The software change was made and tested on 4/22/02. The SDR was closed by R. Parlato on 4/23/02.

SECTION 4

QA Supervisor:	(None)	**Licensing Supervisor:**	(None)

SECTION 5

Project:	CAP Activities & Actions		
State:	Quality Check	Active/Inactive:	Active
Owner:	PBNP CAP Admin	AR Type:	Parent
Submitter:	RICHARD FLESSNER	Assigned Date:	9/3/2002
Last Modified Date:	9/12/2002 10:12:43 AM	Last Modifier:	RICHARD FLESSNER
Last State Change Date:	9/3/2002 6:45:49 PM	Last State Changer:	RICHARD FLESSNER
Close Date:			
One Line Description:	Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW		
NUTRK ID:	CR 01-3595		
Child Number:	0		
References:	CR 01-2278 RCE 01-069 GOOD CATCH LER 266/2001-005-00		
Update:	This CA is being issued to document a completed action.		
Import Memo Field:	LER 266/2001-005-00 made the committment that " Simulator modifications to enhance modeling the potential failure of the AFWS pumps following loss of instrument air scenarios are being pursued."		
CAP Admin:	PBNP CAP Admin	Site:	Point Beach
OLD_ACTION_NUM:			
Cartridge and Frame:			

ATTACHMENTS AND PARENT/CHILD LINKS

Subtask from CAP001415: Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW

Linked to ACE000314: Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW

Simulator Discrepancy Report

SDR Num.	*Title*	*Orig*	*Date*
02-0046	Install auto pump trips per plant direction	rdp	4/22/2002

Status	*System*	*Closed By*	*Close Date*
COMP	PMP	rdp	4/23/2002

Description

MODELING OF MULTI-STAGE PUMP FAILURES ON THE SIMULATOR

It was recently determined that the PBNP simulator needed to model pump failure due to low flows. Particularly vulnerable to these kinds of failure are horizontal split case multi-stage centrifugal pumps. These are the SI and AFW pumps.

Failure occurs when water being pumped is reduced to the point that pump energy is not removed at a sufficient rate and shows up as thermal energy rather than pressure x volume work If the thermal energy raises the liquid to the saturation point localized or generalized boiling occurs that upsets the hydro-dynamic supporting of the shaft and causes severe vibration of the rotating element The vibration of the shaft causes contact between the rotating element and the casing, severe localized heating, and shaft seizure due to the rapid expansion of the rotating element.

Shaft seizure may cause the prime mover (turbine or motor) to stall, or it may cause the shaft/coupling to break allowing the prime mover to continue running. Failure mode is indeterminate and could be modeled as either shaft seizure or shaft breakage without loss of fidelity.

The following approach uses several simplifications to arrive at a reasonable figure for modeling low-flow induced pump failures. Industrial experience demonstrates that failure under these conditions is very rapid. However, there is little verifiable empirical data to establish a close correlation for predicting low flow failures. The heat balance approach used below is judged to be as good as any method for the practical purposes of modeling expected conditions in a training simulator.

Cavitation (boiling) will occur when the liquid enthalpy reaches the saturation point at the eye of the pump impellor. Each stage boosts pressure sequentially, so in theory only the first stage is a concern. If sufficient flow is maintained to remove the energy imparted by the first stage without reaching saturation, the pump should continue to function

However, other factors (such as internal recirculation) come into play that can also lead to severe vibrations and rapid failure. Therefore, to simplify matters (and to be consistent with anecdotal observations of pump failure), it is assumed that all of the pump work is deposited in the liquid at atmospheric pressure. This is a reasonable assumption that offsets the likelihood of a higher suction head due to an elevated head tank level (RWST or CST) and low piping friction head losses with the high pressure drop at the suction of a pump.

Based on the above assumption, when sufficient energy is imparted by the pump to raise the flow through it to 212 deg F, cavitation (and therefore failure) are assumed to occur.

Although higher temperatures are permitted by various plant designs, Technical Specifications, and procedures, it will be assumed that the pump inlet temperature is 70 deg F. This is judged to be a representative ambient temperature for normal plant operations. If suction temperatures are lower the predicted minimum flow that will prevent failure will decrease, and vice versa

The difference in liquid enthalpy between 212 deg F and 70 deg F is ~141 Btu/lbm

The heat imparted by the pump is a function of both the brake horsepower and the pump efficiency at a given flow rate, and both are taken from the manufacturer's pump curves. The specific heat input is then

$q = W'(1-h)/m'$

Where:
- q is the specific heat input in Btu/lbm (equivalent to the change in enthalpy)
- W' is the break horsepower from the pump curve (Hp) converted to Btu/min
- h is the pump efficiency from the pump curve
- m' is the mass flow rate through the pump (gpm) converted to lbm/min

Substituting 141 Btu/lbm for q, rearranging to solve for the critical mass flow rate, and using appropriate conversion factors, this equation becomes:

$q'critical = 0.361\ Hp(1-h)$

Where q'critical is in gpm. Because both pump efficiency and Horsepower are (strictly speaking) not linear, this equation must be solved iteratively. However, for all practical purposes the functions are reasonably linear within the small range of interest and the solution converges very quickly.

Motor Driven AFW Pumps:

From the pump curves for P-38A&B, the pump efficiency at ~6 gpm is 3 6%, and the brake horsepower is ~150 Hp Substituting into the above equation gives a figure of 5 2 gpm. This is as close a solution as can be obtained by reading the curves. Use 6 gpm as the failure flow for these pumps.

Turbine Driven AFW Pumps:

From the pump curves for 1P-29 and 2P-29, the pump efficiency at ~5 gpm is ~2%, and the brake horsepower is ~200 Hp. Substituting into the above equation gives a figure of 7 gpm Trying 10 gpm (4% efficiency and 200 Hp) gives a figure of 6.9 gpm. These two figures bracket the actual value and are virtually identical Use 7 gpm as the failure flow for these pumps

SI Pumps

From the pump curves for 1/2P-15A&B, the pump efficiency at ~10 gpm is 2.5%, and the brake horsepower is ~300 Hp Substituting into the above equation gives a figure of 10.6 gpm. This is as close a solution as can be obtained by reading the curves. Use 11 gpm as the failure flow for these pumps.

Suggestions for Modeling Failures

It is not reasonable to instantaneously fail the pumps immediately upon dropping to less than the flows listed above. A realistic failure would be for the pumps to suffer unrecoverable failure 30 seconds after dropping below the listed flows. Timely restoration of flow above the threshold could be modeled to avert ultimate failure, but if this is not done within ~15 seconds, severe degradation should be modeled as a penalty (50% degraded pump curve).

T. C. Kendall (the previous letter was created per plant management direction to provide modeling information to the simulator..)

References:

Outage: ***Mod Number:*** ***Priority:***

SHWR: ***HW Change:*** ***HW Spec:*** ***Date:***

Hardware Scope

SW Change: y ***SW Eng:*** rdp ***Date:*** 4/22/2002

Software Scope

Created subroutine autotrip with calls from intlkp and intlkpu2 for P29,P15 and P38 (both units except for P38). Setpoints as directed by the included letter from Ton Kendal. Database modification for new subroutine.

OPC Spec: A. Morris ***Date*** 4/22/2002

Operations Scope

LIMITED SCOPE SIMULATION TEST

Test being conducted in support of SDR No.: 02-0046 *Date of Test:* 4/22/2002

Brief Description of Test

Tested unit AFW and SI pumps in accordance with the pump trip criteria outlined in engineering transmittal attachment "MODELING OF MULTI-STAGE PUMP FAILURES ON THE SIMULATOR".

Test Objectives

Verify pump trips on a 30-second timer when low flow criterion is met Verify that the pump does NOT trip if flow is recovered within the 30-second time alloted. Verify that the newly installed trip does not adversly impact other failure modes for each pump potentially disrupting training Verify that after pump trip that the pump is NOT recoverable.

Initial Conditions for Test, IC No. or plant conditions established(Reference Procedure).

I/C 24 (adequate conditions to opeate the Turbine-Driven AFW pump at full capacity)

LOAs and Equipment Overrides required for Test.

LOA for: Pump recirc vlaves, pump discharge valves, pump suction valves.

Malfunctions/Component Failures entered during conduct of test, including severity, time of activation, and ramp time.

Malfunctions for: Broken Shaft, Head Capacity, Bearing failure, and Shaft Seizure. Component failures for: applicable FTs and PTs, TD-AFW pump trip-throttle valve.

Test Results

Each pump (the HHSI, MD-AFW, TD-AFW) met the test objectives outlined for that pump, satisfactorily.

Test Satisfactory ◉ *Test Unsatisfactory* ○ *SPF Submitted:* ☐

Test Conducted By: A. Morris

STATE CHANGE HISTORY

Initiate	Assign Work	Assign	Conduct Work	Work Complete	Review & Approval	Approved	Quality Check
by RICHARD FLESSNER	9/3/2002 6 51:49 PM Owner RICHARD FLESSNER	by RICHARD FLESSNER	9/3/2002 6 52.39 PM Owner RICHARD FLESSNER	by RICHARD FLESSNER	9/3/2002 6 58.41 PM Owner RICHARD FLESSNER	by RICHARD FLESSNER	9/3/2002 6 59.04 PM Owner PBNP CAP Admin

SECTION 1

Activity Request Id:	CA026224		
Activity Type:	Corrective Action	**Submit Date:**	9/3/2002 6:51:49 PM
Site/Unit:	Point Beach - Common		
Activity Requested:	CA#18: Revise the EOP validation process to include PRA involvement.		
CATPR:	N	**Initiator:**	MASTERLARK, JAMES
Initiator Department:	EPN Engineering Programs Nuclear Safety Analysis PB	**Responsible Group Code:**	EXC Engineering Processes Continuous Improvement PB
Responsible Department:	Engineering	**Activity Supervisor:**	RICHARD FLESSNER
Activity Performer:	RICHARD FLESSNER		

SECTION 2

Priority:	3	**Due Date:**	9/3/2002
Mode Change Restraint:	(None)	**Management Exception From PI?:**	N
QA/Nuclear Oversight?:	N	**Licensing Review?:**	N
NRC Commitment?:	N	**NRC Commitment Date:**	

SECTION 3

Activity Completed:

9/3/2002 6.51:49 PM - RICHARD FLESSNER:
This CA is being issued to document a completed corrective action.

9/3/2002 6:58:41 PM - RICHARD FLESSNER:
The EOP/AOP Verification and Validation processes were combined into one process with issuance of Rev 2 of OM 4.3.2 on 5/13/2002 and cancellation of OM 4.3.3. OM 4.3.2 step 4.2.4 requires involvement of the PRA Group to review technical changes. Attachmnet D contains a PRA Core Damage Risk Matrix listing Procedures and applicable Events to be used for validation.

SECTION 4

QA Supervisor:	(None)	**Licensing Supervisor:**	(None)

SECTION 5

Project:	CAP Activities & Actions		
State:	Quality Check	Active/Inactive:	Active
Owner:	PBNP CAP Admin	AR Type:	Parent
Submitter:	RICHARD FLESSNER	Assigned Date:	9/3/2002
Last Modified Date:	9/3/2002 7:16:46 PM	Last Modifier:	RICHARD FLESSNER
Last State Change Date:	9/3/2002 6:59.04 PM	Last State Changer:	RICHARD FLESSNER
Close Date:			
One Line Description:	Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW		
NUTRK ID:	CR 01-3595		
Child Number:	0		
References:	CR 01-2278 RCE 01-069 GOOD CATCH		
Update:			
Import Memo Field:			
CAP Admin:	PBNP CAP Admin	Site:	Point Beach
OLD_ACTION_NUM:			
Cartridge and Frame:			

ATTACHMENTS AND PARENT/CHILD LINKS

Subtask from CAP001415: Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW

Linked to ACE000314: Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW

Nuclear Power Business Unit
DOCUMENT REVIEW AND APPROVAL

* Per Jim Green, Take Rev Bars off! GJW 5/13

Note: Refer to NP 1.1.3 for requirements.

I - INITIATION

Doc Number OM 4.3.2 Unit PB0 Usage Level Information Proposed Rev No 2

Title EOP/AOP Verification/Validation Process Classification NA

☒ Revision ☐ Cancellation ☐ New Document ☐ Other (e.g., periodic review, admin hold)

List Temporary Changes/Feedbacks Incorporated:

Description of Alteration/Reason (If necessary, continue description of changes on PBF-0026c and attach)

Total rewrite, revised format per Procedure Writers' Guide, incorporated OM 4.3.3, EOP Validation (Rev. 0) information and PRA Core Damage Risk data. See PBF-0026c for details.

List other documents required to be effective concurrently with the revision (e.g., other procedures, forms, drawings, etc.):

PBF-2102a (Rev. 0), 2102b (Rev. 0), 2103a (Rev. 0), 2103b (Rev. 0), 2103c (Rev. 0)

Document Preparer (print/sign) James G Green / [signature] Date 5/1/02

Indicates draft prepared according to NP1.1.3, any commitments/bases changes have been documented and resolved

II - TECHNICAL REVIEW

(Cannot be the Preparer or Approval Authority)

Technical Reviewer (print/sign) JG VANDERNBOSCH / [signature] Date 5/1/02

Indicates draft technically correct, consistent with references/bases/upper tier requirements, requirements of NP 1.1.3 completed.

III - DOCUMENT OWNER REVIEW

Required Reviewers/Organizations: OPS / TRAINING / REGULATORY ENG / NUCLEAR ENG / PRA

Validation Required? ☒ NO ☐ YES ☐ WAIVED (Group Head Approval and Reason Required) NOTE: REQ REVIEWS HAVE BEEN COMPLETED

Reason Validation Waived:

Continue on PBF-0026c if necessary.

Validation Waiver Approval: [signature] 5/7/02

Group Head Signature

Changes pre-screened according to NP 5.1.8? ☐ NO ☒ YES (Provide documentation according to NP 5.1.8)

Screening completed according to NP 5.1.8? ☒ NA ☐ YES (Attach copy) Safety evaluation required? ☐ NO ☐ YES

Training or briefing required? ~~☒~~ NO ☒ YES If YES, training or briefing required before issue? ☒ NO ☐ YES

Training assistance desired? ~~☒~~ NO ☒ YES If YES, Training Coordinator contacted/date: P Smith / 5/7/00

☒ QR/MSS Review NOT Required (Admin or NNSR only) ☐ QR Review Required ☐ MSS Review Required (reference NP 1.6.5)

Document Owner (print/sign) G.D. STRAMASKY / G.D. Stramasky Date 5.4.02

Indicates document is technically correct, can be performed as written, does not adversely affect personnel or nuclear safety, appropriate reviews have been performed (i.e., technical, cross-disciplinary, validation and 50.59/72.48), comments have been resolved and incorporated as appropriate, affected documents/ training/briefing have been identified and word processing completed. Document Control notified if emergent issuance required (e.g., may be less than 2 days for procedure issuance)

IV - APPROVAL

(The Preparer, Qualified Reviewer (QR), and Approval Authority shall be different individuals)

QR/MSS (print/sign) N/A / Date

Indicates 50.59/72.48 applicability assessed, any necessary screenings/evaluations performed, determination made as to whether additional cross-disciplinary review required, and if required, performed.

MSS Meeting No.

Approval Authority (print/sign) K Sokol / [signature] Date 5/7/02

V - RELEASE FOR DISTRIBUTION

☒ NA ☐ YES Pre-implementation requirements complete (e.g., training/briefings, affected documents, word processing, etc.).

☒ Specific effective date not required. Issue per Document Control schedule.

☐ Required effective date: (Coordinate date with Document Control)

Document Owner/Designee (print/sign) K Sokol / [signature] Date 5/7/02

Effective Date (to be entered by Document Control). MAY 13 2002

REC'D MAY 1 9 2002 MICROFILMED MAY 3 1 2002

References: NP 1.1.3, NP 1.1.5, NP 1.1.6, NP 1.2.3, NP 1.2.5, NP 1.2.6

Doc Number OM 4.3.2 Revision 1 Unit PB0

Title EOP/AOP Verification/Validation Process

Temporary Change Number _____

Description of Changes:

Step *	Change/Reason
Cover Sheet	Added cover sheet per Procedures Writers' Guide. / This is pre-screened to Criteria #1-Editoral.
1.0	Simplified PURPOSE statement and incorporated information from OM 4.3.3, EOP Validation. / This is pre-screened to Criteria #2-Administrative Procedure.
2.0	Added new section {DISCUSSION} per Procedures Writers' Guide. / This is pre-screened to Criteria #1-Editoral.
2.1 through 2.2	Incorporated information from the old PURPOSE sections of OM 4.3.2 and OM 4.3.3. / This is pre-screened to Criteria #1-Editoral.
2.3	Added steep 2.3 in reference to the PRA Risk matrix in Attachment D. / This is pre-screened to Criteria #2-Administrative Procedure.
2.4 through 2.7	Added steps. / This information is clarifying in nature. This is pre-screened to Criteria #2-Administrative Procedure.
3.1 through 3.3	Incorporated information from the old RESPONSIBILITIES sections of OM 4.3.2 and OM 4.3.3. / This is pre-screened to Criteria #1-Editoral.
3.4	Added {Nuclear Engineering} responsibility. / This is pre-screened to Criteria #2-Administrative Procedure.
3.5	Added {Reactor Engineering} responsibility. / This is pre-screened to Criteria #2-Administrative Procedure.
4.1	Added {General} step to Section 4.0. / This allows a place for non-specific information to be located together. / This is pre-screened to Criteria #2-Administrative Procedure.
4.1.1 through 4.1.2	Incorporated information from the old PROCEDURE sections of OM 4.3.2 and OM 4.3.3. / This is pre-screened to Criteria #1-Editoral.
4.1.3	Added step to cross reference other procedures in the event standard steps are revised. / This is pre-screened to Criteria #2-Administrative Procedure.
4.1.4	Added step to reference the EOPSTPT for applicable changes. / This is pre-screened to Criteria #2-Administrative Procedure.
4.1.5	Incorporated information from the old PROCEDURE section of OM 4.3.2. / This is pre-screened to Criteria #1-Editoral.
4.1.6	Added step referencing the Deviation Document. / This is pre-screened to Criteria #2-Administrative Procedure.
4.2.1 NOTE	Added NOTE. / This information is clarifying in nature. This is pre-screened to Criteria #2-Administrative Procedure.

Other Comments

* Note: Recording of Step Number(s) is not required for multiple occurrences of identical information or when not beneficial to reviewers

Doc Number OM 4.3.2 Revision 1 Unit PB0

Title EOP/AOP Verification/Validation Process

Temporary Change Number _____

Description of Changes:

Step *	Change/Reason
4.2.1	Added new step to differentiate between Technical changes and Editorial changes to EOPs/AOPs. / This is pre-screened to Criteria #2-Administrative Procedure.
4.2.2	Added new step to reference new Attachment A for Tech. Evaluation Guidelines. / This is pre-screened to Criteria #2-Administrative Procedure.
4.2.3	Incorporated information from the old PROCEDURE section of OM 4.3.2. / This is pre-screened to Criteria #1-Editoral.
4.2.4	Incorporated information from the old PROCEDURE section of OM 4.3.2. Revised {Verification Team} requirements. Added PRA Group reference. / Expanded Team member requirements and PRA Group involvement allows for more accurate evaluation. This is pre-screened to Criteria #2- Administrative Procedure.
4.2.5 through 4.2.8	Incorporated information from the old PROCEDURE section of OM 4.3.2. / This is pre-screened to Criteria #1-Editoral.
4.2.8 NOTE	Added NOTE. / This information is clarifying in nature. This is pre-screened to Criteria #2-Administrative Procedure.
4.2.9	Added step referencing a safety review. / This is pre-screened to Criteria #2-Administrative Procedure.
4.2.10 Note through 4.2.13	Added this NOTE and steps to ensure specific groups review/evaluate procedure changes that effect their areas of responsibility. / This is pre-screened to Criteria #2-Administrative Procedure.
Section 4.3	Incorporated information from the old PROCEDURE section of OM 4.3.2, and revised and reformatted the steps within the section to be consistent with the Validation steps. / This is pre-screened to Criteria #1-Editoral.
Section 4.4	Incorporated information from the old PROCEDURE section of OM 4.3.3. / This is pre-screened to Criteria #1-Editoral.
4.4.1.a through 4.4.1.b	Incorporated information from the old PROCEDURE section of OM 4.3.3. / This is pre-screened to Criteria #1-Editoral.
4.4.1.c	Added new step referencing Table-top validation method. / This is pre-screened to Criteria #2-Administrative Procedure.
4.4.2	Added new step defining the Validation Team Leader qualifications. / This is pre-screened to Criteria #2-Administrative Procedure.
4.4.3.a	Incorporated information from the old PROCEDURE section of OM 4.3.3. / This is pre-screened to Criteria #1-Editoral.

Other Comments

* Note: Recording of Step Number(s) is not required for multiple occurrences of identical information or when not beneficial to reviewers

Point Beach Nuclear Plant
DOCUMENT REVIEW AND APPROVAL CONTINUATION

Doc Number OM 4.3.2 Revision 1 Unit PB0

Title EOP/AOP Verification/Validation Process

Temporary Change Number _____

Description of Changes:

Step *	Change/Reason
4.4.3.b through 4.4.3.d	Added new sub-steps defining the requirements of the Validation Team. / This is pre-screened to Criteria #2-Administrative Procedure.
4.4.3.e	Incorporated information from the old PROCEDURE section of OM 4.3.3. / This is pre-screened to Criteria #1-Editoral.
4.4.4	Added new step directing the Validation Team to review the Verification Teams work. / This is pre-screened to Criteria #2-Administrative Procedure.
4.4.5 through 4.4.6	Incorporated information from the old PROCEDURE section of OM 4.3.3. / This is pre-screened to Criteria #1-Editoral.
4.5.1.a through 4.5.1.d	Incorporated information from the old PROCEDURE section of OM 4.3.3. / This is pre-screened to Criteria #1-Editoral.
4.5.1.e	Added new step for the evaluation of the Simulator response. / This is pre-screened to Criteria #2-Administrative Procedure.
4.5.1.f	Incorporated information from the old PROCEDURE section of OM 4.3.3. / This is pre-screened to Criteria #1-Editoral.
4.5.2.a	Added new step to define the course of the simulator scenario performance. / This is pre-screened to Criteria #2-Administrative Procedure.
4.5.2.b through 4.5.2.c	Incorporated information from the old PROCEDURE section of OM 4.3.3. / This is pre-screened to Criteria #1-Editoral.
4.5.2.d	Added new step to direct use of alternative methods of validation for parts of the procedure that are not evaluated by the simulator. / This is pre-screened to Criteria #2-Administrative Procedure.
Section 4.6	Added new section to define the steps to be followed during a Walkthrough Validation. / This is pre-screened to Criteria #2-Administrative Procedure.
Section 4.7	Added new section to define the steps to be followed during a Table-top Validation. / This is pre-screened to Criteria #2-Administrative Procedure.
Section 4.8 NOTE	Added NOTE to direct the re-performance of portions of the verification or validation processes. / This is pre-screened to Criteria #2-Administrative Procedure.
4.8.1 through 4.8.2	Incorporated information from the old PROCEDURE section of OM 4.3.3. / This is pre-screened to Criteria #1-Editoral.
4.8.3	Added new step for the evaluation of the Simulator response. / This is pre-screened to Criteria #2-Administrative Procedure.

Other Comments

* Note: Recording of Step Number(s) is not required for multiple occurrences of identical information or when not beneficial to reviewers

References: NP 1.1.3, NP 1.2.3

Doc Number OM 4.3.2 Revision 1 Unit PB0

Title EOP/AOP Verification/Validation Process

Temporary Change Number _____

Description of Changes:

Step *	Change/Reason
4.8.4 through 4.8.5	Incorporated information from the old PROCEDURE section of OM 4.3.3. / This is pre-screened to Criteria #1-Editoral.
4.8.6	Added new step describing the post-validation responsibilities of the Team Leader. / This is pre-screened to Criteria #2-Administrative Procedure.
4.9.1 NOTE	Added NOTE. / This information is clarifying in nature. This is pre-screened to Criteria #2-Administrative Procedure.
4.9.1	Added new step describing the final approval process. / This is pre-screened to Criteria #2-Administrative Procedure.
4.9.2	Incorporated information from the old PROCEDURE section of OM 4.3.3. / This is pre-screened to Criteria #1-Editoral.
4.9.3	Added new step describing the Operations Manager responsibilities. / This is pre-screened to Criteria #2-Administrative Procedure.
5.1 through 5.9	Incorporated information from the old PROCEDURE section of OM 4.3.2. Deleted references to {NOM EOP}, {NP 1.2.2} and {PBNP EOP}. / {NOM EOP} and {NP 1.2.2} have been canceled. {PBNP EOP} is a redundant reference. This is pre-screened to Criteria #1-Editoral.
5.10 through 5.12	Added references to new forms developed from the forms in the old OM 4.3.3. / This is pre-screened to Criteria #2-Administrative Procedure.
6.0	Added new section {BASIS} per Procedures Writers' Guide. / This is pre-screened to Criteria #1-Editoral.
Attachment A	Added new Attachment A to provide guidance for Technical Evaluations. / This is pre-screened to Criteria #2-Administrative Procedure.
Attachment B	Added new Attachment B to provide guidance for Status Tree Evaluations. / This is pre-screened to Criteria #2-Administrative Procedure.
Attachment C	Incorporated information from the old TABLE 1 of OM 4.3.3. / This is pre-screened to Criteria #1-Editoral.
Attachment C step 2.3	Added new step for guidance in the validation of actions taken outside the Control Room. / This is pre-screened to Criteria #2-Administrative Procedure.
Attachment D	Added new Attachment D to provide guidance for PRA Core Damage Risk Assessment. / This is pre-screened to Criteria #2-Administrative Procedure.

SINCE THIS IS COMBINING OM 4.3.3 + 4.3.2 THE TITLE OF OM 4.3.2 WILL BE CHANGED TO EOP/AOP VERIFICATION/VALIDATION PROCESS [illegible] 5/7/02

Other Comments

* Note: Recording of Step Number(s) is not required for multiple occurrences of identical information or when not beneficial to reviewers

Point Beach Nuclear Plant

10 CFR 50.59/72.48 APPLICABILITY FORM

Brief Activity Title or Description: **Total rewrite of OM 4.3.2, EOP/AOP Verification/Validation Process**

This form is required to be completed and attached to the applicable activity change forms to document all or portions of an activity that are covered by another regulation other than 10 CFR 50.59 and 10 CFR 72.48 (pre-screening criteria 2). See NP 5.1.8, 10 CFR 50.59/72.48 Applicability, Screening and Evaluation (New Rule).

NOTE: **Guidance for searching the FSAR, Technical Specifications, Regulatory Commitments (CLB Commitment Database) and other licensing basis documents can be found in NP 5.1.8, Attachment G.**

NOTE: **Although 10 CFR 50.59 and 72.48 may not be applicable to the processes listed below, change activities conducted under these processes may require changes to the FSAR. If so, initiate FSAR changes per NP 5.2.6, FSAR Revisions.**

	Regulatory or Plant Process	YES	NO
1.	Does the activity require a change to the Facility Operating License, License Conditions or Technical Specifications? (If the answer is YES, process the applicable changes per NP 5.2.7, License Amendment Request Preparation, Review and Approval.)	☐	☒
2.	**NOTE: The Quality Assurance Plan is described in FSAR Section 1.4.** Does the activity require a change to the Quality Assurance Program? If the answer is YES, process the applicable changes per NP 11.1.3, QA Program Revisions.	☐	☒
3.	**NOTE: Implementation of Security Plan changes that require physical changes to the plant, or changes to operator access to the plant require a screening. NOTE: Security is described in FSAR Section 12.7.** Does the activity require a change to the PBNP Security Plan, a safeguards contingency plan, or security training and qualification plan? If the answer is YES, assess the acceptability of the change per 10 CFR 50.54(p) using Security procedures.	☐	☒
4.	**NOTE: The Emergency Plan is described in FSAR Section 12.6.** Does the activity require a change to the Emergency Plan? If the answer is YES, process the applicable changes per NP 1.8.1, Emergency Preparedness Procedures.	☐	☒
5.	**NOTE: The Radiation Protection Program is described in FSAR Section 11.4.** Does the activity require a change to the PBNP Radiation Protection Program described in NP 4.2.9, Radiation Protection, OR is the activity within the scope of NP 4.2.9 and 10 CFR 20, Standards for Protection Against Radiation?	☐	☒
6.	**NOTE: Changes to the plant or method of evaluation that result in re-analysis of the FSAR loss-of-coolant accident (LOCA) analysis require a screening.** Does the activity require a change to the FSAR LOCA analysis results subject to 10 CFR 50.46, Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors? If the answer is YES, process the applicable changes per NP 5.2.12, 10 CFR 50.46 Reporting Requirements, and NP 5.2.6 FSAR Revisions.	☐	☒
7.	**NOTE: Regulatory commitments are found in the CLB Commitment Database.** Does the activity involve a change to a Regulatory Commitment ? If the answer is YES, process the applicable changes per NP 5.1.7, Regulatory Commitment Changes.	☐	☒
8.	Does the activity involve a change to the Environmental Manual (EM), Radiological Effluent Control Program Manual (RECM), Offsite Dose Calculation Manual (ODCM), or Process Control Program (PCP), AND does NOT involve changes in use of explosive gases in waste treatment systems? If the answer is YES, document the applicable changes per the requirements of TS 15.7.8.7.B {ITS 5.5.1}.	☐	☒

Point Beach Nuclear Plant

10 CFR 50.59/72.48 APPLICABILITY FORM

Regulatory or Plant Process	YES	NO
NOTE: **For purposes of determining 10 CFR 50.59 / 72.48 applicability, the determination of an administrative procedure below takes precedence over definitions or classifications in other plant procedures or guidelines.**		
9. Does the activity require a change to an administrative procedure or controlled document ONLY?	☒	☐
ALL of the following statements shall be true for the procedure or controlled document to be considered administrative.		
a. DOES NOT direct how plant structures, systems, or components are operated, maintained, tested or repaired either specifically OR generically.		
b. DOES NOT specify acceptance criteria or operating limits for plant structures, systems, or components.		
c. DOES NOT specify parts, materials, chemicals, lubricants, etc. to be used in plant structures, systems, or components.		
d. DOES NOT specify compensatory action(s) to address plant structures, systems, or components out of service, or to address non-conforming conditions.		
e. DOES NOT affect operator access to operating areas of the plant.		

10 CFR 50.59/72.48 APPLICABILITY CONCLUSION

NOTE: If ANY portion of the activity is NOT controlled by one or more of the processes above, further 10 CFR 50.59 / 72.48 review is required (i.e., portions not covered by the above processes shall be prescreened to other criteria or screened).

	YES	NO
ALL aspects of the activity are controlled by one or more of the processes above, therefore NO additional 10 CFR 50.59 and 72.48 review is required.	☒	☐

If the above question is answered NO, briefly describe the portions of the activity NOT covered by one or more of the above processes:

Performed By	James G Green /	JGGreen	Date 5/1/02
	Name (Print)	Signature	
Reviewed By	K Sokol /	[illegible]	Date 5/1/02
	Name (Print)	Signature	

OM 4.3.2

EOP/AOP VERIFICATION/VALIDATION PROCESS

DOCUMENT TYPE:	Administrative
REVISION:	2
EFFECTIVE DATE:	May 13, 2002
APPROVAL AUTHORITY:	Department Manager
PROCEDURE OWNER (title):	Group Head
OWNER GROUP:	Operations

1.0 PURPOSE

The purpose of this procedure is to establish the requirements for the verification and validation processes for the Emergency Operating Procedures (EOP) and Abnormal Operating Procedures (AOP).

The verification and validation processes are applicable to procedures designated with EOP, ECA, SEP, CSP, ST, and AOP.

2.0 DISCUSSION

2.1 Verification of EOPs and AOPs is the process of independently checking that the procedures are technically correct, that any deviations from the corresponding ERG/ARG guidance are justified, that the procedures are compatible with plant hardware, and that the procedures adhere to the guidance in OM 4.3.1, AOP and EOP Writers' Guide.

2.2 Validation of EOPs and AOPs is the process of exercising procedures to ensure that they are usable, that the language and level of information is appropriate, and that the procedures will function as intended. The validation requirements of this procedure are not applicable to revisions made for the correction of typographical errors.

2.3 The matrix in Attachment D was developed based on initiating events with a frequency of core damage greater than 1E-6 and an initiating event frequency of greater that 1E-3. The selected scenarios were then compared to the procedures that the operator would most likely use to prevent core damage. It is expected that procedure validation would consider those scenarios where an X is marked. This matrix is risk based only and should not be used as the sole consideration for determining scenarios for procedural validation.

2.4 EOPs, AOPs, and supporting documentation are revised for the following reasons:

- Plant design changes
- Operator comments or change requests
- Industry or plant operating experience
- ERG or ARG revisions
- Corrective action program
- Tech Spec changes
- Revisions to other related program instructions

2.5 EOP revisions associated with design changes, Tech Spec changes, or other related procedure changes should normally be implemented concurrently with the change. EOP revisions required to correct technical deficiencies in the EOPs shall be completed in a timely manner.

2.6 Operator requalification training on EOPs provides a means of periodically verifying the technical adequacy of emergency procedures. Operators and training personnel are responsible for ensuring that problems or discrepancies discovered in EOPs during training are documented . Proposed enhancements and suggestions for improvement of the EOPs should also be encouraged.

2.7 Temporary changes to the EOPs and AOPs will be processed and controlled by NP 1.2.3, Temporary Procedure Changes. These changes are usually limited to emergent technical changes and do not require verification or validation per this procedure.

3.0 RESPONSIBILITIES

3.1 Manager's Supervisory Staff (MSS)

The MSS shall have the responsibility of reviewing and approving revisions to the EOPs and AOPs.

3.2 Operations Manager

The Operations Manager shall have the overall responsibility for the EOP Verification and Validation processes.

The Operations Manager shall designate the personnel who will comprise the Verification Team.

3.3 EOP Writer

The EOP writer shall determine the need for revision of the EOP supporting documents and develop revisions for those documents as necessary.

3.4 Nuclear Engineering

Nuclear Engineering should coordinate the necessary changes if a revision to the EOPSTPT is required.

3.5 Reactor Engineering

Reactor Engineering should initiate revisions to the Safety Parameter Display System (SPDS) if revision to CSP-ST.0, Critical Safety Function Status Trees, are required. These revisions shall not be implemented until approval of the CSP-ST.0 revision.

4.0 PROCEDURE

4.1 General

4.1.1 The Emergency Response Guideline (ERG) or Abnormal Response Guideline (ARG) documents shall be reviewed to evaluate the intent of the corresponding ERG/ARG steps and whether the proposed change constitutes a deviation from the WOG guidelines.

4.1.2 The applicable EOP Deviation Document shall be reviewed to ensure that previous commitments are properly evaluated and to assess the justification for the present version of the step.

4.1.3 Similar or related steps/actions contained in other emergency procedures shall be evaluated for potential impact.

4.1.4 When setpoints are involved, the EOP Setpoint Document (EOPSTPT) shall be reviewed to ensure that setpoints are correctly implemented and to determine if revision of the EOPSTPT is required.

4.1.5 Review the applicable portions of OM 4.3.1, AOP and EOP Writers' Guide, to ensure compliance with the writers guide.

4.1.6 All safety related deviations from the WOG guidelines shall be documented and justified in the associated Deviation Document.

4.2 Verification Process

NOTE: Technical changes involve any of the following:

- **Changing the method of performing a step or the sequential order of steps**
- **Changing the intent of any step, note, or caution**
- **Adding, deleting, or changing numerical values, limits, bands, or setpoints**
- **Changing instrumentation or controls used in the procedure**
- **Changing entry/exit conditions or symptoms**
- **Addition or deletion of steps, notes, cautions, graphs, tables, etc.**
- **Any change which deviates from the WOG guidelines**

4.2.1 Technical changes to EOPs should be verified by a multi-discipline team (at least three members) to maximize effectiveness of the verification process. Non-technical (editorial) changes to EOPs and changes to AOPs may be verified by a single individual provided that the individual is a licensed operator and a qualified reviewer.

4.2.2 Technical changes to EOPs and changes to AOPs should be evaluated using Attachment A, Technical Evaluation Guidelines. Changes to Critical Safety Function Status Trees should be evaluated using Attachment B, Status Tree Evaluation Guidelines.

4.2.3 To ensure an independent verification process, personnel who have been involved in the development of the procedures(s) being verified should not be selected as verifier or appointed to the Verification Team.

4.2.4 The Verification Team members shall consist of, as a minimum, a Chairman, a licensed operator (SRO or RO), and a Training representative. Other members should be selected based on the type of change(s) being made to the procedure. For technical changes, a member of the PRA Group should review the changes but does not have to be a part of the Verification Team meeting.

4.2.5 The Verification Team members shall be listed on PBF-2102a, EOP Verification Team Meeting Form.

4.2.6 Verification Team members should obtain source documents as necessary, such as WOG guidelines, Deviation Documents, and Background Documents. Other documents such as Tech Specs, FSAR, and other supporting procedures may also be applicable.

4.2.7 Review applicable portion(s) of the revised procedure. Depending upon the scope of the revision, it may be necessary to review the entire procedure and other interfacing procedures to adequately verify the revision. If step numbering or sequencing is affected by the revision, then the entire procedure shall be verified for internal step number referencing.

NOTE: **Minor discrepancies may be resolved by the Verification Team without the use of PBF-2102b, EOP Verification Discrepancy Form.**

4.2.8 Identify and document discrepancies on PBF-2102b, EOP Verification Discrepancy Form.

4.2.9 A safety evaluation, in addition to the screening review, should be prepared for changes which involve new deviations from the WOG guidelines.

NOTE: The required reviews contained in the following steps may be performed concurrently with the verification process if the appropriate personnel are part of the verification team. If performed separately, the review should be identified as a Cross-Discipline Review. The Operations procedure writer is responsible for ensuring that assigned reviewers understand the scope of the review required.

4.2.10 Engineering shall review EOP/AOP revisions which involve any of the following:

a. New deviations from WOG guidelines or changes in the method or scope of deviations from the ERG or ARG.

b. Addition, deletion, or changes in setpoints or setpoint usage.

c. Changes to status trees or other changes affecting SPDS displays.

d. Additions or changes to actions outside the control room which could impact radiation dose estimates.

e. Changes in instrumentation used in EOPs which could affect compliance with Reg Guide 1.97, Post Accident Monitoring Instrumentation.

f. Proposed revisions to AOPs that affect Technical Specifications surveillance requirements.

4.2.11 Reactor Engineering should review proposed revisions to EOPs or AOPs which may affect Reactivity Management.

4.2.12 The PRA Group should review any proposed major revisions to EOPs or AOPs.

4.2.13 Organizations other than Operations (such as Chemistry, Radiation Protection, or Maintenance) should review proposed revisions to EOPs and AOPs which affect actions by the affected organization.

4.3 Resolution of Verification Discrepancies

4.3.1 Verification discrepancies are documented using PBF-2102b, EOP Verification Discrepancy Form, so that future revisions will not undo corrections or improvements made as a result of the verification process.

4.3.2 The Validation Chairperson shall assign personnel (preferably those responsible for writing the procedures) to prepare a resolution for each discrepancy.

4.3.3 The personnel assigned to resolve the discrepancy shall:

a. Propose a resolution to correct the discrepancy on PBF-2102b, EOP Verification Discrepancy Form.

b. Obtain concurrence from the Verification Chairperson, as applicable.

c. If the Verification Chairperson does not concur with the resolution, coordinate efforts to assess and resolve the discrepancy.

d. Document the final resolution on PBF-2102b, EOP Verification Discrepancy Form.

4.3.4 If the discrepancy cannot be resolved between the personnel assigned to resolve the discrepancy and the Verification Chairperson, then the Verification Chairperson shall recommend a corrective action and obtain approval from the Operations Manager or designee.

4.3.5 After resolution of the discrepancy has been determined, the Verification Chairperson shall:

a. Ensure the procedure is changed to incorporate the resolution of the discrepancy.

b. Determine the scope of any additional verification required.

c. Document completion of the additional verification.

d. Determine if additional training is required and, if so, notify the Training Department.

4.4 Validation Process

4.4.1 The validation method shall be selected using the following guidance:

a. The simulator method is preferred and should be used, when practical, because this method:

- More accurately demonstrates operator response to a specific scenario.
- Effectively identifies discrepancies between instructions and Control Room hardware.
- Effectively identifies discrepancies between instructions and the operators execution of them.

b. The walkthrough method should be used when:

- Use of the simulator method is impractical due to modeling constraints or other limitations.
- In combination with the simulator method when the simulator method is partially impractical.
- When the revision affects action taken outside the Control Room.
- For changes which do not warrant simulator validation due to the nature or scope of the change.

NOTE: **The walkthrough method is more effective than a table-top discussion in ensuring that the instructions contain the necessary level of detail and are compatible with plant hardware and personnel.**

c. The table-top method should be used only when the simulator and walkthrough methods cannot be used effectively OR for minor editorial or technical revisions which do not involve plant hardware and do not warrant simulator or walkthrough validation.

4.4.2 The Validation Team Leader shall be designated based upon the scope of the validation and the validation method(s) to be used. The Validation Team Leader should possess expertise in as many of the following areas as possible:

a. Supervisory skills

b. Plant Operations

c. Operations Training

d. Technical Bases

e. Development of EOP/AOPs

4.4.3 The Validation Team members requirements should be based on the following:

a. Technical changes to an EOP should be validated by a multi-disciplined team consisting of at least three members. Revisions to AOPs and minor changes to EOPs do not require a multi-disciplined team nor do they require a minimum of three team members.

b. The Validation Team should collectively be knowledgeable in the following areas:

- Plant Operations
- Training/Simulator Instruction
- Technical Bases
- Development of EOP/AOPs

c. At least one member of the Validation Team shall be a licensed operator. The operations personnel used as the operating crew for the validation scenarios may be included as part of the Validation Team.

d. At least one member of the Validation Team shall be a simulator instructor (N/A for walkthrough or tabletop validation methods).

e. The Validation Team members shall be listed on PBF-2103a, EOP Validation Form.

4.4.4 The Validation Team Leader shall review the PBF-2102a, EOP Verification Team Meeting Form and any PBF-2102b, EOP Verification Discrepancy Form(s) to determine the validation methods to be used and identify significant changes incorporated into the new procedure revision.

4.4.5 The Validation Team Leader shall outline one or more scenarios encompassing the identified changes in the procedure. Select plant failures that will initiate the desire response, considering the following:

a. Use both single and multiple failures where practical.

b. Use concurrent and sequential failures where practical.

c. Use dual unit failures where practical.

d. If the simulator is to be used, select simulator malfunctions that closely model the selected failures.

4.4.6 Each validation scenario shall be documented using on PBF-2103b, EOP Validation Scenario Form.

4.5 Simulator Validation Method

4.5.1 The Procedure Writer or Validation Team Leader should prepare for simulator validation as follows:

a. Schedule licensed operators and a simulator instructor to participate in the simulator validation. Operators selected should be representative of the training level expected of all operators.

b. Arrange for the needed resources to support the validation such as simulator time, copies of procedures and relate instructions, and copies of the scenarios to be covered.

c. Review the purpose and objective of the validation with the operator(s) involved. Include a discussion of the procedure revision.

d. Brief the operators on how the validation will be conducted.

e. Evaluate any known simulator characteristics which are different from the actual plant responses for impact on the validation.

f. Prior to beginning the scenario, the Validation Team will discuss any differences between units that may come into play during execution of the scenario. The Validation Team Leader should ensure that the operators are aware of these differences and what effect they have on execution of the steps to be validated.

4.5.2 Conduct of the Simulator Method.

a. The operators will use the procedures in response to the scenario enacted on the simulator. The procedure writer may be present but should not interfere or provide guidance during the scenario.

b. The Validation Team will assess the procedures by noting any problems or deviations during the simulator run.

c. At the conclusion of each simulator run, the Validation Team will conduct a debriefing as follows:

- Evaluate the instruction using Attachment C, Validation Guidelines and document all discrepancies on PBF-2103c, EOP Validation Discrepancy Form.

- Allow operators to present any problems or discrepancies that they identified during the simulator run. Document all discrepancies identified.

- Discuss any deviations noted during the simulator run to identify discrepancies in the procedures.

d. Any portions of the procedure or other procedures impacted by the revision which cannot be validated on the simulator should be validated separately using the walkthrough or tabletop methods.

4.6 Walkthrough Validation Method

4.6.1 The Procedure Writer or Validation Team Leader should prepare for walkthrough validation as follows:

a. Schedule personnel to participate in the walkthrough. Individuals selected should be representative of the training level expected of all similarly qualified personnel.

b. Arrange for the needed resources to support the validation such as copies of procedures and relate instructions, and copies of the scenarios to be covered, and related technical documentation.

c. Review the purpose and objective of the validation with the personnel involved. Include a discussion of the procedure revision.

d. Brief the personnel on how the validation will be conducted.

e. Prior to beginning the walkthrough, the Validation Team will discuss any differences between units that may come into play during execution of the walkthrough. The Validation Team Leader should ensure that the personnel are aware of these differences and what effect they have on execution of the steps to be validated.

4.6.2 Conduct of the Walkthrough Validation

a. Walkthrough validation should be performed at the in-plant location(s) where the procedure would be performed.

b. If the procedure being validated is written for either unit, then a walkthrough should be performed on both units.

c. The Validation Team Leader will use the scenario to direct the walkthrough by first providing the plant initial conditions and then providing appropriate cues while the personnel walk through each procedure step.

d. The personnel will use the procedures in accordance with the scenario and walk through or talk through actions they would take in response to each instruction step. Personnel should:

- Describe actions they are taking.
- Identify information sources used to take actions.
- Identify controls used to carry out actions expected system response(s), how response(s) are verified, and action(s) to be taken if response(s) did not occur.

e. At any time during the walkthrough, personnel may stop to identify any problems or discrepancies in the procedures. Validation Team members may ask questions during the validation.

f. The Validation Team will assess the procedures by noting any performance problems during the walkthrough.

g. At the conclusion of each walkthrough, the Validation Team will conduct a debriefing as follows:

- Evaluate the instruction using Attachment C, Validation Guidelines.
- Review comments made during the walkthrough and document all discrepancies identified.
- Discuss any performance deviations to identify discrepancies in the procedures which resulted in the deviation.

4.7 Table-Top Validation Method

4.7.1 The Procedure Writer or Validation Team Leader should prepare for table-top validation as follows:

a. Schedule personnel to participate in the validation. Individuals selected should be representative of the training level expected of all similarly qualified personnel.

b. Arrange for the needed resources to support the validation such as copies of procedures and relate instructions, and the scenarios to be covered.

c. Review the purpose and objective of the validation with the personnel involved. Include a discussion of the procedure revision.

d. Brief the personnel on how the validation will be conducted.

e. Prior to beginning the scenario, the Validation Team will discuss any differences between units that may come into play during execution of the scenario. The Validation Team should ensure that the personnel are aware of these differences and what effect they have on execution of the steps to be validated.

4.7.2 Conduct of the Table-Top

a. The Validation Team Leader will use the scenario to direct the table-top discussion by first providing the plant initial conditions and then providing appropriate cues while the performer discusses each procedure step.

b. The personnel will use the procedures in accordance with the scenario, discussing the actions taken in response to each instruction step while identifying any problems or discrepancies in the procedure(s).

c. During the table-top, the Validation Team will discuss and evaluate the instructions against Attachment C, Validation Guidelines. All discrepancies from the checklist or from individual comments will be documented on an on PBF-2103c, EOP Validation Discrepancy Form.

d. The Validation Team will assess the procedures by noting any performance problems during the walkthrough.

e. At the conclusion of the table-top discussion, the Validation Team will discuss any deviations to identify discrepancies in the procedures which resulted in the deviation and document all discrepancies on PBF-2103c, EOP Validation Discrepancy Form.

NOTE: EOP/AOP changes to resolve verification/validation discrepancies may require repeating portions of the verification and/or validation process.

4.8 Resolution of Validation Discrepancies

4.8.1 Validation discrepancies are documented using form PBF-2103c, EOP Validation Discrepancy Form, so that future revisions will not undo corrections or improvements made as a result of the validation process.

4.8.2 The Verification Team Leader shall assign personnel (preferably those responsible for writing the procedures) to prepare a resolution for each discrepancy.

4.8.3 Discrepancies involving plant response from simulator validation shall be evaluated to determine if they were caused or aggravated by simulator modeling deficiencies.

4.8.4 The personnel assigned to resolve the discrepancy shall:

a. Propose a resolution to correct the discrepancy on PBF-2103c, EOP Validation Discrepancy Form.

b. Obtain concurrence from the Validation Team Leader, as applicable.

c. If the Validation Team Leader does not concur with the resolution, coordinate efforts to assess and resolve the discrepancy.

d. Document the final resolution on PBF-2103c, EOP Validation Discrepancy Form.

4.8.5 If the discrepancy cannot be resolved between the personnel assigned to resolve the discrepancy and the Validation Team Leader, then the Validation Team Leader shall recommend a corrective action and obtain approval from the Operations Manager or designee.

4.8.6 After resolution of the discrepancy has been determined, the Validation Team Leader shall:

a. Ensure the procedure is changed to incorporate the resolution of the discrepancy.

b. Determine the scope of any additional validation required.

c. Document completion of the additional validation.

d. Determine if additional training is required and, if so, notify the Training Department.

4.9 Final Approval of EOP/AOP Revisions

NOTE: **Temporary changes to the EOPs and AOPs can be approved via NP 1.2.3, Temporary Procedure Changes.**

4.9.1 Following completion of the verification and validation process, including resolution of all discrepancies, final approval is obtained.

4.9.2 MSS review and approval is required for technical revisions to the EOPs. If the basis and step deviation documents are affected by the change, the revised background document should be submitted with the EOP for MSS review.

4.9.3 All EOP/AOPs and background documents shall be approved by the Operations Manager or his designee.

5.0 REFERENCES

5.1 NUREG 0899, Guidelines for the Preparation of Emergency Operating Procedures

5.2 NRC Generic Letter 82-33, Supplement 1 to NUREG-0737 - Requirements for Emergency Response Capability

5.3 C. W. Fay letter to H. R. Denton, "Response to Generic Letter No. 82-33. . . .," April 15, 1983.

5.4 OM 4.3.1, AOP and EOP Writers' Guide

5.5 Westinghouse Owners' Group (WOG), Emergency Response Guidelines (ERGs)

5.6 Westinghouse Owners' Group (WOG), Abnormal Response Guidelines (ARGs)

5.7 PBF-2102a, EOP Verification Team Meeting Form

5.8 PBF-2102b, EOP Verification Discrepancy Form

5.9 Institute of Nuclear Power Operations (INPO) Guidelines, Emergency Operating Procedures Verification Guidelines, 83-004, March 1983

5.10 PBF-2103a, EOP Validation Form

5.11 PBF-2103b, EOP Validation Scenario Form

5.12 PBF-2103c, EOP Validation Discrepancy Form

6.0 BASES

NONE

ATTACHMENT A
TECHNICAL EVALUATION GUIDELINE
Page 1 of 3

1.0 (EOP)
Are entry conditions consistent with those listed in the Owner's Group guidelines or are deviations justified in the basis and deviation documents
(AOP/SEP)
Are entry conditions logical. (reflective of the expected conditions leading to performance of the instruction). Are the entry conditions observable.

2.0 (EOP)
Is the sequence of steps consistent with that in the Owner's Group Guidelines or are deviations adequately justified in the basis and deviation documents.
(AOP/SEP)
Are the steps sequenced logically. Does the sequence follow good operations principles.

3.0 (EOP)
Are all steps consistent with the intent of those in the Owner's Group Guidelines or are deviations adequately justified in the basis and deviation documents.
(AOP/SEP)
Is the intent of each step understandable. Does the step provide adequate detail.

4.0 (EOP)
Have all applicable Owner's Group Guideline steps been incorporated into the procedure or are deviations adequately justified in the basis and deviation documents.
(AOP/SEP)
Are the steps necessary instructions provided to the user.

5.0 (EOP)
Are differences from the Owner's Group Guidelines consistent with the intent of the Owner's Group Guidelines.

6.0 (EOP)
Is documentation adequate to explain the intent of complex steps.
(AOP/SEP)
Is documentation adequate to explain the intent of complex steps.

7.0 (EOP)
Is all Owner's Group Guidelines "bracketed" information, pertinent to the plant design, incorporated.
(AOP/SEP)
Is applicable plant design and components clearly addressed by the instruction.

ATTACHMENT A
TECHNICAL EVALUATION GUIDELINE
Page 2 of 3

8.0 (EOP)
Have all references to systems or components in the Owner's Group Guidelines that are applicable to the plant design been included.
(AOP/SEP)
Are all references to system, component and plant design clear and correct.

9.0 (EOP)
Are required computations, specified in the procedure. consistent with Owner's Group Guidelines or deviations adequately justified within source documents.
(AOP/SEP)
Are all required computations specified in the procedure. Has adequate guidance been given and is space available for working and recording computations.

10.0 (EOP)
Are the cautions and notes, as specified in the procedure, consistent with the Owner's Group Guidelines or are deviations adequately justified in the basis and deviation documents.
(AOP/SEP)
Are cautions and notes specified in the instruction clear and concise. Do they provide adequate information to convey the message.

11.0 (EOP)
Are the contingency actions in the procedure consistent with those specified in the Owner's Group Guidelines or are deviations adequately justified in the basis and deviation documents.
(AOP/SEP)
If specified/used, are contingency actions clear and easily understood. Do they provide adequate detail for implementation.

12.0 (EOP)
Is there a conflict between the foldout page requirements and the action steps of the procedure.
(AOP/SEP)
Is there any conflict between steps and required actions.

13.0 (EOP)
Are the required steps to be performed consistent with the plant design.
(AOP/SEP)
Are the steps consistent with plant design.

14.0 (EOP)
Are the quantitative ranges as specified in the procedure consistent with the plant design.
(AOP/SEP)
Are the quantitative ranges as specified in the procedure consistent with the plant design.

ATTACHMENT A
TECHNICAL EVALUATION GUIDELINE
Page 3 of 3

15.0 (EOP)
Are the limits, as specified in the procedure consistent with those specified in the Owner's Group Guidelines or are deviations adequately justified in the basis and deviation documents.
(AOP/SEP)
Are limits clearly specified.

16.0 (EOP)
Are the charts, tables, and curves presented in the procedure consistent with the Owner's Group Guidelines or are deviations adequately justified in the basis and deviation documents.
(AOP/SEP)
Are the charts, tables, and curves consistent with the information provided in source documents.

17.0 (EOP)
Do parameter values, numerical values, and setpoints in the procedure correspond with the parameter values, numerical values, and setpoints specified in Setpoints Document.
(AOP/SEP)
Do parameter values, numerical values, and setpoints in the procedure correspond with the parameter values, numerical values, and setpoints specified in supporting technical documentation.

18.0 (EOP)
If the revision involves a change to a setpoint, have all the procedures affected been revised. Verify against the list of affected procedures contained in the setpoints document.

19.0 (EOP)
If the revision affects a "standard" step, have all of the procedures affected been revised. Verify against the list of affected procedures contained in the standard step document.

ATTACHMENT B
STATUS TREE EVALUATION GUIDELINE
Page 1 of 3

1.0 WRITERS' GUIDE CONVENTIONS

1.1 Procedure Title

1.1.1 Is the title 10 words or less.

1.1.2 Are the important words placed at or near the beginning of the title.

1.2 Identification Information

1.2.1 Does the procedure number include the required information:

a. Instruction type

b. Instruction number

2.0 STATUS TREE FORMAT

2.1 Page Format

2.1.1 Does the Status Tree clearly show the transitions.

2.2 Symbol Coding

2.2.1 Are the symbols used correctly.

2.2.2 Are arrows positioned correctly.

2.3 Function Flow and Branching

2.3.1 Does the flow path move from left-to-right.

2.3.2 Is sufficient spacing allowed between flow paths.

2.3.3 Are the number of arrowheads sufficient to indicate flow.

2.3.4 Does the flow path go down for each favorable response.

ATTACHMENT B
STATUS TREE EVALUATION GUIDELINE
Page 2 of 3

3.0 READABILITY

3.1 Text

3.1.1 Is the text in black type against a light background.

3.1.2 Is the text readable at arms length under degraded lighting conditions.

3.1.3 Is the typeface legible and consistent.

3.1.4 Is spacing between letters and words adequate.

3.1.5 Is the correct line spacing used.

4.0 WRITING STYLE

4.1 Step Construction

4.1.1 Does each step contain only one statement.

4.1.2 Are the statements simple and precise.

4.1.3 Are double negatives avoided.

4.1.4 Are terms used consistently within and among status trees.

4.1.5 Does each decision step clearly indicate a yes or no answer.

5.0 MECHANICS OF STYLE

5.1 Spelling

5.1.1 Is the spelling correct.

5.2 Abbreviations and Acronyms

5.2.1 Are abbreviations and acronyms used consistently.

5.2.2 Are abbreviations used in accordance with the Writers' Guide.

ATTACHMENT B
STATUS TREE EVALUATION GUIDELINE
Page 3 of 3

5.3 Curves and Tables

5.3.1 Are the curves and tables legible, consistent with the instructions, and usable.

5.3.2 Are the safe and unsafe regions of curves labeled.

5.4 Hyphenation

5.4.1 Are hyphens used correctly.

5.4.2 Is hyphening at the end of a line avoided.

ATTACHMENT C
VALIDATION GUIDELINES
Page 1 of 4

1.0 USABILITY

1.1 Level of Detail

1.1.1 Are the introductory sections of the instruction sufficient.

1.1.2 Is there sufficient information to perform the specified actions at each step.

1.1.3 Are the alternatives adequately described at each decision step.

1.1.4 Are labeling, abbreviations, and nomenclature as provided in the instruction sufficient to enable the operator to find the needed equipment.

1.1.5 Does the instruction have all information or instructions needed to manage the emergency condition.

1.1.6 Are the actions sufficient to correct the condition.

1.1.7 Are the titles and numbers sufficiently descriptive to enable the operator to find appropriate instructions.

1.2 Understandability

1.2.1 Is the instruction's typeface easy to read.

1.2.2 Are the figures and tables easy to read with accuracy.

1.2.3 Can the values on figures and charts be easily determined.

1.2.4 Are the cautions and note statements readily understandable.

1.2.5 Are the individual instruction steps readily understandable.

1.2.6 Were the step sequences understood.

ATTACHMENT C
VALIDATION GUIDELINES
Page 2 of 4

2.0 OPERATIONAL CORRECTNESS

2.1 Plant Compatibility

2.1.1 Can the actions specified in the procedure be performed in the designate sequence.

2.1.2 If alternate success paths exist, does the procedure use the best method to accomplish the task.

2.1.3 Can the information from the plant instrumentation be obtained, as specified, by the instructions.

2.1.4 Are the available Control Room instrumentation and annunciators adequate for the Operator to recognize the entry or prerequisite conditions.

2.1.5 Are the instructions entry or prerequisite conditions appropriate for the plant symptoms displayed to the operator.

2.1.6 Is all the equipment required to accomplish the task specified in the instruction.

2.1.7 Do the plant resources agree with the instruction.

2.1.8 Are the instrument readings and tolerances stated in the instruction consistent with the instrument values displayed on the instruments.

2.1.9 Is the instruction physically compatible with the work situation (e.g., too bulky to hold, binding would not allow them to lie flat in the work space, no place to lay the instruction down to use).

2.1.10 Are the instrument readings and tolerances specified by the instruction for remotely located instruments accurate.

2.1.11 Can plant parameters be maintained within limits or bands specified in the procedure.

ATTACHMENT C
VALIDATION GUIDELINES
Page 3 of 4

2.2 Operator Compatibility

2.2.1 If time intervals are specified, can the instruction action steps be performed on the plant within or at the designated time intervals.

2.2.2 Will environmental conditions permit completing the required actions.

2.2.3 If concurrent or sequential steps are required by more than one individual, can the required actions be coordinated adequately.

2.2.4 Can personnel follow the designated action step sequences.

2.2.5 Can a particular step, set of steps, or other information be readily located when required.

2.2.6 Can instruction branches be entered at the correct point.

2.2.7 Are place keeping aids utilized as required by the user's guide.

2.2.8 Are instruction exit points adequately specified.

2.2.9 Are the procedures compatible with the operating shift manning.

2.2.10 If steps and instructions are verified with signoffs, are provisions adequate.

2.2.11 Do Operators interfere with each other physically.

2.2.12 Is there adequate Radiation Protection support and/or provisions to make the required entries into contaminated areas.

2.2.13 Does plant staffing support procedure requirements.

2.2.14 Is the procedure adequate to allow properly trained personnel to complete the task without errors.

ATTACHMENT C
VALIDATION GUIDELINES
Page 4 of 4

2.3 Additional Guidelines for Validation of Local Operator Actions

2.3.1 Can the Operator easily locate the component from a combination of the information in the procedure and operator training/knowledge.

2.3.2 Is the component clearly identified by name and/or number.

2.3.3 Is the component easily accessible.

2.3.4 Are special tools needed to operate the component.

2.3.5 Is the environment at the component location suitable to allow the operator to perform desired actions.

2.3.6 Do the local actions require more than one operator.

2.3.7 Are communications available from the remote location.

2.3.8 Is the Operator performing the local actions familiar with the procedure and does he/she understand the objective and/or consequences of his/her actions.

2.3.9 Are the local actions required to be performed in a specific time period. If so, can the actions be completed within this time period.

ATTACHMENT D
PRA CORE DAMAGE RISK MATRIX
Page 1 of 1

Procedure	EVENT				
	SGTR	Turbine Trip without the Condenser	LOOP	Loss of CCW	Steam Line Break
EOP 0	X	X	X	X	X
EOP 0.0	--	--	--	--	--
EOP 0.1	--	X	X	X	--
EOP 0.2	--	--	X	X	--
EOP 0.3	--	--	X	X	--
EOP 0.4	--	--	X	X	--
EOP 1	X	--	X	--	X
EOP 1.1	--	--	--	--	--
EOP 1.2	X	--	--	X	--
EOP 1.3	--	--	X	--	--
EOP 2	--	--	--	--	X
EOP 3	X	--	--	--	X
EOP 3.1	X	--	--	--	--
EOP 3.2	X	--	--	--	--
EOP 3.3	X	--	--	--	--
ECA 0.0	--	--	X	--	--
ECA 0.1	--	--	X	--	--
ECA 0.2	--	--	--	--	--
ECA 1.1	--	--	--	--	--
ECA 1.2	--	--	--	--	--
ECA 2.1	X	--	--	--	X
ECA 3.1	X	--	--	--	--
ECA 3.2	X	--	--	--	--
ECA 3.3	X	--	--	--	--
CSP C.1	X	--	X	X	X
CSP H.1	X	--	X	--	X

Point Beach Nuclear Plant

DOCUMENT FEEDBACK

FEEDBACK REQUEST

Document Number OM 4.3.2 Revision 3 Unit 0

Title EOP/AOP verification/validation process

Requested Change (attach mark-up as necessary): Step 4.2.4 states "other members should" change to " other members shall". Step 4.2.12 states "The PRA group should" change to "The PRA group shall". Shall is more appropriate for these statements.

Reason for Change: The original intent of these steps was to be a shall.

Suggested Priority (☐ Immediate Action ☐ Start Revision ☒ Next Revision) Date Needed (if applicable) _____

Requested By (print and sign) J. Pruit / Date 9/18/02

DISPOSITION

☐ **APPROVED** (☐ Immediate Action ☐ Start Revision ☐ Next Revision)

This issue ☐ DOES NOT / ☐ DOES require an Action Request according to NP 1.1.4 and NP 5.3.1.

AR No. _____

☐ **REJECTED** (include reason below)

Comments:

Document Owner (print and sign) / Date _____

(Forward copy to requestor and original to procedure writer)

Flessner, Richard

From: Pruitt, Jerry
Sent: Wednesday, September 18, 2002 11:09 AM
To: Flessner, Richard
Subject: FW: Feedback

Additional info for you. Doc

-----Original Message-----
From: Vandenbosch, Terry
Sent: Wednesday, September 18, 2002 10:10 AM
To: Pruitt, Jerry
Subject: RE: Feedback

I'll add it. The number is OPS 2002-01364.

-----Original Message-----
From: Pruitt, Jerry
Sent: Wednesday, September 18, 2002 10:02 AM
To: Vandenbosch, Terry
Cc: Pruitt, Jerry
Subject: RE: Feedback

Terry,
On step 4.2.12, you may want to also change "major" to "technical". Should be ok without it, but would be a little cleaner. Thanks, Doc

Requested Change (attach mark-up as necessary): Step 4.2.4 states "other members should" change to " other members shall". Step 4.2.12 states "The PRA group should" change to "The PRA group shall". Shall is more appropriate for these statements.

-----Original Message-----
From: Vandenbosch, Terry
Sent: Wednesday, September 18, 2002 9:42 AM
To: Pruitt, Jerry
Subject: Feedback

Attached is a copy of the feedback. I won't have a number until tomorrow.

<< File: OM 431 feedback.doc >>

STATE CHANGE HISTORY

Initiate	Assign Work	Assign	Conduct Work	Work Complete	Review & Approval	Approved	Quality Check
by RICHARD FLESSNER	9/3/2002 7.07 24 PM Owner RICHARD FLESSNER	by RICHARD FLESSNER	9/3/2002 7.08.14 PM Owner RICHARD FLESSNER	by RICHARD FLESSNER	9/3/2002 7:13.12 PM Owner RICHARD FLESSNER	by RICHARD FLESSNER	9/3/2002 7:13 41 PM Owner PBNP CAP Admin

SECTION 1

Activity Request Id:	CA026225		
Activity Type:	Corrective Action	**Submit Date:**	9/3/2002 7:07:24 PM
Site/Unit:	Point Beach - Common		
Activity Requested:	CA#19. Modify the AFW recirculation valves to provide a back-up pneumatic supply to allow time for operator actions.		
CATPR:	N	**Initiator:**	MASTERLARK, JAMES
Initiator Department:	EPN Engineering Programs Nuclear Safety Analysis PB	**Responsible Group Code:**	EXC Engineering Processes Continuous Improvement PB
Responsible Department:	Engineering	**Activity Supervisor:**	RICHARD FLESSNER
Activity Performer:	RICHARD FLESSNER		

SECTION 2

Priority:	3	**Due Date:**	9/3/2002
Mode Change Restraint:	(None)	**Management Exception From PI?:**	N
QA/Nuclear Oversight?:	N	**Licensing Review?:**	N
NRC Commitment?:	Y	**NRC Commitment Date:**	

SECTION 3

Activity Completed:

9/3/2002 7:07:24 PM - RICHARD FLESSNER:
This CA is being issed to document a completed corrective action.

9/3/2002 7:13:12 PM - RICHARD FLESSNER:
MR 01-144 was initiated to provide N2 back-up to AFW mini-flow valves AF-4007 and AF-4014. MR 01-144 was accepted on 2/6/02. MR 02-001 was initiated to provide air back-up to AFW mini-flow valves 1/2AF-4002. MR 02-001 was accepted on 4/1/02.

SECTION 4

QA Supervisor:	(None)	**Licensing Supervisor:**	(None)

SECTION 5

State:	Quality Check	Active/Inactive:	Active
Owner:	PBNP CAP Admin	AR Type:	Parent
Submitter:	RICHARD FLESSNER	Assigned Date:	9/3/2002
Last Modified Date:	9/12/2002 10:10:07 AM	Last Modifier:	RICHARD FLESSNER
Last State Change Date:	9/3/2002 7:13:41 PM	Last State Changer:	RICHARD FLESSNER

Close Date:

One Line Description: Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW

NUTRK ID: CR 01-3595

Child Number: 0

References:
CR 01-2278
RCE 01-069
GOOD CATCH
LER 266/2001-005-00

Update:

Import Memo Field: LER 266/2001-005-00 made the commitment that "Plant modifications to enhance system reliability, including providing a backup air or nitrogen supply to the minimum recirculation valves, are being evaluated."

CAP Admin:	PBNP CAP Admin	Site:	Point Beach

OLD_ACTION_NUM:

Cartridge and Frame:

ATTACHMENTS AND PARENT/CHILD LINKS

Subtask from CAP001415: Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW

Linked to ACE000314: Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW

Point Beach Nuclear Plant PLANT CHANGE INITIATION	PLANT MODIFICATION/MINOR PLANT CHANGE NO.: 01-144 WO# 9950688/9950689

INITIATION

Title: AFW MOTOR DRIVEN PUMP MINI RECIRC CONTROL VALVE MODIFICATION

☒ QA ☐ AQ ☐ Non-QA ☒ SR ☐ Non-SR Unit 1 ☐ Unit 2 ☐ Common ☒

CHAMPS System Code: AF EWR: CR: CR01-2278/CR01-3595

Project Objectives: PROVIDE A ~~SAFETY RELATED~~ BACKUP N2 SYSTEM TO THE AFW MTR DRIVEN PMP MINI-FLOW CONTROL VLS, AF-4007 AND AF-4014, SO THE VALVES FUNCTION ON LOSS OF INST AIR.

S.W. 1/25/02

Proposed Scope: INSTALL JUMPERS FROM THE AFW MOTOR-DRIVEN PUMP MINI-FLOW RECIRC CONTROL VALVES TO THE AFW MTR DRIVEN PMP DISCH CONT VLVS, AF-4012 AND AF-4019, WHICH CURRENTLY HAVE SEPARATE BACKUP NITROGEN SUPPLIES.

Initiated By: Stewart A. Wietholter Date. 12/11/2001

CHANGE DETERMINATION

	YES	NO	
Is the change Temporary?		X	If YES go to NP 7.3.1 Temp Mod
Is this a Setpoint Only change?		X	If YES go to NP 7.3.8 Setpoints.
Is this an Equivalent change?		X	If YES go to NP 9.3.3 SPEED
Document change only?		X	If YES determine if previously evaluated
Does previous evaluation encompass change?		X	If YES proceed with document changes
Commercial Facility Change?		X	If YES, determine if document updates are required.
For Commercial Facility Change Only: Document Updates?		X	If YES contact design supervisor. If NO proceed outside of Engineering process controls Document below.
Is this small scope?	X		If YES perform Minor Plant Change If NO, it is a Plant Modification. Go to EAC for review and approval (NP 7.2.1)

If it is determined that this is not a Plant Change or Modification, document and/or attach justification Also, attach document update checklist if necessary.

ENGINEERING CHANGE PROCESS TO USE:

Minor Plant Change

Stewart A. Wietholter 12/11/01
Prepared By: Date

[signature] 12/11/01
Engineering Group Lead Date

Point Beach Nuclear Plant PLANT DESIGN CHANGE CHECKLIST	PLANT MODIFICATION/MINOR PLANT CHANGE NO.: 01-144

Title: AFW MOTOR DRIVEN PUMP MINI RECIRC CONTROL VALVE MODIFICATION

DESIGN SUPERVISOR

Design Controls and Project Controls (Ref. NP 7.2.1, Commentary, for completion of this section.)

Check Applicable Design Controls:		Clarifications/Basis.
☒	Design Input Checklist (PBF-1584)	
☒	DUC (PBF-1606)	
☒	Design Verification Notice (PBF-1583)	
☒	Calculations	
☒	Design Documentation (PBF-1585), or equivalent	
☒	Design Change In Progress DCN's	
☐	Engineering Change Requests	
☐	Specifications	
☐		
☐		

Check Applicable Project Controls:		Clarifications/Basis:
☐	Modification Team Required (indicate minimum groups to request)	
☐	Conceptual Design Package Required	
☒	Budget Design Project (Impact) Number	3.0181-62-0077
☐	Detailed Project Schedule	
☐	IWP Required	

Assigned Modification Engineer: Stewart Wietholter

Design Supervisor. [signature] Date: 1/25/02

Point Beach Nuclear Plant PLANT DESIGN CHANGE CHECKLIST	PLANT MODIFICATION/MINOR PLANT CHANGE NO.: 01-144

CONCEPTUAL DESCRIPTION/REFERENCE INFORMATION (IF APPLICABLE)

GROUP HEAD CONCEPTUAL DESIGN REVIEW AND ACCEPTANCE [Check here if not required: ☑]

Review conceptual design. Attach comments on NPBU Document Review Comment Sheet (PBF-1622 or equivalent)

Group	Acceptance Signature	Date	Comments
Radiation Protection			☐ None ☐ Attached
Fire Protection			☐ None ☐ Attached
Installing Organization			☐ None ☐ Attached
			☐ None ☐ Attached
			☐ None ☐ Attached
			☐ None ☐ Attached
			☐ None ☐ Attached
Design Supervisor	N/A		☐ None ☐ Attached

Point Beach Nuclear Plant PLANT DESIGN CHANGE CHECKLIST	PLANT MODIFICATION/MINOR PLANT CHANGE NO.: 01-144

FINAL DESIGN REVIEWS
Review final design. Attach comments on Document Review Comment Sheet (PBF-1622 or equivalent)

Group	Acceptance Signature	Date	Comments
Radiation Protection	non-applicable		☐ None ☐ Attached
Fire Protection Engineer	[signature]	1-18-2002	☑ None ☐ Attached
Installing Organization (I&C)	[signature]	1/24/2002	☑ None ☐ Attached
Mechanical Maintenance	[signature]	01/24/02	☑ None ☐ Attached
Operations	[signature]	1/25/02	☑ None ☐ Attached
System Eng	[signature]	1/24/02	☑ None ☐ Attached
Component Eng	[signature]	1/25/02	☑ None ☐ Attached
Tech. Review	[signature]	1/25/02	☑ None ☐ Attached

NDEPENDENT REVIEW OF INSTALLATION DOCUMENTS (IWP or Work Order Plan) List all IWP's and WO's used for installation

IWP's/WO#(s) WO 9950688, WO 9950689

All design and licensing requirements have been incorporated in the installation and testing document(s).

Reviewer: [signature] / JEFF Novak Date: 1/25/02

RELEASE FOR INSTALLATION
All design controls have been properly implemented and the project has been appropriately reviewed. All necessary documents are approved. This design is released for installation. Comments regarding release of this design are noted below:

Design Supervisor: [signature] Date: 1/25/02

COMMENTS

Point Beach Nuclear Plant PLANT DESIGN CHANGE CHECKLIST	PLANT MODIFICATION/MINOR PLANT CHANGE NO.: 01-144

ACCEPTANCE

Plant modification is installed, tested, and all documents required for acceptance are complete.

Modification Engineer: Stewart A. Witholter Date: 2/6/02

CLOSEOUT

Plant modification is complete, including submittal of all document updates in the Document Update Checklist (PBF-1606). Reference change tracking numbers on PBF-1606 where appropriate (DCN numbers, FCR numbers, etc.)

Modification Engineer: _____ Date: _____

Design Supervisor: _____ Date: _____

NUCLEAR INFORMATION MANAGEMENT

Microfilm the entire modification package.