

INITIATION

Title: AUX FEED WATER PUMP P-38B MINIMUM FLOW RECIRCLINE ORIFICE

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

CHAMPS System Code: AF EWR: 99-031, CR 99-1391

Priority: A3D Cost Estimate: 35,000

Project Objectives: ELIMINATE EXCESSIVE NOISE AND VIBRATION IN THE PIPING ATTRIBUTED TO CAVITATIONAL EROSION IN ORIFICE RO-04015

Proposed Scope: REPLACE EXISTING PRESSURE REDUCING ORIFICE RO-04015 IN THE AF SYSTEM PUMP P-38B MINIMUM RECIRC LINE

Initiated By: Foltynowicz, A. A. Foltynowicz Date: 11-15-99

FDGH

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

Check Applicable Design Controls:

- ☒ Design Input Checklist (PBF-1584)
- ☒ DUC (PBF-1606)
- ☒ Design Verification Notice (PBF-1583)
- ☒ Working Drawings
- ☒ ECRs
- ☒ Calculations
- ☐ Specifications
- ☒ Design Documentation (PBF-1585), or equivalent

Clarifications/Basis:

Check Applicable Project Controls:

- ☒ Fire Protection/Appendix R Review
- ☒ Project Team Required (indicate minimum groups to request)
- ☐ Conceptual Design Package Required
- ☒ Budget Design Project (Impact) Number
- ☐ Detailed Project Schedule
- ☒ IWP Required

Clarifications/Basis:

N9500261

MICROFILMED

JUN 01 2001

Assigned Project Manager: A. Foltynowicz

FDGH: A. Foltynowicz

Date: 1/28/00

UPDATES TO THIS FORM COVERED BY EXISTING SCR 98-0942

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COMPLETE 1/103

NUCLEAR POWER BUSINESS UNIT  
PLANT MODIFICATION

PLANT MODIFICATION NO.: 99-029\*B

PROJECT MANAGER - ESTABLISH PROJECT TEAM

Group Represented	Assigned Team Member	Group Represented	Assigned Team Member
Radiation Protection	D. LeClair		
Fire Protection	D. Foltynski	<i>William A. Altguter</i>	
Installing Organization			
Operations	M. Schug		
System Engineering	J. P. Schroeder		
QA	J. P. Jacek		
QC	R. Geier	<i>RTH</i>	

*NO training req'd*  
FDGH Concurrence:

*P. J. Harnish*

Date: 1/28/00

PROJECT MANAGER

Indicate any additional modification package information, if any: None

PROJECT MANAGER/FDGH

Indicate any clarifications or changes to design controls or project controls:  
(Note: FDGH approval required if design controls or project controls relaxed)

FDGH:

*P/D RTH 1/28/00*

Date:

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NUCLEAR POWER BUSINESS UNIT  
PLANT MODIFICATION

PLANT MODIFICATION NO.: 99-029\*B

PROJECT MANAGER - CONCEPTUAL DESIGN

[Check here if not required: ☒

Provide a concise description of the conceptual design. List all attached documents which define the conceptual design. See commentary in NP 7.2.1 for additional guidance.

Conceptual Design Complete: \_\_\_\_\_

Project Manager \_\_\_\_\_

Date \_\_\_\_\_

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)

<u>Group</u>	<u>Acceptance Signature</u>	<u>Date</u>	<u>Comments</u>	
Radiation Protection	_____	_____	<input type="checkbox"/> None	<input type="checkbox"/> Attached
Fire Protection	_____	_____	<input type="checkbox"/> None	<input type="checkbox"/> Attached
Installing Organization	_____	_____	<input type="checkbox"/> None	<input type="checkbox"/> Attached
_____	_____	_____	<input type="checkbox"/> None	<input type="checkbox"/> Attached
_____	_____	_____	<input type="checkbox"/> None	<input type="checkbox"/> Attached
_____	_____	_____	<input type="checkbox"/> None	<input type="checkbox"/> Attached
_____	_____	_____	<input type="checkbox"/> None	<input type="checkbox"/> Attached
_____	_____	_____	<input type="checkbox"/> None	<input type="checkbox"/> Attached

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NUCLEAR POWER BUSINESS UNIT  
PLANT MODIFICATION

PLANT MODIFICATION NO: 99-029-B

FINAL DESIGN REVIEWS

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

Group	Acceptance Signature	Date	Comments	
Radiation Protection		5-22-00	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Attached
Fire Protection Engineer		5-17-00	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Attached
Installing Organization		5-18-00	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Attached
Operations		5-25-00	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Attached
System Engineering		5-18-00	<input type="checkbox"/> None	<input checked="" type="checkbox"/> Attached
QA		5-18-2000	<input type="checkbox"/> None	<input checked="" type="checkbox"/> Attached
QC		5-22-2000	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Attached
			<input type="checkbox"/> None	<input type="checkbox"/> Attached

INDEPENDENT REVIEW OF INSTALLATION DOCUMENTS

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

Reviewer:

Rob Chapman /

Date:

5/31/2000

FDGH - RELEASE

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:

FDGH:

Date:

6/2/00

PROJECT MANAGER - CLOSEOUT

Plant modification is complete, including submittal of all document updates in the Document Update Checklist (PBF-1606).

List all Work Order(s) used for installation:

9919512

Project Manager:

Date:

12-22-00

NUCLEAR INFORMATION MANAGEMENT

Microfilm the entire modification package.

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UPDATES TO THIS FORM COVERED BY EXISTING SCR 98-0942

**FINAL DESIGN DESCRIPTION  
MODIFICATION REQUEST 99-029\*B**

**PURPOSE**

The purpose of the proposed modification is to minimize piping line noise and vibration when operating Auxiliary Feedwater (AF) pump P-38B in the recirculation mode. In addition, socket-weld failures by cycle fatigue created by this vibration will be eliminated. Vibration and excessive noise were attributed to turbulence and cavitation resulting from the flow condition through restrictive orifice RO-04015. The reduction of piping line noise and vibration will be accomplished by implementation of the recommendations of the Engineering Work Request (EWR) 99-031, which is to replace the existing RO-04015 with a new one.

In addition, as recommended by CR 99-1391, portion of the AF piping associated with the RO will be replaced in order to be welded back with oversized socket welds. The purpose for oversized socket welds is to offer a significant high cycle fatigue improvement over standard ASME Code socket weld in vibration-critical application.

Modification request (MR) 99-029\*B was initiated to control the replacement of the RO-04015.

**SCOPE**

The scope of MR 99-029\*B is to replace RO-04015 with a new pressure reducing orifice. In addition, pipe from the 90 deg elbow upstream of the RO to the upstream socket weld on the isolation valve (AF-00040), will be replaced. The replacement piping will be welded with socket welds that are oversized in a 2/1 configuration as described in EPRI PR 107455 and 111188.

This modification is classified as Quality Assurance (QA), Safety-Related (SR), Seismic Class 1 modification. The RO is classified as ASME Non-Section XI item.

This modification is design to and adheres to the requirements of the Current Licensing Basis (CLB) as discussed in the approved 50.59 Safety Evaluation for this modification.

**DESIGN INPUTS**

- DG-M09, Revision 1, Design Requirements for Piping Stress Analysis, July 17, 1995.
- Power Piping Code, USAS B31.1.0-1967.
- DG-M03, Revision 8, Bechtel Piping Class Summary, January 24, 2000.

**FINAL DESIGN DESCRIPTION  
MODIFICATION REQUEST 99-029\*B**

- Wisconsin Electric Power Company, Drawing GLD M-217, Sheet 1, QA Classification Diagram Auxiliary Feedwater System QA Classification Diagram, Point Beach Nuclear Plant – Unit 1 & 2, Revision 11.
- Bechtel Drawing P-103, Emergency Feedwater Pumps To Main Feedwater Lines 4" & 3"-DB-3, Revision 10.
- Bechtel Drawing P-159, Aux. F.W. From Heating Boiler Cnds. Return & Pump Recirc. To Cnds Stg. Tank 6" & 3" JG-4 Unit 1.
- ASME, Boiler and Pressure Vessel Code, Section III, 1977 Edition (with Winter 1978 Addenda).
- Flowserve Pressure Reducing Orifice Drawing 103, 2" 600# Cast Stainless Steel Pressure Reducing Device, September 1, 1999.
- PBNP Final Safety Analysis Report, Auxiliary Feedwater System.
- Design Basis Document DBD-01, Auxiliary Feedwater System.
- EWR 99-031, AF Pump Recirculation Noise In The Control Room
- CR 99-1391, SCAQ on Potential Common Mode Failure Mechanism Affecting Welds In AFW Pump Recirc. Line.
- Wisconsin Electric Power Company, Point Beach Nuclear Plant – RCE 99-081, "Socket – Weld Failures In Auxiliary Feedwater Pump Recirculation Piping".
- Bechtel Specification No. 6118-M-6, Rev. 3, "Specification For Auxiliary Feedwater Pumps Point Beach Nuclear Plant Units 1 & 2 Wisconsin-Michigan Power Company, dated 10/28/68.
- EPRI TR-111188, "Vibration Fatigue Testing of Socket Welds". Interim Report, December 1998.
- EPRI TR-107455, "Vibration Fatigue of Small Bore Socket-Welded Pipe Joints", Final Report, June 1997.

**DESIGN DESCRIPTION AND ANALYSIS**

The proposed modification MR 99-029\*B, replaces RO-04015 installed in the AF pump P-38B minimum flow recirculation line, with a new RO. The presently installed RO was accredited with causing flow induced cavitation, therefore, allowing for excessive noise and vibration in the AF piping system.

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MODIFICATION REQUEST 99-029\*B**

The proposed modification meets the design, materials, fabrication, construction, and examination and testing standards of the existing installation. The proposed modification will be essentially a direct replacement for the components already installed and operational. The replacement RO will have the same function as the existing orifice RO-04015, which is to provide pressure reduction and act as a pressure boundary for the AF system piping.

A comparison of the mechanical and flow performance characteristics of existing vs. new RO indicates that replacement RO is equal or better. The replacement RO will provide improved anti-cavitation characteristics, thus, will minimize hydrodynamic noise and vibration under liquid application.

The original design requirements for the RO are specified in the Bechtel Specification No. 6118-M-6, Rev. 3. "Specification For Auxiliary Feedwater Pumps Point Beach Nuclear Plant Units 1 & 2 Wisconsin-Michigan Power Company, dated 10/28/68.

This specification does not address design/construction specifics for this RO. It specifies that, "Each pump shall be furnished with a pressure reducing orifice to be used in conjunction with the on-off control valve in the pump recirculation piping. The orifice shall be provided with ended weld connections for installation in AF piping. If the flow through the orifice may cause erosion, special materials, such as 316 stainless steel, shall be used."

The currently installed RO, was designed and constructed by the Byron-Jackson Company (BJCO) (MR 88-099). It was procured to a commercial program (not an Appendix B, QA Program) and dedicated for its application.

The replacement RO was procured from the Flowserve Company under P.O.# 4500291375, to the requirements of the 10 CFR 50, Appendix B, QA Program. This includes among other QA requirements, a flow calculations to demonstrate that the orifice will perform as specified. A seismic analysis and report, to demonstrate that the orifice will operate during and after a seismic event was determined not to be required for this RO. This determination was performed by WE Seismic Qualification Group and is discussed in detail in the Safety Evaluation for this modification.

The design of new RO is different than the presently installed orifice. The existing RO uses inner orifice plates to control the flow and pressure drop across the orifice. The new RO work in a similar manner except that control of flow and pressure drop is accomplished by directing the flow over the series of close-fitting cylindrical stages, each constructed with expansion holes and intersecting circumferential channels that restrict the flow. This flow path of multiple restriction and enlargements reduces the pressure gradually across each trim cylinder, avoiding the sharp pressure drop typical to conventional, single-throttling orifice.

The replacement RO is contained in a 2"- 600# cast stainless steel body (ASME A 351 Grade CF3A). RO's body is designed to the requirements of ASME B31.1 and ASME B16.34 - 1996 Edition. Its working pressure is 1440 psig, thus, meeting the Pipe Class 2"-DB-3 requirements.

**FINAL DESIGN DESCRIPTION  
MODIFICATION REQUEST 99-029\*B**

A hydrostatic pressure test of the replacement RO shell was performed at the Flowserve facility in accordance with ASME/ANSI B 16.34, except that the test pressure was maintained for at least 30 minutes.

In addition to RO replacement, some of the existing piping associated with RO will also be replaced. The piping to be replaced is shown on Working Drawing SK-MR-99-029\*B and includes the 90° piping elbow upstream of the RO-04015 to the upstream socket weld on the isolation valve AF-00040.

This piping replacement is necessary in order to provide oversized socket welds. The replacement piping and RO will be joined by socket welds which are oversized in a 2/1 configuration. The oversized socket weld detail is shown on Working Drawing SK-MR-99-029\*B.

The design and construction materials requirements for AF piping are summarized in the Wisconsin Electric Design and Installation Guideline DG-M02. The piping to be replaced is classified as Pipe Class 2"-DB-3. This Pipe Class specifies carbon steel materials, however due to wear concerns the existing piping is stainless steel (ASTM A-Grade TP 316). Thus, replacement piping and piping components will be also stainless steel.

The replacement piping material for the proposed modification is ASTM A-312 Grade TP 316. The replacement piping fittings material is ASTM A-182 Grade F 304. The replacement piping and piping components meet the pressure and temperature ratings for Pipe Class 2"-DB-3.

The replacement RO is heavier than existing one, and it will add weight to the existing AF piping system. In addition, the replacement piping assembly will have a slightly different internal length of piping than the existing piping layout. However, face-to-face length of the replacement pipe spool piece will be exactly the same as the existing one. These differences between the existing and proposed piping configurations have been addressed by the Wisconsin Electric Co. (WE) analysis which have demonstrated ASME B 31.1 compliance of the modified piping. Addendum A to Piping System Qualification Report WE-100070, Rev. 1 documents this evaluation.

In addition, the flow characteristic of the replacement RO and its affect on the associated plant calculations was evaluated. This evaluation was documented in Addendum A to Calculation No. N-91-063, "P3&A & B Recirc Line System Characteristics", Rev.0 and Addendum A to Calculation No. N-91-069, "Impact of Higher Capacity Recirculation System for the Electric Motor Driven AFW Pumps", Rev. 0.

The results of this evaluation found that the slight differences in the flow characteristic between existing and replacement pressure reducing orifices is acceptable and does not significantly alter the above calculations results.

Components for proposed modification were procured as QA/Safety Related material.



## FINAL DESIGN DESCRIPTION MODIFICATION REQUEST 99-029\*B

None of the above changes is introducing a new, unknown equipment to PBNP. Furthermore, replacement components are passive in nature when the system is operational and will be designed, installed and tested in accordance with existing procedures and controls.

To implement this modification, the portion of the AF piping will be cut at the socket weld at valve AF-00040 and disconnected at the orifice's FE-04050B flange. This disassembly is shown on Sketch SK-MR-99-029\*B.

Piping, and pipe components removed will not be reused for this modification. The only exception is orifice's FE-04050B flange and its associated pipe stub up to 90° elbow. This assembly will be inspected and then reused.

To assure high quality of socket welds, a replacement piping spool piece (containing new RO) will be fabricated in the shop in accordance with details provided by Working Drawing SK-MR-99-029\*B.

Implementation of this modification will reduce the possibility for line noise and vibration when operating this line in the recirculation mode.

The proposed modification is located in the Control Building on Elevation 8", and adheres to the requirements of the Fire Protection Evaluation Report. A fire protection analysis, for the affected area, has been performed and the Fire Protection Conformance Checklist, PBF-2060 has been completed and approved.

Design pressure, operating pressure, design temperature and other pertinent design parameters for RO are specified in the Data Sheet attached to the P.O.# 4500291375.

No procedure changes result from this modification. This is a physical replacement of a RO and associated portion of the AF system. There will be no additional components added or operating modes changes that will require operating procedure changes.

Welding for this modification will be performed in accordance with welding procedures WP-7.

FME will be practiced to avoid foreign material intrusion into the AF system.

Health Physics (HP) will determine the radiological requirements for the proposed installation.

NDE requirements for the Pipe Class affected by the proposed modification are specified in NP 7.4.3 and the original code of construction, USAS B31.1-1967. They require the finished socket welds to receive a Visual Examination (VT).

The affected existing welds have a history of failure, therefore, in addition to VT of the final socket welds, root welds will receive VT and Liquid Penetrant Examination (PT). Piping socket welds shall be examined in accordance with ASME B31.1 - 1992.

To ensure equipment intended function when returned to service following the proposed modification, a post-modification test will be performed. The post-modification test will consist of:

**FINAL DESIGN DESCRIPTION  
MODIFICATION REQUEST 99-029\*B**

- initial service leak test.
- replacement RO performance test.

The proposed modification will be installed during the non-outage year 2000 time frame. Installation of this modification does not require Unit 1 or Unit 2 Shutdown. However, it will require entry into a seven (7) day LCO.

AF-40 will be relied upon to isolate the CSTs from the modified portion during installation. This valve is 1500# class, globe valve that is socket welded. Backpressure on this valve is approximately 15 psig, which reduces the likelihood of leakage. If leakage does occur, it would be very small, and flooding is not a serious concern. If the leakage prevents welding, then a contingency action (i.e. freeze seal) will have to be employed to isolate the leakage to allow welding to be completed.

Painting of the piping modified by the proposed modification is not required (stainless steel piping material).

#### DESIGN OUTPUT

The Installation Work Plan IWP 99-029\*B will be prepared to identify installation requirements including pre-operational conditions, installation testing and post installation testing requirements. In addition, a 10 CFR 50.59 Safety Evaluation has been prepared to identify any CLB affects/changes.

The following calculations were prepared to address the proposed modification:

Orifice manufacturer's (Flowserve Co.) calculation.

Addendum A to WE Piping System Qualification Report WE-100070, Rev. 1.

Addendum A to WE Calculation No. N-91-063, Rev. 0.

Addendum A to WE Calculation No. N-91-069, Rev. 0.

The following Installation Work Plan is associated with this modification:

IWP 99-029\*B, Aux Feed Water Pump P-38B Minimum Flow Recirc Line Orifice - Unit 0

The following working drawing is associated with this modification:

SK-MR-99-029\*B, Auxiliary Feedwater System Orifice RO - 04015 Replacement, Unit 1 & 2.

Bill of Materials (BOM) for IWP 99-029\*B.

**FINAL DESIGN DESCRIPTION  
MODIFICATION REQUEST 99-029\*B**

Fire Protection Conformance Checklist., PBF-2060

10 CFR 50.59/72.48 Safety Evaluation, SE 2000-0055

MR NUMBER 99-029\*E  
(WO#, if non-mod)

## Required For

Acceptance  
(Completion)

Closeout  
(Submittal)

1. Lesson Plans
2. Plant Status Update/Just-in-Time Training
3. Training Handbook
4. Simulator Changes Initiated

## 1. Drawings

- a. Pen & Ink changes and DCNs initiated for Control Room Drawings – Logics, P&IDs, 499 series elementaries.
  - b. Pen & Ink changes and DCNs initiated for Work Control Center Drawings - P&IDs
  - c. Pen & Ink changes and DCNs initiated for I&C Drawings - Reactor Protection and Safeguards Elementaries.
  - d. Master Data Book - Control Room, Work Control Center, and Local Panel – PBF-2093
  - e. Drawing Revisions - PBF-1508
  - f. New Drawings - PBF-1592
  - g. Drawings Voided - PBF-1592
  - h. Working Drawings Transferred/Voided - PBF-1592
- Purchase Orders - (also contract numbers)
- Specifications
- Component Instruction Manuals (for issue, revision, deletion) – PBF-1586
- Cable and Raceway Data Schedule Revisions - PBF-0091
- WERLDS Data Base Revision - Design Guideline DG-E08.
- Environmental and Seismic Qualification Documentation Updates – Ref. NP 7.7.1, NP 7.7.2.
- FPER Revisions - NP 5.2.11
- Update Fire Protection manual
- Calculations added/deleted / revised - PBF-1608
- FSAR - change, NP 5.2.6
- Technical Specification - change; specify section(s) affected and change request number, if known.

UPDATES TO THIS FORM COVERED BY EXISTING SCR 97-412

NUCLEAR POWER BUSINESS UNIT  
MODIFICATION REQUEST CHECKLIST

MR NUMBER 99-029\*B  
(WO#, if non-mod)

DOCUMENTATION UPDATE SHEET AND CLOSEOUT CHECKLIST

Required For

N/A	Acceptance (Completion)	Closeout (Submittal)
X		
X		
X		
X		
		X
X		
X		
X		
	X	
		X
X		
		X
X		
X		
X		
		X
		(IT10,10A,10B)
X		
X		
X		
X		
X		
X		
X		

13. Report major changes to radwaste treatment systems with annual FSAR update per PBNP Tech Spec 15.7.8.5.
14. EPIX Update - report MR changes to the EPIX Coordinator.
15. ALARA Review - specify minutes or review document.
16. Report major changes to the containment aluminum inventory list with FSAR update.
17. DBD Revisions - PBF-1611
18. PSA Models and Documentation - PBF-1626

C. CHAMPS DATABASE

1. Equipment Identification - additions assigned from CHAMPS
2. Permanent Labeling - labels on new equipment; PBF-9900
3. Temporary Labeling - labels on new equipment; PBF-2074
4. Equipment Record - update to CHAMPS coordinator specify change(s); PBF-9922
5. Spare parts stocking and scrapping inputs into CHAMPS; PBF-9925, PBF-1023
6. Unused material removed from modification bin.

D. OPERATIONS -

1. Abnormal Operating, Normal Operating, and Refueling Procedures - PBF-0026a
2. Operating Instructions and Checklists - PBF-0026a
3. Alarm Response and RMS Alarm Setpoint and Response Books - PBF-0026a
4. Testing - TS, IT, ORT, other - PBF-0026a
5. EOPs, ECAs, CSPs - PBF-0026a
6. Periodic Callups - PBF-9920
7. Fire Protection Procedure - PBF-0026a
8. EOP Setpoints, EOP Instrument Uncertainty Calculations - PBF-8001
9. Tank Level Book - PBF-0026a
10. Emergency Plan and EPIPs - PBF-0026a

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MIR NUMBER 99-029\*B  
(WO#, if non-mod)

## Required For

Acceptance  
(Completion)

Closeout  
(Submittal)

1. Maintenance Procedures/Instructions – PBF-0026a
2. ICPs - PBF-0026a
3. Setpoint Document -- PBF-8001
4. Preventative Maintenance - initiate/revise CHAMPS callups:  
PBF-9921/9920
5. Ensure station batteries' load profile changes are incorporated into  
the appropriate discharge test RMPs.

1. Security Procedures
2. Security Plan

1. ISI Program
2. IST Program
3. Miscellaneous HX ECT/Cleaning program
4. Reactor Engineering Instructions - change, specify section(s) affected.
5. Reactor Engineering Refueling Procedures – change; specify section(s) affected.
6. Software Control – specify system affected and software change request number
7. Component maintenance programs.
8. Governing calculations and models (e.g., SW model, DC loading, EDG loading, piping analysis, structural loading, etc.).

## 1. ECRs

1. ECR Final Resolution completed and approved by FDGH.
2. ECR Implementation completed.



Title of Proposed Change, Test or Experiment: AUX. FEED WATER PUMP P-38A AND P-38B MINIMUM FLOW RECIRC LINE FLOW ORIFICE REPLACEMENT.

Reference Document(s) #: MODIFICATION 99-029\*A AND 99-029\*B, EWR 99-031, CR 99-1391, RCE 99-081, ASME B31.1, EPRI PR 111188.

Prepared by: A. FOLTYNOWICZ/R. CHAPMAN  
Name (Print)

A. Foltynowicz / R. Chapman  
Signature

Date: 4-10-00/4-10

Reviewed by: J. P. SCHROEDER  
Name (Print)

J. P. Schroeder  
Signature

Date: 4/13/00

MSS Review: W. J. Herriman  
Name (Print)

W. J. Herriman  
Signature

MSS#: 2000-023

Manager - PBNP Approval:

Brian O'Grady  
Name (Print)  
Br. R. Hendle

Br. R. Hendle  
Signature

Date: 5/10/00

### SECTION 1 - SCREENING

A. Describe the proposed change, test, or experiment. Include interim configurations or conditions.

Engineering Work Request (EWR) 99-031 had been written requesting the evaluation of high level noise and vibration present in all Auxiliary Feedwater (AF) pumps recirculation lines during their operation. This evaluation had determined that the installed pressure reducing orifices (ROs), are cavitating, therefore, inducing excessive noise and vibration in the associated piping.

In addition, Condition Report CR 99-1391 had been written to address the issue of pinhole leaks in the socket welds which have developed in pumps P-38A and P-38B recirculation lines. To improve socket weld's cycle fatigue response over standard ASME Code socket weld profile in vibration critical application the root cause evaluation RCE 99-081 recommended replacement of socket welds with oversized socket welds.

The proposed modifications 99-029\*A and 99-029\*B will replace the existing orifices RO-04008 and RO-04015 in the AF system with improved design orifices and also will install oversized socket welds in the associated piping.

The purpose of the proposed modifications is to minimize piping line noise and vibration and preclude socket weld failure when operating these lines.

The design features of the replacement ROs differ from presently installed ROs. The existing ROs use inner orifice plates to control the flow and pressure drop across them. The replacement ROs, work in a similar manner except that control of flow and pressure drop is accomplished by directing the flow over the series of close-fitting cylindrical stages, each constructed with expansion holes and intersecting circumferential channels that restrict the flow.

The replacement ROs are designed and constructed to the requirements of a 10 CFR 50, Appendix B, QA Program.

A seismic analysis and report, to demonstrate that the orifice will operate during and after a seismic event was determined by WE Seismic Qualification Group not to be required for these ROs. This determination was based on rugged design of the ROs body and pressure reducing component.

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SECTION 1 - CONTINUATION

In order to install oversized socket welds, piping associated with the replacement ROs will also be replaced. Replaced piping will include the 90 deg. elbow upstream of the RO up to and including the upstream weld on the AF pumps recirculation line isolation valve AF-27 for pump P-38A and valve AF-40 for pump P-38B.

The proposed modification will meet design, material and construction standards of the existing installation. The implementation of the proposed modification, will not affect the overall performance of the AF system, operation or function of the AF pumps P-38A and P-38B and the ability of AF system to perform its intended safety functions.

Post modification testing will include a visual exam (VT) of all replaced piping socket welds. Piping welds will be examined in accordance with ASME B31.1 -- 1992. Performance of this exam is required by both the original piping specification, Bechtel M-78, and the original code of construction, USAS B31.1- 1967. USAS B31.1 -- 1967 also requires that post modification testing include an initial service leak test at normal system operating temperature and pressure. In addition, a functional test and verification of the pressure drop and flow through replacement ROs will also be performed.

MR 99-029\*A controls the replacement of the RO-04008 and MR 99-029\*B controls the replacement of the RO-04015.

The proposed modifications are scheduled to be installed with Unit 1 and 2 in Power Operation. A seven (7) day LCO for AF system pumps P-38A and P-38B will be required for each unit with the RCS above 350°F to install each modification. Upon completion of each of the modifications, the new installed ROs will perform the same function as the existing orifices RO-04008 and RO-04015.

List relevant current licensing basis (CLB) and Independent Spent Fuel Storage Installation (ISFSI) licensing basis documents and sections.

1. FPER, Auxiliary Feedwater System, Figure 6.6 -- 4a.
1. FSAR Section 1.3, General Design Criteria.
3. FSAR Section 10.1, Steam And Power Conversion System.
4. FSAR Section 10.2, Auxiliary Feedwater System.
5. FSAR Section 14.1.9, Loss of External Electric Load.
6. FSAR Section 14.1.10, Loss of Normal Feedwater.
7. FSAR Section 14.1.11, Loss of All AC Power to the Auxiliaries.
8. FSAR Section 14.2.4, Steam Generator Tube Rupture.
9. TS Section 15.3.4, Steam And Power Conversion System.
10. TS section 15.4.8, Auxiliary Feedwater System.

- C. Does the proposed change, test or experiment involve a change to any Technical Specification? (For the ISFSI, does the proposed change, test, or experiment involve a change in the license conditions as contained in the Certificate of Compliance?) If a change is required, briefly describe what the change should be and why it is required. If "Yes," see NP 10.3.1 for guidance. ☐ Yes ☒ No

The proposed change does not affect the Technical Specification (TS) elements and requirements for the Auxiliary Feedwater System. The proposed change also does not affect any system that interface with the ISFSI. Thus no TS change is required.

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SECTION 1 - CONTINUATION

Screening for 10 CFR 50.59 and 10 CFR 72.48 Applicability:

*NOTE: If any question in Section 1.D.1 is answered "yes," complete section 2, "10 CFR 50.59 Safety Evaluation."  
If any question is answered "yes," the "no" answers do not have to be explained.*

1. 10 CFR 50.59 Screening:

- a. Does the proposed activity change the facility as described in the CLB? ☒ Yes ☐ No  
If "No," explain:

The PBNP CLB does not specifically discuss the design details of the AF system pumps recirculation line or its pressure reducing orifice. The CLB does state that AF system pumps P-38A and P-38B are equipped with recirculation line to ensure minimum flow required to dissipate pump heat. Thus, making these lines a critical component of the pumps. Pumps P-38A and P-38B are used to mitigate the consequences of some of the accidents evaluated in the CLB. The operation and function of the AF system pumps P-38A and P-38B will not change as a result of this modification. However, the design of replacement ROs is different than the design of the presently installed ROs. The existing ROs use an inner orifice plates to control the flow and pressure drop across the orifice. The new ROs work in a similar manner except that control of flow and pressure drop is accomplished by directing the flow over the series of close-fitting cylindrical stages, each constructed with expansion holes and intersecting circumferential channels that restrict the flow. This flow path of multiple restriction and enlargements reduces the pressure gradually across each trim cylinder, avoiding the sharp pressure drop typical to conventional, single-throttling orifice. The installation of replacement ROs will not require a revision to FSAR Figure 10.2-1 Sheet 1. However, due to a different ROs design, the proposed activity constitutes a change to facility as presently described in the current CLB.

- b. Does the proposed activity change procedures as described in the CLB? If "No," explain: ☐ Yes ☒ No

- c. Could the proposed activity affect the operation, function, or method of performing the function of an SSC as described in the CLB? (This includes interim conditions.) If "No," explain. ☐ Yes ☒ No

- d. Will a test or experiment be performed which is not described in the CLB? If "No" explain. ☐ Yes ☒ No

*NOTE: If question "a" in Section 1.D.2 below is answered "no," responses to questions "b" through "e" are not required and the 10 CFR 72.48 Screening is finished. If question "a" is answered "yes," then questions "b" through "e" shall be answered.*

2. 10 CFR 72.48 Screening for the Independent Spent Fuel Storage Installation (ISFSI):

- a. Could the proposed activity affect the design, operation, function or method of performing the function of any ISFSI-related structures, systems, or components identified in Attachment C of N.P. 10.3.1? ☐ Yes ☒ No



SECTION 2 - 10 CFR 50.59 SAFETY EVALUATION

1. Could the proposed activity increase the probability of occurrence of an accident or event previously evaluated in the CLB? ☐ Yes ☒ No

The proposed activity to replace existing ROs affects AF pump P-38A and P-38B recirculation lines. These ROs are not discussed in the CLB in any manner as a contributor or initiator to an accident or event scenarios already evaluated. However, they do function to support the operation of the AF system pumps P-38A and P-38B and these pumps are involved in such accidents as "Loss of Normal Feedwater", "Loss of All AC Power to the Auxiliaries", "Loss of External Electric Load", and "Steam Generator Tube Rupture". The proposed activity of replacement of the RO-04008 and RO-04015 does not effect the actuation of the AF system or its operation as presently evaluated in the CLB. The proposed modifications will meet design, material and construction standards of the existing installation. The changes that will be implemented by the proposed modification will not affect the overall performance of the AF System and operation or function of the AF pumps P-38A and P-38B to perform their intended functions. Based on this premise, there is no increase to the probability of occurrence of an accident or event that has been previously analyzed in the CLB.

The implementation of the proposed modifications will require for one motor-driven AF pump at a time to be taken out of service for a period of seven (7) days. This is allowed by the requirements of the Technical Specification Section 15.3.4 C. This Section allows two (2) unit operation where one motor-driven pump may be out-of-service for up to seven (7) days.

2. Could the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the CLB? ☐ Yes ☒ No

The CLB discusses the use of the AF system pumps P-38A and P-38B to ensure that adequate feedwater is supplied to the serviced Steam Generators for heat removal.

The proposed modification is replacing the existing orifices RO-04008 and RO-04015 with new orifices that support the operation of the AF pumps P-38A and P-38B. During accident conditions, the safety related functions of each of the AF pump recirculation line orifice is as follows.

1. Provide passive flow resistance in the AF system pump recirculation line; thereby establishing the required recirculation flow and pressure drop from AF system pump discharge pressure to CST pressure. These ROs must provide adequate flow to prevent low-flow instabilities and excessive fluid temperature rise in the AF system pumps.

1. Limit the recirculation flow in the event that the recirculation control valve fails to close during AF system pump operation.

3. Passively maintain the AF system pressure boundary integrity.

The replacement piping assemblies existing piping configuration will not be changed as a result of this modification.

The replacement ROs are contained in a 2"-600#, cast stainless steel body (ASME A 351 Grade CF8M) designed to the requirements of ASME B16.34 - 1996 Edition. Their design pressure is 1440 psig, thus, meeting the Pipe Class 2"-DB-3 requirements. A hydrostatic pressure test of the replacement ROs shell was performed by the Vendor in accordance with ASME/ANSI B 16.34, except that the test pressure was maintained for at least 30 minutes which exceeds the 10 minutes requirement of the Code.

The replacement ROs are slightly heavier than the existing ones. This difference in weight has been addressed by the Wisconsin Electric Co. (WE) analysis which have demonstrated ASME B 31.1 compliance of the modified piping. Addendum A to Piping System Qualification Report WE-100070, Rev. 1 documents this evaluation. In addition, the flow characteristic of the replacement ROs and its affect on the associated plant calculations was evaluated and documented in Addendum No. N-91-063-00-A to Calculation No. N-91-063, "P38A & B Recirc Line System Characteristics", Rev. 0 and Addendum No. N-91-069-00-A to Calculation No. N-91-069, "Impact of Higher Capacity Recirculation System for the Electric Motor Driven AF Pumps", Rev. 0. The results of this evaluation found that the slight differences in the flow characteristic between existing and replacement ROs do not significantly alter the affected calculations results and are acceptable.

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SAFETY EVALUATION REPORT

Section 2 - Continuation

A comparison of the mechanical and performance characteristics of the replacement ROs versus the existing ROs indicates that replacement ROs are either identical or better. The replacement ROs will provide improved flow characteristics, prevent cavitation and minimize pipe vibration, thus eliminate socket weld failure. The review of the properties of the materials selected for these modifications indicates that they are either equivalent or better than presently installed materials.

The components are passive in nature when the system is operational and will be designed, installed and tested in accordance with the existing procedures and controls. Therefore, they do not introduce any new failure mechanisms not already considered for the area.

FME and PMT will be implemented to ensure the proper operation of the system upon completion of the modification. Based on the above, the proposed modification will not increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the CLB.

3. Could the proposed activity increase the radiological consequences of an accident, event, or malfunction of equipment important to safety previously evaluated in the CLB? ☐ Yes ☒ No

Analyses for accidents that result in the loss of Normal Feedwater require AF flow of 200 gpm to affected Unit. Fail safe closure of AOVs, AF-4007 for pump P-38A and AF-4014 for pump P-38B ensures that there is a high-pressure feedwater supply to the steam generators in order to maintain water inventory for removal of heat energy from the reactor coolant system in the event of inoperability or unavailability of the main feedwater system. If these AOV valves fail to close, the restriction orifices RO-04008 and RO-04015, respectively will limit the amount of feedwater recirculated back to the CST. Addendum No. N-91-063-00-A to Calculation No. N-91-069 shows that in that event, P-38A and P-38B will deliver approximately 110 gpm to their respective SG, which exceeds the assumed value in the accident analysis. In addition, the proposed activity does not create new radiological release mechanisms or paths. Based on the above, the proposed activity does not increase the radiological consequences of an accident, event, or malfunction of equipment important to safety previously evaluated in the CLB.

4. Could the proposed activity create the possibility of an accident or event of a different type than any previously evaluated in the CLB? ☐ Yes ☒ No

The proposed modifications will have the same piping configuration, installing equivalent or better components. As discussed in Section 2 of this SE, the replacement ROs will be tested and evaluated to demonstrate suitability for this application. The modified recirculation lines will function identically to the currently installed recirculation lines. A technical evaluation of the replacement ROs indicates that these ROs are more suitable (no cavitation) for this application than the presently installed ROs. Therefore, the proposed activity will not create the possibility of an accident or event of a different type than any previously evaluated in the CLB.

5. Could the proposed activity create the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the CLB? ☐ Yes ☒ No

The proposed modification will replace the existing components with equivalent, replacement components or superior components evaluated and tested for this application. The non-affected piping trains will be maintained in service to ensure operation of the AF system. Once the new equipment is physically installed and modification testing complete, each recirculation line will be functionally tested (PMT) to ensure they function as designed.

The oversized socket welds and replacement ROs do not change the function, method(s) of operation, or introduce any new credible failure mechanisms to the AF pumps P-38A and P-38B and their recirculation lines. The replacement ROs consist of globe valve body with anti-cavitation trim. Valve bonnet and stem/plug are not included. The flow passage area of replacement ROs could possibly lead to reduced pump recirculation flow during operation of the pumps with SW since particles/debris in the SW could be filtered by the RO's trim. To preclude this, the ROs design directs flow through the outside of the trim. The outside cartridge of the trim contains the smallest size flow passage area. The flow passage area then become progressively

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NUCLEAR POWER DEPARTMENT  
SAFETY EVALUATION REPORT

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Section 2 - Continuation

larger. Therefore, the smallest flow passage areas are located at the zone of highest differential pressure. This design feature reduces the potential of debris accumulation on the RO's trim.

In addition, the safety related function of the AF pumps P-38A and P-38B is to deliver sufficient flow for accidents that are time sensitive to AF system startup (LONF, LOOP), LOL, SGTR and MSLB accidents and provide sufficient flow for long term decay heat removal for accidents such as a SBLOCA. The recirculation line flow path is not required to support this function since the pump discharge valves will automatically open fully in response to the accident and provide a flowpath for the pump. The recirculation line AOV automatically closes approximately 45 seconds after the pump discharge flow is approximately 95 gpm and increasing. Failure to pass flow through the recirculation orifice during the 45 seconds would be conservative since flow to the SGs would be delivered sooner. The recirculation line AOV is also design as a failed closed valve to ensure that recirculation flow is not diverted from the SG in the event of a loss of instrument air.

Based on the above, implementation of the proposed modifications will not create the possibility of a malfunction equipment important to safety of a different type than any previously evaluated in the CLB

- 6 Does the proposed activity reduce the margin of safety defined in the basis for any Technical Specification? ☐ Yes ☒ No

T.S. 15.3.4 Steam and Power Conversion System

This section of the Technical Specification discusses the operability requirements for the AF pumps to ensure the capability to remove decay heat from the core. The proposed modifications will be performed in accordance with the LCO requirements of this T.S. The proposed modifications have no effect on CST level requirements in this T.S. Therefore, there is no reduction in the margin of safety defined in this section of the Technical Specifications.

T.S. 15.4.8 Auxiliary Feedwater System

This section of the Technical Specification discusses the requirement to verify the operability of the AF system and its ability to respond properly when required. The proposed modification will not alter any testing requirements or periodicity discussed in the basis of this T.S. Therefore, there is no reduction in the margin of safety as defined in this section of the Technical Specification.

Based on the above and recognizing that the AF system's function and operability will not be affected by the proposed modifications, the margin of safety as defined by the Technical Specifications is not reduced.

DOES THE ACTIVITY, CHANGE, TEST, OR EXPERIMENT INVOLVE A 10 CFR 50.59  
UNREVIEWED SAFETY QUESTION? (IS THE ANSWER TO ANY OF THE ABOVE QUESTIONS  
YES?) ☐ Yes ☒ No

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SECTION 2 - 10 CFR 50.59 EVALUATION SUMMARY

B.

The summary section should contain three brief paragraphs (no more than one page total), including: 1) Description of the proposed change including interim configurations, 2) Justification logic for the answers to the safety evaluation questions, and 3) Conclusion (i.e., is a USQ or Technical Specification conflict involved?)

The proposed modifications 99-029\*A and 99-029\*B will replace orifices RO-04008 and RO-04015 in a AF system with improved design orifices. In addition, oversized socket welds will be provided in the associated piping. The existing orifices were cavitating, therefore inducing excessive noise, vibration and socket welds failure in the piping.

The implementation of the proposed modifications will require for one motor-driven AF pump at a time to be taken out of service for a period of seven (7) days. This is allowed by the requirements of the Technical Specification Section 15.3.4 C. This Section allows two (2) unit operation where one motor-driven pump may be out-of-service for up to seven (7) days.

The orifices AF system orifices RO-04008 and RO-04015 are not discussed in the CLB in any manner as a contributor or initiator to an accident or event scenarios already evaluated in the CLB. However, these orifices support the operation of the AF pumps P-38A and P-38B which are required to mitigate some of the CLB analyzed accidents.

The proposed replacement will meet design, material, construction and testing standards of the existing installation and will not degrade the overall performance, operation or function of the AF pumps P-38A and P-38B. Therefore, the pumps will be able to perform their intended safety functions. The analysis included in the MR 99-029\*A and MR 99-029\*B design packages and post installation testing in the work plan ensure that the AF pumps function as designed. The AF system does not participate in radiological release mechanisms for the PBNP, and no new radiological release mechanisms or paths are created. Based on that, the proposed activity will not increase the probability of occurrence of an accident or the radiological consequences of an accident or malfunction as previously evaluated in the CLB. Also, the proposed activity will not create the probability of an accident of a different type than any previously evaluated in the CLB.

The installation work plan included precautions to ensure that no other safety related components were affected during the installation. With the completion of the orifices replacement, AF pumps functionality will remain the same. No equipment is degraded by this installation, thus the probability of occurrence of a malfunction of equipment important to safety as previously evaluated in the CLB is not increased.

The proposed modification will replace the existing components with equivalent or superior components, evaluated and tested to demonstrate suitability for this application. The modified system will function identically to the current installed system. The replacement ROs will provide improved flow characteristics and will prevent cavitation damage, thus minimize pipe vibration under liquid application and associated socket weld failure. The replacement ROs do not change the function, method(s) of operation, or introduce any new credible failure mechanisms to the AF pump P-38A and P-38B recirculation line.

The recirculation line flow path is not required to support AF system in its response to the design basis accidents since the AF pumps discharge valves will automatically open fully in response to the accident and provide a flowpath for the pump.

Failure to pass flow through the recirculation orifice due to potential of SW debris accumulation on the RO's trim would be conservative since flow to the SGs would be delivered sooner. Therefore, this activity will not create the possibility of a malfunction of equipment important to safety of a different type than any previously evaluated in the CLB.

T.S. 15.3.4, "Steam and Power Conversion System" and T.S. 15.4.8, "Auxiliary Feedwater System" discusses the requirement to verify the operability of the AF system and its ability to respond properly when required, they do not discuss margin of safety.

In conclusion, based on the justification above, the proposed modifications MR 99-029\*A and MR 99-029\*B to replace RO-4008 and RO-4015 do not introduce an unreviewed safety question and do not involve a change to the Technical Specifications.

NUCLEAR POWER BUSINESS UNIT  
DESIGN VERIFICATION NOTICE

Title of Document AUX FEED WATER PUMP P-38B MINIMUM FLOW RECIRC LINE ORIFICE REPLACEMENT

Document No. MR 99-029\*B Rev. 0 Date 4/14/2000

Design Verification Method: ☒ Design Review ☐ Alternate Calcs ☐ Qualification Testing

UPDATES TO THIS FORM COVERED BY EXISTING SCR 97-410

REVIEWER CHECKLIST CONSIDERATIONS:

	<u>Yes</u>	<u>No</u>	<u>N/A</u>
1. Were the inputs correctly selected and incorporated into design?	<u>X</u> ✓		
2. Are assumptions necessary to perform the design activity adequately described and reasonable? Where necessary, are the assumptions identified for subsequent reverifications when the detailed design activities are completed?	<u>X</u> ✓		
3. Are the appropriate quality and quality assurance requirements specified?	<u>X</u> ✓		
4. Are the applicable codes, standards, and regulatory requirements including issue and addends properly identified and are their requirements for design met?	<u>X</u> ✓		
5. Have applicable construction and operating experience been considered?	<u>X</u> ✓		
6. Have the design interface requirements been satisfied?	<u>X</u> ✓		
7. Was an appropriate design method used?	<u>X</u> ✓		
8. Is the output reasonable compared to inputs?	<u>X</u> ✓		
9. Are the specified parts, equipment and processes suitable for the required application?	<u>X</u> ✓		
10. Are the specified materials compatible with each other and the design environmental conditions to which the material will be exposed?	<u>X</u> ✓		
11. Have adequate maintenance features and requirements been specified?	<u>X</u> ✓		
12. Are accessibility and other design provisions adequate for performance of needed maintenance and repair?	<u>X</u> ✓		
13. Has adequate accessibility been provided to perform the in-service inspection expected to be required during the plant life?	<u>X</u> ✓		
14. Has the design properly considered radiation exposure to the public and plant personnel?			<u>X</u> ✓
15. Are the acceptance criteria incorporated in the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished?	<u>X</u> ✓		
16. Have adequate pre-operational (IST, PMT, ISI, snubber, etc.), subsequent periodic test, and inspection requirements been appropriately specified, including acceptance criteria?	<u>X</u> ✓		
17. Are adequate handling, storage, cleaning, and shipping requirements specified?	<u>X</u> ✓		
18. Are adequate identification requirements specified?	<u>X</u> ✓		
19. Are requirements for records adequately specified?	<u>X</u> ✓		
20. Will the change remain within the analyzed or specified capabilities of any affected equipment?	<u>X</u> ✓		
21. Has a field inspection been done?	<u>X</u> ✓		
22. Have impacts on other systems been identified?	<u>X</u> ✓		

COMMENTS: ☒ None ☐ Attached (Use Form PBF-1633)

Design Prepared By: Foltynowicz, A

Date 5/30/00

Reviewed By: R. Chapman

Date 5/31/2000

Approval By: R. F. Hornak

Date 6/2/00

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NUCLEAR POWER BUSINESS UNIT  
DESIGN INPUT CHECKLIST

Modification or Temporary Modification Number: 99-029\*B

Title: Aux. Feed Water Pump P-38B Minimum Flow Recirc. Line Orifice

**INSTRUCTIONS:** Consider the basic functions of each structure, system, and component, (SSC), when answering the questions. The designer shall check the appropriate box for each design input or section. All inputs that apply to the design shall be explained. The explanation may be documented on this checklist or in the design summary. The reviewer shall review the checklist, and any differences between the designer and the reviewer should be addressed. This checklist addresses most design concerns, but is not all encompassing. Any additional concerns should be addressed in the design summary.

(Updates to this form covered by SCR 97-411.)

APPLIES TO DESIGN

YES

NO

**A. General codes, standards, regulatory requirements, and design criteria.**

1. Are any of the PBNP FSAR general design criteria applicable? (Reference FSAR, Section 1.3. Identify and address design criteria as appropriate.)

☒

☐

Review of PBNP FSAR for applicable GDCs identified the following applicable GDCs: 1,2 5, and 42.

2. Are any design requirements contained in commitments affected? (Reference CLB database and the Safety Evaluation/Screening associated with this change.)

☒

☐

SE 2000-0055 was performed to evaluate this modification's impact on the design requirements contained in the CLB.

3. Meet State of Wisconsin Administrative Code requirements? (Refer to ILHR 41.42, PSC 114, and other sections as appropriate for requirements.)

☐

☒

4. Meet existing DNR permits or require DNR approval? (Contact WE Environmental Department.)

☐

☒

5. Consider the effect of design and accident conditions, such as pressure, temperature, fluid chemistry and radiation on components, including internal elastomers and material coating compatibility. (Changes in design parameters may impact Environmental Qualification.)

☒

☐

6. Incorporate new types/models of equipment not presently used at PBNP?

☐

☒

7. Affect accessibility of any equipment? Consider interim conditions, future maintenance, and in-service inspection. (Reference CIMs and drawings for manufacturer's clearance requirements.)

☐

☒

8. Require penetrating a barrier? (Reference NP 8.4.11.)

☐

☒

9. Consider operating experience from PBNP and industry events. (Reference DG-G04 for operating experience reviews and NPRDS, NODIL, CHAMPS, INPO Keywords, or other databases.)

☒

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# DESIGN INPUT CHECKLIST

APPLIES TO DESIGN

YES

NO

10. Consider failure effects on structures, systems, and components: (Failure analysis is only required for maintenance rule systems. Contact the NSA-PSA group for guidance and scope.)

☒

a. The design discusses those events/accidents which the system/components are to withstand?

☐

☐

b. The failure effect of the system/components: (Reference the NSA-PSA Group, Operating Experience, & IEEE-352-1975.)

☐

☐

- How components may fail, and the effect of the failure on the system and related systems?
- What mechanisms might produce failures?
- How a failure would be detected?
- What provisions are included to compensate for the failure?

11. Does the design add or remove components in containment?

☒

a. Change the amount of exposed aluminum in containment? (Reference DG-G07 and FSAR Section 5.6.)

☐

☐

b. Change the amount of exposed zinc in containment? (Reference DG-G07.)

☐

☐

c. Introduce materials into containment that could affect sump performance or lead to equipment degradation? (Reference DG-G07.)

☐

☐

d. Decrease free volume of containment?

☐

☐

e. Require addition or modification of a containment penetration boundary? (Consult the containment system engineer.)

☐

☐

f. Require painting in containment? (Reference MI 36.3.)

☐

☐

12. Consider potential for fuel failure?

☒

a. Affect fuel handling equipment?

☐

☐

b. Present the potential for introducing foreign material/debris into the RCS or connected systems?

☐

☐

c. Affect core barrel flow patterns? ("Baffle jetting" concerns)

☐

☐

# DESIGN INPUT CHECKLIST

APPLIES TO DESIGN

YES

NO

## Mechanical requirements. (Contact Mechanical Design Engineering for guidance.)

1. Have applicable ASME Boiler & Pressure Vessel codes or other standards been identified? (Reference the applicable specification. In addition, safety-related components should be reconciled with DG-M116, and QA components should be reconciled with ANSI N45.2.) ☒ YES ☐ NO
2. Affect or add components/systems to ASME Section XI class 1, 2, or 3 equipment? (Reference PBNP CHAMPS, CBD drawings, and IST Coordinator. If YES, follow NP 7.2.5, Repair/Replacement Program.) ☐ YES ☒ NO
3. Require State of Wisconsin Administrative Code permits/approvals? (Reference NP 7.4.9, Wisconsin Administrative Code for Boilers and Pressure Vessels or the Authorized Inspector.) ☐ YES ☒ NO
4. Consider component performance requirements such as capacity, rating, output? ☒ YES ☐ NO
5. Consider hydraulic requirements such as pump net positive suction heads, allowable pressure drops, allowable fluid velocities and pressures, valve trim requirements, packing/seal requirements? ☒ YES ☐ NO
6. Provide vents, drains, and sample points to accommodate operational, maintenance and testing needs? ☐ YES ☒ NO
7. Require service water? (Both essential and nonessential service water loads are modeled, and load changes must be evaluated. Contact the SWAP Coordinator.) ☐ YES ☒ NO
8. Require the addition of check valves? (Reference DG-M13 for selection guidance.) ☐ YES ☒ NO
9. Require and evaluate any additional loading on instrument or service air, circ. fire protection, or demineralized water, or other system? ☐ YES ☒ NO
10. Evaluate any additional loading on HVAC systems or affect ventilation flow during or after installation? (This will require an EQ review for potential updates to EQSS, EQML & EQMR.) ☐ YES ☒ NO
11. Require insulation? (Reference WE specification PB-85 for insulation, and NP 1.9.10 for asbestos control.) ☐ YES ☒ NO
12. Require lubrication? (Reference Lubrication Manual.) ☐ YES ☒ NO
13. Require an independent means of pressure relief? (Reference B31.1.) ☐ YES ☒ NO

# DESIGN INPUT CHECKLIST

## APPLIES TO DESIGN

	<u>YES</u>	<u>NO</u>
14. Affect the assigned system design pressure or temperature?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
15. Involve cobalt-laden materials into the RCS or into systems that supply the RCS? (Reference NP 4.2.29, "Source Term Reduction Program.")	<input type="checkbox"/>	<input checked="" type="checkbox"/>
16. Are new materials and their coatings/plating compatible with system chemistry and disposal systems?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>C. Electrical requirements. (Contact Electrical Design Engineering for guidance.)</b>		
1. Consider design conditions such as ampacity, voltage drop?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Consider component and system performance requirements, such as current, voltage, or power?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Consider redundancy, diversity and separation requirements of structures, systems and components? (Reference DG-E07 for separation of electrical circuits.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Comply with protective relaying requirements of equipment and systems?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Selection of overcurrent devices for proper protection and coordination? (Reference DG-E04 for selection of molded case circuit breakers.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Affect available fault current at any bus?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Assure that all added cables meet fire retardancy requirements? (Reference FPER Section 4.1.8, IEEE 383.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8. Be compatible with existing electrical insulation and wiring?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9. Affect ampacity of existing cables?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10. Maintain UL (or equivalent) listings?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
11. Alter the voltage harmonic distortion content or change the non-linear loading (i.e., the addition of switching power supplies, the alteration of the circuit's power factor, etc.) on a vital or sensitive instrument bus?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
12. Add new raceways? (Reference DG-E03 for electrical raceway sizing and DG-E02.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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# DESIGN INPUT CHECKLIST

APPLIES TO DESIGN

13. Add cables to existing electrical raceways?

☐
☒

14. Be routed through fire wrapped raceways?

☐
☒

15. Affect the station grounding or lightning protection system?

☐
☒

16. Make any vital circuit susceptible to ground?

☐
☒

17. Affect emergency diesel loading? (Reference DG-E06 for diesel load change evaluation.)

☐
☒

18. Add more station battery loading?

☐
☒

19. Add load to a vital bus?

☐
☒

20. Add load to a non-vital bus?

☐
☒

21. Be compatible with service transformer capacity?

☐
☒

## D. Instrumentation and control requirements. (Contact I&C Design Engineering for guidance.)

1. Consider design conditions such as pressure, temperature, fluid chemistry, amperage, voltage?

☐
☒

2. Have the instruments been properly selected for the application?

☐
☒

3. Have sufficient instruments for operators to monitor the process?

☐
☒

4. Have appropriate instrument scales?

☐
☒

5. Have the instruments, control switches, and indicating devices been appropriately located for human factors (both for operations and maintenance)? (Reference DG-G01.)

☐
☒

6. Have alarms for off-normal conditions?

☐
☒

7. Be capable of or require remote and/or local operation?

☐
☒

# DESIGN INPUT CHECKLIST

## APPLIES TO DESIGN

	YES	NO
8. Be capable of or require manual and/or automatic operation?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9. Require calibration and maintenance requirements for the instruments to be specified?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10. Have specified the instruments with proper range and accuracy?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
11. Address solid state vulnerability to RFI?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>E. Structural requirements. (Contact Civil Design Engineering for guidance.)</b>		
1. Affect or scope seismically qualified equipment (Class 1 or 2) and therefore require a seismic qualification evaluation? (Reference NP 7.7.2, "Seismic Qualification of Equipment.")	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Affect seismic boundaries?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Affect stress calculations of pipe? (Reference DG-M09.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Affect the loading or require changes to existing equipment foundations?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Affect wall stress calculations for pressurized concrete cubicles or structures?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Require analysis of non-seismic components placed over or adjacent to seismic components?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Add items which span between two separate seismic areas/buildings? (The effect of the relative movement must be addressed.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8. Require clearance review for seismic movement or thermal expansion considerations?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9. Require a floor or wall loading analysis? (Reference Bechtel C-dwgs.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10. Require the addition of new supports, hangers, or foundations or add weight to or between existing supports, hangers, or foundations during installation or post-installation? (Reference DG-M09 and DG-M10 for pipe support.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
11. Add new or add load to seismically qualified raceways? (Reference NP 7.7.2, "Seismic Qualification of Equipment.")	<input type="checkbox"/>	<input checked="" type="checkbox"/>

# DESIGN INPUT CHECKLIST

APPLIES TO DESIGN

12. Modify, attach to, or locate within the proximity of masonry block walls? (Reference IEB 80-11 Block Wall Program.)

YES NO

☐ ☒

13. Require core drills, expansion anchors, or re-bar cuts? (Reference DG-C01 for expansion anchor design and installation.)

☐ ☒

14. Create an external or internal missile hazard?

☐ ☒

15. Consider wind and storm loading on external structures?

☐ ☒

16. Require protection from high energy fire or jet? (Reference E.A. Appendix A.2.)

☐ ☒

17. Consider dynamic requirements such as vibration, and shock

☐ ☒

## F. Programs

1. ASME Section XI and QA considerations:

a. Affect IST acceptance criteria or conditions? (Contact Component Engineer.)

☐ ☒

b. Require classification of new components? (Reference DG-G06 for system, component, and part classification.)

☐ ☒

c. Affect QA-scope systems or boundaries? (Contact Site Programs Engineering Support for Q-List.)

☒ ☐

d. Require special personnel/equipment qualifications not proceduralized at PBNP (i.e., underwater welding)?

☐ ☒

e. Require material certification or other certification to ensure quality equal to or better than the affected SSC? (These requirements need to be specified in the specification or purchase requisition.)

☒ ☐

f. Have all design requirements, such as pressure or current rating, been reviewed against lot descriptions or been specified on purchase requisitions/specifications?

☒ ☐

2. Fire protection considerations:

a. Affect the Fire Protection manual?

☐ ☒

# DESIGN INPUT CHECKLIST

## APPLIES TO DESIGN

	<u>YES</u>	<u>NO</u>
b. Affect fire protection requirements? (Reference Section 8.4 of the FPER.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Affect access to a fire zone, fire protection equipment or Appendix R safe shutdown equipment? (Reference FPER Section 8.4.3.1.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Affect fire protection system performance? (Reference FPER Section 8.4.3.1.3.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Will the change affect the existing fire protection features, exemption requests, or regulatory commitments listed in the Fire Hazard Evaluation(s) of an Appendix R safe shutdown fire zone in FPER Section 5.6?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Based on Tables 6.7-1 to 6.7-4 and Figures 6.6-1 to 6.6-8h and 6.9-1 to 6.9-2.d, will the change add to, delete from, or revise the listed systems and components? (Reference FPER Section 8.4.3.2.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Orifice replacement is within an Appendix R flow boundary, however, it will not affect the capability to safe shutdown the reactor.		
g. Increase permanent combustible loading in a room? (Reference FPER Section 8.4.3.1.4.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h. Open a fire barrier? (Reference NP 8.4.11 and Fire Barrier Drawings WE PBL-218 Sheets 1-20, FPER Section 8.4.3.1.2.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If any questions b through h are applicable, an evaluation must be performed using the FPCC checklist, PBF-2060 per Section 8.4.3 of the FPER.

### 3. Flooding protection considerations:

A flooding analysis should be performed if any of the following questions are applicable and answered yes. (Reference Section 4.3 of DG-C02.)

a. Modify potential flooding sources or add new potential flooding sources to a flood zone and thereby increase the direct and/or indirect flooding vulnerability of essential equipment?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Degrade existing flood barriers or flood mitigation features providing unanalyzed pathway for flooding to propagate? (Reference Section 3.2 of DG-C02.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Involve the opening of potential flood sources anywhere at the station? (Installation procedures need to address inadvertent flooding. Reference DG-C02, Section 4.4.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Reduce the capacity to isolate or cope with flooding? (Reference Sect. 4.2 of DG-C02.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Change plant drainage backfill requirements?	<input type="checkbox"/>	<input checked="" type="checkbox"/>



# DESIGN INPUT CHECKLIST

## APPLIES TO DESIGN

YES

NO

- f. Locate essential equipment or supporting systems where it would be susceptible to flooding? (Flooding conditions may also impact Environmental Qualification.)

☐
☒

### 4. Environmental considerations:

- a. Be subject to adverse environmental conditions during storage or construction? (Reference NP 9.5.2.)
- b. Require freeze protection or affect existing freeze protection?
- c. Locate safety-related or post accident monitoring equipment in a HARSH environment? (Reference NP 7.7.1.)
- d. Require Environmental Qualification (EQ)? (Reference NP 7.7.1 for EQ qualification.)
- e. Be attached to an EQ system/component? (This will require an EQ review for potential updates to EQSS, EQML & EQMR. Reference EQ master list.)
- f. Change environmental parameters (e.g., pressure, temperature, radiation, humidity)? (Reference NP 7.7.1, "Environmental Qualification of Electrical Equipment.")

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### 5. Radiation Protection (RP) and ALARA considerations: (Reference DG-G03, "ALARA Consideration Guideline for Design & Installation.")

The areas mentioned below are normally within the RCA, but radiological concerns should be considered for SSC outside the RCA also.

- a. Affect any SSC in an RWP required area, a contaminated area, or a radiation area, including opening of a system that may be a radiological concern?
- b. Will the change generate excessive radwaste or highly radioactive/contaminated waste?
- c. Remove any plant equipment from a potentially contaminated system (including ROP systems)?
- d. Result in an anticipated increase in operational or maintenance exposures?
- e. Result in an expected exposure of greater than 1 Rem for any individual during installation of the change?

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## DESIGN INPUT CHECKLIST

## APPLIES TO DESIGN

YESNO

- f. Result in an anticipated collective exposure of greater than 2 Rem for the installation of the change? ☐ ☒

If questions d, e, or f apply and are answered yes, then an ALARA review shall be performed. (Reference NP 4.2.3. "ALARA Review Procedure.")

## 6. Chemistry considerations:

- a. Require or affect established chemistry limits? (Contact system engineer and review chemistry procedures.) ☐ ☒
- b. Require any routine chemical analyses? (Contact system engineer and review chemistry procedures.) ☐ ☒
- c. Require chemical additives? (Contact PBNP Chemistry.) ☐ ☒
- d. Do new fluids/chemicals need to be evaluated for TRI (Toxic Release Inventory), CHES, critical applications, or special disposal requirements? (Contact Chemistry/Chemical Engineering.) ☐ ☒

## C. Installations

1. Installation requirements/plant conditions have been determined? ☒ ☐

2. Consider test and inspection requirements, including the conditions under which they will be performed? (Reference NP 7.4.1 for pressure test requirements, NP 7.4.3 for post-maintenance and modification NDE requirements, NP 1.2.5 for special test procedures, and OM 4.2.2 for in-service tests.) ☒ ☐

3. Have post-installation acceptance criteria been properly specified to test the intended function of the component(s)/system? ☒ ☐

4. Comply with all WF lifting and rigging requirements? (Reference WE Safety Manual, PBNP Safe Load Path procedures, and NP 8.4.7.) ☐ ☒

5. Require special handling, shipping, or environmental conditions for storage or construction? (Reference NP 9.5.2 for material storage.) ☐ ☒

6. Consider transportability requirements such as size and shipping weight limitations. ☐ ☒

7. Require spare parts or special non-standard items or tools? ☐ ☒

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# DESIGN INPUT CHECKLIST

APPLIES TO DESIGN

YES

NO

8. Will any added components introduce chemical contaminants to the system? (i.e., preservative coating on valves, coatings on weld rod can also introduce contaminants) ☐ YES ☒ NO
9. Consider personnel requirements and limitations, including the qualification and number of personnel available for plant operation, maintenance, testing and inspection, and permissible personnel radiation exposures? ☐ YES ☒ NO
10. Operational requirements under various conditions, such as plant startup, normal plant shutdown, plant emergency operation, special or infrequent operation, and system abnormal or emergency operation.
  - a. Require new procedures or procedure changes? (Reference NP 1.2.5.) ☐ YES ☒ NO
  - b. Potentially impact other systems, components, or structures during installation? ☐ YES ☒ NO
  - c. Present installation impacts on plant operations (i.e., fire watches, etc.)? ☒ YES ☐ NO
11. Access and administrative requirements for plant security: If any security requirements are applicable, notify Security.
  - a. Create an opening >96 in.<sup>2</sup> in any wall, ceiling, or other barrier? ☐ YES ☒ NO
  - b. Require work within 20' of fence? ☐ YES ☒ NO
  - c. Affect security equipment and documents, including those containing safeguards information? (Contact Security for design development requirements and design concurrence.) ☐ YES ☒ NO
  - d. Affect access controls? ☐ YES ☒ NO
12. Safety requirements:
  - a. Affect safety equipment and thereby create personnel hazards (i.e., removal of handrails)? ☐ YES ☒ NO
  - b. Introduce hazardous material into the plant? (Reference NP 1.9.1.) ☐ YES ☒ NO
  - c. Affect evacuation routes or escape provisions from enclosures? ☐ YES ☒ NO
  - d. Meet OSHA regulations? (Reference Wisc. Electric Safety Manual and OSHA 29 CFR 1910.) ☒ YES ☐ NO

DESIGN INPUT CHECKLIST

APPLIES TO DESIGN

YES

NO

Designed by:

M. FOLTYNOWICZ A. FOLY

Date: 05-30-00

Reviewed by:

Rob Chapman / Roll Cef

Date: 5/31/2000

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IWP NUMBER: 99-029\*BPage 1 of 18

## INSTALLATION WORK PLAN

PBNP MINOR PROCEDURE ☐Check As  
ApplicableWORK ORDER WORK PLAN ☒FOR MODIFICATION # MR 99-029\*B, WO # 9919512

INSTALLATION WORK PLAN TITLE

Aux Feed Water Pump P-38B Minimum Flow Recirc. OrificeUNIT 0

QA-SCOPE



NON QA-SCOPE

Originator A. FoleyDate 5-18-2000Reviewer MHCDate 5/31/2000Final Design  
Group Head P. J. HornDate 6/2/00Quality Engineer Sam P. EganDate 5-18-2000

5-22-00

Installation  
Group Head Sam P. EganDate 5-18-00Manager -  
Operations or DSS M. KellyDate 5-25-00

NOTE: Changes to this work plan must be done with the concurrence of the responsible or team engineer and the installation supervisor, or as delineated within the IWP.

DG-G02.5  
Revision 1

UNCLASSIFIED

AUX FEED WATER PUMP P-38B MINIMUM FLOW  
RECIRC LINE ORIFICE  
UNIT 1 & 2

---

1.0 SCOPE

- 1.1 The scope of this installation work plan is to replace the portion of the existing line 2"-DB-3, including pressure reducing orifice RO-04015. The replaced piping and RO will be welded back utilizing oversized socket welds.
- 1.2 The purpose of this modification is to reduce piping line noise and vibration when operating Auxiliary Feedwater (AF) pump P-38B in the recirculation mode. The presently installed pressure reducing orifice (RO) is cavitating, therefore, allowing for excessive noise and cavitation induced pipe vibration. The purpose for oversized socket welds is to offer a significant high cycle fatigue improvement over standard ASME Code socket weld in vibration-critical application.
- 1.3 The approach of this installation is as follows:
- 1.3.1 Pre-fabricate new section of pipe as shown on sketch SK-MR-99-029\*B.
  - 1.3.2 Isolate and drain the affected piping.
  - 1.3.3 Remove portion of the existing line 2"-DB-3.
  - 1.3.4 Install new sections of line 2"-DB-3.
  - 1.3.5 Perform VT and PT exams on all new welds.
  - 1.3.6 Functionally test the mini-recirc. line to verify operability.
  - 1.3.7 Perform inservice leak check of new/modified piping and welds.
- 1.4 This installation is QA-scope work.
- QA Scope Clarification:
- The piping downstream of RO-04015 is non-QA scope.
- 1.5 Installation of this IWP will be performed during the Reactor being in any operating condition. The pump P-38B will be out of service under a seven (7) day LCO. No other AF pump can be out of service.
- 1.6 This modification will not affect any ASME Section XI pressure boundaries.

AUX FEED WATER PUMP P-38B MINIMUM FLOW  
RECIRC LINE ORIFICE  
UNIT 1 & 2

---

1.7 Support Requirements

- 1.7.1 Operations: Support to install and remove danger tags, system draining, and post maintenance and operability testing.
- 1.7.2 NDE Group: Perform visual (VT) and liquid penetrant examinations where specified in this IWP.
- 1.7.3 Security: Performs fire watch duties as directed by Operations.
- 1.7.4 QC: Support as required.
- 1.7.5 Engineering: Support NDE evaluations and post maintenance testing.  
  
RE: Alex Foltynowicz    Pager-5518    Home Tel. No. 686-0098
- 1.7.6 Construction:
  - a. Perform erection and removal of scaffolding, as required.
  - b. Perform removal and installation of piping and supports.
  - c. Prepare as-built sketches of modified piping configuration.

2.0 PRE-INSTALLATION REQUIREMENTS

2.1 References:

- 2.1.1 Working drawing:
  - a. SK-MR-99-029\*B, "Auxiliary Feedwater System Orifice RO - 04015 Replacement, Unit 1 & 2.
- 2.1.2 Vendor/Contractor drawing:
  - a. Flowserve Corporation drawing of the replacement orifice.

AUX FEED WATER PUMP P-38B MINIMUM FLOW  
RECIRC LINE ORIFICE  
UNIT 1 & 2

---

Responsible Engineer has assured that all references listed above are approved and the applicable requirements have been incorporated into the IWP. The references are either with the Installation Group, attached, or are readily available to the Installation Group.

RE A. Foley Date 09-11-00

2.1.3 Applicable Codes and Standards:

- a. USAS B31.1 – 1967
- b. ASME B31.1 – 1992

2.1.4 Supplemental Procedures:

- a. MI 32.1 Flange and Closure Bolting
- b. MI 32.8 Guidelines for Opening Piping Systems
- c. MI 32.9 Scaffolding Erection
- d. NP 1.9.6 Plant Cleanliness, Storage, and Inspection Program
- e. NP 1.9.9 Transient Combustible Control
- f. NP 1.9.13 Ignition Control Procedure
- g. NP 1.9.15 Danger Tag Procedure
- h. NP 8.4.10 Exclusion of Foreign Material from Plant Components and Systems
- i. NP 8.5.2 CHAMPS Equipment Database Usage and Control
- j. PBF-9142 Bolting-Torque And Loading
- k. NDE-451 Liquid Penetrant Weld Examination
- l. NDE-700 Visual Weld Examination
- m. WP-7 Welding Procedure for Stainless Steels Group P-8 GTAW-Pipe Diameters Over 1" OD



AUX FEED WATER PUMP P-38B MINIMUM FLOW  
RECIRC LINE ORIFICE  
UNIT 1 & 2

---

2.2 Background References (those references not needed to perform work):

2.2.1 Drawings:

- a. Bechtel Drawing M-217, Sh. 1, P&ID of Auxiliary Feedwater System
- b. Bechtel Drawing P-103, Stress Isometric of Emergency Feedwater Pumps to Main Feedwater Lines 4" & 3"-DB-3

2.3 Installation Preparation Activities

- 2.3.1 A Bill of Material (BOM) is attached to this IWP or is included on the Working Drawing.
- 2.3.2 The Responsible Engineer has assured that all materials on the BOM are on site, available for the modification, and QA released.
- 2.3.3 New CHAMPS label for RO-04015 is required and has been requested.

The RE/IS has assured that all of the above Installation Preparation Activities are complete.

RE/IS *Jim Gant* Date 9-11-00

2.4 Pre-Installation Discussions

- 2.4.1 A pre-installation discussion with the Installation Group representative, the Testing Group representative, and the Acceptance Group representative has been performed.

RE/IS *Jim Gant* Date 9-11-00

- 2.4.2 A field walkdown has been performed, if necessary, to verify that all aspects of the procedure may be performed as intended.

IS *Jim Gant* Date 9-11-00

AUX FEED WATER PUMP P-38B MINIMUM FLOW  
RECIRC LINE ORIFICE  
UNIT 1 & 2

---

- 2.4.3 A commitment has been obtained from Security to support fire watch requirements. Record the responsible group below.

Fire Watch Support Group W/P Date 10-21-00

- 2.4.4 Foreign material exclusion (FME) shall be controlled per NP 8.4.10, Exclusion of Foreign Material from Plant Components and Systems, and PB 9158, FME Checklist.

RE/IS Jca Date 9-13-00

2.5 Personnel Safety Concerns

The following precautionary personnel safety requirements are recommended for this IWP:

- 2.5.1 Caution should be exercised when lifting or rigging components.
- 2.5.2 This installation will take place in an area of increased fire awareness. Installation personnel shall take precautions against fire hazards.
- 2.5.3 Aux. Feedwater pump P-38B minimum recirculation line does not have drain connections. To allow this line to drain, metering orifice's (FE-04050B) downstream flange will be broken open. Safety caution of MI 32.8, Guideline for Opening Piping Systems shall be utilized.

The Installation Supervisor is aware of the above listed safety concerns.

IS Jca Date 9-13-00

2.6 Identification of Permits Required

- 2.6.1 Work Order # 9919512 for this IWP has been written and submitted to CHAMPS. The Work Order number has been recorded on the IWP coversheet.

AUX FEED WATER PUMP P-38B MINIMUM FLOW  
RECIRC LINE ORIFICE  
UNIT 1 & 2

- 2.6.2 Ignition control permit is required for welding and shall be obtained by the Installation Supervisor when needed.

The Installation Supervisor has assured that all necessary permits for this installation will be obtained.

IS JCA Date 9-13-00

2.7 Pre-Installation Work

**NOTE:** The following work will not affect or be connected to any system that is either operating or in service and therefore it can be started before Release for Installation.

- 2.7.1 Using the referenced Working Drawing, prepare Contractor Welder Travelers for all new welds.

JCA 9-13-  
CE/Date

**Note:** During pre-fabrication process perform the following root weld examinations in accordance with Step 2.7.3:

1. Liquid penetrant weld examination.
2. Visual weld examination.

- 2.7.2 Pre-fabricate piping assembly, including replacement orifice RO-04015, in accordance with the Working Drawing SK-MR-99-029\*B.

JCA 9-13-  
CE/Date

- 2.7.3 Perform visual examination (VT) of all pre-fabricated piping root welds in accordance with NDE-700. In addition, perform liquid penetrant examination (PT) of all pre-fabricated piping root welds in accordance with NDE-451. The acceptance criteria for piping welds are ASME B31.1 - 1992 and Working Drawing SK-MR-99-029\*B.

VT Exam  
☒ Sat.    ☐ Unsat.

PT Exam  
☒ Sat.    ☐ Unsat.

**Note:** If an unsat inspection condition is identified, NDE will not sign off this step until the appropriate evaluation and /or rework along with re-inspection has been accomplished.

ED 9-13-  
NDE/Date

AUX FEED WATER PUMP P-38B MINIMUM FLOW  
RECIRC LINE ORIFICE  
UNIT 1 & 2

Note: After pre-fabrication process perform the following weld examinations in accordance with Step 2.7.4:

1. Visual weld examination.

- 2.7.4 Perform visual examination (VT) of all finished welds in accordance with NDE-700. The acceptance criteria for piping welds are ASME B31.1 – 1992 and Working Drawing SK-MR-99-029\*B.

VT Exam

☒ Sat.

☐ Unsat.

Note: If an unsat inspection condition is identified, NDE will not sign off this step until the appropriate evaluation and /or rework along with re-inspection has been accomplished.

\* ACCEPTED FINAL VT. ON WELDS 4015B, 4015C & 4015E PER SOCKET WELD DETAIL ON DRAWING BSK-MR-99-029 \* B. J. Lumbard 11-2-00

\* J. Lumbard 11-2  
NDE/Date

2.8 Operational Installation Prerequisites

- 2.8.1 This installation will be performed during the Reactor being in any operating condition.

- 2.8.2 Establish twice per shift fire rounds per OM.3.27, Protection of Safe Shutdown/Appendix R Equipment.

QJ 11/2/00  
OPS/Date

- 2.8.3 Enter applicable LCO for P-38B. AF system pump being Out-Of-Service.

QJ 11/2/00  
OPS/Date

NOTE: The following step indicates a recommended Danger Tag Series. This may be altered depending on the plant conditions as determined by the DSS.

AUX FEED WATER PUMP P-38B MINIMUM FLOW  
RECIRC LINE ORIFICE  
UNIT 1 & 2

2.8.4 Prepare a Danger Tag Series for the equipment listed below.  
DO NOT HANG the tags until instructed to do so in Section 3.0.

- a. Valve AF-00040, Pump P-38B Mini Recirc Outlet,  
CLOSED
- b. Valve AF-04014, Pump P-38B Mini Recirc Control,  
~~CLOSED~~ Gagged open 11/7/00 *[Signature]*
- c. Pump P-38B Electric Motor, DE-ENERGIZED

*[Signature]* 11/7/00  
OPS/Date

2.8.5 Isolate and Danger Tag P-38B, AF system pump.

*[Signature]* 11/7/00  
OPS/Date

2.8.6 Obtain Ignition Control Permit, PBF-0068.

IS *[Signature]* Date 11-6-00 Time 1200

2.8.7 Release For Installation

All of the above operational installation prerequisites have been met and it is acceptable to proceed with the installation.

DSS *[Signature]* Date 11/7/00 Time 0857

2.8.8 All other installation prerequisites have been met including performance of a pre-job brief with all involved personnel, as required.

RE/IS *[Signature]* Date 11-7-00

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FEBRUARY 24, 2000

AUX FEED WATER PUMP P-38B MINIMUM FLOW  
RECIRC LINE ORIFICE  
UNIT 1 & 2

3.0 INSTALLATION

3.1 QC Requirements

Hold, inspect, or witness points are included, as needed, in the body of the installation description.

3.2 Installation Description

**NOTE:** The following is a detailed step-by-step listing of the actions necessary to perform this IWP. The steps are to be performed in a logical work order. Work can be performed in an order other than as written at the discretion of the Responsible Engineer or the Installation Supervisor.

3.2.1 Hang the Danger Tag Series prepared in Step 2.8.4.

*al* 11/7/00  
OPS/Date

3.2.2 Provide temporary supporting and shoring as required to ensure that the piping does not shift following cutting.

*ja* 11-8-00  
CE/Date

**CAUTION**

Aux. Feed. pump P-38B minimum recirculation line does not have a drain connections. To allow system to drain, downstream flange of metering orifice FE- 04050B shall be broken open. Safety caution of MI 32.8, Guidelines for Opening Piping Systems shall be observed.

3.2.3 Drain and vent Line 2"-DB-3 by breaking the flange at orifice FE-04050B. Control drainage as well as possible by using hoses, and catch basins. Coordinate with Operations as necessary.

*ja* 11-8-00  
CE/Date

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AUX FEED WATER PUMP P-38B MINIMUM FLOW  
RECIRC LINE ORIFICE  
UNIT 1 & 2

CAUTION

If leakage past isolation valve AF-40 is seen, STOP work and contact the IS or RE immediately.

CAUTION

Take extreme care to apply all possible fire protection precautions in the AF pump P-38B cubical.

3.2.4 Post continuous fire watch per Ignition Control Procedure, NP 1.9.13.

3.2.5 Remove the piping assembly, including orifice RO-04015, as required per Working Drawing SK-MR-99-029\*B. Note exact orientation of FE-4050B orifice plate before removing. Retain the orifice for reinstallation later.

*Jm*  
IS/Date

*Jca 11-8-*  
CE/Date

FME Hold Point

3.2.6 Perform FME cleanliness inspection and install temporary FME covers on all unattended open pipe ends. The guidelines of the FME "Checklist", PBF-9158, shall apply to this IWP.

*Jca 11-8-*  
CE/Date

3.2.7 Cut out metering orifice's FE-04050B flange including pipe stub away from piping assembly removed in Step 3.2.5. Save remaining pipe for examination by Engineering.

*Jca 11-8-*  
CE/Date

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AUX FEED WATER PUMP P-38B MINIMUM FLOW  
RECIRC LINE ORIFICE  
UNIT 1 & 2

FME HOLD Point

- 3.2.8 Prior to installation, perform FME cleanliness inspection of FE-04050B's flange with a pipe stub and piping assembly pre-fabricated in Step 2.7.2.

QO 11-8-00  
JCA 11-8-00  
CE/Date

- 3.2.9 Install the FE-04050B orifice flange and pipe stub.

JCA 11-8-00  
CE/Date

QC HOLD Point

- 3.2.10 Torque bolts using a staggered pattern. Torque the bolts to 255 Ft-Lbs (+/-) 12 Ft-Lbs in accordance with PBF-9142.

QC SHALL witness final torquing of bolts.

M&TE: MCTW-109

Cal. Due Date: 4-4-01

Final "As Left" torque value: 255 FT/LBS

11-8-00  
JCA  
QC/Date

Note: During field installation process perform the following root weld examinations in accordance with Step 3.2.12:

1. Liquid penetrant weld examination.
2. Visual weld examination.

- 3.2.11 Install the piping assembly pre-fabricated in Step 2.7.2 in accordance with Working Drawing SK-MR-99-029\*B.

MCS 11-8-00  
CE/Date

- 3.2.12 Perform visual examination (VT) of all field root welds in accordance with NDE-700. In addition, perform liquid penetrant examination (PT) of all field root welds in accordance with NDE-451. The acceptance criteria for piping welds are ASME B31.1 - 1992 and Working Drawing SK-MR-99-029\*B.

VT Exam

☒ Sat. ☐ Unsat.

welds noted A, B, C, D, E

PT Exam

☒ Sat. ☐ Unsat.

welds noted A, B, C, D, E



AUX FEED WATER PUMP P-38B MINIMUM FLOW  
RECIRC LINE ORIFICE  
UNIT 1 & 2

Note: If an unsat inspection condition is identified, NDE will not sign off this step until the appropriate evaluation and /or rework along with re-inspection has been accomplished.

*John F. Davis*  
NDE/Date 11/11/00

Note: Perform following final weld examination in accordance with Step 3.2.13:

## 1. Visual weld examination.

- 3.2.13 Perform visual examination (VT) of all finished field welds in accordance with NDE-700. The acceptance criteria for piping welds is ASME B31.1 - 1992 and Working Drawing SK-MR-99-029\*B.

SAT - 405 B, C, E. Sounding welds for  
LE Jan 11/00

VT Exam

☒ Sat.

☐ Unsat.

Note: If an unsat inspection condition is identified, NDE will not sign off this step until the appropriate evaluation and /or rework along with re-inspection has been completed.

*fillet weld shall be 1/2" minimum 2D  
x 1/4 11-8-00*

*MJK 11-9-00*  
NDE/Date

- 3.2.14 Remove temporary supports.

*MGB 11-9*  
CE/Date

- 3.2.15 Mark-up Working Drawing SK-MR-99-029\*B. to indicate new as-installed configuration of this modification.

*as is*

*MGB 11-9*  
CE/Date

- 3.2.16 Restore fire protection for AF system pump room as necessary and notify Construction to release fire watch.

*DM 11/9/00*  
OPS/Date

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AUX FEED WATER PUMP P-38B MINIMUM FLOW  
RECIRC LINE ORIFICE  
UNIT 1 & 2

3.3 Clean up

Remove all construction debris, tools, and material from the work area.  
Ensure all work areas meet PBNP housekeeping expectation.

IS *[Signature]* Date 11-9-00

3.4 Installation Complete

3.4.1 As-Built Description

This IWP was installed  
by: Williams Power Date 11-9-00

The installation was performed in accordance with this IWP  
and drawings (list revisions):

ECR(s) No. 2000-0222  
CR(s) No. a/p  
Other considerations a/p

Attach any additional documentation of the as-built description  
to this IWP.

3.4.2 List all calibrated equipment used during installation of this  
modification.

AD-47CWF  
11-9-00 MCTW-109

3.4.3 The installation of this IWP is complete. It has been installed in accordance  
with this IWP and all associated ECRs.

RE *[Signature]* for Duane Hofstra Date 11-9-00  
IS *[Signature]* per telecon Date 11-9-00

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AUX FEED WATER PUMP P-38B MINIMUM FLOW  
RECIRC LINE ORIFICE  
UNIT 1 & 2

---

4.0 TESTING

4.1 Testing Information

4.1.1 The acceptance tests for this modification are:

- a. Initial Service Leak Test performed at normal operating pressure and temperature.
- b. Functional Test of new orifice RO-04015 performed during the IT-10, "Test of Electrically-Driven Auxiliary Feed Pumps And Valves" or IO-62A, "Motor-Driven Auxiliary Feedwater System (P-38A & P-38B).

4.1.2 The intent of the testing is to:

- a. Verify the functional performance of new orifice.
- b. Verify the integrity of the modified piping.
- c. Verify that all new welds associated with modified piping are leak tight.
- d. Satisfy the pressure testing requirements of NP 7.4.1.

4.1.3 Acceptance criteria for the testing is as follows:

- a. Piping and fittings within the modified piping boundary shall not show an evidence of structural distress (bulging or deformation) at normal system operating temperature and pressure.
- b. Piping and fittings within the modified piping boundary shall not show an evidence of through-wall leakage or at any new welds at normal system operating temperature and pressure.
- c. Flow reading on FIT-4050B must be between 70 and 100 gpm.

4.2 Pre-Test Requirements

4.2.1 Remove the Danger Tags that were hung in Step 3.2.1.

4.2.2 Prepare pump P-38B for the re-start. Fill and vent pump.

*ARM* 11-16  
OPS/Dat  
*ARM* 11-16  
OPS/Dat

AUX FEED WATER PUMP P-38B MINIMUM FLOW  
RECIRC LINE ORIFICE  
UNIT 1 & 2

4.3 Release for Testing

- 4.3.1 The Aux Feed System's pump P-38B operating mode is as required for testing. Testing can start.

DSS JPAL/RJH Date 11-10-00 Time 0455

4.4 Testing

Note: Sound and vibration data may be collected as directed by the System Engineer while the pump is running during the performance of IT-10 or OI-62A.

RO-04015 Performance Test.

- 4.4.1 Align AF system as necessary and perform pump P-38B recirc. line flow performance test utilizing IT-10, "Test of Electrically-Driven Auxiliary Feed Pumps And Valves" or OI-62A, "Motor-Driven Auxiliary Feedwater System (P-38A & P-38B) procedures. Record a flow reading from FIT-04050B while valve AF-04014 is open.

Flow Reading FIT-04050B 64 gpm.

Flow Reading UT # 1 70 gpm.

Flow Reading UT # 2 70 gpm.

Acceptance criteria: The flow reading must be between 70 and 100 gpm.

\* Un sat  
Due to Insufficient  
Uncertainty

JJN/11/10/00  
ENG/Date

IF RO-04015 Performance Test is unacceptable perform steps 4.4.1a, 4.4.1b, 4.4.1c, 4.4.1d and 4.4.1e

- 4.4.1a Prepare a Danger Tag Series for the equipment listed below. DO NOT HANG the tags until instructed to do so in Section 3.0.

- Valve AF-00040, Pump P-38B Mini Recirc Outlet, CLOSED
- Valve AF-04014, Pump P-38B Mini Recirc Control, CLOSED

JJN 11/10/00

AUX FEED WATER PUMP P-38B MINIMUM FLOW  
RECIRC LINE ORIFICE  
UNIT 1 & 2

c. Pump P-38B Electric Motor, DE-ENERGIZED

4.4.1b Isolate, and Danger Tag P-38B, AF system pump.

Qm  
OPS/Date

4.4.1c Perform Attachment B

Qm  
OPS/Date

4.4.1d Clear Danger Tag P-38B, AF system pump.

MB 11/10/00  
MT/Date

4.4.1e Align AF system as necessary and perform pump P-38B recirc. line flow performance test utilizing IT-10, "Test of Electrically-Driven Auxiliary Feed Pumps And Valves" or OI-62A, "Motor-Driven Auxiliary Feedwater System (P-38A & P-38B) procedures. Record a flow reading from FIT-04050B while valve AF-04014 is open.

ML 11/13/00  
OPS/Date

Flow Reading FIT-04050B 75 gpm.

Flow Reading UT # 1 50 gpm.

Flow Reading UT # 2 51 gpm.

Acceptance criteria: The flow reading must be between 70 and 100 gpm.

QPA 11-10-00  
ENG/Date

00/11/11 NAC

AUX FEED WATER PUMP P-38B MINIMUM FLOW  
RECIRC LINE ORIFICE  
UNIT 1 & 2

---

Initial Service Leak Test.

**CAUTION**

Use caution when examining piping and welds. The system operating pressure may be in excess of 1300 Psig.

- 4.4.2 Perform the Initial Service Leak Test of the new piping and welds while the pump P-38B is running during IT-10 or OI-62A. Examine for leakage all new joints. Record results of the Initial Service Leak Test below and in the PBF 0042a&b, attached:

SAT

OKM 11-10-00  
OPS/Date

Acceptance criteria: No visual evidence of weeping or leaking at tested fittings and joints.

AUX FEED WATER PUMP P-38B MINIMUM FLOW  
RECIRC LINE ORIFICE  
UNIT 1 & 2

4.5 Testing Results

- 4.5.1 Attach any additional testing documentation to this IWP.
- 4.5.2 List all calibrated equipment used during testing of this modification.

Flow meter #1 CEFM-001  
Flow meter #2 CEFM-002

- 4.5.3 The testing is completed and all Acceptance Criteria have been met.

Testing Supervisor *D. P. Achord* Date 11/10/00

5.0 RESTORATION

5.1 Pre-Acceptance

- 5.1.1 The following items must be completed prior to acceptance:

- a. All ECRs have final approvals.
- b. All update items required prior to acceptance on PBF-1606 have been completed.
- d. All testing described above has been satisfactorily completed.

All of the above items have been completed.

RE PER TELECON W/ ALEX FOLYNOWICZ Date 11/10/00  
*D. P. Achord*

TEST COPY AVAILABLE

AUX FEED WATER PUMP P-38B MINIMUM FLOW  
RECIRC LINE ORIFICE  
UNIT 1 & 2

5.2 System Restoration

5.2.1 Close out any remaining tagouts and permits for this IWP.

5.2.2 Aux Feedwater pump P-38B is ready for release for operation.

DSS *Myra DPA* Date 11-10-00 Time 1505

6.0 ACCEPTANCE

6.1 Verify systems and components affected by this modification are placed in an appropriate condition for present plant configuration.

6.2 Exit LCO on AF pump P-38B.

6.3 If fire rounds in progress, then discontinue fire rounds.

6.4 Final Acceptance

This installation and the associated modification have been installed and tested and are acceptable.

DSS *Myra DPA* Date 11-10-00

*Myra* 11-1  
OPS/Date

1506 *Myra* 11-10-00  
OPS/Date

*Myra* 11-10  
OPS/Date

Return completed IWP and modification to Responsible Engineer

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MR 99-029'B

**BILL OF MATERIALS**

Rev. 0 01/18/00

**ATTACHMENT A**

**IWP 99-029\*B**

**WO 9919512**

**Account No. N9500261**

Materials for Piping Assembly

Item	SR	Size	Description	Model Number	Qty	Lot No.	Comments
1	S	2"	Pipe, Sch 80		4 ft	9017551	Seamless Stainless Steel, ASTM A-312, Type TP 316
2	S	2"	Elbow, 90 deg., 3000 lb, socket weld		1	9015019	ASTM A-182, Grade F304
3	S	2"	Pressure Reducing Device	Flowserve Serial # 0D981A.004	1		Stainless Steel, P.O. 4500291375
4	N	2"	Gasket, Flexitallic		2	9154223	Flexitallic, 1500 Lb., Blue Asbestos and 304 S.S.

**MICROFILMED**

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## ATTACHMENT B

### MODIFICATION TO FLOW ORIFICE ASSEMBLY

Steps to be followed in exact order per Vendor Specification  
All items to be SAVED for Reinstallation unless noted otherwise.

NOTE: Perform following utilizing Sketch No. 3, unless noted otherwise.

- |     |   |                                |
|-----|---|--------------------------------|
| 1.0 | Remove the nuts (114) from the studs (108).   | <u>MB 11/10-00</u><br>MTN/DATE |
| 2.0 | Remove the bonnet cap (blind flange) (70) from the device body (1).<br>Protect the gasket surface from damage   | <u>MB 11/10-00</u><br>MTN/DATE |
| 3.0 | Remove the bonnet cap gasket (55) and discard.  | <u>MB 11/10-00</u><br>MTN/DATE |
| 4.0 | Remove the seat retainer (30) and place in a safe location.   | <u>MB 11/10-00</u><br>MTN/DATE |
| 5.0 | Remove the seat ring (20) and place it in a safe location protecting the<br>gasket surface from damage.   | <u>MB 11/10-00</u><br>MTN/DATE |
| 6.0 | Remove the seat ring gasket (58) and discard.   | <u>MB 11/10-00</u><br>MTN/DATE |
| 7.0 | Grind off the tack weld holding the alignment pin in place in<br>the seat retainer (30) and remove the alignment pin. Save the alignment<br>pins for re-use if they not damage  | <u>MB 11/10-00</u><br>MTN/DATE |
| 8.0 | Remove the innermost (6 <sup>th</sup> ) stage of the seat retainer (30).  | <u>MB 11/10-00</u><br>MTN/DATE |
| 9.0 | <p>Drill <del>four</del> <sup>5 in (6) 5th</sup> additional 0.076 +/- 0.002 (#48) holes as shown<br/>on the attached marked up sketch 1 of the innermost (6<sup>th</sup>) stage of the seat<br/>retainer (30) and remove any burrs.</p> | <u>MB 11/10-00</u><br>MTN/DATE |

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**NOTE:** Alignment marks are located at the top of the seat retainer (30).

- 10.0 Re-assemble the seat retainer (30) being careful to maintain the original orientation of the stages.

MB 11/10-00  
MTN/DATE

- 11.0 Install the alignment pins and tack-weld them in place with a 1/8" tack-weld on the edge of the outer hole in the seat retainer (30).

**NOTE:** If alignment pins were damaged from STEP 7, fabricate new ones in accordance with sketch 2, attached.

- 12.0 Install a new seat ring gasket (58) in the body (1).

MB 11/10-00  
MTN/DATE

- 13.0 Install the seat ring (20) in the body (1).

MB 11/10-00  
MTN/DATE

- 14.0 Install the re-assembled seat retainer (30) in the body (1) being careful to center it on the seat ring (20).

MB 11/10-00  
MTN/DATE

- 15.0 Install a new bonnet cap gasket (55) in the body.

MB 11/10-00  
MTN/DATE

- 16.0 Place the bonnet cap (70) on the body (1).

MB 11/10-00  
MTN/DATE

- 17.0 Reinstall the nuts (114) on the Studs (108) and torque them to 130 foot-pounds.

MB 11/10-00  
MTN/DATE

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-2X 0.125 (1/8) THRU  
EQUALLY SPACED AND ALIGNED  
WITH HOLE PATTERN AS SHOWN  
FOR ALIGNMENT PIN

(30)  
54X  $\varnothing .076 \pm .002$  (48) THRU  
 $\varnothing .125$  (1/8)  $\nabla .071$  (54 HOLES)  
5 ROWS, 6 HOLES/ROW.  
CENTERED IN CHANNEL

POINT BEACH TO  
DRILL THESE HOLES

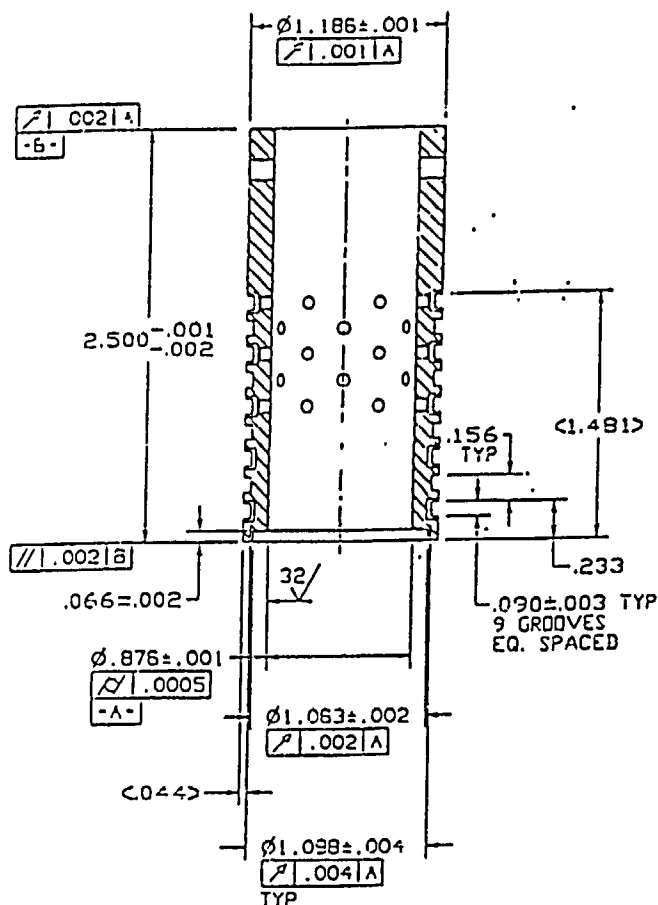
550  
11/19/00  
JAN 11/10/00

NOTE: DRILL 3/8" DIA.  
... OF 6 IN. DIA. (#40) THRO  
... HOLES TO BE DIAMETRIC-  
... ALLY OPPOSITE AND  
... EQUALLY SPACED  
... BETWEEN HOLES IN ...  
... ROW ABOVE ...

WEPCO - POINT BEACH

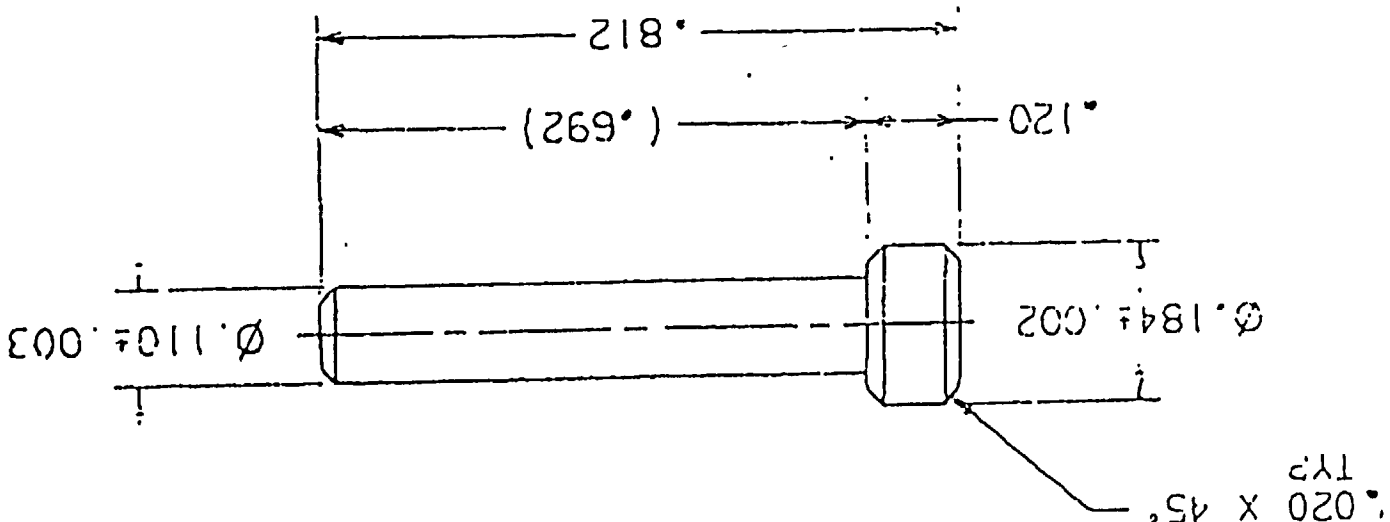
### SEAT RETAINER SKETCH

## SKETCH 1



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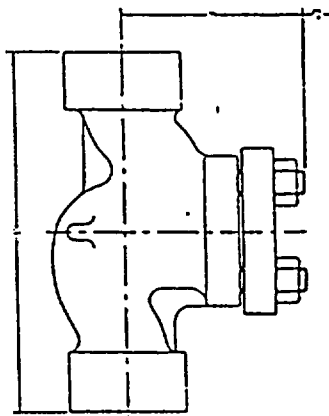
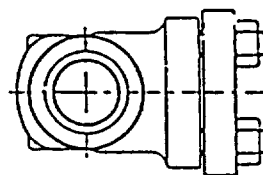
SKETCH 2



WEPCO-POINT BEACH  
ALIGNMENT PIV SKETCH - ASTM A-479 TP 204 or 316

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IMP 95-C-297B  
Page 5 of 5



1713	Br	St. Leon	1713	Br	St. Leon
1	1000	1000	1	1000	1000
2	1000	1000	2	1000	1000
3	1000	1000	3	1000	1000
4	1000	1000	4	1000	1000
5	1000	1000	5	1000	1000
6	1000	1000	6	1000	1000
7	1000	1000	7	1000	1000
8	1000	1000	8	1000	1000
9	1000	1000	9	1000	1000
10	1000	1000	10	1000	1000
11	1000	1000	11	1000	1000
12	1000	1000	12	1000	1000
13	1000	1000	13	1000	1000
14	1000	1000	14	1000	1000
15	1000	1000	15	1000	1000
16	1000	1000	16	1000	1000
17	1000	1000	17	1000	1000
18	1000	1000	18	1000	1000
19	1000	1000	19	1000	1000
20	1000	1000	20	1000	1000
21	1000	1000	21	1000	1000
22	1000	1000	22	1000	1000
23	1000	1000	23	1000	1000
24	1000	1000	24	1000	1000
25	1000	1000	25	1000	1000
26	1000	1000	26	1000	1000
27	1000	1000	27	1000	1000
28	1000	1000	28	1000	1000
29	1000	1000	29	1000	1000
30	1000	1000	30	1000	1000
31	1000	1000	31	1000	1000
32	1000	1000	32	1000	1000
33	1000	1000	33	1000	1000
34	1000	1000	34	1000	1000
35	1000	1000	35	1000	1000
36	1000	1000	36	1000	1000
37	1000	1000	37	1000	1000
38	1000	1000	38	1000	1000
39	1000	1000	39	1000	1000
40	1000	1000	40	1000	1000
41	1000	1000	41	1000	1000
42	1000	1000	42	1000	1000
43	1000	1000	43	1000	1000
44	1000	1000	44	1000	1000
45	1000	1000	45	1000	1000
46	1000	1000	46	1000	1000
47	1000	1000	47	1000	1000
48	1000	1000	48	1000	1000
49	1000	1000	49	1000	1000
50	1000	1000	50	1000	1000
51	1000	1000	51	1000	1000
52	1000	1000	52	1000	1000
53	1000	1000	53	1000	1000
54	1000	1000	54	1000	1000
55	1000	1000	55	1000	1000
56	1000	1000	56	1000	1000
57	1000	1000	57	1000	1000
58	1000	1000	58	1000	1000
59	1000	1000	59	1000	1000
60	1000	1000	60	1000	1000
61	1000	1000	61	1000	1000
62	1000	1000	62	1000	1000
63	1000	1000	63	1000	1000
64	1000	1000	64	1000	1000
65	1000	1000	65	1000	1000

	A	C	F	and other not shown
WCH	11.3	10	5.7	20.05
and	207	24.5	145	14 KC

NOTES

1. VALVE IS DESIGNED TO ACCOMMODATE WITH AMP 81434 - 1981  
WITH 1988 JUNE-WEA STANDARD CLASS

2. APPROX  $C_p = 2.3$

3. VALVE TAG NO. 5 NO-1004 NO-1815

INTERVIEW DATED 10/10/78  
BY SA [REDACTED]  
AT [REDACTED]  
[REDACTED]

2"-600 LB  
WALTER MARK I CHANNEL STREAM  
PRESSURE REDUCING DEVICE

Model 2000 Pressure Pump		Pressure, psi	
<p>2" - 800 lb WALTER MARK I CHANNEL STRUT PRESSURE REDUCING DEVICE</p>			
Test No.	Rate	Rate, lbs./sq. in.	Pressure, psi
1	100	100	100
2	200	200	200
3	300	300	300
4	400	400	400
5	500	500	500
6	600	600	600
7	700	700	700
8	800	800	800
9	900	900	900
10	1000	1000	1000
11	1100	1100	1100
12	1200	1200	1200
13	1300	1300	1300
14	1400	1400	1400
15	1500	1500	1500
16	1600	1600	1600
17	1700	1700	1700
18	1800	1800	1800
19	1900	1900	1900
20	2000	2000	2000
21	2100	2100	2100
22	2200	2200	2200
23	2300	2300	2300
24	2400	2400	2400
25	2500	2500	2500
26	2600	2600	2600
27	2700	2700	2700
28	2800	2800	2800
29	2900	2900	2900
30	3000	3000	3000
31	3100	3100	3100
32	3200	3200	3200
33	3300	3300	3300
34	3400	3400	3400
35	3500	3500	3500
36	3600	3600	3600
37	3700	3700	3700
38	3800	3800	3800
39	3900	3900	3900
40	4000	4000	4000
41	4100	4100	4100
42	4200	4200	4200
43	4300	4300	4300
44	4400	4400	4400
45	4500	4500	4500
46	4600	4600	4600
47	4700	4700	4700
48	4800	4800	4800
49	4900	4900	4900
50	5000	5000	5000
51	5100	5100	5100
52	5200	5200	5200
53	5300	5300	5300
54	5400	5400	5400
55	5500	5500	5500
56	5600	5600	5600
57	5700	5700	5700
58	5800	5800	5800
59	5900	5900	5900
60	6000	6000	6000
61	6100	6100	6100
62	6200	6200	6200
63	6300	6300	6300
64	6400	6400	6400
65	6500	6500	6500
66	6600	6600	6600
67	6700	6700	6700
68	6800	6800	6800
69	6900	6900	6900
70	7000	7000	7000
71	7100	7100	7100
72	7200	7200	7200
73	7300	7300	7300
74	7400	7400	7400
75	7500	7500	7500
76	7600	7600	7600
77	7700	7700	7700
78	7800	7800	7800
79	7900	7900	7900
80	8000	8000	8000
81	8100	8100	8100
82	8200	8200	8200
83	8300	8300	8300
84	8400	8400	8400
85	8500	8500	8500
86	8600	8600	8600
87	8700	8700	8700
88	8800	8800	8800
89	8900	8900	8900</

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NUCLEAR POWER BUSINESS UNIT  
FIRE PROTECTION CONFORMANCE CHECKLIST

MR Number MR 99-029\*B Unit 1            Unit 2            Common Facilities X  
System AF Location            Control Bldg. El. 8 ft.           

AFFECTED FIRE ZONE(S) (see FPER Sect. 5.3 - 5.5) 304

**PURPOSE**

The Fire Protection Conformance Checklist (FPCC) was developed to help evaluate the impact of plant modifications, procedural changes, and tests on the plant fire protection program and safe shutdown capability for compliance with 10 CFR 50 Appendix R and other plant fire protection license commitments.

The FPCC also provides the screening criteria to ensure that a 10 CFR 50.59 safety evaluation is performed on activities that affect the design basis of fire protection equipment or plant's capability to achieve and maintain safe shutdown for any design basis fire. If the FPCC screening indicates the plant fire protection or safe shutdown design basis will be affected, a 10 CFR 50.59 screening shall be performed per NP 10.3.1, Authorization of Changes, Tests, and Experiments (10 CFR 50.59), with consideration of the FPCC information, to determine if an unreviewed safety question is involved. The design basis fire is the accident to be considered in the 10 CFR 50.59 evaluation. The FPCC becomes part of the documentation supporting the 10 CFR 50.59 screening and safety evaluation.

**INSTRUCTIONS**

1. Complete the Fire Protection Conformance Checklist (FPCC) as directed in paragraph 8.4.3 of the FPER.
2. Determine whether the modification affects general plant industrial or Appendix R fire protection features by completing Sections 1.0 - 4.6 of the FPCC.  
  
Use the paragraphs in FPER 8.4.3.1 that correspond to the FPCC sections for additional information and guidance when answering the questions in the checklist.
3. Determine whether the modification affects Appendix R safe shutdown systems or components by completing Sections 5.0 - 10.5 of the FPCC.  
  
Use the paragraphs in FPER 8.4.3.2 - 8.4.3.7 that correspond to the FPCC sections for additional information and guidance when answering the questions in these sections of the checklist.
4. Consider requirements for a 10 CFR 50.59 screening by reviewing paragraph 11.0.
5. Sign and date the FPCC.

## FIRE PROTECTION CONFORMANCE CHECKLIST

### FIRE PROTECTION EVALUATION

#### 1.0 PLANT ACCESS (Ref. FPER 8.4.3.1.1)

- 1.1 Does the modification add/delete/revise any doors, walls, structures or equipment that may impede or alter access to a fire?

☐ Yes, go to 1.2  
☒ No, go to 1.3

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 1.2 Are alternate access routes available to the area of concern?

☐ Yes, go to 1.3  
☐ No, go to 1.8, complete actions and resume at 1.3

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 1.3 Does the modification add/revise/remove ventilation that may either directly or indirectly alter air flow within an area or from area to area to impede access to a fire?

☐ Yes, go to 1.8, complete actions and resume at 1.4  
☒ No, go to 1.4

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 1.4 Does the modification require installation of locks on previously unlocked doors or structural changes such as the addition/deletion/revision of walls, stairways, or doors?

☐ Yes, go to 1.5  
☒ No, go to 1.6

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 1.5 Does the installation of locals or structural changes affect the existing access/egress routes for fire fighting activity, safe shutdown equipment operations, and/or post-fire repairs?

☐ Yes, go to 1.8, complete actions and resume at 1.6  
☐ No, go to 1.6

Comments: \_\_\_\_\_  
\_\_\_\_\_



## FIRE PROTECTION CONFORMANCE CHECKLIST

- 1.6 Does the modification affect the Appendix R safe shutdown timelines (time and motion study for AOP 10A, AOP 10B, AOP 10C, or AOP 10D contained in FPER Sections 6.8 and 6.9, Figs. 6.8-3 and 6.9-3)?

- ☐ Yes, go to 1.8, complete actions and resume at 1.7  
☒ No, go to 1.7

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 1.7 Does the modification block safe shutdown equipment or a local control station required to be accessible for safe shutdown? (Ref. FPER Tables 6.7-1 to 6.7-4)

- ☐ Yes, go to 1.8, complete actions and resume at 2.1  
☒ No, go to 2.1

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 1.8 The modification affects plant accessibility. List the access effect(s) and refer to FPER, Section 8.4.4, RESUME checklist completion.

Access Effects: \_\_\_\_\_  
\_\_\_\_\_

### 2.0 APPENDIX R BARRIERS (Ref. FPER 8.4.3.1.2)

- 2.1 Does the modification delete any fire barriers/area appearing in FPER, Section 5.3 - 5.5? of Vol. 2 FPER, Drvgs. PBC 218, Shts. 1-19)

- ☐ Yes, go to 2.2  
☒ No, go to 2.3

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 2.2 Has a new barrier/area been defined?

- ☐ Yes, go to 2.3  
☐ No, go to 2.14, complete actions and resume at 2.3

Comments: \_\_\_\_\_  
\_\_\_\_\_

## FIRE PROTECTION CONFORMANCE CHECKLIST

- 2.3 Does the modification revise any existing fire barriers (e.g., changes to supporting structural steel barrier thickness or material etc.)?

☐ Yes, go to 2.14, complete actions and resume at 2.4  
☒ No, go to 2.4

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 2.4 Does the modification add/delete/revise any penetrations to fire barriers due to cables or pipes?

☐ Yes, go to 2.5  
☒ No, go to 2.6

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 2.5 Are the appropriate barrier penetration procedures specified? (NP 8.4.11)

☐ Yes, go to 2.6  
☐ No, go to 2.14, complete actions and resume at 2.6

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 2.6 Does the modification add or replace any fire doors, frames or dampers?

☐ Yes, go to 2.7  
☒ No, go to 2.8

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 2.7 Do the new/replaced dampers/doors/frames meet requirements for rated fire barriers in the fire zone and fire damper installation configurations as specified in FPER Section 5.6? (In FPER Vol. 2 Fire Hazard Evaluations)

☐ Yes, go to 2.8  
☐ No, go to 2.15, complete actions and resume at 2.8

Comments: \_\_\_\_\_  
\_\_\_\_\_

## FIRE PROTECTION CONFORMANCE CHECKLIST

- 2.8 Does the modification add or relocate any cable raceways to a location which presents intervening combustibles between redundant safe shutdown trains? (Review Exemption Requests - Bases for Fire Zone in FPER Vol. 2-3)

- ☐ Yes, go to 2.9  
☒ No, go to 2.10

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 2.9 Does the modification include installation of approved fire stops?

- ☐ Yes, go to 2.10  
☐ No, go to 2.5, complete actions and resume at 2.10

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 2.10 Does the modification add/delete/revise any cable to an existing raceway which presents intervening combustibles between redundant safe shutdown trains?

- ☐ Yes, go to 2.11  
☒ No, go to 2.12

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 2.11 Does the modification include installation/reinstallation of approved fire stops?

- ☐ Yes, go to 2.12  
☐ No, go to 2.15, complete actions and resume at 2.12

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 2.12 Does the modification add/delete/revise any curb, dikes, or drains in the area as described in FPER Vol. 1, Section 4.1.12, 8.3.2.1.3 and Specific Fire Zone(s) Fire Hazard Evaluation(s) in FPER Vols. 2 and 3, Section 5.6?

- ☐ Yes, go to 2.14, complete actions and resume at 2.13  
☒ No, go to 2.13

Comments: \_\_\_\_\_  
\_\_\_\_\_

## FIRE PROTECTION CONFORMANCE CHECKLIST

- 2.13 Does the modification obstruct, remove/revise any suppression system or water spray nozzles or plume impingement shields in the area?

☐ Yes, go to 2.14, complete actions and resume at 3.1  
☒ No, go to 3.1

Comments: \_\_\_\_\_

- 2.14 Do the affected barriers/fire areas protect safe shutdown components or cables?

☐ Yes, go to 2.15  
☐ No, go to 2.16

Comments: \_\_\_\_\_

- 2.15 The modification impacts Appendix R compliance. List the affected items and refer to FPER, Section 8.4.4.1 RESUME checklist completion.

Affected Items: \_\_\_\_\_

- 2.16 The modification could impact fire protection commitments and/or codes. List the affected item and refer to FPER, Section 8.4.4.2. RESUME checklist completion.

Affected Items: \_\_\_\_\_

### 3.0 FIRE PROTECTION SYSTEMS (Ref. FPER 8.4.3.1.3)

- 3.1 Does the modification affect any portion of the fire protection system?

☐ Yes, go to 3.2  
☒ No, go to 3.4

Comments: \_\_\_\_\_

- 3.2 Is the affected portion of fire protection system required for Appendix R safe shutdown compliance? (See Exemption Request or Regulatory commitment Sections of Specific Fire Zone(s) Fire Evaluation(s) in FPER Vols. 2 and 3, Section 5.6)

☐ Yes, go to 3.3  
☐ No, go to 3.4

Comments: \_\_\_\_\_

## FIRE PROTECTION CONFORMANCE CHECKLIST

- 3.3 Will the modified portion of fire protection systems meet the requirements of Appendix R as stated in the Fire Zone Evaluations Vols. 2 and 3, FPER Section 5.6?

- ☐ Yes, go to 3.4  
☐ No, to go 3.18, complete actions and resume at 3.4

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 3.4 Does the modification add/delete/revise any fire protection system electrical components?

- ☐ Yes, go to 3.5  
☒ No, go to 3.6

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 3.5 Does the modification add/delete/revise anything that could impede the required fire protection system function?

- ☐ Yes, go to 3.17, complete actions and resume at 3.6  
☐ No, go to 3.6

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 3.6 Does the modification add/delete/revise any fire detectors?

- ☐ Yes, go to 3.17, complete actions and resume at 3.7  
☒ No, go to 3.7

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 3.7 Does the modification revise any ventilation system flow patterns or structural arrangements which may affect fire detection/suppression capability?

- ☐ Yes, go to 3.17, complete actions and resume at 3.8  
☒ No, go to 3.8

Comments: \_\_\_\_\_  
\_\_\_\_\_

## FIRE PROTECTION CONFORMANCE CHECKLIST

3.8 Does the modification affect the annunciator system of the fire detectors?

- ☐ Yes, go to 3.17, complete actions and resume at 3.9  
☒ No, go to 3.9

Comments: \_\_\_\_\_

3.9 Does the modification add any new suppression systems?

- ☐ Yes, go to 3.10  
☒ No, go to 3.11

Comments: \_\_\_\_\_

3.10 Has a suppression effects analysis been performed? (See Inadvertent Suppression Actuation, Technical Evaluation in FPER 9.1)

- ☐ Yes, go to 3.11  
☐ No, go to 3.13, complete actions and resume at 3.11

Comments: \_\_\_\_\_

3.11 Does the modification delete any suppression systems?

- ☐ Yes, go to 3.17, complete actions and resume at 3.12  
☒ No, go to 3.12

Comments: \_\_\_\_\_

3.12 Does the modification revise any suppression systems (e.g., changes in size, spacing, or arrangement of nozzles, piping, or pipe hangers)?

- ☐ Yes, go to 3.17, complete actions and resume at 3.13  
☒ No, go to 3.13

Comments: \_\_\_\_\_

## FIRE PROTECTION CONFORMANCE CHECKLIST

- 3.13 Does the modification affect discharge characteristics of gaseous systems due to changes in room volume or ventilation systems?

☐ Yes, go to 3.17, complete actions and resume at 3.14  
☒ No, go to 3.14

Comments: \_\_\_\_\_

- 3.14 Does the design change affect the discharge of sprinklers due to structural/mechanical changes?

☐ Yes, go to 3.17, complete actions and resume at 3.15  
☒ No, go to 3.15

Comments: \_\_\_\_\_

- 3.15 Does the modification remove/revise any hose stations, hydrants, or fire extinguishers?

☐ Yes, go to 3.17, complete actions and resume at 3.16  
☒ No, go to 3.16

Comments: \_\_\_\_\_

- 3.16 Does the design change add/delete/revise any local or remote alarm actuation systems?

☐ Yes, go to 3.17, complete actions and resume at 4.1  
☒ No, go to 4.1

Comments: \_\_\_\_\_

- 3.17 Are the affected detection/suppression actuation system components located in a fire area/zone for Appendix R compliance?

☐ Yes, go to 3.18  
☐ No, go to 3.19

Comments: \_\_\_\_\_

- 3.18 The modification impacts on Appendix R compliance. List the affected components and refer to FPER Section 8.4.4.1. RESUME checklist completion.

Comments: \_\_\_\_\_

## FIRE PROTECTION CONFORMANCE CHECKLIST

- 3.19 The modification could impact fire protection commitments and/or codes. List the affected components and refer to FPER, Section 8.4.4.2. RESUME checklist completion.

Comments: \_\_\_\_\_  
\_\_\_\_\_

4.0 COMBUSTIBLE LOADING/FIRE HAZARD (Ref. FPER 8.4.3.1.4)

- 4.1 Does the modification increase combustible loading or fire hazard due to new cable installed in cable trays?

- ☐ Yes, go to 4.4, complete actions and resume at 4.2  
☒ No, go to 4.2

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 4.2 Does the modification increase combustible loading or fire hazard due to lubricating oil or grease?

- ☐ Yes, go to 4.4, complete actions and resume at 4.3  
☒ No, go to 4.3

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 4.3 Does the modification increase the combustible loading or fire hazard due to the addition of ordinary combustibles or combustible liquids?

- ☐ Yes, go to 4.4  
☒ No, fire protection checklist complete. Continue with Appendix R Safe Shutdown Evaluation at Item 5.1

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 4.4 Does the increase affect the established level of fire hazard for the given fire area stated in the fire zone evaluation contained in Vol. 2 and 3 of FPER Section 5.6? NOTE: Contact NES Fire Protection Engineer if input is needed.

- ☐ Yes, go to 4.5, complete actions and resume at 4.5  
☐ No, go to 4.5

Comments: \_\_\_\_\_  
\_\_\_\_\_



## FIRE PROTECTION CONFORMANCE CHECKLIST

- 4.5 Does the increase exceed the existing fire control design capabilities of fire protection features for the given fire area? NOTE: Contact NES Fire Protection Engineer if input is needed.

- ☐ Yes, go to 4.6, complete actions. Continue with Appendix R Safe Shutdown Evaluation at Item 5.1
- ☐ No, fire protection checklist complete. Continue with Appendix R Safe Shutdown Evaluation at Item 5.1

Comments: \_\_\_\_\_

\_\_\_\_\_

- 4.6 The modification impacts fire protection compliance. List the fire area and refer to FPER Section 8.4.4. RESUME checklist completion.

Fire Area: \_\_\_\_\_

\_\_\_\_\_

### APPENDIX R SAFE SHUTDOWN EVALUATION

#### 5.0 SAFE SHUTDOWN COMPONENTS (Ref. FPER 8.4.3.2.2 and 8.4.3.2.3)

- 5.1 Does the modification require addition of a safe shutdown component? Is the component located within the Appendix R flowpath boundaries shown in Figs. 6.6-1 to 6.6-8H and Figs. 6.9-1 to 6.9-2.d in FPER Vol. 4, Section 6.0.

- ☐ Yes, go to 5.2
- ☒ No, go to 5.5

Comments: \_\_\_\_\_

\_\_\_\_\_

- 5.2 Will the new component support other safe shutdown systems or component(s)? (Refer to Safe Shutdown Components Tables 6.7-1 to 6.7-4 in FPER Vol. 4, Section 6.7)

- ☐ Yes, go to 5.3
- ☐ No, go to 5.4

Comments: \_\_\_\_\_

\_\_\_\_\_

- 5.3 Are the safe shutdown system(s) or component(s) which the new component will be supporting required to operate for a fire in the fire area in which the new component will be located?

- ☐ Yes, go to 5.18, complete actions and resume at 5.4
- ☐ No, go to 5.4

Comments: \_\_\_\_\_

\_\_\_\_\_

## FIRE PROTECTION CONFORMANCE CHECKLIST

- 5.4 Is a redundant component located either outside of the fire area or provided with Appendix R, Section III.G.2 separation? (See Section 6.1.1.2 for separation criteria)

- ☐ Yes, go to 5.5  
☐ No, go to 5.18, complete actions and resume at 5.5

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 5.5 Does the modification require deletion of a safe shutdown component? (Ref. Tables 6.7-1 to 6.7-4, CHAMPS Appendix R Code or Figures 6.6-1 through 6.6-8H and Figures 6.9-1 to 6.9-2.d)

- ☐ Yes, go to 5.6  
☒ No, go to 5.7

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 5.6 Does a safe shutdown component exist that will perform the same function for which the component under consideration was required by AOP 10A, AOP 10B, AOP 10C, or AOP 10D? (Ref. FPER 6.8 and 6.9 descriptions of shutdown procedures)

- ☐ Yes, go to 5.7  
☐ No, go to 5.18, complete actions and resume at 5.7

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 5.7 Does the modification require revision of a safe shutdown component? (Ref. Tables 6.7-1 to 6.7-4, CHAMPS Appendix R Code or Figures 6.6-1 through 6.6-8H and Figures 6.9-1 to 6.9-2.d)

- ☒ Yes, go to 5.8  
☐ No, go to 5.9

Comments: MR 99-029\*B replaces RO-04015 in the recirculation line on the Auxiliary FW pump P-38B. This orifice is in an Appendix R flow path and when it is placed back into service it will not affect the systems ability to perform.  
\_\_\_\_\_

- 5.8 Will the revised shutdown component continue to perform its function required by AOP 10A, AOP 10B, AOP 10C, and AOP 10D? (Ref. FPER 6.8 and 6.9)

- ☒ Yes, go to 5.9  
☐ No, go to 5.18, complete actions and resume at 5.9

Comments: \_\_\_\_\_  
\_\_\_\_\_

## FIRE PROTECTION CONFORMANCE CHECKLIST

- 5.9 Does the modification add/delete/revise safe shutdown equipment to the system flow path or boundary isolation from interconnecting systems? (Refer to Appendix R Boundary Figs. 6.6-1 to 6.6-8H and Figs. 6.9-1 to 6.9-2.d)

☐ Yes, go to 5.11

☒ No, go to 5.10

Comments: \_\_\_\_\_

- 5.10 Does the modification add/delete/revise safe shutdown equipment to a connection to the system flow path or boundary isolation from interconnecting systems? (See Appendix R Boundary Figs. 6.6-1 to 6.6-8H and Figs. 6.9-1 to 6.9-2d)

☐ Yes, go to 5.11

☒ No, go to 5.13

Comments: \_\_\_\_\_

- 5.11 Does the modification affect the operation of the system (e.g., changes in system flow rate, change in normal positions, etc. See Safe Shutdown System Description FPER Section 6.6)?

☐ Yes, go to 5.12

☐ No, go to 5.13

Comments: \_\_\_\_\_

- 5.12 Does the modification violate the safe shutdown systems performance goals as presented in FPER Vol. 4, Section 6.0, including all Subsections 6.1 to 6.19?

☐ Yes, go to 5.18, complete actions and resume at 5.13

☐ No, go to 5.13

Comments: \_\_\_\_\_

- 5.13 Does the modification affect any mechanical sub- or support components of safe shutdown components not listed on the safe shutdown equipment list (e.g., SOVs, check valves, etc.) (See CHAMPS Appendix R Listing. If it is a support component for safe shutdown equipment, then it also becomes a safe shutdown component.)?

☒ Yes, go to 5.14

☐ No, go to 5.16

Comments: \_\_\_\_\_

## FIRE PROTECTION CONFORMANCE CHECKLIST

- 5.14 Does the modification to the sub- or support component affect the operability of its associated safe shutdown equipment? (i.e., Failure of a support component that results in failure of a safe shutdown component)

- ☐ Yes, go to 5.15  
☒ No, go to 5.16

Comments: The modified Auxiliary FW pump P-38B recirculation line will be set to operate the same as the original recirculation line.

- 5.15 Will the safe shutdown equipment continue to perform its function required by AOP 10A, AOP 10B, AOP 10C, and/or AOP 10D? (Ref. FPER 6.8 and 6.9)

- ☐ Yes, go to 5.16  
☐ No, go to 5.18, complete actions and resume at 5.16

Comments: \_\_\_\_\_

- 5.16 Does the modification add/delete/revise any electrical sub or support components which support the identified safe shutdown component(s) (e.g., power supplies, relays, switches, motor operators)? (Ref. Associated Circuit Analysis FPER 6.13)

- ☐ Yes, go to 5.17  
☒ No, go to 6.2

Comments: \_\_\_\_\_

- 5.17 Do the sub- or support components impact the operability of associated safe shutdown equipment required by AOP 10A, AOP 10B, AOP 10C, and/or AOP 10D? (Ref. FPER 6.8 and 6.9)

- ☐ Yes, go to 5.18, complete actions and resume at 6.1  
☐ No, go to 6.1

Comments: \_\_\_\_\_

- 5.18 The addition/deletion/revision of safe shutdown components, sub- or support components affects safe shutdown. List the equipment and the affected systems and refer to FPER Section 8.4.4.1. RESUME checklist completion.

Safe Shutdown System(s), Components, Sub- or Support  
Component(s): \_\_\_\_\_

## FIRE PROTECTION CONFORMANCE CHECKLIST

### 6.0 SAFE SHUTDOWN CABLE ASSOCIATED CIRCUITS AND SPURIOUS OPERATION (Ref. FPER 8.4.3.3)

6.1 Does the modification require addition of a safe shutdown cable? (Ref. FPER 8.4.3.3.1)

- ☐ Yes, go to 6.2  
☒ No, go to 6.4

Comments: \_\_\_\_\_

6.2 Will the cable be routed in a fire area(s) where, if a fire is postulated, the associated safe shutdown component is required to be operable? (Ref. FPER 6.13 and 8.4.3.3.2) (See Figs. 6.6-8.a to 6.6-8.h and 6.9-1 to 6.9-2.d)

- ☐ Yes, go to 6.3  
☒ No, go to 6.4

Comments: \_\_\_\_\_

6.3 Will the failure of the new cable cause the associated safe shutdown component to be inoperable?

- ☐ Yes, go to 6.19, complete actions and resume at 6.4  
☐ No, go to 6.4

Comments: \_\_\_\_\_

6.4 Does the modification require deletion of a safe shutdown cable? (Ref. 8.4.3.3.1, Fire Zone Evaluations in FPER 5.6 and INDMS shutdown analysis)

- ☐ Yes, go to 6.5  
☒ No, go to 6.7

Comments: \_\_\_\_\_

6.5 Will the deletion of the cable affect local and/or remote control or indication capability of the associated safe shutdown component?

- ☐ Yes, go to 6.6  
☐ No, go to 6.7

Comments: \_\_\_\_\_

## FIRE PROTECTION CONFORMANCE CHECKLIST

- 6.6 Is the affected local and/or remote contro. or indication capability of the associated safe shutdown component required for Appendix R safe shutdown by AOP 10A, AOP 10B, AOP 10C, and/or AOP 10D? (Ref. FPER 6.8 and 6.9)

- ☐ Yes, go to 6.19, complete actions and resume at 6.7  
☐ No, go to 6.7

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 6.7 Does the modification require revision or rerouting of an existing safe shutdown cable?

- ☐ Yes, go to 6.8  
☒ No, go to 6.10

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 6.8 Does the rerouting of the cable maintain the separation of unique trains required by Appendix R to achieve safe shutdown?

- ☐ Yes, go to 6.9  
☐ No, go to 6.19, complete actions and resume at 6.10

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 6.9 Will the revision of the cable affect the operability of the associated safe shutdown component?

- ☐ Yes, go to 6.19, complete actions and resume at 6.10  
☐ No, go to 6.10

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 6.10 Does the modification require addition or revision of a circuit connected or to be connected to safe shutdown power supply? (Ref. FPER 8.4.3.3.2 and Figs. 6.6-8.a to 6.6-8.h and Figs. 6.9-1 to 6.9-2.d)

- ☐ Yes, go to 6.11  
☒ No, go to 6.12

Comments: \_\_\_\_\_  
\_\_\_\_\_

## FIRE PROTECTION CONFORMANCE CHECKLIST

- 6.11 Will adequate electrical coordination between the safe shutdown power supply feeder breaker and the added or revised component breaker or fuse exist? (Ref. FPER 8.4.3.3.2.2 and 6.13.3)

- ☐ Yes, go to 6.12  
☐ No, go to 6.19, complete actions and resume at 6.12

Comments: \_\_\_\_\_

- 6.12 Does the modification require addition or revision of any non-safe shutdown circuits?

- ☐ Yes, go to 6.13  
☒ No, go to 6.15

Comments: \_\_\_\_\_

- 6.13 Will the new or revised cables be equipped with circuit breakers, fuses or some kind of current limiting device? (Ref. FPER 6.13.3.1)

- ☐ Yes, go to 6.15  
☐ No, go to 6.14

Comments: \_\_\_\_\_

- 6.14 Will the new or revised cables share a common enclosure (raceway, panel etc.) with safe shutdown cables? (Ref. FPER 8.4.3.3.2.2 and 6.13.3.3)

- ☐ Yes, go to 6.19, complete actions and resume at 6.15  
☐ No, go to 6.15

Comments: \_\_\_\_\_

- 6.15 Does the modification add/delete/revise any safe shutdown components and/or high/low pressure interfaces which could operate spuriously? (Ref. FPER Vol. 4, Section 6.14.1.1 and FPER 8.4.3.3.3.1)

- ☐ Yes, go to 6.16  
☒ No, go to 6.17

Comments: \_\_\_\_\_

## FIRE PROTECTION CONFORMANCE CHECKLIST

- 6.16 Could the addition/deletion/revision of the spurious safe shutdown components alter system operation and prevent the achievement of safe shutdown? (FPER 8.4.3.3.1, 6.13.1.2, and 6.14)

- ☐ Yes, go to 6.19, complete actions and resume at 6.17  
☐ No, go to 6.17

Comments: \_\_\_\_\_

- 6.17 Does the modification add/delete/revise the circuits of any safe shutdown equipment listed in FPER Vol. 1, Spurious Operations Table 6.8.4.1

- ☐ Yes, go to 6.18  
☒ No, go to 7.1

Comments: \_\_\_\_\_

- 6.18 Will the recommended resolution for mitigating the spurious operation listed in Table 6.8.4.1 remain applicable after the modification?

- ☐ Yes, go to 7.1  
☐ No, go to 6.19, complete actions and resume at 7.1

Comments: \_\_\_\_\_

- 6.19 The modification impacts safe shutdown. List the safe shutdown circuits and associated components and refer to FPER Section 8.4.4.1. RESUME checklist completion.

Comments: \_\_\_\_\_

### 7.0 EFFECTS ON EXEMPTIONS/EVALUATIONS (Ref. FPER)

- 7.1 Is the modification proposed to be implemented in a fire zone for which an exemption is noted in the Fire Zone Evaluation in FPER Vol. 2 and/or Vol. 3 Section 5.6?

- ☒ Yes, go to 7.6, complete actions and resume at 7.2  
☐ No, go to 7.2

Comments: \_\_\_\_\_



## FIRE PROTECTION CONFORMANCE CHECKLIST

7.2 Does the modification add/delete/revise any safe shutdown or spurious components and/or cables?

- ☐ Yes, go to 7.6 complete actions and resume at 7.3  
☒ No, go to 7.3

Comments: \_\_\_\_\_

7.3 Does the modification increase the combustible loading or level of fire hazard (including intervening combustibles) above that approved in an NRC exemption in the fire zone of concern? (See fire zone evaluations for zone in which the modification is planned - FPER 5.6) The following fire zones have exemption conditions associated with restricting intervening combustibles. Review the fire evaluation for these fire zones in FPER Section 5.6

142	CCW Pump Room
151	SI/CS Pump Room
156	1B32 MCC Room
166	2B32 MCC Room
304	AFW Pump Room
318	Cable Spreading Room
552	SW Pump Room

- ☐ Yes, go to 7.6, complete actions and resume at 7.4  
☒ No, go to 7.4

Comments: Fire Protection in Room 304 have been previously identified and Hourly Fire rounds are being performed. This work will be governed by controls prescribed by NP 1.9.9 and NP 1.9.13.

7.4 Does the modification add/delete/revise a detection or suppression system that has been credited with an NRC exemption in the fire zone of concern? (See applicable fire zone evaluation in FPER 5.6)

- ☐ Yes, go to 7.6, complete actions and resume at 7.5  
☒ No, go to 7.5

Comments: \_\_\_\_\_

7.5 Does the modification affect any other means of fire protection (hatches, curbs, etc.) which formed the basis for an NRC exemption? (See applicable fire zone evaluation in FPER 5.6)?

- ☐ Yes, go to 7.6, complete actions and resume at 7.7  
☒ No, go to 7.7

Comments: \_\_\_\_\_

## FIRE PROTECTION CONFORMANCE CHECKLIST

- 7.6 Does the modification violate a basis for the requested exemption listed in the exemption request section of the fire zone fire evaluation in FPER Vol. 2 and/or Vol. 3, Section 5.6?

- ☐ Yes, go to 7.9  
☐ No, RESUME Checklist Completion

Comments: \_\_\_\_\_

- 7.7 Are the systems, components, or cables redundant to the systems, components, or cables affected by the modification located in fire zones for which other exemptions are noted in the fire zone evaluations in FPER Vol. 2 and/or Vol. 3, Section 5.6?

- ☐ Yes, go to 7.8  
☒ No, go to 8.1

Comments: \_\_\_\_\_

- 7.8 Does the modification violate a basis for these other exemption(s) (accessibility, low combustible loading, barriers, equipment location, etc.) listed in the exemption request section of the fire zone fire evaluation in FPER Vol. 2 and/or Vol. 3, Section 5.6?

- ☐ Yes, go to 7.9, complete actions and resume at 8.1  
☐ No, go to 8.1

Comments: \_\_\_\_\_

- 7.9 The modification violates the basis for an exemption or evaluation. List the basis affected and refer to FPER Section 8.4.4.1. RESUME checklist completion.

Cables and Components: \_\_\_\_\_

### 8.0 EMERGENCY LIGHTING (Ref. FPER 8.4.3.5)

- 8.1 Does the modification add/delete/revise safe shutdown component(s) for which manual operation is required by AOP 10A, AOP 10B, AOP 10C, and/or AOP 10D? (FPER Section 6.8 and 6.9)

- ☐ Yes, go to 8.2  
☒ No, go to 8.4

Comments: \_\_\_\_\_

## FIRE PROTECTION CONFORMANCE CHECKLIST

- 8.2 Is emergency lighting which meets the requirements of Appendix R, Section IIIJ provided at the component(s) and access/egress routes thereto? (FPER Section 6.1.9 and 9.1)

- ☐ Yes, go to 8.4  
☐ No, go to 8.3

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 8.3 Does the modification add emergency lighting which meets the requirements of Appendix R, Section IIIJ at the added component(s) and access/egress routes thereto? (FPER Section 6.1.9 and 9.2)

- ☐ Yes, go to 8.4  
☐ No, go to 8.11, complete action and resume at 8.4

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 8.4 Does the modification add/delete/revise an emergency lighting system or any emergency lights?

- ☐ Yes, go to 8.5  
☒ No, go to 8.7

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 8.5 Is the affected portion of the emergency lighting system required for Appendix R safe hot shutdown and/or fire fighting purposes?

- ☐ Yes, go to 8.6  
☐ No, go to 8.7

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 8.6 Does the affected portion of emergency lighting system meet the requirements for intensity, coverage, and required battery capacity of the emergency lighting technical evaluation for Point Beach Nuclear Plant, FPER Vol. 5, Section 9.2?

- ☐ Yes, go to 8.7  
☐ No, go to 8.11, complete action and resume at 8.7

Comments: \_\_\_\_\_  
\_\_\_\_\_

## FIRE PROTECTION CONFORMANCE CHECKLIST

- 8.7 Does the modification downgrade the ability to perform firefighting/safe shutdown activities efficiently during a blackout?

☐ Yes, go to 8.11, complete action and resume at 8.4  
☒ No, go to 8.8

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 8.8 Does the modification involve any structural changes or equipment installations that may block the illumination path of an emergency light?

☐ Yes, go to 8.9  
☒ No, go to 9.1

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 8.9 Is the affected emergency light required for safe shutdown (e.g., required for illumination of safe shutdown component, local control station, or access/egress routes thereto)?

☐ Yes, go to 8.10  
☐ No, go to 9.1

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 8.10 Does the affected emergency light still meet the requirements of the emergency lighting technical evaluation for Point Beach Nuclear Plant, FPER Vol. 5, Section 9.2?

☐ Yes, go to 9.1  
☐ No, go to 8.11, complete action and resume at 9.1

Comments: \_\_\_\_\_  
\_\_\_\_\_

- 8.11 The modification impacts on Appendix R safe shutdown compliance. List the affected position of emergency lighting system and refer to FPER Section 8.4.4.1. RESUME checklist completion.

Emergency Lighting System: \_\_\_\_\_  
\_\_\_\_\_

## FIRE PROTECTION CONFORMANCE CHECKLIST

### 9.0 PLANT COMMUNICATIONS (Ref. FPER 8.4.3.6)

9.1 Does the modification add/delete/revise plant Motorola IIT-1000 Portable Radio communication systems?

☐ Yes, go to 9.2

☒ No, go to 9.4

If yes, verify communications between local control stations by updating the Appendix R radio test performed in CR92-806 and included in FPER Section 9.0.

Comments: \_\_\_\_\_

9.2 Is the affected portion of plant communication system required for Appendix R safe shutdown and/or fire fighting purposes? (See FPER 4.1.11)

☐ Yes, go to 9.3

☐ No, go to 9.4

Comments: \_\_\_\_\_

9.3 Does the modification add/delete/revise anything (e.g., antenna system, repeaters, power supplies, etc.) that could impede plant communications including radio transmission or reception? (See FPER 4.1.11)

☐ Yes, go to 9.6, complete action and resume at 9.4

☐ No, go to 9.4

Comments: \_\_\_\_\_

9.4 Does the modification involve any structural changes that may impede radio transmission reception, or other communication means? (See FPER 4.1.11)

☐ Yes, go to 9.5

☒ No, go to 10.1

Comments: \_\_\_\_\_

9.5 Will the affected communication system still perform its function?

☐ Yes, go to 10.1

☐ No, go to 9.6, complete actions and resume at 10.1

Comments: \_\_\_\_\_

## FIRE PROTECTION CONFORMANCE CHECKLIST

- 9.6 The modification impacts on safe shutdown. List the affected portion of plant communication system and refer to FPER Section 8.4.4.1. RESUME checklist completion.

Plant Communication System: \_\_\_\_\_

### 10.0 REACTOR COOLANT PUMP OIL COLLECTION SYSTEM (Ref. FPER 8.4.3.7)

- 10.1 Does the modification affect any portion of the RCP oil collection system? (See FPER 6.1.10.3)

- ☐ Yes, go to 10.2  
☒ No, Sign checklist complete below Item 10.5

Comments: \_\_\_\_\_

- 10.2 Does the modification affect the quantity of oil in the reactor coolant pumps?

- ☐ Yes, go to 10.5, complete actions and resume at 10.3  
☐ No, go to 10.3

Comments: \_\_\_\_\_

- 10.3 Does the modification affect the seismic design of the RCP oil collection system?

- ☐ Yes, go to 10.5, complete actions and resume at 10.4  
☐ No, go to 10.4

Comments: \_\_\_\_\_

- 10.4 Does the modification require the temporary removal of the RCP oil collection system during unit operation?

- ☐ Yes, go to 10.5, complete actions and sign checklist complete  
☐ No, sign checklist complete below Item 10.5

Comments: \_\_\_\_\_

- 10.5 The modification impacts on safe shutdown compliance. List the components of the affected portion of the RCP lube oil collection system and refer to FPER Section 8.4.4.1. RESUME checklist completion.

Components: \_\_\_\_\_

## FIRE PROTECTION CONFORMANCE CHECKLIST

### 110 RESULTS

If the completion of any FPCC screening from Sections 1.0 - 10.0 indicates the modification impacts safe shutdown compliance, then the plant fire protection or safe shutdown design basis may be affected. A 10 CFR 50.59 screening must be performed per NP 10.3.1, Authorization of Changes, Tests, and Experiments (10 CFR 50.59), with consideration of the FPCC information to determine if an unreviewed safety question is involved. The design basis fire is the accident to be considered in the 10 CFR 50.59 evaluation. The FPCC becomes part of the documentation supporting the 10 CFR 50.59 screening and safety evaluation.

Inform the NPSU Fire Protection Engineer if fire protection program commitments or compliance with 10 CFR 50, Appendix R will be affected.

Conformance checklist completed.

By: Foltynowicz, A

A. Foltynowicz

Date: 5-17-00



INTERNAL  
CORRESPONDENCE

EDMS ✓  
FILE M1.1  
MR 99-029-B

NPM 2000-0172

To: M. Schug                      D. Faltynski                      D. LeClair                      J. McCullum  
T. Spencer                      J. P. Schroeder                      J. Polacek                      R. Chapman

From: A. Foltynowicz *A. Foltynowicz*

Date: February 16, 2000

Subject: MR 99-029\*B PACKAGE DISTRIBUTION REVIEW TRANSMITTAL

Copy To: (W/O Attachments)

R. Hornak                      D. Schoon                      J. Barrows                      W. Wilson  
L. Armstrong  
File: M1.1 MR 99-029\*B

Attached is the design package for MR 99-029\*B, Auxiliary Feedwater Pump P-38A Minimum Flow Recirc Line Orifice Replacement, for your review and comments. The supporting documents are:

- Design Description
- Design Input Checklist
- Work Order Work Plan IWP 99-029\*B
- Working drawing
- Fire Protection Conformance Checklist
- 50.59 Safety Evaluation
- Documentation Update Checklist
- Bill of Materials for IWP 99-029\*B

Note that not all documents are included with everyone's package. Also, IWP 99-029\*B is not yet complete, but it is reflected in the design documents. It covers non-outage activities to support this modification and will be submitted at a later date.

Please review the package applicable to your review and return the package with comments. I am requesting that reviews be completed by Monday, 04/03/00. Contact me at X7411 if you require additional information.

AF/kls

Attachments

3 18 2000