STATE CHANGE HISTORY

Initiate by RICHARD FLESSNER	Assign Work 2/5/2002 3 57 47 PM Owner TOM CARTER	Assign by TOM CARTER	Conduct Work 2/7/2002 3 39 56 PM Owner JAMES M JOHNSON	Update by SCOTT PFAFF	Conduct Work 2/8/2002 7 02.39 AM Owner JAMES HANNA	Return by JAMES HANNA	Assign Work 3/4/2002 8 00.13 AM Owner TOM CARTER
Reassign by SCOTT PFAFF	Assign Work 3/12/2002 10 35 09 AM Owner WILLIAM ZIPP	Reassign by WILLIAM ZIPP	Assign Work 3/21/2002 2.55.35 PM Owner RICHARD FLESSNER	Reassign by RICHARD FLESSNER	Assign Work 4/11/2002 1:59.00 PM Owner DICK HORNAK	Assign by DICK HORNAK	Conduct Work 4/15/2002 2.20 15 PM Owner JASON HAWMAN
Work Complete by JASON HAWMAN	Review & Approval 7/31/2002 1:24 10 PM Owner DICK HORNAK	Reject by DICK HORNAK	Conduct Work 8/13/2002 9 23 47 AM Owner JASON HAWMAN	Return by RICHARD FLESSNER	Assign Work 8/13/2002 9 26 53 AM Owner DICK HORNAK	Assign by DICK HORNAK	Conduct Work 8/13/2002 9 33 26 AM Owner ROB CHAPMAN
Work Complete by ROB CHAPMAN	Review & Approval 9/4/2002 3 55.01 PM Owner DICK HORNAK	Approved by DICK HORNAK	Quality Check 9/5/2002 12 00:41 PM Owner PBNP CAP Admin				

SECTION 1

Activity Request Id:	CA003702		
Activity Type:	Corrective Action	**Submit Date:**	2/5/2002 3.57:47 PM
Site/Unit:	Point Beach - Common		
Activity Requested:	Review the description of the AFW recirculation line function in the FSAR, DBD-01, and the IST Program for consistency and accuracy, and initiate revisions as required		
CATPR:	N	**Initiator:**	FLESSNER, RICHARD
Initiator Department:	EX Engineering Processes PB	**Responsible Group Code:**	EDMP Engineering Design Mechanical PB
Responsible Department:	Engineering	**Activity Supervisor:**	DICK HORNAK
Activity Performer:	ROB CHAPMAN		

SECTION 2

Priority:	3	**Due Date:**	9/13/2002
Mode Change Restraint:	(None)	**Management Exception From PI?:**	N
QA/Nuclear Oversight?:	N	**Licensing Review?:**	N

NRC Commitment?: N ⊗ NRC Commitment Date:

SECTION 3

Activity Completed:

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

1/18/2002 12.54PM - LARRY PETERSON
Reassigned to R. Flessner for completion following extension

3/12/2002 10 35AM - SCOTT PFAFF:
Reassigned to B. Zipp for work assignment due to the transfer of J Hanna (per request of T. Carter)

4/15/2002 2:20PM - DICK HORNAK.
As the previous owners of this item seem to have shirked their responsibilities in dispositioning it, assigning this research to JOH.

7/31/2002 1:24:10 PM - JASON HAWMAN:
The FSAR and DBD-01 were checked for consistency and accuracy. The IST program coordinator was consulted for the IST description.

FSAR 10.2 describes 1/2AOV AF-4002 as dissipating turbine driven pump heat, but does not describe failure position or emergency air supply. The same applies for AF-4007 and 4014 for the motor driven pumps. The 45-second delay on the mini-flow circulation for motor driven pump stability and coast down is also described. There is also analysis of a postulated single control failure for AF-4007 or 4014 that that forces excess air to one of these valves, causing it to fail OPEN This is the opposite scenario to the action item The FSAR does not analyze the circulation line for the loss of air.

DBD-01 Section 1.3.1.9 describes the air supply to all the local AOVs , and describes a nitrogen backup for AF-4012 and 4019, but not for the mini-recirc valves.

The System Endurance parameter section 2.2.3 contains no description of the mini-recirc, even though it has a direct bearing on the longevity of the AFW pump. The only consideration was the magnitude of the various water supplies, and not on actual pump needs.

Section 3.8 lists the function of the recirc valves. One of these functions describes a manual gag in the open position to ensure minimum pump recirculation for the turbine driven pumps during plant fires. There is no listing for pneumatic power to for the purpose of protecting to the pumps. The Component Parameter Worksheet section 3 8.2 specifically states under the Valve Open header that there is no Safety Related function that requires these valves to be open This is still true, due to the assumption that an Operator is on location during the evolution to put full flow to the Steam Generators or shut the pumps down as necessary. Section 3.8.5 discusses pump protection as part of the background on determining the correct failure position, and even notes that the source documents do not consider the worst case of a loss of air and active failure shut of the pump discharge valve, resulting in pump deadhead. A note at the bottom remarks that such a combination of failures falls outside the system design and licensing basis because NUREG –0800 has not been incorporated into the PBNP license.

The IST program does not currently cover the mini-recirc AOVs, due to the fact that minimum flow for the AFW pumps is not considered a Safety Related function

The above sources are not in conflict on any facts, and none of the descriptions contains incorrect data, so no changes will be needed to correct inconsistencies between them Modification 01-144 makes changes to increase the reliability of the air supply to the AOVs, and changes will come as part of the modification closeout, but these changes will not correct any current inconsistency. There are also discussions underway to make the mini-recirc line Safety Related, but no decision has been made on if or how much of the mini-recirc line will be made Safety Related This item should be close, with no following actions for document updates necessary.

8/13/2002 9.33.26 AM - DICK HORNAK:
See 8/13/2002 Note created during Reject transition Reassigning to RCC and changed Due

Date to reflect that in letter NRC 2002-0068.

9/3/2002 5 03:45 PM - RICHARD FLESSNER:
This priority for this item was incorrectly changed from a 3 to a 4 and is being returned to a 3 As a CA from a RCE a priority 3 is the correct level (There is a CAP and ACE addressing this issue) The due date is being revised to 9/13/02 because the previous due date change was not approved by a senior manager. Jim Freels approved a new due date of 9/13/02.

9/4/2002 3 55 01 PM - ROB CHAPMAN:
Close this item to new action item CA026231, which will track installation of MR 02-029 and updates to the FSAR, DBD, and IST background document as needed to reflect the functions of the AFW Mini Recirc AOVs.

9/5/2002 12 00.41 PM - DICK HORNAK:
We have reviewed the description of the AFW recirculation line function in the FSAR, DBD-01 and the IST Program and find the only changes that are required are those resulting from the recent decision to upgrade the open function to safety related. These updates to the design and licensing basis are being implemented via MR 02-029, Aux Feed Mini Recirc Safety Upgrade. The evaluations required for this item are complete and this item may be closed

CA 026231 has been initiated to track the completion of MR 02-029 and documentation updates related to its closure.

SECTION 4

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

SECTION 5

Project:	CAP Activities & Actions		
State:	Quality Check	**Active/Inactive:**	Active
Owner:	PBNP CAP Admin	**AR Type:**	Daughter
Submitter:	RICHARD FLESSNER	**Assigned Date:**	8/13/2002
Last Modified Date:	9/6/2002 9.09 12 AM	**Last Modifier:**	DICK HORNAK
Last State Change Date:	9/5/2002 12:00 41 PM	**Last State Changer:**	DICK HORNAK
Close Date:			
One Line Description:	Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW		
NUTRK ID:	CR 01-3595		
Child Number:	1		
References:	CR 01-2278ÈRCE 01-069ÈGOOD CATCH		
Update:			
Import Memo Field:			
CAP Admin:	PBNP CAP Admin	**Site:**	Point Beach
OLD_ACTION_NUM:			
Cartridge and Frame:			

NOTES/COMMENTS

Note created during 'Return' transition by JAMES HANNA (3/4/2002 8 00.13 AM)
Item requires reassignment to new AF system engineer.

Note created during 'Reject' transition by DICK HORNAK (8/13/2002 9 23.47 AM)
In light of recent communication with NRC via letter NRC 2002-0068 dated August 12, 2002, and the station's desire to upgrade portions of the miniflow line and the open function of the miniflow AOV's to Safety Related, this item should remain open until design and licensing documentation are appropriately changed to reflect this position.

Note created during 'Return' transition by RICHARD FLESSNER (8/13/2002 9:26:53 AM)
Returned to Dick Hornak per his request. (RAF)

Additional Approval Note by DICK HORNAK (9/6/2002 9.09.12 AM)
During preparation of MR 01-144 and MR 02-001 which were installing backup pneumatic supplies to the AFW mini-recirc AOVs, an extensive review of the FSAR, DBDs, and IST background document was performed. As part of closeout for these mods, FSAR change requests were prepared to document the new backup supplies. The IST background document did not require revision at this time. A markup of DBD-01 was prepared, which corrected many errors and inconsistencies, and added reference to these mods This update has not yet been submitted.

Now that the decision has been made to make the recirc AOVs open function safety related, as implemented by MR 02-029, new updates will be required to the FSAR, Tech Spec Bases, DBDs, and the IST background document. The previous DBD-01 update is being revised to incorporate the new mod. New updates for all other documents are being prepared. These updates will be tracked by MR 02-029.

ATTACHMENTS AND PARENT/CHILD LINKS

ACE000314: Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW

CAP001415: Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW

Point Beach Nuclear Plant

FINAL SAFETY ANALYSIS REPORT CHANGE REQUEST

FCR 02 - 019

1. SOURCE DOCUMENT(S). (List the MR, SER, NRC correspondence, or other document that prompts the FSAR change.)

MR 02-001, MR 01-144, CR 01-2278, CR 01-3595, SCR 2002-0010-01, SCR 2001-0989-01, SCR 2002-0005-01, EVAL 2002-005 (SCR 2001-0989-01, SCR 2002-0005-01 documented that a 50.59 evaluation was required). Cayia Letter to File, "Designation of Backup Pneumatics for AFW Mini-Recirculation Valves as Safety Related," April 25, 2002, NPM 2002-0228

2. a. EFFECT(S) ON FSAR: (Describe the requested FSAR changes and the basis for FSAR markups.)

(1) **FSAR 7.3.3.4, Manual AFW Flow Control During Plant Shutdown.** Added discussion of operator actions required in the event of loss of instrument air (INSERT A)·

"If a loss of instrument air also occurs, or a Auxiliary Feedwater Pump minimum flow recirculation valve fails closed, manual operator action is required to prevent the potential failure of the pump(s) By procedure, the operator will either secure running pump(s), or maintain a minimum forward flow through the still running pump(s) to prevent pump damage that could be caused by overheating "

Basis for the change is EVAL 2002-005 which evaluated changes to EOPs and AOPs which required the operator to either secure running pumps, or maintain a minimum forward flow through the running pumps as necessary to maintain steam generator level. Basis: EVAL 2002-005; NPM 2002-0228.

(2) **FSAR 9.7.1 DESIGN BASIS** (FSAR 9.7, Instrument Air (IA) / Service Air (SA)) Added the following text about he non-safety-related functions of the instrument air system resulting from modifications MR 01-144 and MR02-001 (INSERT B):

"The IA system also performs the following non-safety-related functions:

The nitrogen gas bottles that supply the motor-driven Auxiliary Feedwater Pump discharge control valves also supply pneumatic pressure to the motor-driven auxiliary pump(s) minimum recirculation valve(s) to open, or maintain the valve(s) open, for a period of time in the event of a loss of instrument air. This backup supply provides additional time for operators to secure the pump(s) or establish minimum flow through the pump(s) to prevent overheating. Isolation check valves are provided to isolate the nitrogen supply from instrument air.

Accumulator tanks are provided as a backup pneumatic source in the instrument air lines to the turbine-driven Auxiliary Feedwater Pump minimum recirculation control valve for each unit This backup supply will allow the recirculation line to open, or maintain the valve(s) open, for a period of time in the event of a loss of instrument air. This backup supply provides additional time for operators to secure the pump or establish minimum flow through the pump to prevent overheating. Isolation check valves are provided to isolate the accumulator tanks from instrument air "

Basis: MR 01-144, MR 02-001, SCR 2002-0010-01.

(3) **FSAR 10.2.2 System Design and Operation, page 10.2-2** (FSAR 10.2, Auxiliary Feedwater System (AF)) Added following text (INSERT C):

"An air accumulator tank is provided in the instrument air line as a backup pneumatic source to the AF-4002 recirculation line valve for a period of time in the event of a loss of instrument air. This provides additional time for the operator to either secure the pump, or maintain a minimum flow through the operating pump, and prevent pump damage that could be caused by overheating."

Basis for the change is EVAL 2002-005 which evaluated changes to EOPs and AOPs which required the operator to either secure running pumps, or maintain a minimum forward flow through the running pumps to prevent damage due to overheating; and, MR 02-001, SCR 2002-0010-01 for the addition of the accumulators Basis: EVAL 2002-005; NPM 2002-0228, MR 02-001, SCR 2002-0010-01

4) **FSAR 10.2.2 System Design and Operation, page 10.2-3** (FSAR 10.2, Auxiliary Feedwater System (AF)) Added following text (INSERT D).

"The backup nitrogen supply used for the back-pressure control valves is also used to provide a backup pneumatic source to the AF-4007 and AF-4014 recirculation line valves for a period of time in the event of a loss of instrument air. This provides additional time for the operator to either secure the pump(s), or maintain a minimum flow through the operating pump(s), and prevent pump damage that could be caused by overheating "

Basis for the change is EVAL 2002-005 which evaluated changes to EOPs and AOPs which required the operator to either secure running pumps, or maintain a minimum forward flow through the running pumps as necessary to maintain prevent damage to the pumps due to overheating; and. MR 01-144, SCR 2002-0010-01 for the use of the existing backup nitrogen supply for the recirculation valves. Basis: EVAL 2002-005, NPM 2002-0228, MR 01-144, SCR 2002-0010-01.

(5) **FSAR 10.2.2 System Design and Operation, page 10.2-3** (FSAR 10.2, Auxiliary Feedwater System (AF)) Added following text (INSERT E):

"Operator action is required to maintain proper steam generator levels and control auxiliary feedwater flow. In the event that multiple auxiliary feedwater pumps start and run as designed, the initial auxiliary feedwater flow will be significantly greater than the design basis flow."

This change reiterates the current discussion in FSAR 7.3.3.4 regarding manual AFW flow control is required during plant shutdown, and reinforces the point that greater than design basis flows will occur if multiple AFW pumps start and therefore operator action is required to maintain stem generator level and control auxiliary feedwater flow. Basis: FSAR 7.3.3.4 and EVAL 2002-005.

b. TECHNICAL SPECIFICATION BASES AFFECTED: TS B 3.7.5 Auxiliary Feedwater (AFW) System

c. ☒ CORRESPONDING TECHNICAL SPECIFICATION BASES CHANGE SUBMITTED - OR ☐ NOT APPLICABLE

3. ☒ ATTACH MARKUPS FROM CURRENT FSAR PAGE(S)

4 SIGNIFICANCE OF THE FSAR CHANGES(S):

☒ FSAR Licensing Basis Change

☐ Editorial Change

Justification: The proposed changes have had 50.59 review per screening SCR 2002-0010-01 and 50.59 evaluation EVAL 2002-005 and incorporates changes in the PBNP facility and procedures.

5 INITIATOR: David Black (Print Name) David Black (Signature) DATE: 7-11-02

REVIEWER: Rob Chapman (Print Name) [signature] (Signature) DATE: 7-18-02

6. Forward this FCR to Licensing Retain a copy for your records. If required by the associated procedure. attach a copy of the FCR to the associated source document (e.g , MR) Final disposition of the FCR will be documented in accordance with NP 5.2.6 and retained in the designated file

7. REGULATORY SERVICES AND LICENSING DISPOSITION:

☐ FCR Rejected for reasons discussed below If rejected, notified initiator on this date: _____

☒ FCR Accepted.

Printed Name of Licensing Reviewer: L.A. Schofield Signature: L.A. Schofield Date: 8-16-02

Discussion:

The text added to FSAR 7.3.3.4, 9.7.1 and 10.2.2 is supported by several documents: EVAL 2002-005, SCR 2002-0010-01, SCR 2001-0989-01, SCR 2002-0005-01, MR 01-144, MR 02-001, and NPM 2002-0228.

8. FSAR COORDINATOR DISPOSITION:

☐ FCR Rejected for reasons discussed below. Notified initiator on this date: 8-30-2002

☒ FCR Accepted

Printed Name of FSAR Coordinator: David Black Signature: David Black 8-3-2002

Discussion:

9. FINAL DISPOSITION

☐ FCR addressed entirely by FSAR Revision dated: _____

☐ FCR addressed partially. Interim changes were made under FSAR Revision dated: _____

Changes are subject to FCR number _____

Discussion:

FSAR Coordinator: Print Name: _____ Signature: _____ Date: _____

10 RETAIN IN DOCUMENT CONTROL FILE: A1.5.1

c. Containment Isolation Reset

NUREG 0578 Item 2.1.4 and NUREG 0737 Item II.E.4.2 require that the containment isolation design shall be such that resetting the isolation signal will not result in the automatic reopening of containment isolation valves, and that reopening of containment isolation valves shall require deliberate operator action. Resetting of safety injection, containment ventilation isolation, or containment isolation will not automatically open any of the fluid paths to or from containment which are isolated upon receipt of the initiating signal. The valves must be individually opened by deliberate operator action. Containment ventilation isolation valves are locked shut and may only be opened during a cold shutdown. Additionally, resetting of Safety Injection does not reset containment ventilation isolation or containment isolation. Resetting of containment isolation or containment ventilation isolation can occur only if the initiating signal is no longer present.

7.3.3.4 Manual AFW Flow Control During Plant Shutdown

The successful operation of the engineered safety features only involves actuation, with one exception. This exception is manually controlling steam generator water level using the auxiliary feedwater pumps during plant shutdown, to remove reactor decay and sensible heat. This manual control involves positioning the auxiliary feedwater flow control valves in order to maintain proper steam generator water level. Steam generator water level indication and controls are located in the control room and at a local control station.

Add Insert A

7.3.3.5 Separation of SI Reactor Trip Signals

The SI actuation contacts that supply a signal to the reactor trip logic originate in each of the two ESFAS logic trains. Each ESFAS logic train supplies a reactor trip signal to both trains of reactor protection logic. This leads to a unique condition where the ESFAS logic A train is communicating with the RPS logic B train (as well as with the A train), and the ESFAS B train is communicating with the RPS A train (as well as with the B train). This condition does not create an electrical separation conflict between redundant trains because the inputs to reactor protection are channel-related. Within each train of reactor protection, the two inputs from SI actuation train A & B enter two separate channel-related racks. There, the inputs drive separately fused isolation relays.

7.3.3.6 Seismic Qualification of ESF Actuation System Equipment

The protection system components seismic qualification test program described in Section 7.2 3.4 for reactor protection system components also applies to ESFAS components.

INSERT A. FSAR 7.3.3.4 Manual AFW Flow Control During Plant Shutdown

If a loss of instrument air also occurs, or an Auxiliary Feedwater Pump minimum flow recirculation valve fails closed, manual operator action is required to prevent the potential failure of the pump(s). By procedure, the operator will either secure running pump(s), or maintain a minimum forward flow through the still running pump(s) to prevent pump damage that could be caused by overheating.

Editorial changes for consistency with existing FSAR 7.3.3.4
LAS
8-16-02

9.7 INSTRUMENT AIR (IA) / SERVICE AIR (SA)

There are two compressed air systems that supply air plant-wide: the instrument air (IA) system and the service air (SA) system. The SA system can be cross-tied to supply the IA system automatically or manually. The instrument air system supplies dry, oil-free air to pneumatic controllers and control valves required for the normal operation of both units. The service air system provides non-dried, oil-free air to the plant services header for equipment not requiring the dry air provided by the IA system.

9.7.1 DESIGN BASIS

The only active safety-related design basis functions of these systems is the automatic isolation of instrument air into containment on a containment isolation signal (this function is provided by containment isolation valves (1/2 IA-3047 and 1/2 IA-3048) and the closure of the purge supply and exhaust valve boot seal accumulator check valves (1VNPSE-18, 1VNPSE-28, IA-1280 & IA-1281 for Unit 1 and 2VNPSE-18, 2VNPSE-28, IA-1401 & IA-1402 for Unit 2) on loss of instrument air pressure The service air containment isolation valves (1/2 SA-17 and 1/2 SA-27) are locked shut manual valves.

The IA and SA systems perform the following safety-related functions:

The IA system shall automatically isolate the instrument air lines penetrating containment whenever a containment isolation signal exists to maintain containment integrity and prevent release of radioactivity to the outside environment.

The IA system shall automatically isolate the purge supply and exhaust valve accumulators, including the supplemental nitrogen bottle system for 2VNPSE-3212 and 2VNPSE-3244, from the IA system during a loss of instrument air to maintain containment integrity and prevent release of radioactivity to the outside environment.

Nitrogen gas bottles supply the motor driven Auxiliary Feedwater Pump discharge control valves with nitrogen pressure for valve operation during loss of instrument air. Nitrogen gas bottles also supply the Power Operated Relief Valves (PORV's) with nitrogen pressure for valve operation during loss of instrument air while the Low Temperature Over Pressure (LTOP) system is functional.

The SA system shall be capable of maintaining isolation of the service air lines penetrating containment during accident conditions to maintain containment integrity and prevent release of radioactivity to the outside environment.

Add Insert B

INSERT B. FSAR 9.7.1 Design Basis

(Add the following text to the end of the 6/02 version of FSAR Section 9.7.1)

The IA system also performs the following non-safety-related functions:

The nitrogen gas bottles that supply the motor-driven Auxiliary Feedwater Pump discharge control valves also supply pneumatic pressure to the motor-driven auxiliary pump(s) minimum recirculation valve(s) to open, or maintain the valve(s) open, for a period of time in the event of a loss of instrument air. This backup supply provides additional time for operators to secure the pump(s) or establish minimum flow through the pump(s) to prevent overheating. Isolation check valves are provided to isolate the nitrogen supply from instrument air.

Accumulator tanks are provided as a backup pneumatic source in the instrument air lines to the turbine-driven Auxiliary Feedwater Pump minimum recirculation control valve for each unit. This backup supply will allow the recirculation line to open, or maintain the valve(s) open, for a period of time in the event of a loss of instrument air. This backup supply provides additional time for operators to secure the pump or establish minimum flow through the pump to prevent overheating. Isolation check valves are provided to isolate the accumulator tanks from instrument air.

The AF system also performs the following functions related to regulatory commitments:

In the event of a station blackout (prolonged loss of offsite and onsite AC power) affecting both units, the AF system shall be capable of automatically supplying sufficient feedwater to remove decay heat from both units without any reliance on AC power for one hour (Reference 1).

In the event of plant fires, including those requiring evacuation of the control room, the AF system shall be capable of manual initiation to provide feedwater to a minimum of one steam generator per unit at sufficient flow and pressure to remove decay and sensible heat from the reactor coolant system over the range from hot shutdown to cold shutdown conditions. The AF system shall support achieving cold shutdown within 72 hours (Reference 2).

In the event of an Anticipated Transient Without Scram (ATWS), the AF system shall be capable of automatic actuation by use of equipment that is diverse from the reactor trip system. This is accomplished by the AMSAC system described in FSAR Section 7.4. An AFW pump start delay time of less than or equal to 90 seconds is assumed in the ATWS analysis. This delay time consists of a 30 second AMSAC time delay plus a 60 second AF system pump start response time. (Reference 4)

10.2.2 SYSTEM DESIGN AND OPERATION

The auxiliary feedwater system consists of two electric motor-driven pumps, two steam turbine-driven pumps, pump suction and discharge piping, and the controls and instrumentation necessary for operation of the system. Redundancy is provided by utilizing two pumping systems, two different sources of power for the pumps, and two sources of water supply to the pumps. The system is categorized as seismic Class I and is designed to ensure that a single fault will not obstruct the system function.

One system utilizes a steam turbine-driven pump for each unit (1/2P-29) with the steam capable of being supplied from either or both steam generators. This system is capable of supplying 400 gpm of feedwater to a unit, or 200 gpm to each steam generator through normally throttled MOVs AF-4000 and AF-4001. The feedwater flowrate from the turbine-driven auxiliary feedwater pump depends on the throttle position of these MOVs. Check valves are provided to help prevent backflow when the pumps are not in service. Each pump has an AOV (AF-4002) controlled recirculation line back to the condensate storage tanks to ensure minimum flow to dissipate pump heat. The pump drive is a single-stage turbine, capable of quick starts from cold standby and is directly connected to the pump. The turbine is started by opening either one or both of the isolation valves (MS-2019 and MS-2020) between the turbine supply steam header and the main steam lines upstream of the main steam isolation valves. The turbine and pump are normally cooled by service water with an alternate source of cooling water from the firewater system.

Add Insert C

The other system is common to both units and utilizes two similar motor-driven pumps (P-38A and P-38B), each capable of obtaining its electrical power from the plant emergency diesel generators. Each pump has a capacity of 200 gpm with pump P-38A capable of supplying the A steam generator in either or both units through an AOV back-pressure control valve AF-4012 and normally closed MOVs, AF-4022 and AF-4023, and with pump P-38B capable of supplying the B steam generator in either or both units through an AOV back-pressure control valve AF-4019 and normally closed MOVs AF-4020 and AF-4021. Both back-pressure control valves fail open when instrument air to the valves is lost. The valves are provided with a backup nitrogen supply to provide pneumatic pressure in the event of a loss of instrument air. This backup supply assures that the valves do not move to the full open position which combined with low steam generator pressures may cause the pump motor to trip on time overcurrent due to high flow conditions. Each pump has an AOV, AF-4007 for P-38A and AF-4014 for P-38B, controlled recirculation line back to the condensate storage tanks to ensure minimum flow to prevent hydraulic instabilities and dissipate pump heat. The discharge headers also provide piping, valves, and tanks for chemical additions to any steam generator. The pump bearings are ring lubricated and bearing oil is cooled by service water. Chemicals may be added using the tanks installed in the discharge headers or via a cart built to carry the chemicals and inject them into the suction headers. The use of the cart is preferred for reasons of personnel safety and ease of addition.

Add Insert D

The water supply source for the auxiliary feedwater system is redundant. The normal source is by gravity feed from two nominal capacity 45,000 gallon condensate storage tanks while the safety-related supply is taken from the plant service water system whose pumps are powered from the diesel generators if station power is lost.

It is possible that a loss of normal feedwater initiated by a seismic event could also result in the interruption of the normal source of auxiliary feedwater from the condensate storage tanks because the condensate storage tanks are not classified as seismic Class I. The plant operators would be alerted to this problem by receipt of low suction pressure alarms on the auxiliary feedwater pumps. Pump protection is ensured by providing a low suction pressure trip. This trips the motor-driven pump breakers and the turbine-driven pump trip/throttle valves 1MS-2082 and 2MS-2082, to ensure that the pumps are available, after a loss of condensate suction, to be switched to the safety-related water supply. Switchover to the alternate source of seismically qualified auxiliary feedwater, the service water system, can be accomplished by the operators in five minutes or less (Reference 3).

The auxiliary feedwater system has no functional requirements during normal, at power, plant operation It is used during plant startup and shutdown and during hot shutdown or hot standby conditions when chemical additions or small feedwater flow requirements do not warrant the operation of the main feedwater and condensate systems

During normal plant operations, the auxiliary feedwater system is maintained in a standby condition ready to be placed in operation automatically when conditions require. The auxiliary feedwater pumps are automatically started on receipt of any of the following signals:

Turbine-driven feedwater pumps

1. Low-low water level in both steam generators in one unit starts the corresponding pump.

2. Loss of both 4.16 kv buses supplying the main feedwater pump motors in one unit starts the corresponding auxiliary feedwater pump.

3. Trip or shutdown of both main feedwater pumps or closure of both feedwater regulating valves in one unit starts the corresponding pump. These signals are processed through AMSAC at power levels above 40%.

Motor-driven feedwater pumps

1. Low-low water level in either associated steam generator.

2. Trip or shutdown of both main feedwater pumps or closure of both feedwater regulating valves in one unit. These signals are processed through AMSAC at power levels above 40%.

3. Safeguards sequence signal.

The Anticipated Transients Without Scram Mitigating System Actuation Circuit (AMSAC) is further discussed in FSAR Section 7.4.

The motor-driven auxiliary feedwater pump discharge motor operated valves are configured to open automatically, and the steam generator blowdown isolation valves are configured to close automatically, based upon the same signals that start the motor-driven pumps. This ensures automatic delivery of design basis auxiliary feedwater flow to an affected unit's steam generators without operator action. Auxiliary feedwater pump flow and direct flow indication for each steam generator is provided in the control room. Flow indication is also available locally at the discharge of each pump.

Add Insert E

INSERT C. FSAR 10.2.2 System Design and Operation

An air accumulator tank is provided in the instrument air line as a backup pneumatic source to the AF-4002 recirculation line valve for a period of time in the event of a loss of instrument air. This provides additional time for the operator to either secure the pump, or maintain a minimum flow through the operating pump, and prevent pump damage that could be caused by overheating.

INSERT D. FSAR 10.2.2 System Design and Operation

The backup nitrogen supply used for the back-pressure control valves is also used to provide a backup pneumatic source to the AF-4007 and AF-4014 recirculation line valves for a period of time in the event of a loss of instrument air. This provides additional time for the operator to either secure the pump(s), or maintain a minimum flow through the operating pump(s), and prevent pump damage that could be caused by overheating.

INSERT E. FSAR 10.2.2 System Design and Operation

Operator action is required to maintain proper steam generator levels and control auxiliary feedwater flow. In the event that multiple auxiliary feedwater pumps start and run as designed, the initial auxiliary feedwater flow will be significantly greater than the design basis flow.

le of Proposed Activity: Backup Air Systems for Auxiliary Feedwater Pump Minimum Flow Recirculation Valves

Associated Reference(s) #: MR 02-001, MR 01-144, CR 01-2278, CR 01-3595, Calculation 2001-0056, Calculation 2002-0002, Calculation 2002-0001, Calculation M-09334-266-IA.1 Rev 0 – Nitrogen Backup System to AFW Pump Discharge Valve, Calculation S-09334-266-IA.2 Rev 2 – 3D Restraint with Girard Tube Clamp, Calculation 14410.11-NP(B)-001-XE Rev 0 - Qualification of 6 Foot Spans for 3/8 inch Tubing at PBNP, ASME Section VIII – Pressure Vessels, ASME B31.1 – Power Piping, IT 10, IT 10A, IT 10B, EOP 0, EOP 0.1, ECA 0.0, AOP 5B, MR 97-038, NPM 2002-0030, Calculation WE-0005-06, NPM 2002-0228

Prepared by:	Rob Chapman Name (Print)	Signature	Date:	4-26-02
Reviewed by:	Jeff Novak Name (Print)	Signature	Date:	4/26/02

PART I (50.59/72.48) - DESCRIBE THE PROPOSED ACTIVITY AND SEARCH THE PLANT AND ISFSI LICENSING BASIS (Resource Manual 5.3.1)

NOTE: The "NMC 10 CFR 50.59 Resource Manual" (Resource Manual) and NEI 96-07, Appendix B, Guidelines for 10 CFR 72.48 Implementation should be used for guidance to determine the proper responses for 10 CFR 50.59 and 10 CFR 72.48 screenings.

..1 Describe the proposed activity and the scope of the activity being covered by this screening. (The 10 CFR 50 59 / 72.48 review of other portions of the proposed activity may be documented via the applicability and pre-screening process requirements in NP 5.1.8.) Appropriate descriptive material may be attached.

Revision 1 of the screening has incorporated a change in the safety classification of the new components, as requested by PBNP management per NPM 2002-0228.

CR 01-2278, CR 01-3595 and LER 266/2001-005-00 identified an issue that could cause a common mode failure of all auxiliary feedwater pumps. If an accident or event has occurred that has led to the loss of instrument air, then the auxiliary feedwater pump minimum recirculation control valves 1/2AF-4002 for 1/2P-29, AF-4007 for P-38A, and AF-4014 for P-38B will all fail closed. During this event, it will become necessary for operations to throttle back auxiliary feedwater flow to control steam generator level, especially if all four auxiliary feedwater pumps auto start as designed. If care is not taken to ensure that the minimum recirculation valves are open, and the pump discharge valves are shut with no minimum flow path, then the pumps will dead head and fail in a very short time due to overheating. Currently, there is guidance in EOP 0, EOP 0.1, ECA 0.0, and AOP 5B to direct operations to verify adequate pump flow if instrument air has been lost before reducing flow to the steam generators, or to stop the pump.

To provide additional assurance that the auxiliary feedwater pumps will not be damaged on a loss of instrument air, backup air sources will be supplied to all minimum flow recirculation valves. These modifications are an enhancement that will reduce the core damage probability from a loss of instrument air and increase the time for an operator to take manual action to override the valves open. Instrument air accumulator tanks will be installed by MR 02-001 for the 1/2P-29 valves (1/2AF-4002), and the existing nitrogen backup system for the MDAFP discharge valves will be tied in by MR 01-144 for the P-38A/B valves (AF-4007, AF-4014).

Currently, the auxiliary feedwater minimum flow recirculation valves do not have a safety function in the open position, however this function is a design function described in FSAR Section 10.2 and Technical Specification Bases B3.7.5. The basis for the recirculation valves not having a safety function in the open position is that all of the auxiliary feedwater pumps will have open discharge valves upon auto-start (even with a loss of instrument air), and thus the minimum flow recirculation line is not needed early in the accident or event. These minimum

recirculation valves currently have an augmented quality function to open (by manual override) to ensure adequate flow though the associated auxiliary feedwater pump during an Appendix R fire within 45 minutes (per Calculation WE-0005-06), and the backup systems installed by these modifications may be credited to support this function.

The new components will be installed safety-related due to their risk significance. These components will not support a safety function, but will be classified safety-related based on a PBNP management decision, as described in NPM 2002-0228. These modifications will ensure a safety-related supply of air or nitrogen to ensure that the auxiliary feedwater pumps have adequate cooling.

These modifications will provide a sufficient secondary source of air or nitrogen such that these valves are able to operate for at least two hours stroking 10 times per hour if the regular instrument air system is disabled due to a seismic event, tornado, fire, or loss of offsite power. No changes will be made to the control circuitry of the valves, and they will still open automatically when the auxiliary feedwater pump flow drops below the setpoint, when the pumps are started, and when the pumps are secured.

MR 02-001 – 1/2AF-4002 - TDAFP Mini Recirc Valves

For 1/2AF-4002, a stainless steel accumulator tank will be installed in each of the instrument air lines to the mini recirc valves. Upstream of these tanks will be two check valves in series that will isolate the tank from the rest of the instrument air system. These check valves will be spring loaded and will shut on a very small differential pressure to ensure that the tank pressure will remain as high as possible when the instrument air pressure drops. The volume of the tanks will be approximately 150 gallons, which is greater than the required minimum volume determined by Calculation 2001-0056 to be needed to stroke each valve 10 times per hour for two hours. In order to reduce the amount of air required to stroke the valve and thus the tank size, the pressure regulator for the AF-4002 valves which is currently set at 85 psig, and will be re-set to 65 psig. The valve will still stroke full open at this pressure. Calculation 2001-0056 has also verified that these valves will pass full flow even when less than 20% open, since the flow restricting orifices 1/2RO-4003 govern the flow rate in the recirculation line and have the lowest flow coefficient.

The accumulator tanks will be ASME code vessels, designed to Section VIII, and will be rated to 200 psig. These tanks will be installed in the north and south sections of the auxiliary feedwater pump room (not in the pump cubicles). The tank locations were chosen based on the best possible tubing run, and to limit obstructions to plant equipment. Isolation valves will be installed to permit replacement of the check valves should leakage or failure occur. The tubing will be configured such that system pressure can be used to test each the check valves, if necessary.

The new tubing will be routed through the wall that separates the 1P-29 cubicle from the south section of the auxiliary feedwater pump room (Fire Zone 304S). This is a 3 hour rated fire wall that is considered a partition within a fire zone. The penetration will be filled and the wall will maintain its 3 hour fire rating.

MR 01-144 – AF-4007 and AF-4014 – MDAFP Mini Recirc Valves

The existing nitrogen supply systems for the AF-4012 and AF-4019 MDAFP Discharge Control Valves (one independent system for each valve) will be used to supply the AF-4007 and AF-4014 MDAFP Minimum Recirculation Control Valves. The existing instrument air isolation check valves AF-131/133 (for AF-4012) and AF-151/153 (AF-4019) and nitrogen tubing and tanks will be used for the AF-4007 and AF-4014 valves. New tubing will be installed to connect the nitrogen supply tubing near the AF-4012/4019 valves downstream of the check valves to the AF-4007/4014 minimum recirculation valves. Also, a bypass line will be installed around the AF-133/153 check valves to allow the AF-131/151 check valves to be tested using system pressure, if necessary. The existing instrument air connections to the AF-4007/4014 valves will be capped.

The nitrogen system pressure regulators (PCV-4053/4058) are currently set to 60 psig, and will be re-set to 65 psig This will increase the margin for stroking the recirculation valves open, although this is still less than the normal valve regulator setting of 100 psig. Calculation 2002-0002 has verified that these valves are full open at this pressure, and that they will pass full flow even when less than 20% open, since the flow

restricting orifices RO-4008/4015 govern the flow rate and have the lowest flow coefficient in the recirculation line. This increase in pressure regulator setting will not affect the discharge valve positioners, since they normally operate with 100 psig instrument air, but only require 45 psig.

The existing nitrogen supply system installed by MR 97-038 consists of two nitrogen bottles, with one valved in and the other bottle maintained full in standby mode. When the aligned bottle pressure drops to the changeout point, the standby bottle is aligned, and the drain bottle is replaced with a full bottle. Calculation 2002-0002 determined the changeout pressure for the bottle that will supply 90 minutes of nitrogen to the discharge and minimum recirculation valves. Therefore, there is always greater than three hours of capacity available in the system at any given time, although operator action is required to align the standby bottle.

Although the AF-4007/4014 valves do not have a safety function to open, all components in the air supply line to the valve will be installed as safety related, since it will be part of the pressure boundary for the existing discharge valve backup system, which was installed safety-related by MR 97-038. Several existing instrument air components upstream of the solenoid valve that are not safety related will be reclassified as safety related. This can be done on the basis that these components have demonstrated adequate functionality over time, and these components will also be leak tested by MR 01-144. This is equivalent to qualification testing, and therefore these components may be dedicated. Furthermore, the dimensions of these components have been verified to be appropriate for the installation. Finally, the material acceptability will be evaluated based on a detailed walkdown.

Common Issues

All new tubing and valves installed for both modifications will be stainless steel and have design ratings that are the same as or greater than the existing components. All new components will be installed using ASME B31.1. All new tubing, valves, and accumulators will be analyzed as seismic Class 1. Standard wall mounted tube supports will be used and supported with Hilti bolts into the walls of the auxiliary feedwater pump room. Calculation 14410 11-NP(B)-001-XE Rev 0 (including Addendum A) provides a seismic basis for the use of tubing supports and a required spacing, and the limitations of this calculation shall apply to all tubing installation. Supports for the pressure gauges for MR 02-001 will be designed in accordance with Calculation S-09334-266-IA.2 Rev 2. The floor supports for the accumulator tanks were seismically analyzed by Calculation 2001-0001. Portions of the system not covered by any calculation will receive a SQUG walkdown to ensure seismic adequacy.

Currently the nitrogen system AF-133/153 check valves are safety-related and in the IST program. They are leak tested quarterly by IT 10, and are also tested by IT 10A and IT 10B. The upstream check valves AF-131/151 will not be tested periodically, but a bypass line is being installed to facilitate testing, should it be necessary in the future. The check valves for the instrument air accumulator (1/2AF-173) will be added to the IST program, and will be periodically tested. They will also be tested as PMT for the modification.

The specified two hour time duration on the backup systems is not a licensing basis requirement. There is a one hour required coping duration for the Station Blackout event (FSAR Appendix A.1), and a 45 minute requirement for Appendix R (Calculation WE-0005-06), but no other time requirements are specified. Two hours was chosen conservatively to be enough time to allow an operator to be dispatched to the auxiliary feedwater pump room to take manual action if necessary, and to bound current and future requirements. The sizing of these systems with a two hour capability does not imply a new licensing basis requirement to supply these valve for two hours.

The minimum recirculation valves were assumed in each of the calculations to stroke 10 times per hour. This is a conservative estimate that was also used in the original calculation for the MDAFP discharge valve nitrogen backup system (Calculation M-09334-266-IA.1). Simulator runs have confirmed that this is very conservative since operations personnel will typically attempt to maintain the steam generator levels steady by balancing auxiliary feedwater flow with steam flow. See Calculations 2001-0056 and 2002-0002 for more details on this assumption.

Modifications MR 01-144 and MR 02-001 and the issue documented in LER 2001-005-00 will necessitate a revision to FSAR Sections 9.7 (Instrument Air) and 10.2 (Auxiliary Feedwater) and to Technical Specification Bases 3.7.5 to clearly reflect the design function of the minimum recirculation valves to open and to describe the backup air supplies installed by these modifications.

Necessary updates to Appendix R documents to take credit for the backup systems will be evaluated by a separate 50.59. However, this 50.59 can provide the basis for the backup systems to perform this function.

I.2 Search the PBNP Current Licensing Basis (CLB) as follows: Final Safety Analysis Report (FSAR), FSAR Change Requests (FCRs) with assigned numbers, the Fire Protection Evaluation Report (FPER), the CLB (Regulatory) Commitment Database, the Technical Specifications (both Custom and Improved), the Technical Specifications Bases, and the Technical Requirements Manual. Search the ISFSI licensing basis as follows: VSC-24 Safety Analysis Report, the VSC-24 Certificate of Compliance, the CLB (Regulatory) Commitment Database, and the VSC-24 10 CFR 72.212 Site Evaluation Report. Describe the pertinent design function(s), performance requirements, and methods of evaluation for both the plant and for the cask/ISFSI as appropriate. Identify where the pertinent information is described in the above documents (by document section number and title). (Resource Manual 5.3.1 and NEI 96-07, App. B, B.2)

FSAR Section 7.4.1 – AMSAC
FSAR Section 9.7 – Instrument Air / Service Air
FSAR Section 10.2 – Auxiliary Feedwater
FSAR Figure 10.2-1 Sheet 1 – Bech M-217 Sh. 1 – Auxiliary Feedwater System
FSAR Figure 10.2-1 Sheet 2 – Bech M-217 Sh. 2 – Auxiliary Feedwater System
FSAR Section 14.1.10 – Loss of Normal Feedwater
FSAR Section 14.1.11 – Loss of All AC Power to the Station Auxiliaries
FSAR Section 14.2.4 – Steam Generator Tube Rupture
FSAR Section 14.2.5 – Rupture of a Steam Pipe
FSAR Appendix A.1 – Station Blackout
FPER 5.2.2 – Safe Shutdown Systems and Equipment
FPER 5.2.5.2.3 – Auxiliary Feedwater Pump Room
SSAR 2.3.1.4 – Reactor Heat Removal Function
SSAR 2.3.2.4 – Auxiliary Feedwater System
Tech Spec 3.7.5 – Auxiliary Feedwater
Tech Spec Bases B 3.7.5 – Auxiliary Feedwater
LER 266/2001-005-00

See Part II for the description of the design functions and performance requirements.

Does the proposed activity involve a change to any Custom or Improved Technical Specification (ITS)? Changes to Technical Specifications require a License Amendment Request (Resource Manual Section 5.3.1.2).

Technical Specification Change : ☐ Yes ☒ No

If a Technical Specification change is required, explain what the change should be and why it is required.

I.4 Does the proposed activity involve a change to the terms, conditions or specifications incorporated in any VSC-24 cask Certificate of Compliance (CoC)? Changes to a VSC-24 cask Certificate of Compliance require a CoC amendment request.

☐ Yes ☒ No

If a storage cask Certificate of Compliance change is required, explain what the change should be and why it is required.

---------- 10 CFR 50.59 SCREENING ----------

PART II (50.59) - DETERMINE IF THE CHANGE INVOLVES A *DESIGN FUNCTION* (Resource Manual 5.3.2)

Compare the proposed activity to the relevant CLB descriptions, and answer the following questions:

YES	NO	QUESTION
☒	☐	Does the proposed activity involve Safety Analyses or structures, systems and components (SSCs) credited in the Safety Analyses?
☒	☐	Does the proposed activity involve SSCs that support SSC(s) credited in the Safety Analyses?
☒	☐	Does the proposed activity involve SSCs whose failure could initiate a transient (e.g., reactor trip, loss of feedwater, etc.) or accident, OR whose failure could impact SSC(s) credited in the Safety Analyses?
☒	☐	Does the proposed activity involve CLB-described SSCs or procedural controls that perform functions that are required by, or otherwise necessary to comply with, regulations, license conditions, orders or technical specifications?
☐	☒	Does the activity involve a *method of evaluation* described in the FSAR?
☐	☒	Is the activity a *test or experiment*? (i.e., a non-passive activity which gathers data)
☐	☒	Does the activity exceed or potentially affect a *design basis limit for a fission product barrier (DBLFPB)*? (NOTE: If THIS questions is answered YES, a 10 CFR 50.59 Evaluation is required.)

If the answers to ALL of these questions are NO, mark Part III as not applicable, document the 10 CFR 50.59 screening in the conclusion section (Part IV), then proceed directly to Part V - 10 CFR 72.48 Pre-screening Questions.

If any of the above questions are marked YES, identify below the specific design function(s), method of evaluation(s) or DBLFPB(s) involved.

These modifications affect the operation of the minimum recirculation valves for the auxiliary feedwater pumps (1/2AF-4002, AF-4007, AF-4014). These valves have the following design functions

A.1. To isolate the minimum recirculation line to ensure that the auxiliary feedwater pumps deliver the required flow to the steam generators as needed to support the following accidents or events: LONF, LOAC, MSLB, SGTR, ATWS, Appendix R, and SBO.
A.2. To open to provide flow through the auxiliary feedwater pumps to prevent hydraulic instabilities and to dissipate pump heat.
A.3. To maintain the pressure boundary integrity of the auxiliary feedwater system.

These modifications affect the auxiliary feedwater system, which has the following design functions:

B.1. To automatically start and ensure that adequate feedwater is supplied to the steam generators for heat removal during accidents which may result in a main steam safety valve opening (LONF – including ATWS, and LOAC).
B.2. To automatically start and provide flow to maintain steam generator levels during accidents which require or result in rapid reactor coolant system cooldown (SGTR, MSLB).
B.3. To allow the isolation of all lines to the ruptured steam generator in the SGTR event.
B.4. To provide sufficient feedwater to remove decay heat for one hour during a station blackout event (TDAFP only).
B.5. To provide sufficient flow to the steam generators to remove decay heat to achieve cold shutdown within 72 hours following a plant fire (Appendix R).
B.6. To withstand a seismic event (designed as seismic Class 1) and to ensure that steam generator levels are maintained during a seismic event.
B.7. To provide flow to the steam generators during plant startup and shutdown, and during hot shutdown or hot standby conditions for chemical additions and when operation of the main feedwater and condensate systems is not warranted.

These modifications also affect the instrument air system, which has the following design functions:

C.1. To provide dry, oil-free air to pneumatic controllers and control valves required for the normal operation of both units.
C.2. To isolate instrument air lines inside containment on a containment isolation signal to maintain containment integrity.
C.3. To ensure that the purge supply and exhaust valve boot seals are inflated to maintain containment integrity.
C.4. To supply nitrogen to the motor driven auxiliary feedwater pump discharge control valves.
C.5. To supply nitrogen to the power operated relief valves (PORVs) when LTOP is functional.
C.6. To ensure that the instrument air headers inside containment can be depressurized to preclude the chance of a circuit fault causing a PORV or CVCS seal return valve to open.

These modifications are being installed in the Auxiliary Feedwater Pump Room, which has the following design functions:

D.1. The walls act as 3-hour rated fire barriers
D.2. The walls are designed to withstand a seismic event without failing.

RT III (50.59) - DETERMINE WHETHER THE ACTIVITY INVOLVES ADVERSE EFFECTS (Resource Manual 5.3.3)

If ALL the questions in Part II are answered NO, then Part III is ☐ NOT APPLICABLE.

Answer the following questions to determine if the activity has an *adverse effect* on a design function. Any YES answer means that a 10 CFR 50.59 Evaluation is required; EXCEPT where noted in Part III.3.

III.1 CHANGES TO THE FACILITY OR PROCEDURES

YES	NO	QUESTION
☐	☒	Does the activity adversely affect the *design function* of an SSC credited in safety analyses?
☐	☒	Does the activity adversely affect the method of performing or controlling the *design function* of an SSC credited in the safety analyses?

If any answer is YES, a 10 CFR 50.59 Evaluation is required. If both answers are NO, describe the basis for the conclusion (attach additional discussion as necessary):

The modifications will improve the ability for the minimum flow recirculation valves to perform their non safety-related design function in the open position (A.2). Currently, this design function is completely provided by either the instrument air system or by manual operator action. These modifications will install backup systems to perform this design function after instrument air is lost before operator action is taken. These backup systems (nitrogen bottles and air accumulators) will always be available if the instrument air system fails, and will be isolated from the instrument air system with two check valves in series. The backup systems for the recirculation valves will be installed using safety-related components, even though they are not supporting a safety function for the minimum recirculation valves. The components for the MDAFP recirculation valves will be classified as safety-related since they are part of the nitrogen system pressure boundary required for the AF-4012/4019 valves. The components for the TDAFP recirculation valves will be installed safety related and seismic Class 1. There will not be an adverse effect on the existing non safety-related instrument air system that currently supports this design function. The recirculation valves will need to operate at a lower air pressure of 65 psig, but the valves will still fully open at this pressure, and Calculations 2001-0056 and 2002-0002 has shown that the valves will pass adequate flow to perform this design function when they are only approximately 20% open. The net effect of these modifications is an improvement that results in a lower core damage probability (see NPM 2002-0030), and will ensure that the minimum flow recirculation valves have the capability to open and that the auxiliary feedwater pumps will not be damaged by operating at low flows. Therefore, design function A.2 is not adversely affected, and is actually enhanced. This will provide the operators with additional time to diagnose the loss of instrument air and take action to properly control auxiliary feedwater flow and secure pumps if required.

Under most conditions when the auxiliary feedwater system is needed, the recirculation valves must be closed (design function A.1). The addition of these backup systems will not create a new failure mode that will fail the valve in the open position when it is needed to be shut. The source of the air is independent of the circuitry that would open and close the valve. The solenoid valves and associated circuitry that supply the air to the actuator are being not being affected, and are currently qualified as safety-related. The minimum recirculation valves will still fail closed on loss of air, although this failure is less likely to occur with the installation of these backup systems. Therefore, these modifications will not have an adverse effect on design function A.1, and the likelihood that the valves will fail open has not been affected.

These modifications will not affect the auxiliary feedwater pressure boundary in any way, and thus design function A.3 is not adversely affected. The modifications will only involve the instrument air and nitrogen systems that actuate the minimum recirculation valves and the MDAFP discharge valves.

The air accumulators for the TDAFP recirc valves installed in the instrument air lines will not adversely affect any of the design functions of the instrument air system (C.1 through C 6). Once the accumulators have been pressurized, there is no additional long-term loading on the system required by installing accumulator tanks. The tank will not affect the operation of the other safety related accumulators or nitrogen bottles anywhere in the instrument air system. The accumulator tanks and all new tubing will be installed and anchored as seismic Class 1, which will preclude interactions with other plant equipment.

The nitrogen tie in for the MDAFP recirc valves will utilize the existing nitrogen backup system for the MDAFP discharge control valves. Calculation 2002-0002 was performed to show that the existing nitrogen bottles are adequate to supply nitrogen to stroke the minimum recirculation valves and the discharge valves, with no additional bottles necessary, for two hours. Nitrogen bottle changeout at a pressure that ensures 90 minutes from one bottle with a second full bottle available will not change from current practice, other than the changeout pressure will be reduced, which is an improvement. There will be a negligible effect on the discharge valves stroke time to close by opening the recirculation valve with the same system. Furthermore, there are currently no stroke time acceptance criteria for the discharge valves opening and the recirculation valves closing. Since the calculation has shown that the existing system can handle the additional demand, there is no adverse affect on the discharge valves, and there is therefore no adverse effect on design function C.4. The backup nitrogen systems for the MDAFP discharge valves will still be fully capable of supporting the design functions of the MDAFPs and the auxiliary feedwater system (functions B.1 through B.7).

All new components, including the new tubing, valves, and accumulator tanks will be designed as seismic Class 1. Therefore, the components installed by MR 01-144 and MR 02-001 will not adversely affect the seismic design functions of any components or systems in the auxiliary feedwater pump room (design function D.2) and the auxiliary feedwater system (design function B.6).

The new components will not affect the ability of the auxiliary feedwater pump room walls to act as 3 hour rated fire barriers (design function D.1). No additional combustible loading is being added to the auxiliary feedwater pump room (Fire Zones 304N, 304M, 304S).

III.2 CHANGES TO A METHOD OF EVALUATION

(If the activity does not involve a method of evaluation, these questions are ☒ NOT APPLICABLE.)

YES	NO	QUESTION
☐	☐	Does the activity use a revised or different method of evaluation for performing safety analyses than that described in the CLB?
☐	☐	Does the activity use a revised or different method of evaluation for evaluating SSCs credited in safety analyses than that described in the CLB?

If any answer is YES, a 10 CFR 50.59 Evaluation is required. If both answers are NO, describe the basis for the conclusion (attach additional discussion, as necessary).

III.3 TESTS OR EXPERIMENTS

If the activity is not a test or experiment, the questions in III.3.a and III.3.b are ☒ NOT APPLICABLE.

a. Answer these two questions first:

YES	NO	QUESTION
☐	☐	Is the proposed test or experiment bounded by other tests or experiments that are described in the CLB?
☐	☐	Are the SSCs affected by the proposed test or experiment isolated from the facility?

If the answer to BOTH questions in V.3.a is NO, continue to III.3.b. If the answer to EITHER question is YES, then describe the basis.

b Answer these additional questions ONLY for tests or experiments which do NOT meet the criteria given in III 3.a above. If the answer to either question in III.3.a is YES, then these three questions are ☐ NOT APPLICABLE.

YES	NO	QUESTION
☐	☐	Does the activity utilize or control an SSC in a manner that is outside the reference bounds of the design bases as described in the CLB?
☐	☐	Does the activity utilize or control an SSC in a manner that is inconsistent with the analyses or descriptions in the CLB?
☐	☐	Does the activity place the facility in a condition not previously evaluated or that could affect the capability of an SSC to perform its intended functions?

If any answer in III.3.b is YES, a 10 CFR 50.59 Evaluation is required. If the answers in III.3.b are ALL NO, describe the basis for the conclusion (attach additional discussion as necessary):

Part IV - 10 CFR 50.59 SCREENING CONCLUSION (Resource Manual 5.3.4).

Check all that apply:

A 10 CFR 50.59 Evaluation is ☐ required or ☒ NOT required.

A Point Beach FSAR change is ☒ required or ☐ NOT required. If an FSAR change is required, then initiate an FSAR Change Request (FCR) per NP 5.2.6.

A Regulatory Commitment (CLB Commitment Database) change is ☐ required or ☒ NOT required. If a Regulatory Commitment Change is required, initiate a commitment change per NP 5.1.7.

A Technical Specification Bases change is ☒ required or ☐ NOT required. If a change to the Technical Specification Bases is required, then initiate a Technical Specification Bases change per NP 5.2.15.

A Technical Requirements Manual change is ☐ required or ☒ NOT required. If a change to the Technical Requirements Manual is required, then initiate a Technical Requirements Manual change per NP 5.2.15.

---------- 10 CFR 72.48 SCREENING -------- ----------

NOTE: **NEI 96-07, Appendix B, Guidelines for 10 CFR 72.48 Implementation should be used for guidance to determine the proper responses for 72.48 screenings.**

PART V (72.48) - 10 CFR 72.48 INITIAL SCREENING QUESTIONS

Part V determines if a full 10 CFR 72.48 screening is required to be completed (Parts VI and VII) for the proposed activity.

YES	NO	QUESTION
☐	☒	Does the proposed activity involve IN ANY MANNER the dry fuel storage cask(s), the cask transfer/transport equipment, any ISFSI facility SSC(s), or any ISFSI facility monitoring as follows: Multi-Assembly Sealed Basket (MSB), MSB Transfer Cask (MTC), MTC Lifting Yoke, Ventilated Concrete Cask (VCC), Ventilated Storage Cask (VSC), VSC Transporter (VCST), ISFSI Storage Pad Facility, ISFSI Storage Pad Data/Communication Links, or PPCS/ISFSI Continuous Temperature Monitoring System?
☐	☒	Does the proposed activity involve IN ANY MANNER SSC(s) installed in the plant specifically added to support cask loading/unloading activities, as follows: Cask Dewatering System (CDW), Cask Reflood System (CRF), or Hydrogen Monitoring System?
☐	☒	Does the proposed activity involve IN ANY MANNER SSC(s) needed for plant operation which are also used to support cask loading/unloading activities, as follows. Spent Fuel Pool (SFP), SFP Cooling and Filtration (SF), Primary Auxiliary Building Ventilation System (VNPAB), Drumming Area Ventilation System (VNDRM),

RE-105 (SFP Low Range Monitor), RE-135 (SFP High Range Monitor), RE-221 (Drumming Area Vent Gas Monitor), RE-325 (Drumming Area Exhaust Low-Range Gas Monitor), PAB Crane, SFP Platform Bridge, Truck Access Area, or Decon Area?

☐ ☒ Does the proposed activity involve a change to Point Beach CLB design criteria for external events such as earthquakes, tornadoes, high winds, flooding, etc.?

☐ ☒ Does the activity involve plant heavy load requirements or procedures for areas of the plant used to support cask loading/unloading activities?

☐ ☒ Does the activity involve any potential for fire or explosion where casks are loaded, unloaded, transported or stored?

If ANY of the Part V questions are answered YES, then a full 10 CFR 72.48 screening is required and answers to the questions in Part VI and Part VII are to be provided. If ALL the questions in Part V are answered NO, then check Parts VI and VII as not applicable. Complete Part VIII to document the conclusion that no 10 CFR 72.48 evaluation is required.

PART VI (72.48) - DETERMINE IF THE CHANGE INVOLVES A ISFSI LICENSING BASIS *DESIGN FUNCTION*

(If ALL the questions in Part V are NO, then Part VI is ☒ NOT APPLICABLE.)

Compare the proposed activity to the relevant portions of the ISFSI licensing basis and answer the following questions:

YES	NO	QUESTION
☐	☐	Does the proposed activity involve cask/ISFSI Safety Analyses or plant/cask/ISFSI structures, systems and components (SSCs) credited in the Safety Analyses?
☐	☐	Does the proposed activity involve plant, cask or ISFSI SSCs that support SSC(s) credited in the Safety Analyses?
☐	☐	Does the proposed activity involve plant, cask or ISFSI SSCs whose function is relied upon for prevention of a radioactive release, OR whose failure could impact SSC(s) credited in the Safety Analyses?
☐	☐	Does the proposed activity involve cask/ISFSI described SSCs or procedural controls that perform functions that are required by, or otherwise necessary to comply with, regulations, license conditions, CoC conditions, or orders?
☐	☐	Does the activity involve a *method of evaluation* described in the ISFSI licensing basis?
☐	☐	Is the activity a *test or experiment*? (i.e., a non-passive activity which gathers data)
☐	☐	Does the activity exceed or potentially affect a cask *design basis limit for a fission product barrier (DBLFPB)*? (NOTE: If THIS questions is answered YES, a 10 CFR 72.48 Evaluation is required.)

If the answers to ALL of these questions are NO, mark Parts VII as not applicable, and document the 10 CFR 72.48 screening in the conclusion section (Part VIII).

If any of the above questions are marked YES, identify below the specific design function(s), method of evaluation(s) or DBLFPB(s) involved.

PART VII (72.48) - DETERMINE WHETHER THE ACTIVITY INVOLVES ADVERSE EFFECTS (NEI 96-07, Appendix B, Section B.4.2.1)

(If ALL the questions in Part V or Part VI are answered NO, then Part VII is ☒ NOT APPLICABLE.)

Answer the following questions to determine if the activity has an *adverse effect* on a design function. Any YES answer means that a 10 CFR 72.48 Evaluation is required; EXCEPT where noted in Part VII.3.

1 Changes to the Facility or Procedures

YES	NO	QUESTION

☐	☐	Does the activity adversely affect the *design function* of a plant, cask, or ISFSI SSC credited in safety analyses?
☐	☐	Does the activity adversely affect the method of performing or controlling the *design function* of a plant, cask, or ISFSI SSC credited in the safety analyses?

If any answer is YES, a 10 CFR 72.48 Evaluation is required. If both answers are NO, describe the basis for the conclusion (attach additional discussion, as necessary):

VII.2 Changes to a Method of Evaluation

(If the activity does not involve a method of evaluation, these questions are ☐ NOT APPLICABLE.)

YES	NO	QUESTION
☐	☐	Does the activity use a revised or different method of evaluation for performing safety analyses than that described in a cask SAR?
☐	☐	Does the activity use a revised or different method of evaluation for evaluating SSCs credited in safety analyses than that described in a cask SAR?

If any answer is YES, a 10 CFR 72.48 Evaluation is required. If both answers are NO, describe the basis for the conclusion (attach additional discussion, as necessary):

i.3 Tests or Experiments

(If the activity is not a test or experiment, the questions in VII.3.a and VII.3.b are ☐ NOT APPLICABLE.)

a. Answer these two questions first:

YES	NO	QUESTION
☐	☐	Is the proposed test or experiment bounded by other tests or experiments that are described in the cask ISFSI licensing basis?
☐	☐	Are the SSCs affected by the proposed test or experiment isolated from the cask(s) or ISFSI facility?

If the answer to both questions is NO, continue to VII.3.b. If the answer to EITHER question is YES, then briefly describe the basis.

b. Answer these additional questions ONLY for tests or experiments which do not meet the criteria given in VII.3.a above. If the answer to either question in VII.3.a is YES, then these three questions are ☐ NOT APPLICABLE:

YES	NO	QUESTION
☐	☐	Does the activity utilize or control an SSC in a manner that is outside the reference bounds of the design bases as described in the ISFSI licensing basis?
☐	☐	Does the activity utilize or control a plant, cask or ISFSI facility SSC in a manner that is inconsistent with the analyses or descriptions in the ISFSI licensing basis?
☐	☐	Does the activity place the cask or ISFSI facility in a condition not previously evaluated or that could affect the capability of a plant, cask, or ISFSI SSC to perform its intended functions?

If any answer in VII.3.b is YES, a 10 CFR 72.48 Evaluation is required. If the answers are all NO, describe the basis for the conclusion (attach additional discussion as necessary):

PART VIII - DOCUMENT THE CONCLUSION OF THE 10 CFR 72.48 SCREENING

Check all that apply:

A 10 CFR 72.48 Evaluation is ☐ required or ☒ NOT required. Obtain a screening number and provide the original to Records Management regardless of the conclusion of the 50.59 or 72.48 screening.

A VSC-24 cask Safety Analysis Report change is ☐ required or ☒ NOT required. If a VSC-24 cask SAR change is required, then contact the Point Beach Dry Fuel Storage group supervisor.

A Regulatory Commitment (CLB Commitment Database) change is ☐ required or ☒ NOT required. If a Regulatory Commitment Change is required, initiate a commitment change per NP 5.1.7.

A change to the VSC-24 10 CFR 72.212 Site Evaluation Report is ☐ required or ☒ NOT required. If a VSC-24 10 CFR 72.212 Site Evaluation Report change is required, then contact the Point Beach Dry Fuel Storage group supervisor.

of Proposed Activity: Unit 1 EOP-0 - Rev. 35, Unit 2 EOP-0 - Rev. 36, Unit 1 EOP-0.1, Rev 24, Unit 2 EOP-0.1 - Rev 23

Associated Reference(s) #: CR 01-2278, Action 2; CAP001804; EVAL 2002-005, CR 01-3595

Prepared by: David Black (Name (Print)) David Black (Signature) Date: 6-20-2002

Reviewed by: Richard P. Wood (Name (Print)) Richard P. Wood (Signature) Date: 6/21/2002

PART I (50.59/72.48) - DESCRIBE THE PROPOSED ACTIVITY AND SEARCH THE PLANT AND ISFSI LICENSING BASIS (Resource Manual 5.3.1)

NOTE: The "NMC 10 CFR 50.59 Resource Manual" (Resource Manual) and NEI 96-07, Appendix B, Guidelines for 10 CFR 72.48 Implementation should be used for guidance to determine the proper responses for 10 CFR 50.59 and 10 CFR 72.48 screenings.

I.1 Describe the proposed activity and the scope of the activity being covered by this screening. (The 10 CFR 50.59 / 72 48 review of other portions of the proposed activity may be documented via the applicability and pre-screening process requirements in NP 5.1.8.) Appropriate descriptive material may be attached

This screening was revised to address CAP001804 and corrective action CA003360. The original screening was applied to temporary and permanent changes to procedures Unit 1 EOP-0 - Rev 35, Unit 2 EOP-0 - Rev. 36, Unit 1 EOP-0 1, Rev 24, Unit 2 EOP-0.1 - Rev 23 CAP001804 identified a 50 59 evaluation should have been performed for these changes.

A foldout-page item is being added to Units 1 & 2 procedures EOP-0 and EOP-0.1. The foldout page item, "AFW Minimum Flow Requirements", shall address minimum flow required by the AFW pumps in the case of a failed closed mini-recirc valve on any running AFW pumps.

The item below was added to the Foldout Pages in each of the following procedures: EOP-0, Reactor Trip or Safety Injection (Unit 1 and Unit 2), EOP-0.1, Reactor Trip Response (Unit 1 and Unit 2):

"AFW MINIMUM FLOW REQUIREMENTS
IF any AFW pump mini-recirc valve fails, THEN monitor and maintain minimum AFW flow or stop the affected AFW pump as necessary to control S/G levels.
o P-38A minimum flow - GREATER THAN 50 GPM
o P-38B minimum flow - GREATER THAN 50 GPM
o P-29 minimum flow - GREATER THAN 75 GPM"

I.2 Search the PBNP Current Licensing Basis (CLB) as follows: Final Safety Analysis Report (FSAR), FSAR Change Requests (FCRs) with assigned numbers, the Fire Protection Evaluation Report (FPER), the CLB (Regulatory) Commitment Database, the Technical Specifications, the Technical Specifications Bases, and the Technical Requirements Manual Search the ISFSI licensing basis as follows: VSC-24 Safety Analysis Report, the VSC-24 Certificate of Compliance, the CLB (Regulatory) Commitment Database, and the VSC-24 10 CFR 72.212 Site Evaluation Report Describe the pertinent design function(s), performance requirements, and methods of evaluation for both the plant and for the cask/ISFSI as appropriate. Identify where the pertinent information is described in the above documents (by document section number and title) (Resource Manual 5 3.1 and NEI 96-07, App B. B 2)

The Auxiliary Feedwater (AFW) system has the following functions described in the licensing basis:

a. To automatically start and ensure that adequate feedwater is supplied to the steam generators for heat removal during accidents which may result in a main steam safety valve opening (Loss of Normal Feedwater – including ATWS, and Loss of AC to the Station Auxiliaries).
b. To automatically start and provide flow to maintain steam generator levels during accidents which require or result in rapid reactor coolant system cooldown (Steam Generator Tube Rupture and Rupture of a Steam Pipe)
c. To allow the isolation of all lines to the ruptured steam generator in the SGTR event.
d. To provide sufficient feedwater to remove decay heat from both units for one hour during a station blackout event (TDAFP only).
e To provide sufficient flow to the steam generators to remove decay heat to achieve cold shutdown within 72 hours following a plant fire (Appendix R).
f. To withstand a seismic event (designed as seismic Class 1) and to ensure that steam generator levels are maintained during a seismic event.
g To provide flow to the steam generators during plant startup and shutdown, and during hot shutdown or hot standby conditions for chemical additions and when operation of the main feedwater and condensate systems is not warranted.

FSAR 7.2.3.2 Item e. Steam Generator Water Level and Feedwater Flow states: "The basic function of the reactor protection trips associated with low steam generator water level and low feedwater flow is to preserve the steam generator heat sink for removal of long-term residual heat (See Figure 7.2-12). Should a complete loss of feedwater occur with no reactor protection action, the steam generators would boil dry and cause an overtemperature/overpressure excursion of the reactor coolant."

Reactor trips on temperature, pressure, and pressurizer water level will trip the plant before there is any damage to the core or reactor coolant system. However, the residual heat remaining after a trip would cause thermal expansion and discharge of the reactor coolant to containment through the pressurizer relief valves and pressurizer relief tank.

Redundant auxiliary feedwater pumps are provided to prevent the loss of steam generator inventory. Reactor trips act before the steam generators are dry, to reduce the required capacity and starting time requirements for the auxiliary feedwater pumps and minimize the thermal transient on the reactor coolant system and steam generators "

FSAR 7.3.3.4, "Manual AFW Flow Control During Plant Shutdown" states: "The successful operation of the engineered safety features only involves actuation, with one exception. This exception is manually controlling steam generator water level using the auxiliary feedwater pumps during plant shutdown, to remove reactor decay and sensible heat. This manual control involves positioning the auxiliary feedwater flow control valves in order to maintain proper steam generator water level. Steam generator water level indication and controls are located in the control room and at a local control station

FSAR 10.1, Steam and Power Conversion System, Section 10.1.1 Design Basis under "Main Feedwater" states "Reactor trip is actuated either on a coincidence of sustained steam flow - feedwater flow mismatch, coupled with low level in any steam generator or by a low-low steam generator water level. These trips are discussed in further detail in Section 7.2.

Whenever a reactor trip occurs, the main feedwater control valves move to the fully opened position to increase the feedwater flow to the steam generators for faster reduction of reactor coolant temperature to the no-load average temperature value. The valves remain fully open until either one of the following conditions occurs, at which time the respective valve, or valves, fully close:

Abnormally high steam generator level;
Safety injection signal, or
Average temperature error signal (Between measured Tavg and the no load TREF)
reduces to a preset level

Either a high steam generator level or a safety injection signal will close the feedwater bypass valves."

FSAR Figure 10.1-2, Sheet 2 (Unit 1) and Figure 10.1-2A, Sheet 2 show that valves 1/2 CS-466 and 1/2 CS-476 (Main Feedwater Regulating Valves) and valves 1/2 CS-480 and 1/2 CS-48 (Main Feedwater Regulating Bypass Valves) are air-operated, failed closed valves

FSAR 10.2.1, Design Basis states: "The auxiliary feedwater system is designed to supply high-pressure feedwater to the steam generators in order to maintain a water inventory for removal of heat energy from the reactor coolant system by secondary side steam release in the event of inoperability or unavailability of the main feedwater system. In order to meet the design basis required in the Loss of Normal Feedwater/Loss of All AC analysis, one motor driven auxiliary feedwater pump

provides 200 gpm of flow either to one steam generator or split between two steam generators within 5 minutes following receipt of a low-low steam generator water level setpoint signal. Redundant supplies are provided by two pumping systems using different sources of power for the pumps. The design capacity of each system is set so that the steam generators will not boil dry nor will the primary side relieve fluid through the pressurizer relief valves, following a loss of main feedwater flow with a reactor trip."

FSAR 10.2 2, System Design and Operation, states:,"The auxiliary feedwater system consists of two electric motor-driven pumps, two steam turbine-driven pumps, pump suction and discharge piping, and the controls and instrumentation necessary for operation of the system. Redundancy is provided by utilizing two pumping systems, two different sources of power for the pumps, and two sources of water supply to the pumps. The system is categorized as seismic Class I and is designed to ensure that a single fault will not obstruct the system function."

FSAR 10.2.2 also states:

- For the motor-driven pumps: "Each pump has an AOV, AF-4007 for P-38A and AF-4014 for P-38B, controlled recirculation line back to the condensate storage tanks to ensure minimum flow to prevent hydraulic instabilities and dissipate pump heat."
- For the turbine-driven pumps: "Each pump has an AOV (AF-4002) controlled recirculation line back to the condensate storage tanks to ensure minimum flow to dissipate pump heat."

FSAR 10.2.2 also states:

During normal plant operations, the auxiliary feedwater system is maintained in a standby condition ready to be placed in operation automatically when conditions require. The auxiliary feedwater pumps are automatically started on receipt of any of the following signals:

Turbine-driven feedwater pumps

1. Low-low water level in both steam generators in one unit starts the corresponding pump
2. Loss of both 4.16 kv buses supplying the main feedwater pump motors in one unit starts the corresponding auxiliary feedwater pump.
3. Trip or shutdown of both main feedwater pumps or closure of both feedwater regulating valves in one unit starts the corresponding pump. These signals are processed through AMSAC at power levels above 40%.

Motor-driven feedwater pumps

1. Low-low water level in either associated steam generator.
2. Trip or shutdown of both main feedwater pumps or closure of both feedwater regulating valves in one unit. These signals are processed through AMSAC at power levels above 40%
3. Safeguards sequence signal

FSAR Figure 10 2-1 shows that 1/2AF-4002 for 1/2P-29 (turbine-driven pumps), and AF-4007 for P-38A, AF-4014 for P-38B (motor-driven pumps) are all fail-closed valves.

CLB References:
FSAR 7.2.3 2- Specific Control and Protection Interactions
FSAR 7 3.3 4 - Manual AFW Flow Control During Plant Shutdown
FSAR Section 7 4 1 – AMSAC
FSAR Section 10.1 - Steam and Power Conversion System
FSAR Section 10 2 – Auxiliary Feedwater
FSAR Figure 10 2-1 Sheet 1 – Bech M-217 Sh 1 – Auxiliary Feedwater System
FSAR Figure 10 2-1 Sheet 2 – Bech M-217 Sh 2 – Auxiliary Feedwater System
FSAR Section 14.1 10 – Loss of Normal Feedwater

FSAR Section 14.1.11 – Loss of All AC Power to the Station Auxiliaries
FSAR Section 14.2.4 – Steam Generator Tube Rupture
FSAR Section 14.2.5 – Rupture of a Steam Pipe
FSAR Appendix A.1 – Station Blackout
FPER 5.2.2 – Safe Shutdown Systems and Equipment
FPER 5.2.5.2.3 – Auxiliary Feedwater Pump Room
FPER 6.6 - Safe Shutdown Systems
FPER 6.6.4 - Auxiliary Feedwater System
Tech Spec 3.7.5 – Auxiliary Feedwater
Tech Spec Bases B 3.7.5 – Auxiliary Feedwater

I.3 Does the proposed activity involve a change to any Technical Specification? Changes to Technical Specifications require a License Amendment Request (Resource Manual Section 5.3 1.2).

Technical Specification Change : ☐ Yes ☒ No

If a Technical Specification change is required, explain what the change should be and why it is required.

I.4 Does the proposed activity involve a change to the terms, conditions or specifications incorporated in any VSC-24 cask Certificate of Compliance (CoC)? Changes to a VSC-24 cask Certificate of Compliance require a CoC amendment request.

☐ Yes ☒ No

If a storage cask Certificate of Compliance change is required, explain what the change should be and why it is required.

10 CFR 50.59 SCREENING

PART II (50.59) - DETERMINE IF THE CHANGE INVOLVES A *DESIGN FUNCTION* (Resource Manual 5 3.2)

Compare the proposed activity to the relevant CLB descriptions, and answer the following questions·

YES	NO	QUESTION
☒	☐	Does the proposed activity involve Safety Analyses or structures, systems and components (SSCs) credited in the Safety Analyses?
☒	☐	Does the proposed activity involve SSCs that support SSC(s) credited in the Safety Analyses?
☒	☐	Does the proposed activity involve SSCs whose failure could initiate a transient (e.g , reactor trip, loss of feedwater, etc.) or accident, OR whose failure could impact SSC(s) credited in the Safety Analyses?
☒	☐	Does the proposed activity involve CLB-described SSCs or procedural controls that perform functions that are required by, or otherwise necessary to comply with, regulations, license conditions, orders or technical specifications?
☐	☒	Does the activity involve a *method of evaluation* described in the FSAR?
☐	☒	Is the activity a *test or experiment*? (i.e., a non-passive activity which gathers data)
☐	☒	Does the activity exceed or potentially affect a *design basis limit for a fission product barrier (DBLFPB)*? (NOTE: If THIS questions is answered YES, a 10 CFR 50.59 Evaluation is required.)

: answers to ALL of these questions are NO, mark Part III as not applicable, document the 10 CFR 50 59 screening in the conclusion section (Part IV), then proceed directly to Part V - 10 CFR 72 48 Pre-screening Questions.

·ny of the above questions are marked YES, identify below the specific design function(s), method of evaluation(s) or DBLFPB(s) ɔlved.

FSAR 10.2 states each AFW pump has an AOV controlled recirc line back to the CST to ensure minimum flow to dissipate heat. This change ensures the minimum AFW flow requirements will be maintained on any running AFW pump in the case of a failed shut AFW mini-recirc flow control valve.

As indicated in the licensing basis search section, I.2, FSAR 10.2.2 also states·

- For the motor-driven pumps: "Each pump has an AOV, AF-4007 for P-38A and AF-4014 for P-38B, controlled recirculation line back to the condensate storage tanks to ensure minimum flow to prevent hydraulic instabilities and dissipate pump heat."
- For the turbine-driven pumps: "Each pump has an AOV (AF-4002) controlled recirculation line back to the condensate storage tanks to ensure minimum flow to dissipate pump heat."

Thus the AFW mini-recirc valves have a design function to ensure minimum flow through the pumps to keep the pumps from overheating CR 01-3595 identified that with a loss of instrument air (such as would occur with a loss of offsite power that the AFW minimum flow recirculation valves will fail closed. If this is the case, operators need to maintain a minimum water flowrate through the pump(s) to provide adequate cooling, or secure the pump. If all AFW pumps start and run (as designed), operators may need to reduce AFW flow in order to prevent overfilling the steam generators or overcooling the reactor.

As indicated above FSAR 7.3.3.4 states: "The successful operation of the engineered safety features only involves actuation, with one exception. This exception is manually controlling steam generator water level using the auxiliary feedwater pumps during plant shutdown, to remove reactor decay and sensible heat. This manual control involves positioning the auxiliary feedwater flow control valves in order to maintain proper steam generator water level. Steam generator water level indication and controls are located in the control room and at a local control station " Therefore the licensing basis states explicitly that operator action is required to control AFW flow to maintain steam generator level. However, it does not explicitly address controlling flow to ensure AFW pump operability by securing pumps or maintaining minimum pump flows because of the unavailability of the mini-recirculation lines Thus there is an additional manual method of performing and controlling the design function of maintaining steam generator level, and an additional method of performing or controlling minimum flow though the pumps to ensure sufficient cooling is provided in the procedure changes Further there is an adverse affect on the AFW pump function of providing water to the steam generators in that pumps/motors may need to be stopped and restarted to control steam generator level.

PART III (50.59) - DETERMINE WHETHER THE ACTIVITY INVOLVES ADVERSE EFFECTS (Resource Manual 5.3.3)

If ALL the questions in Part II are answered NO, then Part III is ☐ NOT APPLICABLE.

Answer the following questions to determine if the activity has an *adverse effect* on a design function. Any YES answer means that a 10 CFR 50 59 Evaluation is required; EXCEPT where noted in Part III.3.

III.1 CHANGES TO THE FACILITY OR PROCEDURES

YES	NO	QUESTION
☒	☐	Does the activity adversely affect the *design function* of an SSC credited in safety analyses?
☒	☐	Does the activity adversely affect the method of performing or controlling the *design function* of an SSC credited in the safety analyses?

If any answer is YES, a 10 CFR 50.59 Evaluation is required If both answers are NO, describe the basis for the conclusion (attach additional discussion as necessary)

See EVAL 2002-005 for the 50.59 evaluation performed for these procedure changes.

CHANGES TO A METHOD OF EVALUATION

(If the activity does not involve a method of evaluation, these questions are ☒ NOT APPLICABLE.)

YES	NO	QUESTION
☐	☐	Does the activity use a revised or different method of evaluation for performing safety analyses than that described in the CLB?
☐	☐	Does the activity use a revised or different method of evaluation for evaluating SSCs credited in safety analyses than that described in the CLB?

If any answer is YES, a 10 CFR 50.59 Evaluation is required. If both answers are NO, describe the basis for the conclusion (attach additional discussion, as necessary).

III.3 TESTS OR EXPERIMENTS

If the activity is not a test or experiment, the questions in III.3.a and III.3.b are ☒ NOT APPLICABLE.

a. Answer these two questions first:

YES	NO	QUESTION
☐	☐	Is the proposed test or experiment bounded by other tests or experiments that are described in the CLB?
☐	☐	Are the SSCs affected by the proposed test or experiment isolated from the facility?

If the answer to BOTH questions in V.3.a is NO, continue to III.3.b. If the answer to EITHER question is YES, then describe the basis.

b. Answer these additional questions ONLY for tests or experiments which do NOT meet the criteria given in III.3.a above If the answer to either question in III.3.a is YES, then these three questions are ☐ NOT APPLICABLE.

YES	NO	QUESTION
☐	☐	Does the activity utilize or control an SSC in a manner that is outside the reference bounds of the design bases as described in the CLB?
☐	☐	Does the activity utilize or control an SSC in a manner that is inconsistent with the analyses or descriptions in the CLB?
☐	☐	Does the activity place the facility in a condition not previously evaluated or that could affect the capability of an SSC to perform its intended functions?

If any answer in III.3 b is YES, a 10 CFR 50.59 Evaluation is required If the answers in III.3.b are ALL NO, describe the basis for the conclusion (attach additional discussion as necessary)

-t IV - 10 CFR 50.59 SCREENING CONCLUSION (Resource Manual 5.3.4).

Check all that apply:

A 10 CFR 50.59 Evaluation is ☒ required or ☐ NOT required.

A Point Beach FSAR change is ☒ required or ☐ NOT required. If an FSAR change is required, then initiate an FSAR Change Request (FCR) per NP 5.2.6.

A Regulatory Commitment (CLB Commitment Database) change is ☐ required or ☒ NOT required. If a Regulatory Commitment Change is required, initiate a commitment change per NP 5.1.7.

A Technical Specification Bases change is ☒ required or ☐ NOT required. If a change to the Technical Specification Bases is required, then initiate a Technical Specification Bases change per NP 5.2.15.

A Technical Requirements Manual change is ☐ required or ☒ NOT required If a change to the Technical Requirements Manual is required, then initiate a Technical Requirements Manual change per NP 5.2.15.

---------- 10 CFR 72.48 SCREENING -------- ----------

NOTE: **NEI 96-07, Appendix B, Guidelines for 10 CFR 72.48 Implementation should be used for guidance to determine the proper responses for 72.48 screenings.**

PART V (72.48) - 10 CFR 72.48 INITIAL SCREENING QUESTIONS

Part V determines if a full 10 CFR 72.48 screening is required to be completed (Parts VI and VII) for the proposed activity.

;	NO	QUESTION
☐	☒	Does the proposed activity involve IN ANY MANNER the dry fuel storage cask(s), the cask transfer/transport equipment, any ISFSI facility SSC(s), or any ISFSI facility monitoring as follows: Multi-Assembly Sealed Basket (MSB), MSB Transfer Cask (MTC), MTC Lifting Yoke, Ventilated Concrete Cask (VCC), Ventilated Storage Cask (VSC), VSC Transporter (VCST), ISFSI Storage Pad Facility, ISFSI Storage Pad Data/Communication Links, or PPCS/ISFSI Continuous Temperature Monitoring System?
☐	☒	Does the proposed activity involve IN ANY MANNER SSC(s) installed in the plant specifically added to support cask loading/unloading activities, as follows: Cask Dewatering System (CDW), Cask Reflood System (CRF), or Hydrogen Monitoring System?
☐	☒	Does the proposed activity involve IN ANY MANNER SSC(s) needed for plant operation which are also used to support cask loading/unloading activities, as follows: Spent Fuel Pool (SFP), SFP Cooling and Filtration (SF), Primary Auxiliary Building Ventilation System (VNPAB), Drumming Area Ventilation System (VNDRM), RE-105 (SFP Low Range Monitor), RE-135 (SFP High Range Monitor), RE-221 (Drumming Area Vent Gas Monitor), RE-325 (Drumming Area Exhaust Low-Range Gas Monitor), PAB Crane, SFP Platform Bridge, Truck Access Area, or Decon Area?
☐	☒	Does the proposed activity involve a change to Point Beach CLB design criteria for external events such as earthquakes, tornadoes, high winds, flooding, etc.?
☐	☒	Does the activity involve plant heavy load requirements or procedures for areas of the plant used to support cask loading/unloading activities?
☐	☒	Does the activity involve any potential for fire or explosion where casks are loaded, unloaded, transported or stored?

If ANY of the Part V questions are answered YES, then a full 10 CFR 72.48 screening is required and answers to the questions in - t VI and Part VII are to be provided. If ALL the questions in Part V are answered NO, then check Parts VI and VII as not icable. Complete Part VIII to document the conclusion that no 10 CFR 72.48 evaluation is required.

RT VI (72.48) - DETERMINE IF THE CHANGE INVOLVES A ISFSI LICENSING BASIS *DESIGN FUNCTION*

(If ALL the questions in Part V are NO, then Part VI is ☒ NOT APPLICABLE.)

Compare the proposed activity to the relevant portions of the ISFSI licensing basis and answer the following questions:

YES	NO	QUESTION
☐	☐	Does the proposed activity involve cask/ISFSI Safety Analyses or plant/cask/ISFSI structures, systems and components (SSCs) credited in the Safety Analyses?
☐	☐	Does the proposed activity involve plant, cask or ISFSI SSCs that support SSC(s) credited in the Safety Analyses?
☐	☐	Does the proposed activity involve plant, cask or ISFSI SSCs whose function is relied upon for prevention of a radioactive release, OR whose failure could impact SSC(s) credited in the Safety Analyses?
☐	☐	Does the proposed activity involve cask/ISFSI described SSCs or procedural controls that perform functions that are required by, or otherwise necessary to comply with, regulations, license conditions, CoC conditions, or orders?
☐	☐	Does the activity involve a *method of evaluation* described in the ISFSI licensing basis?
☐	☐	Is the activity a *test or experiment*? (i e., a non-passive activity which gathers data)
☐	☐	Does the activity exceed or potentially affect a cask *design basis limit for a fission product barrier (DBLFPB)*? (NOTE: If THIS questions is answered YES, a 10 CFR 72.48 Evaluation is required.)

If the answers to ALL of these questions are NO, mark Parts VII as not applicable, and document the 10 CFR 72.48 screening in the conclusion section (Part VIII).

If any of the above questions are marked YES, identify below the specific design function(s), method of evaluation(s) or DBLFPB(s) involved

PART VII (72.48) - DETERMINE WHETHER THE ACTIVITY INVOLVES ADVERSE EFFECTS (NEI 96-07, Appendix B, Section B.4.2.1)

(If ALL the questions in Part V or Part VI are answered NO, then Part VII is ☒ NOT APPLICABLE.)

Answer the following questions to determine if the activity has an *adverse effect* on a design function. Any YES answer means that a 10 CFR 72.48 Evaluation is required, EXCEPT where noted in Part VII 3.

VII.1 Changes to the Facility or Procedures

YES	NO	QUESTION
☐	☐	Does the activity adversely affect the *design function* of a plant, cask, or ISFSI SSC credited in safety analyses?
☐	☐	Does the activity adversely affect the method of performing or controlling the *design function* of a plant, cask, or ISFSI SSC credited in the safety analyses?

If any answer is YES, a 10 CFR 72.48 Evaluation is required If both answers are NO, describe the basis for the conclusion (attach additional discussion, as necessary):

VII.2 Changes to a Method of Evaluation

(If the activity does not involve a method of evaluation, these questions are ☒ NOT APPLICABLE.)

YES	NO	QUESTION
☐	☐	Does the activity use a revised or different method of evaluation for performing safety analyses than that described in a cask SAR?
☐	☐	Does the activity use a revised or different method of evaluation for evaluating SSCs credited in safety analyses than that described in a cask SAR?

If any answer is YES, a 10 CFR 72.48 Evaluation is required. If both answers are NO, describe the basis for the conclusion (attach additional discussion, as necessary):

VII.3 Tests or Experiments

(If the activity is not a test or experiment, the questions in VII.3.a and VII.3.b are ☒ NOT APPLICABLE.)

a. Answer these two questions first:

YES	NO	QUESTION
☐	☐	Is the proposed test or experiment bounded by other tests or experiments that are described in the cask ISFSI licensing basis?
☐	☐	Are the SSCs affected by the proposed test or experiment isolated from the cask(s) or ISFSI facility?

If the answer to both questions is NO, continue to VII.3.b. If the answer to EITHER question is YES, then briefly describe the basis.

b. Answer these additional questions ONLY for tests or experiments which do not meet the criteria given in VII.3.a above. If the answer to either question in VII.3.a is YES, then these three questions are ☐ NOT APPLICABLE:

YES	NO	QUESTION
☐	☐	Does the activity utilize or control an SSC in a manner that is outside the reference bounds of the design bases as described in the ISFSI licensing basis?
☐	☐	Does the activity utilize or control a plant, cask or ISFSI facility SSC in a manner that is inconsistent with the analyses or descriptions in the ISFSI licensing basis?
☐	☐	Does the activity place the cask or ISFSI facility in a condition not previously evaluated or that could affect the capability of a plant, cask, or ISFSI SSC to perform its intended functions?

If any answer in VII 3.b is YES a 10 CFR 72.48 Evaluation is required. If the answers are all NO, describe the basis for the conclusion (attach additional discussion as necessary)

RT VIII - DOCUMENT THE CONCLUSION OF THE 10 CFR 72.48 SCREENING

Check all that apply:

A 10 CFR 72.48 Evaluation is ☐ required or ☒ NOT required. Obtain a screening number and provide the original to Records Management regardless of the conclusion of the 50.59 or 72.48 screening

A VSC-24 cask Safety Analysis Report change is ☐ required or ☒ NOT required. If a VSC-24 cask SAR change is required, then contact the Point Beach Dry Fuel Storage group supervisor.

A Regulatory Commitment (CLB Commitment Database) change is ☐ required or ☒ NOT required. If a Regulatory Commitment Change is required, initiate a commitment change per NP 5.1.7.

A change to the VSC-24 10 CFR 72.212 Site Evaluation Report is ☐ required or ☒ NOT required. If a VSC-24 10 CFR 72.212 Site Evaluation Report change is required, then contact the Point Beach Dry Fuel Storage group supervisor.

Title of Proposed Activity: EOP/ARP Actions for AFW Mini-Recirc Flow Requirement

Associated Reference(s) # CR 01-2278, Action 2; CAP001804; EVAL 2002-005, CR 01-3595

Prepared by: David Black (Name (Print)) — David Black (Signature) — Date: 6-20-2002

Reviewed by: Richard P. Wood (Name (Print)) — R. P. Wood (Signature) — Date: 6/21/2002

PART I (50.59/72.48) - DESCRIBE THE PROPOSED ACTIVITY AND SEARCH THE PLANT AND ISFSI LICENSING BASIS (Resource Manual 5.3.1)

NOTE: **The "NMC 10 CFR 50.59 Resource Manual" (Resource Manual) and NEI 96-07, Appendix B, Guidelines for 10 CFR 72.48 Implementation should be used for guidance to determine the proper responses for 10 CFR 50.59 and 10 CFR 72.48 screenings.**

I.1 Describe the proposed activity and the scope of the activity being covered by this screening. (The 10 CFR 50.59 / 72.48 review of other portions of the proposed activity may be documented via the applicability and pre-screening process requirements in NP 5.1.8) Appropriate descriptive material may be attached.

This screening was revised to address CAP001804 and corrective action CA003360. The original screening was applied to temporary and permanent changes to the procedures indicated below. CAP001804 identified a 50.59 evaluation should have been performed for these changes.

EOP-0 and EOP-0.1 for both units were revised the AFW Minimum Flow Requirements foldout-page criteria to include the instrument air header pressure low annunciator in the alarm state as additional criteria for monitoring AFW mini-recirc flow requirements

AFW Minimum Flow Requirements foldout-page item was added to ECA-0 0. The foldout-page item is identical to the AFW minimum flow requirements used in EOP-0 and EOP-0.1.

Step 3.1 was added to ARP CO1 A 1-9. The step states to monitor and maintain AFW mini-reck flow requirements should the AFW pump mini-recirc valve fail shut.

The exact wording included in the procedures is as indicated in the following two items:

1. The step below was added to the Foldout Pages in each of the following procedures: EOP-0, Reactor Trip or Safety Injection (Unit 1, Rev. 37 and Unit 2, Rev. 38), EOP-0 1, Reactor Trip Response (Unit 1, Rev 26 and Unit 2, Rev 25), ECA-0 0, Loss of All AC Power (Unit 1, Rev. 30 and Unit 2, Rev. 31)

   AFW MINIMUM FLOW REQUIREMENTS
   IF any AFW pump mini-recirc valve fails shut OR annunciator CO 1 A 1-9, INSTRUMENT AIR HEADER PRESSURE LOW in alarm, THEN monitor and maintain minimum AFW flow or stop the affected AFW pump as necessary to control S/G levels
   - o P-38A minimum flow - GREATER THAN 50 GPM
   - o P-38B minimum flow - GREATER THAN 50 GPM
   - o P-29 minimum flow - GREATER THAN 75 GPM

2. The following step was revised in the Alarm Response Procedure , ARP CO 1 A 1-9, INSTRUMENT AIR HEADER PRESSURE LOW UNIT 0 (Rev. 1)

3.1 Perform the following:
3.1.1 IF any AFW pump mini-recirc valve fails shut in conjunction with this alarm,
THEN monitor and maintain minimum AFW flow
OR stop the affected AFW pump as necessary to control S/G levels.

3.1.2 Respond per ARP CO 1 D 1-2, INSTRUMENT AIR HEADER PRESS LO.

I.2 Search the PBNP Current Licensing Basis (CLB) as follows: Final Safety Analysis Report (FSAR), FSAR Change Requests (FCRs) with assigned numbers, the Fire Protection Evaluation Report (FPER), the CLB (Regulatory) Commitment Database, the Technical Specifications, the Technical Specifications Bases, and the Technical Requirements Manual. Search the ISFSI licensing basis as follows: VSC-24 Safety Analysis Report, the VSC-24 Certificate of Compliance, the CLB (Regulatory) Commitment Database, and the VSC-24 10 CFR 72.212 Site Evaluation Report. Describe the pertinent design function(s), performance requirements, and methods of evaluation for both the plant and for the cask/ISFSI as appropriate. Identify where the pertinent information is described in the above documents (by document section number and title). (Resource Manual 5.3.1 and NEI 96-07, App B, B 2)

The Auxiliary Feedwater (AFW) system has the following functions described in the licensing basis:

a To automatically start and ensure that adequate feedwater is supplied to the steam generators for heat removal during accidents which may result in a main steam safety valve opening (Loss of Normal Feedwater – including ATWS, and Loss of AC to the Station Auxiliaries).
b. To automatically start and provide flow to maintain steam generator levels during accidents which require or result in rapid reactor coolant system cooldown (Steam Generator Tube Rupture and Rupture of a Steam Pipe).
c To allow the isolation of all lines to the ruptured steam generator in the SGTR event.
d. To provide sufficient feedwater to remove decay heat from both units for one hour during a station blackout event (TDAFP only).
e. To provide sufficient flow to the steam generators to remove decay heat to achieve cold shutdown within 72 hours following a plant fire (Appendix R).
f. To withstand a seismic event (designed as seismic Class 1) and to ensure that steam generator levels are maintained during a seismic event.
g. To provide flow to the steam generators during plant startup and shutdown, and during hot shutdown or hot standby conditions for chemical additions and when operation of the main feedwater and condensate systems is not warranted.

FSAR 7.2.3.2 Item e. Steam Generator Water Level and Feedwater Flow states: "The basic function of the reactor protection trips associated with low steam generator water level and low feedwater flow is to preserve the steam generator heat sink for removal of long-term residual heat (See Figure 7.2-12). Should a complete loss of feedwater occur with no reactor protection action, the steam generators would boil dry and cause an overtemperature/overpressure excursion of the reactor coolant."

Reactor trips on temperature, pressure, and pressurizer water level will trip the plant before there is any damage to the core or reactor coolant system. However, the residual heat remaining after a trip would cause thermal expansion and discharge of the reactor coolant to containment through the pressurizer relief valves and pressurizer relief tank.

Redundant auxiliary feedwater pumps are provided to prevent the loss of steam generator inventory Reactor trips act before the steam generators are dry, to reduce the required capacity and starting time requirements for the auxiliary feedwater pumps and minimize the thermal transient on the reactor coolant system and steam generators "

FSAR 7.3.3.4, "Manual AFW Flow Control During Plant Shutdown" states: "The successful operation of the engineered safety features only involves actuation, with one exception This exception is manually controlling steam generator water level using the auxiliary feedwater pumps during plant shutdown, to remove reactor decay and sensible heat. This manual control involves positioning the auxiliary feedwater flow control valves in order to maintain proper steam generator water level Steam generator water level indication and controls are located in the control room and at a local control station.

FSAR 10.1, Steam and Power Conversion System, Section 10 1 1 Design Basis under "Main Feedwater" states. "Reactor trip is actuated either on a coincidence of sustained steam flow - feedwater flow mismatch, coupled with low level in any steam generator or by a low-low steam generator water level. These trips are discussed in further detail in Section 7.2

Whenever a reactor trip occurs, the main feedwater control valves move to the fully opened position to increase the feedwater flow to the steam generators for faster reduction of reactor coolant temperature to the no-load average temperature value. The valves remain fully open until either one of the following conditions occurs, at which time the respective valve, or valves, fully close:

Abnormally high steam generator level,
Safety injection signal; or
Average temperature error signal (Between measured Tavg and the no load TREF) reduces to a preset level

Either a high steam generator level or a safety injection signal will close the feedwater bypass valves."

FSAR Figure 10.1-2, Sheet 2 (Unit 1) and Figure 10.1-2A, Sheet 2 show that valves 1/2 CS-466 and 1/2 CS-476 (Main Feedwater Regulating Valves) and valves 1/2 CS-480 and 1/2 CS-48 (Main Feedwater Regulating Bypass Valves) are air-operated, failed closed valves.

FSAR 10.2.1, Design Basis states: "The auxiliary feedwater system is designed to supply high-pressure feedwater to the steam generators in order to maintain a water inventory for removal of heat energy from the reactor coolant system by secondary side steam release in the event of inoperability or unavailability of the main feedwater system. In order to meet the design basis required in the Loss of Normal Feedwater/Loss of All AC analysis, one motor driven auxiliary feedwater pump provides 200 gpm of flow either to one steam generator or split between two steam generators within 5 minutes following receipt of a low-low steam generator water level setpoint signal. Redundant supplies are provided by two pumping systems using different sources of power for the pumps. The design capacity of each system is set so that the steam generators will not boil dry nor will the primary side relieve fluid through the pressurizer relief valves, following a loss of main feedwater flow with a reactor trip."

FSAR 10.2.2, System Design and Operation, states: "The auxiliary feedwater system consists of two electric motor-driven pumps, two steam turbine-driven pumps, pump suction and discharge piping, and the controls and instrumentation necessary for operation of the system. Redundancy is provided by utilizing two pumping systems, two different sources of power for the pumps, and two sources of water supply to the pumps. The system is categorized as seismic Class I and is designed to ensure that a single fault will not obstruct the system function."

FSAR 10.2.2 also states:

- For the motor-driven pumps: "Each pump has an AOV, AF-4007 for P-38A and AF-4014 for P-38B, controlled recirculation line back to the condensate storage tanks to ensure minimum flow to prevent hydraulic instabilities and dissipate pump heat."

- For the turbine-driven pumps: "Each pump has an AOV (AF-4002) controlled recirculation line back to the condensate storage tanks to ensure minimum flow to dissipate pump heat."

FSAR 10.2.2 also states:

During normal plant operations, the auxiliary feedwater system is maintained in a standby condition ready to be placed in operation automatically when conditions require. The auxiliary feedwater pumps are automatically started on receipt of any of the following signals:

Turbine-driven feedwater pumps

1. Low-low water level in both steam generators in one unit starts the corresponding pump.

2. Loss of both 4 16 kv buses supplying the main feedwater pump motors in one unit starts the corresponding auxiliary feedwater pump

3. Trip or shutdown of both main feedwater pumps or closure of both feedwater regulating valves in one unit starts the corresponding pump These signals are processed through AMSAC at power levels above 40%

Motor-driven feedwater pumps

1. Low-low water level in either associated steam generator.

2. Trip or shutdown of both main feedwater pumps or closure of both feedwater regulating valves in one unit. These signals are processed through AMSAC at power levels above 40%.

3. Safeguards sequence signal.

FSAR Figure 10.2-1 shows that 1/2AF-4002 for 1/2P-29 (turbine-driven pumps), and AF-4007 for P-38A, AF-4014 for P-38B (motor-driven pumps) are all fail-closed valves.

CLB References:
FSAR 7.2.3.2- Specific Control and Protection Interactions
FSAR 7.3.3.4 - Manual AFW Flow Control During Plant Shutdown
FSAR Section 7.4.1 – AMSAC
FSAR Section 10.1 - Steam and Power Conversion System
FSAR Section 10.2 – Auxiliary Feedwater
FSAR Figure 10.2-1 Sheet 1 – Bech M-217 Sh. 1 – Auxiliary Feedwater System
FSAR Figure 10.2-1 Sheet 2 – Bech M-217 Sh. 2 – Auxiliary Feedwater System
FSAR Section 14.1.10 – Loss of Normal Feedwater
FSAR Section 14.1.11 – Loss of All AC Power to the Station Auxiliaries
FSAR Section 14.2.4 – Steam Generator Tube Rupture
FSAR Section 14.2.5 – Rupture of a Steam Pipe
FSAR Appendix A.1 – Station Blackout
FPER 5.2.2 – Safe Shutdown Systems and Equipment
FPER 5.2.5.2.3 – Auxiliary Feedwater Pump Room
FPER 6.6 - Safe Shutdown Systems
FPER 6.6.4 - Auxiliary Feedwater System
Tech Spec 3.7.5 – Auxiliary Feedwater
Tech Spec Bases B 3 7.5 – Auxiliary Feedwater

I.3 Does the proposed activity involve a change to any Technical Specification? Changes to Technical Specifications require a License Amendment Request (Resource Manual Section 5 3.1.2).

Technical Specification Change : ☐ Yes ☒ No

If a Technical Specification change is required, explain what the change should be and why it is required

I.4 Does the proposed activity involve a change to the terms, conditions or specifications incorporated in any VSC-24 cask Certificate of Compliance (CoC)? Changes to a VSC-24 cask Certificate of Compliance require a CoC amendment request.

☐ Yes ☒ No

If a storage cask Certificate of Compliance change is required, explain what the change should be and why it is required

---------- 10 CFR 50.59 SCREENING ----------

PART II (50.59) - DETERMINE IF THE CHANGE INVOLVES A *DESIGN FUNCTION* (Resource Manual 5 3 2)

ıpare the proposed activity to the relevant CLB descriptions, and answer the following questions:

YES NO QUESTION

	☐	Does the proposed activity involve Safety Analyses or structures, systems and components (SSCs) credited in the Safety Analyses?
☒	☐	Does the proposed activity involve SSCs that support SSC(s) credited in the Safety Analyses?
☒	☐	Does the proposed activity involve SSCs whose failure could initiate a transient (e.g., reactor trip, loss of feedwater, etc.) or accident, OR whose failure could impact SSC(s) credited in the Safety Analyses?
☒	☐	Does the proposed activity involve CLB-described SSCs or procedural controls that perform functions that are required by, or otherwise necessary to comply with, regulations, license conditions, orders or technical specifications?
☐	☒	Does the activity involve a *method of evaluation* described in the FSAR?
☐	☒	Is the activity a *test or experiment*? (i e., a non-passive activity which gathers data)
☐	☒	Does the activity exceed or potentially affect a *design basis limit for a fission product barrier (DBLFPB)*? (NOTE: If THIS questions is answered YES, a 10 CFR 50 59 Evaluation is required.)

If the answers to ALL of these questions are NO, mark Part III as not applicable, document the 10 CFR 50.59 screening in the conclusion section (Part IV), then proceed directly to Part V - 10 CFR 72 48 Pre-screening Questions.

If any of the above questions are marked YES, identify below the specific design function(s), method of evaluation(s) or DBLFPB(s) involved

FSAR 10.2 states each AFW pump has an AOV controlled recirc line back to the CST to ensure minimum flow to dissipate heat. This change ensures the minimum AFW flow requirements will be maintained on any running AFW pump in the case of a failed shut AFW mini-recirc flow control valve.

As indicated in the licensing basis search section, I.2, FSAR 10.2.2 also states

- For the motor-driven pumps: "Each pump has an AOV, AF-4007 for P-38A and AF-4014 for P-38B, controlled recirculation line back to the condensate storage tanks to ensure minimum flow to prevent hydraulic instabilities and dissipate pump heat."
- For the turbine-driven pumps: "Each pump has an AOV (AF-4002) controlled recirculation line back to the condensate storage tanks to ensure minimum flow to dissipate pump heat."

Thus the AFW mini-recirc valves have a design function to ensure minimum flow through the pumps to keep the pumps from overheating. CR 01-3595 identified that with a loss of instrument air (such as would occur with a loss of offsite power that the AFW minimum flow recirculation valves will fail closed If this is the case, operators need to maintain a minimum water flowrate through the pump(s) to provide adequate cooling, or secure the pump If all AFW pumps start and run (as designed), operators may need to reduce AFW flow in order to prevent overfilling the steam generators or overcooling the reactor

As indicated above FSAR 7.3.3.4 states: "The successful operation of the engineered safety features only involves actuation, with one exception. This exception is manually controlling steam generator water level using the auxiliary feedwater pumps during plant shutdown, to remove reactor decay and sensible heat. This manual control involves positioning the auxiliary feedwater flow control valves in order to maintain proper steam generator water level Steam generator water level indication and controls are located in the control room and at a local control station." Therefore the licensing basis states explicitly that operator action is required to control AFW flow to maintain steam generator level. However, it does not explicitly address controlling flow to ensure AFW pump operability by securing pumps or maintaining minimum pump flows because of the unavailability of the mini-recirculation lines Thus there is an additional manual method of performing and controlling the design function of maintaining steam generator level, and an additional method of performing or controlling minimum flow though the pumps to ensure sufficient cooling is provided in the procedure changes Further there is an adverse affect on the AFW pump function of providing water to the steam generators in that pumps/motors may need to be stopped and restarted to control steam generator level.

PART III (50.59) - DETERMINE WHETHER THE ACTIVITY INVOLVES ADVERSE EFFECTS (Resource Manual 5 3.3)

If ALL the questions in Part II are answered NO, then Part III is ☐ NOT APPLICABLE.

wer the following questions to determine if the activity has an *adverse effect* on a design function. Any YES answer means that a 10 CFR 50.59 Evaluation is required; EXCEPT where noted in Part III 3.

III.1 CHANGES TO THE FACILITY OR PROCEDURES

YES	NO	QUESTION
☒	☐	Does the activity adversely affect the *design function* of an SSC credited in safety analyses?
☒	☐	Does the activity adversely affect the method of performing or controlling the *design function* of an SSC credited in the safety analyses?

If any answer is YES, a 10 CFR 50.59 Evaluation is required If both answers are NO, describe the basis for the conclusion (attach additional discussion as necessary):

SEE EVAL 2002-005 for the completed 50.59 evaluation.

III.2 CHANGES TO A METHOD OF EVALUATION

(If the activity does not involve a method of evaluation, these questions are ☒ NOT APPLICABLE.)

YES	NO	QUESTION
☐	☐	Does the activity use a revised or different method of evaluation for performing safety analyses than that described in the CLB?
☐	☐	Does the activity use a revised or different method of evaluation for evaluating SSCs credited in safety analyses than that described in the CLB?

If any answer is YES, a 10 CFR 50.59 Evaluation is required. If both answers are NO, describe the basis for the conclusion (attach additional discussion, as necessary)

III.3 TESTS OR EXPERIMENTS

If the activity is not a test or experiment, the questions in III.3.a and III.3.b are ☒ NOT APPLICABLE.

a. Answer these two questions first:

YES	NO	QUESTION
☐	☐	Is the proposed test or experiment bounded by other tests or experiments that are described in the CLB?
☐	☐	Are the SSCs affected by the proposed test or experiment isolated from the facility?

If the answer to BOTH questions in V.3.a is NO, continue to III 3.b. If the answer to EITHER question is YES, then describe the basis.

b Answer these additional questions ONLY for tests or experiments which do NOT meet the criteria given in III.3 a above If the answer to either question in III.3 a is YES, then these three questions are ☐ NOT APPLICABLE.

YES	NO	QUESTION
☐	☐	Does the activity utilize or control an SSC in a manner that is outside the reference bounds of the design bases as described in the CLB?

☐ ☐ Does the activity utilize or control an SSC in a manner that is inconsistent with the analyses or descriptions in the CLB?

☐ ☐ Does the activity place the facility in a condition not previously evaluated or that could affect the capability of an SSC to perform its intended functions?

If any answer in III.3.b is YES, a 10 CFR 50.59 Evaluation is required. If the answers in III.3.b are ALL NO, describe the basis for the conclusion (attach additional discussion as necessary):

Part IV - 10 CFR 50.59 SCREENING CONCLUSION (Resource Manual 5.3.4).

Check all that apply:

A 10 CFR 50.59 Evaluation is ☒ required or ☐ NOT required.

A Point Beach FSAR change is ☒ required or ☐ NOT required If an FSAR change is required, then initiate an FSAR Change Request (FCR) per NP 5.2.6.

A Regulatory Commitment (CLB Commitment Database) change is ☐ required or ☒ NOT required. If a Regulatory Commitment Change is required, initiate a commitment change per NP 5.1.7.

A Technical Specification Bases change is ☒ required or ☐ NOT required. If a change to the Technical Specification Bases is required, then initiate a Technical Specification Bases change per NP 5.2.15.

A Technical Requirements Manual change is ☐ required or ☒ NOT required. If a change to the Technical Requirements Manual is required, then initiate a Technical Requirements Manual change per NP 5.2.15.

---------- 10 CFR 72.48 SCREENING -------- ----------

NOTE: NEI 96-07, Appendix B, Guidelines for 10 CFR 72.48 Implementation should be used for guidance to determine the proper responses for 72.48 screenings.

PART V (72.48) - 10 CFR 72.48 INITIAL SCREENING QUESTIONS

Part V determines if a full 10 CFR 72.48 screening is required to be completed (Parts VI and VII) for the proposed activity.

YES	NO	QUESTION
☐	☒	Does the proposed activity involve IN ANY MANNER the dry fuel storage cask(s), the cask transfer/transport equipment, any ISFSI facility SSC(s), or any ISFSI facility monitoring as follows: Multi-Assembly Sealed Basket (MSB), MSB Transfer Cask (MTC), MTC Lifting Yoke, Ventilated Concrete Cask (VCC), Ventilated Storage Cask (VSC), VSC Transporter (VCST), ISFSI Storage Pad Facility, ISFSI Storage Pad Data/Communication Links, or PPCS/ISFSI Continuous Temperature Monitoring System?
☐	☒	Does the proposed activity involve IN ANY MANNER SSC(s) installed in the plant specifically added to support cask loading/unloading activities, as follows: Cask Dewatering System (CDW), Cask Reflood System (CRF), or Hydrogen Monitoring System?
☐	☒	Does the proposed activity involve IN ANY MANNER SSC(s) needed for plant operation which are also used to support cask loading/unloading activities, as follows: Spent Fuel Pool (SFP), SFP Cooling and Filtration (SF), Primary Auxiliary Building Ventilation System (VNPAB), Drumming Area Ventilation System (VNDRM), RE-105 (SFP Low Range Monitor), RE-135 (SFP High Range Monitor), RE-221 (Drumming Area Vent Gas Monitor), RE-325 (Drumming Area Exhaust Low-Range Gas Monitor), PAB Crane, SFP Platform Bridge, Truck Access Area, or Decon Area?
☐	☒	Does the proposed activity involve a change to Point Beach CLB design criteria for external events such as earthquakes, tornadoes, high winds, flooding, etc.?

☐	☒	Does the activity involve plant heavy load requirements or procedures for areas of the plant used to support cask loading/unloading activities?
☐	☒	Does the activity involve any potential for fire or explosion where casks are loaded, unloaded, transported or stored?

If ANY of the Part V questions are answered YES, then a full 10 CFR 72.48 screening is required and answers to the questions in Part VI and Part VII are to be provided. If ALL the questions in Part V are answered NO, then check Parts VI and VII as not applicable. Complete Part VIII to document the conclusion that no 10 CFR 72.48 evaluation is required

PART VI (72.48) - DETERMINE IF THE CHANGE INVOLVES A ISFSI LICENSING BASIS *DESIGN FUNCTION*

(If ALL the questions in Part V are NO, then Part VI is ☒ NOT APPLICABLE.)

Compare the proposed activity to the relevant portions of the ISFSI licensing basis and answer the following questions:

YES	NO	QUESTION
☐	☐	Does the proposed activity involve cask/ISFSI Safety Analyses or plant/cask/ISFSI structures, systems and components (SSCs) credited in the Safety Analyses?
☐	☐	Does the proposed activity involve plant, cask or ISFSI SSCs that support SSC(s) credited in the Safety Analyses?
☐	☐	Does the proposed activity involve plant, cask or ISFSI SSCs whose function is relied upon for prevention of a radioactive release, OR whose failure could impact SSC(s) credited in the Safety Analyses?
☐	☐	Does the proposed activity involve cask/ISFSI described SSCs or procedural controls that perform functions that are required by, or otherwise necessary to comply with, regulations, license conditions, CoC conditions, or orders?
☐	☐	Does the activity involve a *method of evaluation* described in the ISFSI licensing basis?
☐	☐	Is the activity a *test or experiment*? (i.e., a non-passive activity which gathers data)
☐	☐	Does the activity exceed or potentially affect a cask *design basis limit for a fission product barrier (DBLFPB)*? (NOTE: If THIS questions is answered YES, a 10 CFR 72.48 Evaluation is required.)

If the answers to ALL of these questions are NO, mark Parts VII as not applicable, and document the 10 CFR 72 48 screening in the conclusion section (Part VIII).

If any of the above questions are marked YES, identify below the specific design function(s), method of evaluation(s) or DBLFPB(s) involved.

PART VII (72.48) - DETERMINE WHETHER THE ACTIVITY INVOLVES ADVERSE EFFECTS (NEI 96-07, Appendix B, Section B 4.2.1)

(If ALL the questions in Part V or Part VI are answered NO, then Part VII is ☒ NOT APPLICABLE.)

Answer the following questions to determine if the activity has an *adverse effect* on a design function Any YES answer means that a 10 CFR 72.48 Evaluation is required; EXCEPT where noted in Part VII.3.

VII 1 Changes to the Facility or Procedures

YES	NO	QUESTION
☐	☐	Does the activity adversely affect the *design function* of a plant, cask, or ISFSI SSC credited in safety analyses?
☐	☐	Does the activity adversely affect the method of performing or controlling the *design function* of a plant, cask, or ISFSI SSC credited in the safety analyses?

If any answer is YES, a 10 CFR 72.48 Evaluation is required. If both answers are NO, describe the basis for the conclusion (attach additional discussion, as necessary):

VII.2 Changes to a Method of Evaluation

(If the activity does not involve a method of evaluation, these questions are ☒ NOT APPLICABLE.)

YES	NO	QUESTION
☐	☐	Does the activity use a revised or different method of evaluation for performing safety analyses than that described in a cask SAR?
☐	☐	Does the activity use a revised or different method of evaluation for evaluating SSCs credited in safety analyses than that described in a cask SAR?

If any answer is YES, a 10 CFR 72.48 Evaluation is required. If both answers are NO, describe the basis for the conclusion (attach additional discussion, as necessary)

VII.3 Tests or Experiments

(If the activity is not a test or experiment, the questions in VII.3.a and VII.3.b are ☒ NOT APPLICABLE.)

a. Answer these two questions first:

YES	NO	QUESTION
☐	☐	Is the proposed test or experiment bounded by other tests or experiments that are described in the cask ISFSI licensing basis?
☐	☐	Are the SSCs affected by the proposed test or experiment isolated from the cask(s) or ISFSI facility?

If the answer to both questions is NO, continue to VII.3.b. If the answer to EITHER question is YES, then briefly describe the basis.

b. Answer these additional questions ONLY for tests or experiments which do not meet the criteria given in VII.3 a above. If the answer to either question in VII.3.a is YES, then these three questions are ☐ NOT APPLICABLE.

YES	NO	QUESTION
☐	☐	Does the activity utilize or control an SSC in a manner that is outside the reference bounds of the design bases as described in the ISFSI licensing basis?
☐	☐	Does the activity utilize or control a plant, cask or ISFSI facility SSC in a manner that is inconsistent with the analyses or descriptions in the ISFSI licensing basis?
☐	☐	Does the activity place the cask or ISFSI facility in a condition not previously evaluated or that could affect the capability of a plant, cask, or ISFSI SSC to perform its intended functions?

If any answer in VII 3.b is YES, a 10 CFR 72.48 Evaluation is required. If the answers are all NO, describe the basis for the conclusion (attach additional discussion as necessary)

PART VIII - DOCUMENT THE CONCLUSION OF THE 10 CFR 72.48 SCREENING

Check all that apply:

A 10 CFR 72.48 Evaluation is ☐ required or ☒ NOT required. Obtain a screening number and provide the original to Records Management regardless of the conclusion of the 50.59 or 72.48 screening.

A VSC-24 cask Safety Analysis Report change is ☐ required or ☒ NOT required. If a VSC-24 cask SAR change is required, then contact the Point Beach Dry Fuel Storage group supervisor.

A Regulatory Commitment (CLB Commitment Database) change is ☐ required or ☒ NOT required. If a Regulatory Commitment Change is required, initiate a commitment change per NP 5.1.7.

A change to the VSC-24 10 CFR 72.212 Site Evaluation Report is ☐ required or ☒ NOT required. If a VSC-24 10 CFR 72.212 Site Evaluation Report change is required, then contact the Point Beach Dry Fuel Storage group supervisor.

:le of Proposed Activity: Permanent Procedure Changes to Address Potential for Simultaneous Failure of All AFW Pumps

Associated Reference(s) #: CR 01-2278, CR 01-3595 and LER 266/2001-005-00
Calculation WE-0005-06
OM 3.7, Rev. 10, "AOP and EOP Procedures Sets Use and Adherence"
Flowserve Corporation Pump Division letter dated March 2, 2001
Westinghouse Application Data AD 33-760, dated November 1967
EOP-0, Reactor Trip or Safety Injection (Unit 1 and Unit 2), EOP-0.1, Reactor Trip Response (Unit 1 and Unit 2), ECA-0.0, Loss of All AC Power (Unit 1 and Unit 2), and Alarm Response Procedure, ARP C01 A 1-9, Instrument Air Header Pressure Low (Unit 0)

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PART I – DESCRIBE THE PROPOSED ACTIVITY AND SEARCH THE CURRENT LICENSING BASIS

I.1. Describe the proposed facility change, procedure change, test, or experiment which this evaluation is addressing. Parts of an activity for which 10 CFR 50.59 is not applicable or have been pre-screened or screened are to be documented on Forms PBF-1515a, PBF-1515b or PBF-1515c, or on forms associated with the change activity (i.e., PBF-0026a, PBF-0026c, etc.). 10 CFR 72.48 evaluations are documented on Form PBF-1515e. The applicable description from the screening may be provided.

The proposed activity is to make permanent procedure changes that were implemented in response to a condition that was identified where, with a procedure-directed operator action to control steam generator level (which could be accomplished by reducing flow through one or more AFW pumps), concurrent with a loss of instrument air (which would cause the AFW pumps' mini-recirculation valves to fail close), the potential existed for a simultaneous failure of the multi-stage high pressure AFW pumps due to very low or no flow through running AFW pumps. The procedures were initially revised as a compensatory measure to support AFW pump operability. This 50.59 evaluation will review the procedure changes as a permanent change to the procedures as described in the FSAR to confirm consistency with the licensing basis. The permanent procedure changes will restore the AFW pumps to fully operable status.

This evaluation also forms the basis for changes to the FSAR and Technical Specification Bases to clarify that the mini-recirculation valves require instrument air to function and that either a pump minimum flow is maintained or pumps are secured if the valve fails or instrument air is lost.

This evaluation does not credit backup air sources which have been added to all minimum flow recirculation valves. Instrument air accumulator tanks have been installed by MR 02-001 for the 1/2P-29 valves (1/2AF-4002), and the existing nitrogen backup system for the motor-driven auxiliary feed pump discharge valves has been tied in by MR 01-144 for the P-38A/B valves (AF-4007, AF-4014). These backup air sources are not credited, ~~because the changes were not designated as safety-related~~ 4/27/02 4/27/02

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Abnormal Operating Procedure AOP-5B, Loss of Instrument Air, includes a step to check that the AFW Pump Mini-recirc Valves are gagged open. However, this step is located in the latter part of the procedure and would not be reached in time to prevent pump failure. Therefore, no credit is taken for this procedure in this evaluation.

FSAR 7.3.3.4, "Manual AFW Flow Control During Plant Shutdown" states: *"The successful operation of the engineered safety features only involves actuation, with one exception. This exception is manually controlling steam generator water level using the auxiliary feedwater pumps during plant shutdown, to remove reactor decay and sensible heat. This manual control involves positioning the auxiliary feedwater flow control valves in order to maintain proper steam generator water level."* The following statements appear in the Point Beach Final Facility Description and Safety Analysis Report (FFDSAR, page 7.5-9 dated May 12, 1969) which was part of the basis for the plant's original operating license: *"The successful operation of the engineered safety features involves only actuation, with one exception. This exception is the steam generator level control function associated with plant cooldown using the auxiliary feedwater pumps. This level control system involves remote manual positioning of feedwater flow control valves in order to maintain proper steam generator water level."*

CR 01-2278, CR 01-3595 and LER 266/2001-005-00 identified an issue that could cause a common mode failure of all auxiliary feedwater pumps. If an accident or event has occurred that is due to or has led to the loss of instrument air, then the auxiliary feedwater pump minimum recirculation control valves 1/2AF-4002 for 1/2P-29, AF-4007 for P-38A, and AF-4014 for P-38B will all fail closed. During this event, it will become necessary for operators to throttle back auxiliary feedwater flow to control steam generator level, especially if all auxiliary feedwater pumps auto start as designed. If it is not recognized that the AFW minimum recirculation valves have closed, and pump discharge valves are closed to control steam generator level (with no minimum flow path), then the pumps would dead head and fail in a short time due to overheating.

The auxiliary feedwater minimum flow recirculation valves do not have a safety function in the open position, however this function is a design function described in FSAR Section 10.2 and Technical Specification Bases B3.7.5. The basis for the recirculation valves not having a safety function in the open position is that all of the auxiliary feedwater pumps will have open discharge valves upon auto-start (even with a loss of instrument air), and thus the minimum flow recirculation line is not needed early in the accident or event. These minimum recirculation valves have an augmented quality function to open (by manual override) to ensure adequate flow though the associated auxiliary feedwater pump during an Appendix R fire within 45 minutes (per Calculation WE-0005-06).

The following procedures were changed: EOP-0, Reactor Trip or Safety Injection (Unit 1 and Unit 2), EOP-0.1, Reactor Trip Response (Unit 1 and Unit 2), ECA-0.0, Loss of All AC Power (Unit 1 and Unit 2), and Alarm Response Procedure, ARP C01 A 1-9, Instrument Air Header Pressure Low (Unit 0). The following procedure changes were made:

1. The step below was added to the Foldout Pages in each of the following procedures: EOP-0, Reactor Trip or Safety Injection (Unit 1 and Unit 2), EOP-0.1, Reactor Trip Response (Unit 1 and Unit 2), ECA-0.0, Loss of All AC Power (Unit 1 and Unit 2).

   "AFW MINIMUM FLOW REQUIREMENTS
   IF any AFW pump mini-recirc valve fails shut OR annunciator C01 A 1-9, INSTRUMENT AIR HEADER PRESSURE LOW in alarm, THEN monitor and maintain minimum AFW flow or stop the affected AFW pump as necessary to control S/G levels.
   o P-38A minimum flow - GREATER THAN 50 GPM
   o P-38B minimum flow - GREATER THAN 50 GPM
   o P-29 minimum flow - GREATER THAN 75 GPM"

2. The following step was revised in the Alarm Response Procedure , ARP C01 A 1-9, INSTRUMENT AIR HEADER PRESSURE LOW UNIT 0.

   3.1 Perform the following:
   3.1.1 IF any AFW pump mini-recirc valve fails shut in conjunction with this alarm,
   THEN monitor and maintain minimum AFW flow
   OR stop the affected AFW pump as necessary to control S/G levels.

   3 1 2 Respond per ARP C01 D 1-2, INSTRUMENT AIR HEADER PRESS LO.

Point Beach Operations Manual OM 3.7, "AOP and EOP Procedure Sets Use and Adherence," Section 4.8, "Foldout Pages" specifies the following regarding use of Foldout Pages:

- Foldout pages shall be continuously evaluated whenever the controlling procedure is in use.
- Action shall be taken after the immediate action steps are complete when a foldout page criterion is met.

1.2 Search the PBNP Final Safety Analysis Report (FSAR), pending FSAR Change Requests (FCRs) with assigned numbers, the CLB (Regulatory Commitment) Database, the Fire Protection Evaluation Report (FPER), the Technical Specifications, Technical Specifications Bases, and the Technical Requirements Manual. Identify below the pertinent design function(s), performance requirements, methods of controlling or performing design functions, design basis fission product barrier limits and methods of evaluation. Identify where the pertinent information is described in the above documents (by document section number and title).

The Auxiliary Feedwater (AFW) system has the following functions described in the licensing basis:

a. To automatically start and ensure that adequate feedwater is supplied to the steam generators for heat removal during accidents which may result in a main steam safety valve opening (Loss of Normal Feedwater – including ATWS, and Loss of AC to the Station Auxiliaries).
b. To automatically start and provide flow to maintain steam generator levels during accidents which require or result in rapid reactor coolant system cooldown (Steam Generator Tube Rupture and Rupture of a Steam Pipe).
c. To allow the isolation of all lines to the ruptured steam generator in the SGTR event.
d. To provide sufficient feedwater to remove decay heat from both units for one hour during a station blackout event (TDAFP only).
e. To provide sufficient flow to the steam generators to remove decay heat to achieve cold shutdown within 72 hours following a plant fire (Appendix R).
f. To withstand a seismic event (designed as seismic Class 1) and to ensure that steam generator levels are maintained during a seismic event.
g. To provide flow to the steam generators during plant startup and shutdown, and during hot shutdown or hot standby conditions for chemical additions and when operation of the main feedwater and condensate systems is not warranted

FSAR 7.2.3.2 Item e. Steam Generator Water Level and Feedwater Flow states: "The basic function of the reactor protection trips associated with low steam generator water level and low feedwater flow is to preserve the steam generator heat sink for removal of long-term residual heat (See Figure 7.2-12). Should a complete loss of feedwater occur with no reactor protection action, the steam generators would boil dry and cause an overtemperature/overpressure excursion of the reactor coolant."

Reactor trips on temperature, pressure, and pressurizer water level will trip the plant before there is any damage to the core or reactor coolant system. However, the residual heat remaining after a trip would cause thermal expansion and discharge of the reactor coolant to containment through the pressurizer relief valves and pressurizer relief tank.

Redundant auxiliary feedwater pumps are provided to prevent the loss of steam generator inventory. Reactor trips act before the steam generators are dry, to reduce the required capacity and starting time requirements for the auxiliary feedwater pumps and minimize the thermal transient on the reactor coolant system and steam generators."

FSAR 7.3.3.4, "Manual AFW Flow Control During Plant Shutdown" states: "The successful operation of the engineered safety features only involves actuation, with one exception. This exception is manually controlling steam generator water level using the auxiliary feedwater pumps during plant shutdown, to remove reactor decay and sensible heat. This manual control involves positioning the auxiliary feedwater flow control valves in order to maintain proper steam generator water level Steam generator water level indication and controls are located in the control room and at a local control station.

FSAR 10.1, Steam and Power Conversion System, Section 10.1.1 Design Basis under "Main Feedwater" states: "Reactor trip is actuated either on a coincidence of sustained steam flow - feedwater flow mismatch, coupled with low level in any steam generator or by a low-low steam generator water level. These trips are discussed in further detail in Section 7 2.

Whenever a reactor trip occurs, the main feedwater control valves move to the fully opened position to increase the feedwater flow to the steam generators for faster reduction of reactor coolant temperature to the no-load average temperature value. The

valves remain fully open until either one of the following conditions occurs, at which time the respective valve, or valves, fully close:

Abnormally high steam generator level;
Safety injection signal; or
Average temperature error signal (Between measured Tavg and the no load TREF) reduces to a preset level.

Either a high steam generator level or a safety injection signal will close the feedwater bypass valves."

FSAR Figure 10.1-2, Sheet 2 (Unit 1) and Figure 10.1-2A, Sheet 2 show that valves 1/2 CS-466 and 1/2 CS-476 (Main Feedwater Regulating Valves) and valves 1/2 CS-480 and 1/2 CS-48 (Main Feedwater Regulating Bypass Valves) are air-operated, failed closed valves.

FSAR 10.2.1, Design Basis states: "The auxiliary feedwater system is designed to supply high-pressure feedwater to the steam generators in order to maintain a water inventory for removal of heat energy from the reactor coolant system by secondary side steam release in the event of inoperability or unavailability of the main feedwater system. In order to meet the design basis required in the Loss of Normal Feedwater/Loss of All AC analysis, one motor driven auxiliary feedwater pump provides 200 gpm of flow either to one steam generator or split between two steam generators within 5 minutes following receipt of a low-low steam generator water level setpoint signal. Redundant supplies are provided by two pumping systems using different sources of power for the pumps. The design capacity of each system is set so that the steam generators will not boil dry nor will the primary side relieve fluid through the pressurizer relief valves, following a loss of main feedwater flow with a reactor trip."

FSAR 10.2.2, System Design and Operation, states: "The auxiliary feedwater system consists of two electric motor-driven pumps, two steam turbine-driven pumps, pump suction and discharge piping, and the controls and instrumentation necessary for operation of the system. Redundancy is provided by utilizing two pumping systems, two different sources of power for the pumps, and two sources of water supply to the pumps. The system is categorized as seismic Class I and is designed to ensure that a single fault will not obstruct the system function."

FSAR 10.2.2 also states:

- For the motor-driven pumps: "Each pump has an AOV, AF-4007 for P-38A and AF-4014 for P-38B, controlled recirculation line back to the condensate storage tanks to ensure minimum flow to prevent hydraulic instabilities and dissipate pump heat."

- For the turbine-driven pumps: "Each pump has an AOV (AF-4002) controlled recirculation line back to the condensate storage tanks to ensure minimum flow to dissipate pump heat."

FSAR 10.2.2 also states:

During normal plant operations, the auxiliary feedwater system is maintained in a standby condition ready to be placed in operation automatically when conditions require. The auxiliary feedwater pumps are automatically started on receipt of any of the following signals:

Turbine-driven feedwater pumps

1. Low-low water level in both steam generators in one unit starts the corresponding pump.

2. Loss of both 4.16 kv buses supplying the main feedwater pump motors in one unit starts the corresponding auxiliary feedwater pump.

3. Trip or shutdown of both main feedwater pumps or closure of both feedwater regulating valves in one unit starts the corresponding pump. These signals are processed through AMSAC at power levels above 40%.

Motor-driven feedwater pumps

1. Low-low water level in either associated steam generator.

2. Trip or shutdown of both main feedwater pumps or closure of both feedwater regulating valves in one unit. These signals are processed through AMSAC at power levels above 40%.

3. Safeguards sequence signal.

FSAR Figure 10.2-1 shows that 1/2AF-4002 for 1/2P-29 (turbine-driven pumps), and AF-4007 for P-38A, AF-4014 for P-38B (motor-driven pumps) are all fail-closed valves.

CLB References:
FSAR 7.2.3.2- Specific Control and Protection Interactions
FSAR 7.3.3.4 - Manual AFW Flow Control During Plant Shutdown
FSAR Section 7.4.1 – AMSAC
FSAR Section 10.1 - Steam and Power Conversion System
FSAR Section 10.2 – Auxiliary Feedwater
FSAR Figure 10.2-1 Sheet 1 – Bech M-217 Sh. 1 – Auxiliary Feedwater System
FSAR Figure 10.2-1 Sheet 2 – Bech M-217 Sh. 2 – Auxiliary Feedwater System
FSAR Section 14.1.10 – Loss of Normal Feedwater
FSAR Section 14.1.11 – Loss of All AC Power to the Station Auxiliaries
FSAR Section 14.2.4 – Steam Generator Tube Rupture
FSAR Section 14.2.5 – Rupture of a Steam Pipe
FSAR Appendix A.1 – Station Blackout
FPER 5.2.2 – Safe Shutdown Systems and Equipment
FPER 5.2.5.2.3 – Auxiliary Feedwater Pump Room
FPER 6.6 - Safe Shutdown Systems
FPER 6.6.4 - Auxiliary Feedwater System
Tech Spec 3.7.5 – Auxiliary Feedwater
Tech Spec Bases B 3.7.5 – Auxiliary Feedwater

PART II –DETERMINE IF TECHNICAL SPECIFICATION CHANGE REQUIRED

Does the proposed activity involve a change to any Technical Specification? Changes to Technical Specifications require a License Amendment Request.

Technical Specification Change REQUIRED: ☐ YES ☒ NO

If a Technical Specification or change is required, explain what the change should be and why it is required.

PART III – 10 CFR 50.59 EVALUATION

NOTE: A unique written basis is required to answer each question below. The "NMC 10 CFR 50.59 Resource Manual" (RESOURCE MANUAL) should be used to determine the content of each response. Identify references used to perform evaluation at the beginning of the form and within the written responses.

III.1. Does the proposed activity result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the CLB? (See Section 6.2.1 of the RESOURCE MANUAL) ☐ YES ☒ NO

Basis for answer:

The auxiliary feedwater (AFW) system responds to plant transients and other initiating events or accidents. Failure of an AFW pump to start or run does not initiate a transient or an accident.

The AFW pumps support the following functions:
- To automatically start and ensure that adequate feedwater is supplied to the steam generators for heat removal during accidents which may result in a main steam safety valve opening (Loss of Normal Feedwater – including ATWS, and Loss of AC to the Station Auxiliaries).

- To automatically start and provide flow to maintain steam generator levels during accidents which require or result in rapid reactor coolant system cooldown (Steam Generator Tube Rupture and Rupture of a Steam Pipe).
- To provide sufficient feedwater to remove decay heat from both units for one hour during a station blackout event (TDAFP only).
- To provide sufficient flow to the steam generators to remove decay heat to achieve cold shutdown within 72 hours following a plant fire (Appendix R).

The permanent procedure changes discussed above provide directions to operators to prevent AFW pump failure in the event of a loss of instrument air. Manual operator action to control steam generator level is already part of the Point Beach licensing basis as discussed in Section I.1. In order to accomplish this, operators would control flow to the steam generators by discharge valves, or by securing AFW pumps after decay heat rates decrease and sensible heat is removed from the reactor coolant system. With the exception of an ATWS event, the FSAR Chapter 14 analyses demonstrate that only one pump is required (i.e., 200 gpm flow) to meet the acceptance criteria for Loss of Normal Feedwater and Loss of AC to the Station Auxiliaries. In an ATWS event the analyses do not credit a reactor trip, therefore a larger AFW flow is required to mitigate the event because of continuing nuclear power generation.

The permanent procedure changes ensure adequate flow is maintained to the steam generators, thus providing sufficient cooling to the reactor coolant system to prevent overfill of the pressurizer and the possibility of a small-break LOCA due a relief valve failing due to water relief. Therefore, the frequency of occurrence of a small LOCA that may result from a stuck open pressurizer PORV is not increased.

III.2. Does the proposed activity result in more than a minimal increase in the likelihood of occurrence of a malfunction of an SSC important to safety previously evaluated in the CLB? (See Section 6.2.2 of the RESOURCE MANUAL)
☐ YES ☒ NO

Basis for answer:

An AFW pump failing to start is considered in the FSAR. The procedure changes prescribe that the operator maintain minimum AFW flow or stop the affected AFW pump as necessary to control S/G levels. Operation of AFW pumps at reduced flows and their ability to sustain repeated starts is a concern.

The procedure flow requirements are based on Flowserve Corporation Pump Division letter dated March 2, 2001, Subject: Aux Feed Water Pumps Minimum Flow Analysis. The letter states that the turbine-driven aux feed pump (TDAFP) can operate at a flow rate of 75 gpm for up to 60 hours. These operating flows and times are provided only for determining recommended frequency of overhaul and do not represent time to failure. (Prior to OEM recommended overhaul, the TDAFP can operate up to 1500 hours at a flowrate of 130 gpm, and an unlimited amount of time at 210 gpm.) The letter states that the motor-driven aux feed pump (MDAFP) can operate at a flow rate of 50 gpm for up to 60 hours. (The MDAFP can operate up to 1500 hours at a flowrate of 75 gpm, and an unlimited amount of time at 105 gpm.) Time to failure would be significantly longer times and lower flows.

The licensing basis allows the use of manual operator control of the SG level. Although not explicitly stated in the FSAR, manual control includes starting and stopping the pumps.

NEMA guidelines state that motor driven pumps may be started twice from an initial standby condition with no restrictions After the initial starts, NEMA MG-1 recommends subsequent starts after "... all conditions affecting operation have been thoroughly investigated and the apparatus has been examined for evidence of excessive heating." This guidance encompasses situations where the load or prime mover may have experienced a fault which causes a failure to start or run; excessive temperatures are not expected with the equipment functioning normally. Additional starts, therefore are allowed and are not expected to cause machine failure. Furthermore, motor starting nameplate information directs that after initial starts, the motor may be restarted if run time has exceeded 15 minutes or it has been secured for 60 minutes. Excessive consecutive starting will decrease overall motor lifetime. Starting duty limitations are provided by the manufacturer to provide the longest possible motor lifetime.

At least a minimum of 3 starts of the motor driven auxiliary feedwater pumps is allowed in the first 15 minutes of operation. An additional one or two starts is allowed provided run time is at least 15 minutes between these later starts.

This is in excess of that necessary to control auxiliary feedwater. After starting a secured AFW pump, the operator would throttle flow to maintain SG level. By throttling flow, operators would control level and it would not be necessary to stop the pump nor start the pump a third time. Typical auxiliary feedwater flow rates during the time following the reactor trip would be sufficient to provide flow to ensure pump operability. Based on operator training and knowledge, only one pump would be started if operators had secured all the pumps to control flow.

There are no starting cycle limitations on the turbine-driven AFW pumps. Governor and turbine vendors were contacted by the AFW system engineer to ensure that no duty cycle concerns for the turbine exist. The motor-operated turbine steam supply valves are rated for 5 minutes of operation every hour which corresponds to five open/shut cycles The nameplate guidance for motors and valves is based on manufacturers' recommendations for long life and are considered conservative.

The MDAFP pump motors are supplied from Westinghouse DB-50 Air Circuit breakers. Vendor information (Westinghouse Application Data AD 33-760, dated November 1967) indicates an In-rush, Non-fault Duty Cycle of 750 breaker operations. The recommended operating conditions are a frequency of operation not to exceed 20 in 10 minutes or 30 in one hour. Since MDAFP are only used during start-up, shutdown, and required system testing, the number of operations are well below these breaker operating limits. If an operator is required to secure and restart pumps during a transient, the actions would be performed at a frequency of operation much less than the recommended frequency of operation per hour. The total number of breaker operations would also be less than the recommended value for the entire transient.

The remaining possible malfunction is the operator failing to maintain minimum AFW flow as required to prevent pump failure (i.e, reduce flow through the pump below the minimum value), or failing to secure the pump. The AFW minimum flow requirements are provided on the EOP foldout pages. OM 3.7 requires that foldout pages shall be continuously evaluated whenever the controlling procedure is in use. Immediately after the issue regarding the mini-recirc valves was identified in CR 01-3595, on-shift and on-coming operating crews were briefed on the issue, and just-in-time training was provided in the simulator to subsequent on-coming crews. The control room panels provide AFW flowrate indication for each of the four AFW pumps. There are procedures, training, and existing individual AFW pump flowrate indications in place in the control room to ensure the operator performs this function.

Based on the above, and given the fact that the licensing basis has demonstrated that only one pump (i.e., 200 gpm) is required (per unit) to function to mitigate the applicable transients, the licensing basis will be met in that one AFW pump will still be available to each unit. The MDAFPs and the TDAFPs will be operated within the required service conditions and minimum flows prescribed in operating procedures and reinforced by operator training. Therefore, there is not more than a minimal increase in the likelihood of occurrence of a malfunction of an SSC important to safety previously evaluated in the CLB.

III.3. Does the proposed activity result in more than a minimal increase in the consequences of an accident previously evaluated in the CLB? (See Section 6.2.3 of the RESOURCE MANUAL.) ☐ YES ☒ NO

Basis for answer:

The FSAR accident analysis assumes a minimal AFW flow of 200 gpm, which is within the capability of one AFW pump at pressures greater than the peak calculated SG pressure in the analysis. Therefore the required minimum AFW flow capability will continue to be met by implementation of these procedure changes.

The FSAR analysis of the loss of external electrical load event has demonstrated that the acceptance limits for the RCS and steam generator secondary pressure, and for departure from nucleate boiling ratio (DNBR), have been met. Based on these results, the pressure boundary integrity of the RCS and the secondary side are not challenged, and the fuel cladding integrity is also unchallenged.

The FSAR analysis of the loss of normal feedwater and the loss of ac power events has demonstrated that the pressurizer volume remains below the acceptance limit (i.e., the pressurizer does not overfill). Therefore, the consequences of these events are analyzed in that no water relief occurs and no challenge to the pressurizer PORV or safety valves is created.

The FSAR Steam Generator Tube Rupture (SGTR) and Rupture of a Steam Pipe radiological analyses credit auxiliary feedwater for cooldown through use of the intact steam generator. No specific flowrates are specified in the FSAR, however based on mass release values in the fuel upgrade RTSR, it is determined that the flow rate of 133 gpm is required over the 24 hour cooldown period. The AOP for loss of instrument air directs the operators to gag the recirc valve only to ensure

minimum flow. A caution alerts the operator that gagging could potentially divert flow. During the SGTR or rupture of a steam pipe accident, the Emergency Operating Procedures ensure that auxiliary feedwater is supplied to the non-affected generator and gagging the recirculation valves is not necessary until after cooldown. The flowrates required during these scenarios ensure that the pumps are not deadheaded. The radioactive release from the intact generator is modeled as the amount of steam release required to remove decay heat until RHR cut-in conditions are reached. Since the procedure revisions have been implemented to ensure AFW flow is available, then there is no change in the radiological consequences of these accidents.

Based on the above, the proposed activity does not result in any increase in the consequences of accidents evaluated in the CLB.

III.4. Does the proposed activity result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the CLB? (See Section 6.2.4 of the RESOURCE MANUAL) ☐ YES ☒ NO

Basis for answer:

As indicated in the answer to question III.3, as long as an AFW flowrate required for cooldown can be maintained by the operators by using the procedure changes, then there will be no impact on radiological consequences. The discussion under question II.2 demonstrates that the likelihood of increased failures of AFW pumps is not more than ~~a~~ minimal. Since the procedure changes ensure that the AFW flowrate can be maintained, ~~then~~ there is no increase in the consequences of an SSC important to safety previously evaluated.

III.5. Does the proposed activity create a possibility for an accident of a different type than any previously evaluated in the CLB? (See Section 6.2.5 of the RESOURCE MANUAL.) ☐ YES ☒ NO

Basis for answer:

The auxiliary feedwater (AFW) system responds to plant transients and other initiating events or accidents. Failure of an AFW pump to start or run does not initiate a transient or an accident. However, if all AFW pumps fail to start or fail to run, then this would be an accident of a different type. If all AFW pumps start and run in response to a transient, then the steam generators could be overfilled or the RCS overcooled unless operator action is taken to reduce AFW flow. There are some plant design functions which could contribute to overcooling the RCS or overfilling the steam generators by providing additional feedwater to the steam generator inventory. FSAR 10.1 states: "Whenever a reactor trip occurs, the main feedwater control valves move to the fully opened position to increase the feedwater flow to the steam generators for faster reduction of reactor coolant temperature to the no-load average temperature value. The valves remain fully open until either one of the following conditions occurs, at which time the respective valve, or valves, fully close:

Abnormally high steam generator level;
Safety injection signal; or
Average temperature error signal (Between measured Tavg and the no load TREF)
reduces to a preset level."

Given a loss of instrument air, the main feedwater regulating and bypass valves fail close. Therefore the contribution of this effect to overcooling the RCS and overfilling the SGs will be less than for a normal reactor trip. However, closure of the regulating valves will cause all AFW pumps, to start as discussed in FSAR 10.2.2. So operator action is required to control AFW flow if all pumps start as designed. If the design basis event occurs and only one AFW pump is available per unit, operators would control flow at 200 gpm until steam generator is within the desired bands listed in the EOPs. So initial failure of one or two AFW pumps to start would reduce the requirements for operators to manually control AFW flow to prevent pump failure. This case does not create the possibility that an accident of a different type will occur.

For the situation of all AFW pumps starting as designed, it is likely that the motor driven pumps will feed the unit with the lower steam pressure (due to variations in actual SG relief valve settings). In this case the unit specific TDAFP will be feeding its respective unit's steam generators, while the two MDAFPs will feed the opposite unit along with its unit-specific TDAFP. The latter unit would be the one at risk for overcooling the RCS or overfilling the SGs, and AFW flow would have to be reduced. In this scenario it is very unlikely that the operator would cause all three of these AFPs to fail. The operators have been provided procedural guidance and training to address this scenario as discussed in III.2. Even if operator error caused the failure of two pumps, then there is still one AFW pump available per unit to perform their design basis function. Therefore, the proposed activity does not create a possibility for an accident of a different type than any previously evaluated in the CLB

5. Does the proposed activity create a possibility for a malfunction of an SSC important to safety with a different result than any previously evaluated in CLB? (See Section 6.2.6 of the RESOURCE MANUAL) ☐ YES ☒ NO

Basis for answer:

The FSAR considers the malfunction of an AFW pump failing to start. One situation considered in this evaluation is the possibility of running AFW pumps failing to run after starting because a minimum flow for pump cooling is not maintained due to the loss of instrument air to the pump mini-recirculation valves, and an operator failing to secure pump(s), or failing to maintain minimum pump flow required for cooling. The other situation is the pumps failing to restart after having been secured by an operator. In either of these situations, the result of the malfunction is that the AFW pump fails to provide feedwater to the steam generators. Therefore, the proposed activity does not create the possibility of a malfunction with a different result. The possibility of all AFW pumps failing is discussed in III.5 as the possibility of an accident of a different type.

III.7. Does the proposed activity result in a design basis limit for a fission product barrier as described in the CLB being exceeded or altered? (See Section 6.2.7 of the RESOURCE MANUAL) ☐ YES ☒ NO

Basis for answer:

The procedure changes will provide operators direction such that an AFW flow of 200 gpm will be available. The FSAR analysis of the loss of external electrical load event demonstrates that the acceptance limits for the RCS and steam generator secondary pressure, and for departure from nucleate boiling ratio (DNBR), have been met. Based on these results, the pressure boundary integrity of the RCS and the secondary side are not challenged, and the fuel cladding integrity is also unchallenged.

The FSAR analysis of the loss of normal feedwater and the loss of ac power events has demonstrated that the pressurizer volume remains below the acceptance limit (i.e., the pressurizer does not overfill). The consequences of these events are analyzed in that no water relief occurs and no challenge to the pressurizer PORV or safety valves is created. Therefore no design basis limit for a fission product barrier is exceeded or altered.

III.8. Does the proposed activity result in a departure from a method of evaluation described in the CLB used in establishing the design bases or in the safety analyses? (See Section 6.2.8 of the RESOURCE MANUAL) ☐ YES ☒ NO

Basis for answer:

The procedure changes do not involve a method of evaluation as defined in the NMC 50.59 Resource Manual. Therefore the procedure changes do not result in a departure from a method of evaluation as described in the CLB used in establishing the design bases or in the safety analyses.

PART IV – 10 CFR 50.59 EVALUATION CONCLUSION

NOTE: **If the answer to any of the eight 10 CFR 50.59 evaluation questions above is "YES", then the proposed activity may NOT be implemented until a License Amendment Request has been submitted to and approved by the NRC.**

Based on the results of this evaluation, check ONE of the following:

☒ NO activity requiring prior NRC approval per 10 CFR 50.59 was identified AND NO Technical Specification change is involved. This activity may be implemented in accordance with applicable procedures.

☐ An activity requiring prior NRC approval per 10 CFR 50 59 WAS identified. This activity cannot be implemented without a license amendment request and NRC approval.

☐ A Technical Specification change IS involved with the proposed activity, but NO activity requiring prior NRC approval per 10 CFR 50.59 was identified. This activity cannot be implemented without a license amendment request and NRC approval.

☐ A Technical Specification change IS involved with the proposed activity, AND an activity requiring prior NRC approval per 10 CFR 50.59 was identified. This activity cannot be implemented without a license amendment request and NRC approval.

RT V – LICENSING BASIS UPDATE

Document whether an update to the licensing basis is required as a result of the activity and this evaluation Mark ALL that apply. If no changes are required, then PART V is ☐ NOT APPLICABLE.

☐ A Regulatory Commitment (CLB Database) change is REQUIRED. If a Regulatory Commitment Change is required, initiate a commitment change per NP 5.1.7.

☒ A Point Beach FSAR change is REQUIRED. If an FSAR change is required, then initiate an FSAR Change Request (FCR) per NP 5.2.6. The prepared/reviewed FCR is to be included with the evaluation provided for MSS review.

☒ A Technical Specification Bases change is REQUIRED. If a change to the Technical Specification Bases is required, then initiate a Technical Specification Bases change per NP 5.2.15.

☐ A Technical Requirements Manual change is REQUIRED. If a change to the Technical Requirements Manual is required, then initiate a Technical Requirements Manual change per NP 5.2.15.

PART VI – 10 CFR 50.59 EVALUATION SUMMARY

The evaluation summary is included in the Annual Results and Data Report (NP 5.2.3) to meet the requirements of 10 CFR 50.59(d)(2). The evaluation summary contains three concise paragraphs: the activity description, a summary of the evaluation basis for answering the 10 CFR 50.59 questions, and the conclusion whether a license amendment request and/or Technical ·cification change is required. No new or different information from that in the evaluation (Parts I – IV) is to be included in the .ımary.

Activity Description: The proposed activity is to make permanent procedure changes that were implemented in response to a condition that was identified where, with a procedure-directed operator action to control steam generator level (which could be accomplished by reducing flow through one or more AFW pumps), concurrent with a loss of instrument air (which would cause the AFW pumps' mini-recirculation valves to fail close), the potential existed for a simultaneous failure of the multi-stage high pressure AFW pumps due to very low or no flow through running AFW pumps. This 50.59 evaluation will review the procedure changes as a permanent change to the procedures as described in the FSAR to confirm consistency with the licensing basis. The permanent procedure changes will restore the AFW pumps to fully operable status.

Summary of Evaluation: The auxiliary feedwater (AFW) system responds to plant transients and other initiating events or accidents. Failure of an AFW pump to start or run does not initiate a transient or an accident. The permanent procedure changes ensure adequate flow is maintained to the steam generators, thus providing sufficient cooling to the reactor coolant system to prevent overfill of the pressurizer and the possibility of a small-break LOCA due a relief valve failing due to water relief. Therefore, the frequency of occurrence of a small LOCA that may result from a stuck open pressurizer PORV is not increased. Operation of AFW pumps at reduced flows, and their ability to sustain repeated starts were considered. The minimum flows in the procedures meet vendor recommendations. Impact of periodic restarting of AFW pumps, motors and turbines was considered, along with electrical breaker and MOV operation. Operating procedures and operator training has addressed operator action to maintain minimum AFW flows or to secure the pump(s). Therefore, there is not more than a minimal increase in the likelihood of occurrence of a malfunction of an SSC important to safety previously evaluated in the CLB. The FSAR accident analysis assumes a minimal AFW flow of 200 gpm, which is within the capability of one AFW pump at pressures greater than the peak calculated SG pressure in the analysis. The required minimum AFW flow capability will continue to be met by implementation of these procedure changes. Therefore there is no increase in radiological consequences due to accidents or malfunctions of SSC important to safety. Even if operator error caused the failure of two pumps, then there is still one AFW pump available per unit to perform their design basis function. Therefore, the proposed activity does not create a possibility for an accident of a different type than any previously evaluated in the FSAR. The result of the malfunction of a pump, due to failing to restart or

failing due to low flow, is that the AFW pump fails to provide feedwater to the steam generators which is the same result. Therefore, the proposed activity does not create the possibility of a malfunction with a different result. The FSAR analysis of the loss of normal feedwater and the loss of ac power events has demonstrated that the pressurizer volume remains below the acceptance limit (i.e., the pressurizer does not overfill). The consequences of these events are analyzed in that no water relief occurs and no challenge to the pressurizer PORV or safety valves is created. Therefore no design basis limit for a fission product barrier is exceeded or altered. The procedure changes do not involve a method of evaluation, therefore the procedure changes do not result in a departure from a method of evaluation used in establishing the design bases or in the safety analyses.

Conclusion: The conclusion of the 50.59evaluation was that prior NRC approval is not required to permanently implement these procedure changes.

NPM 2002-0228

NMC
Committed to Nuclear Excellence

INTERNAL
CORRESPONDENCE

To: File

From: Fred J. Cayia

Date: April 25, 2002

Subject: DESIGNATION OF BACKUP PNEUMATICS FOR AFW MINI-RECIRCULATION VALVES AS SAFETY-RELATED

Copy To: L. Armstrong
R. Chapman
J. Novak
M.E. Reddemann
M.E. Warner

Modification MR 02-001 installed a backup air supply to the mini-recirculation valves for 1/2 P-29 Turbine-Driven Auxiliary Feed Water (AFW) Pumps. Mini-recirculation valves 1AF-4002 and 2AF-4002 are currently scoped as Safety Related (SR) by the PBNP QA classification process based on requirements for a closed position for the purposes of ensuring sufficient AFW flow to the steam generators. Scenarios that involve a loss of instrument air introduce a potential common mode failure of the auxiliary feedwater pumps. Since the AF-4002 valves fail closed, they will perform their safety function in the closed position in this event. However, it has been identified that these valves will need to open to facilitate AFW pump cooling should the discharge valves require partial or full closure to control steam generator levels. Closure of the AFW pump discharge valves is controlled procedurally, including instructions to ensure that a running AFW pump has sufficient flow to ensure adequate cooling. Therefore, there is no safety related function for the AF-4002 valves in the open position.

Although there is no safety function in the open position for the mini-recirculation valves. PBNP has decided to conservatively scope the backup pneumatic systems required to open these valves as Safety Related. QA Criterion 6 will be applied to the classification as this criterion states "Systems or portions of systems which provide cooling water for SR equipment or components that are required for (1) emergency core cooling, (2) post-accident containment heat removal, or (3) spent fuel pool cooling." as stated in AM 6-3, Systems and Design Functions Covered by the Quality Assurance Program. This upgrade to the backup air installed by MR 02-001 will make the qualification consistent with the backup nitrogen installed by MR 01-144 for the P-38A/B Motor Driven AFW Pumps.

It is acknowledged that scoping the backup air sources installed by MR 02-001 as safety-related is inconsistent with current PBNP processes for component classification, given the lack of a safety function in the open position for the recirculation valves. However, given the risk significance associated with this issue, more stringent controls than were originally specified by MR 02-001 (augmented quality) are being applied to the equipment installed by this modification. This decision applies only to the backup air supplies to 1/2AF-4002, and is not intended to apply to other components

RECD MAY 08 2002

Point Beach Nuclear Plant

DBD REVISION

Document Control Use Only
DBD Rev:

DBD NO. DBD-01	DBD TITLE: AUXILIARY FEEDWATER SYSTEM

AFFECTED DBD SECTION(S) AND PAGE(S):

Section 1

Section 3

Section 4

Section 7

Section 8

Section 9

INITIATING DOCUMENT(S):

- ☐ Condition Report No: _____
- ☒ Modification Request No: MR 99-029*C/*D, MR 01-144, MR 02-001
- ☐ Calculation Revision/Change No: _____
- ☐ Other _____
- ☐ N/A

DESCRIPTION OF CHANGE
(Attach DBD mark-ups and copies of supporting initiating documents, as practicable.)

Significant revision needed to reflect installation of modifications, and to correct inconsistencies and errors.

REASON FOR CHANGE:

INITIATOR'S NAME EXT: DATE:

DBD SUBJECT MATTER EXPERT (SME) REVIEW

☐ Valid DBD Change Markups completed and attached.

☐ Invalid DBD Change for the following reason. _____

_____

_____
DBD SME (signature/date)

DBD PROGRAM OWNER APPROVAL: DATE:
(not required for Invalid DBD Changes) _____ _____

DBD-01 Update Text Additions

Text A

1AF-4061	1P-29 AFP Mini-Recirc IA 1T-212 Relief
2AF-4061	2P-29 AFP Mini-Recirc IA 2T-212 Relief
1PI-4060	1P-29 AFP Mini-Recirc IA 1T-212 Pressure Indicator
2PI-4060	2P-29 AFP Mini-Recirc IA 2T-212 Pressure Indicator
1T-212	1P-29 AFP Mini-Recirc IA 1AF-4002 Backup Accumulator
2T-212	2P-29 AFP Mini-Recirc IA 2AF-4002 Backup Accumulator

Text B

Subsequently, the pump vendor reduced the minimum allowable flows for the 60 hour accumulated operating time of the AFW pumps to the following values:

Motor-Driven AFW Pump	50 gpm	
Turbine-Driven AFW Pump	75 gpm	[Source 5]

Text C

Position	
Normal Position	Closed
Failure Position	
- Loss of Instrument Air	Automatic control using backup air accumulators or nitrogen bottles
- Loss of Backup Supplies	Closed

Text D

Due to the discovery of a potential common mode failure of all four AFW pumps in a scenario where instrument air has been lost, backup pneumatic sources were installed [Source 4, 5]. These systems were installed safety-related due to the risk significance, even though the recirculation valves do not have a safety function to open [Source 6]. Source 4 tapped into the MDAFP discharge valve nitrogen backup system for use to stroke the AF-4007 and AF-4014 valves. Source 5 installed instrument air accumulator tanks to supply the 1/2AF-4002 valves.

Text E

The backup nitrogen system for the AF-4012 / 4019 valves has been tapped to also provide nitrogen for the MDAFP mini-recirc valves [**Source 12**]. **Source 11** confirmed that based on the changeout pressure given in **Source 10**, there will always be 1.5 hours of nitrogen available to operate the AF-4012 / 4019 discharge valves and the AF-4007 / 4014 mini-recirc valves following a loss of instrument air. **Source 7** has been updated to reflect this limit.

Text F

Source 2 established the design minimum recirculation flow as 80 gpm for the Motor-Driven AFW Pumps and 125 for the Turbine-Driven AFW Pumps. These values provided margin above the original minimum required flow of 70 gpm for the MDAFP and 100 gpm for the TDAFP per **Source 3**. These minimum flows have been reduced to 50 for the MDAFP and 75 for the TDAFP, for an accumulated operational time of 60 hours by **Source 6**, and thus the margin has been increased.

Text G

Listed below are some of the governing codes and standards used for the auxiliary feedwater system. The specific code or standard that applies to the components installed in the system can be found in the documentation that was supplied with the component by the vendor. For most components that are original plant equipment, this information is usually not readily available, but can be inferred from either the original specifications for the system and the design code of the system (USAS B31.1 – 1967, Power Piping). For newer components installed, the procurement (QAR) records, vendor documents, or modification packages should be reviewed.

- USAS B31.1 – 1967, Power Piping: This code was applied to the AFW system piping and components. Newer piping installations are seismically analyzed using some equations from ASME Section III – 1977 with 1978 Addenda. This is done because B31.1 does not provide any guidance on the application of seismic loading on piping system components. However, B31.1 is still the design code for all piping in the auxiliary feedwater system.

- ASME Section III, Rules for Construction of Nuclear Power Plant Components: Some of the replacement valves installed in the AFW system have been designed to Section III, but these valves have not been N-stamped, and are not considered Section III components They meet all the requirements for installation in a B31.1 piping system.

- AWWA D100 – 1967, Standard for Steel Tanks for Water Storage: This standard applies to the design of the Condensate Storage Tanks [REF 9.6.91].

- IEEE 279, Criteria for Protection Systems for Nuclear Power Generating Stations [REF 9.1.4]. This standard applies to the protective system and engineered safety feature instrumentation, including the automatic initiation requirements of NUREG-0737.

Text H

8.28 WE Calculation 2002-0005, "Nitrogen Backup System for MDAFP Discharge Valves (AF-4012/4019) and Minimum Flow Recirculation Valves (AF-4007/4014)", Rev 0 dated 1/28/02 [REF 9.4.50]

This calculation superceded S&L Calculation M-09334-266-IA [REF 9.4.49] which was originally done for MR 97-038 [REF 9.5.134] for installation of a backup nitrogen system for the MDAFP discharge valves (AF-4012/4019).

The new calculation was performed because it was desired to use the existing nitrogen backup system to provide backup gas to the MDAFP minimum flow recirculation valves (AF-4007/4014) per MR 01-144 [REF 9.5.197] to respond to a potential common mode failure of the auxiliary feedwater pumps on a loss of instrument air.

This calculation used conservative assumptions for leakage, and verified that a full bottle provides 2 hours of nitrogen for the discharge and mini-recirc valves. Based on the bottle changeout pressure, 90 minutes of nitrogen in always available, which is the limit stated in AOP 5B [REF 9.5.182].

1.3.1.8 Auxiliary Steam Boundaries

The boundaries between the AFW System and the Auxiliary Steam System are located at the upstream side of manual isolation valves AF-69, HV-254, HV-739, and HV-4599 and at the downstream side of manual isolation valves HV-252, HV-253 and HV-255. The valves with an HV designator are not included within the AFW System boundary, because they are associated with lines whose function is associated with the Auxiliary Steam System.

1.3.1.9 Instrument and Service Air Boundaries

The boundaries between the AFW System and the Instrument and Service Air System are located immediately downstream of the filter-regulators which supply air-operated valves AF-4007, AF-4012, AF-4014, AF-4019, 1AF-4002, and 2AF-4002. Additional boundaries ~~are~~ associated with the backup nitrogen ~~accumulators~~ bottles supplying AF-4012, and AF-4019 and are at the Instrument and Service Air side of isolation valves AF-130, ~~and~~ AF-150, ~~These accumulators support the Instrument and Service Air System to supply a safety-related source of nitrogen to their respective valves~~

1.3.1.10 Other Mechanical Boundaries

The AFW System boundaries are located at the end of the drain piping from drain traps, 1DT-2030, 1DT-2080, 1DT-2081, 2DT-2030, 2DT-2080, and 2DT-2081, at the downstream side of manual isolation valves 1MS-132A and 2MS-132A, and at the turbine-driven AFW pump exhausts to atmosphere.

1.3.2 Electrical Boundaries

AFW System electrical equipment is powered by the following electrical power systems:

- Vital Instrument Bus 120 VAC
- 120 VAC
- 125 VDC
- 480 VAC

AFW electrical boundaries with the above power systems are described generically, below. By convention, the boundary between an AFW electrical component and its power source is at the electrical terminals on the load. Overcurrent protection devices and the downstream power cable up to the load terminals are not included The basis for the boundary locations are as follows

1.5.2 Support Services Supplied to the AFW System

The AFW System requires support from the following systems to perform its functions.

1.5.2.1 Main Steam System

The AFW System requires support from the Main Steam System to provide steam on demand to drive the turbines for AFW pumps 1P-29 and 2P-29.

1.5.2.2 Service Water System

The AFW System requires support from the Service Water System to automatically provide cooling water to the AFW pumps when the pumps start. In addition, the Service Water System is required to provide a manually-aligned, safety-grade, feedwater source to each AFW pump suction.

1.5.2.3 Fire Protection System

The AFW System requires support from the Fire Protection System to provide an automatic backup cooling water supply to the turbine-driven AFW pump bearing coolers, when they are required to operate, in the event that the Service Water System is inoperable (such as during the initial one-hour phase of Station Blackout). Also, the Fire Protection System provides the necessary fire detection and suppression to ensure that physical separation between adjacent AFW equipment is adequate to achieve and maintain safe shutdown [REF 9.2.59].

1.5.2.4 Instrument Air System

The AFW System requires support from the Instrument Air System to provide clean dry air to operate valves. ~~In addition,~~ the Instrument Air System is required to automatically provide a safety-~~grade~~ nitrogen source to each air-operated discharge throttle valve for the MDAFW pumps, in case of a loss of Instrument Air to these valves [REF 9.5.182].

and mini-recirc control valve

and provide safety-related air to the mini recirc control valves for the TDAFW pumps,

1.5.2.5 Secondary Sampling System

The AFW System requires support from the Secondary Sampling System to analyze AFW samples.

1.5.2.6 480 VAC Electrical System

The AFW System requires support from the 480 VAC Electrical System to provide power for AFW pump (P-38A and P-38B) and motor-operated valve (AF-4009, AF-4022, AF-4023, AF-4016, AF-4020 and AF-4021) motor operation. The 480 VAC Electrical System also provides power to the service water suction valves for 1P-29 (1AF-4006) and 2P-29 (2AF-4006). The requirements for the 480 VAC Electrical System, as related to AFW, are discussed in Section 2.7

TABLE 1-1
DBD/CHAMPS SCOPE DIFFERENCES

A. The following equipment is included in the scope of this DBD, but is not listed as AFW in CHAMPS:

Equipment I.D.	Equipment Name
1MS-2019	SG B Steam Header 1P-29 AFP Steam Supply
1MS-2019-O	SG B Steam Header 1P-29 AFP Steam Supply Operator
1MS-2020	SG A Steam Header 1P-29 AFP Steam Supply
1MS-2020-O	SG A Steam Header 1P-29 AFP Steam Supply Operator
2MS-2019	SG B Steam Header 2P-29 AFP Steam Supply
2MS-2019-O	SG B Steam Header 2P-29 AFP Steam Supply Operator
2MS-2020	SG A Steam Header 2P-29 AFP Steam Supply
2MS-2020-O	SG A Steam Header 2P-29 AFP Steam Supply Operator
1MS-2019-M	1P-29 AFP Steam Supply Motor-Operated Valve Motor
1MS-2020-M	1P-29 AFP Steam Supply Motor-Operated Valve Motor
2MS-2019-M	2P-29 AFP Steam Supply Motor-Operated Valve Motor
2MS-2020-M	2P-29 AFP Steam Supply Motor-Operated Valve Motor
1POS-2019	1P-29 AFP Steam Supply MOV Position Switch
1POS-2020	1P-29 AFP Steam Supply MOV Position Switch
2POS-2019	2P-29 AFP Steam Supply MOV Position Switch
2POS-2020	2P-29 AFP Steam Supply MOV Position Switch
1MS-2082	1P-29 AFP OVERSPEED TRIP Throttle Valve
1MS-2082-M	1P-29 AFP OVERSPEED TRIP Motor-Operator Motor
1MS-2082-O	1P-29 AFP OVERSPEED TRIP Motor-Operator Operator
1MS-2082-S	1P-29 AFP OVERSPEED TRIP Solenoid
2MS-2082	2P-29 AFP OVERSPEED TRIP Throttle Valve
2MS-2082-M	2P-29 AFP OVERSPEED TRIP Motor-Operator Motor
2MS-2082-O	2P-29 AFP OVERSPEED TRIP Motor-Operator Operator
2MS-2082-S	2P-29 AFP OVERSPEED TRIP Solenoid

The following equipment is listed as AFW in CHAMPS, but is not included in the scope of this DBD (applicable DBD, if known, is listed in parentheses).

AF-4007A-S	P-38A AFP Cooling Water Solenoid Valve (DBD-12, Service Water)
AF-4014A-S	P-38B AFP Cooling Water Solenoid Valve (DBD-12, Service Water)
AF-04053	AF-04012 Nitrogen Backup Regulator (DBD-6, IA and SA)
AF-04058	AF-04019 Nitrogen Backup Regulator (DBD-6, IA and SA)
AF-04052	AF-04012 Nitrogen Backup Supply Relief (DBD-6, IA and SA)
AF-04057	AF-04019 Nitrogen Backup Supply Relief (DBD-6, IA and SA)
----------	Back-up Nitrogen Bottles for AF-4012/4019 operation (DBD-6, IA and SA)
AF-0137	P-38A AFP AF-4012 Discharge Control Valve Nitrogen Backup Regulator Test Flow Needle Valve

TABLE 1-1
DBD/CHAMPS SCOPE DIFFERENCES
(continued)

AF-0157	P-38B AFP AF-4019 Discharge Control Valve Nitrogen Backup Regulator Test Flow Needle Valve
PI-4051	P-38A AFP AF-4012 Discharge Control Valve Nitrogen Backup Regulator Outlet Pressure Indicator
PI-4054	P-38A AFP AF-4012 Discharge Control Valve Nitrogen Backup Regulator Inlet Pressure Indicator
PI-4056	P-38B AFP AF-4019 Discharge Control Valve Nitrogen Backup Regulator Outlet Pressure Indicator
PI-4059	P-38B AFP AF-4019 Discharge Control Valve Nitrogen Backup Regulator Inlet Pressure Indicator
AF-0145	P-38A AFW AF-4012 Discharge Control Valve Nitrogen Backup South Bottle Outlet Check Valve (DBD-6, IA and SA)
AF-0142	P-38A AFW AF-4012 Discharge Control Valve Nitrogen Backup North Bottle Outlet Check Valve (DBD-6, IA and SA)
AF-0162	P-38B AFW AF-4019 Discharge Control Valve Nitrogen Backup South Bottle Outlet Check Valve (DBD-6, IA and SA)
AF-0165	P-38B AFW AF-4019 Discharge Control Valve Nitrogen Backup North Bottle Outlet Check Valve (DBD-6, IA and SA)

* Insert text A here

3.0 COMPONENT DESIGN BASIS

This section provides design bases and supporting design information for individual components and groups of redundant or "like" components within the system boundary. Only "major" components were selected for inclusion based on their satisfaction of the following criteria:

- actively support a system function, or
- protect the system from damage, or
- provide control, alarm, or monitoring functions.

Accordingly, the following "major" components are discussed:

Component Groups	Section
AFW Pumps	3.1
Condensate Storage Tanks	3.2
AFW Piping	3.3
MOV - MDAFW Pump Discharge Valves	3.4
MOV - TDAFW Pump Discharge Valves	3.5
MOV - AFW Pump Suction Valves from Service Water	3.6
MOV - Steam Supply Valves to AFW Pump Turbines	3.7
AOV - AFW Pump Recirc Flow Control Valves	3.8
AOV - MDAFW Pump Discharge Pressure Control Valves	3.9
Check Valve - AFW Pump Suction Check Valves	3.10
Check Valve - AFW Pump Discharge Check Valves	3.11
Check Valve - Second-Off AFW Check Valves	3.12
Check Valve - First-Off AFW Check Valves	3.13
RV - AFW Pump Suction Relief Valves	3.14
RV - AFW Pump Recirculation Line Relief Valve	3.15
RO - AFW Pump Recirculation Line Restricting Orifices	3.16
Flow Transmitters	3.17
Pressure Transmitters	3.18
Level Transmitters	3.19
Check Valve - First-Off ~~AFW~~ MDAFP Backup Nitrogen ~~Accumulator~~ Bottle Check Valves	3.20
TDAFW Pump Trip Throttle Valves	3.21
Check Valve - First-Off TDAFP Backup Inst. Air Accumulator Check Valves	3.22

Passive components within the boundary that provide little more than pressure boundary integrity or merely align the system for maintenance are not included in Section 3. Accordingly, the following components are not included:

Manual Vent, Drain, and Isolation Valves
Chemical Addition Tank
Turbine Valves (excluding trip throttle valves)
Local Instruments
Power Distribution Cable to Electrical Components
Supporting Structures

COMPONENT PARAMETERS SUMMARY
Section 3.1 (continued)

Component ID	Service
1P29, 2P29	Turbine-Driven AFW Pump
P38A, P38B	Motor-Driven AFW Pump

PARAMETER	VALUE	REFER TO
PERFORMANCE REQUIREMENTS		
1. Delivered Flow Requirements	See Worksheet	2.2.1
2. Allowable Time to Reach Full Capacity		3.1.2
Motor-Driven Pump	See Worksheet	
Turbine-Driven Pump	See Worksheet	
SUPPORTING DESIGN REQUIREMENTS		
3. Minimum Recirculation Flow		3.1.3
Motor-Driven Pump	70 gpm (nominal 89 gpm)	
Turbine-Driven Pump	100 gpm (nominal 126 gpm)	
4. Required NPSH (near runout)		3.1.4
Motor-Driven Pump	37 ft (at 500 gpm per pump curves)	
Turbine-Driven Pump	40 ft (at 700 gpm per pump curves)	
5. Power Supply Requirements		3.1.5
Motor-Driven Pump	460 vac +/- 10%	
Turbine-Driven Pump	Steam Pressure 680 - 1085 psig Intermittent High Steam Pressure of 1193 psig down to low of ~165 psig (375°F) w/ natural circulation in RCS	
6. Control Signals	See Worksheet	3.1.6
remove ~~7. Design Code~~		~~9.6.90~~ 4.2.2 ?
~~• Pump~~	~~Unspecified~~	
~~• Turbine~~	~~Unspecified~~	
8. Pump Protection Signals		3.1.7
• Low Suction Pressure Alarm	7 psig	
• Low Suction Pressure Trip	6.5 psig (with 20 second time delay)	
9. Seismic Requirements	Per Worksheet	3.1.8

COMPONENT PARAMETER WORKSHEET
Section 3.1.3

Component ID	Service
1P29, 2P29	Turbine-Driven AFW Pump
P38A, P38B	Motor-Driven AFW Pump

A. Parameter Minimum Recirculation Flow

B. Value

Motor-Driven Pump	50 ~~70~~ gpm (design minimum) 89 gpm (nominal from modification)
Turbine-Driven Pump	75 ~~100~~ gpm (design minimum) 126 gpm (nominal from modification)

C. Source
1. MR 88-99 [REF 9.5.117]
2. Byron Jackson Ltr 8/7/89 [REF 9.3.20]
3. WMTP 11.21 [REF 9.5.137]
4. WMPCo Ltr to W dated 5/31/67 [REF 9.3.56]
5. Flowserve letter dated 3/2/01 [REF 9.3.113]

D. Background/Reason Co. MR 99-029 [REF 9.5.199]

The original recirculation line capacity (30 gpm) was established solely on the basis of pumped fluid temperature rise [Source 1; Final Design Description]. 72 hour endurance runs performed on 1P-29 and 2P-29 circa 12/79 revealed that the bearing temperatures in long-term recirculation of 30 gpm remained adequately steady [Source 3]. Additionally, early design information regarding the tie-in point for the recirculation line back into the suction side of the pump concluded that the temperature rise was acceptable and no appreciable increase in pump operating temperature was expected [Source 4]. This design was not implemented as the recirculation line for each pump runs back to the CSTs.

In response to IE Bulletin 88-04, the amount of minimum recirculation flow was evaluated to ensure that AFW pumps were protected from the adverse effects of hydraulic instability at low flow rates. It should be noted that the minimum recirculation flows are higher for hydraulic instability at low flow rates than for temperature concerns discussed above. Accordingly, the pump manufacturer stated that the following minimum flows should be followed to avoid pump damage (for accumulated operating time of 60 hrs/year):

Motor-Driven AFW Pump	70 gpm	
Turbine-Driven AFW Pump	100 gpm	[Source 2]

Insert Text B →

Note that ~~these~~ values of minimum required flow [Source 2] provide the basis for sizing the pump recirculation line and restricting the original orifices [Source 1] The nominal flow values of 89 gpm and 126 gpm for the MDAFW and TDAFW pumps, respectively, were derived from final flow orifice sizing established and installed per Source 1. The orifices were later replaced [Source 6], but the nominal flow rates were not significantly affected.

COMPONENT PARAMETER WORKSHEET
Section 3.3.1

Component ID	Service
None	Piping

A. Parameter Design Code

B. Value USAS B31.1-1967

C. Source
1. FSAR [REF 9.2.57]
2. Piping Spec M-78 [REF 9.6.93]
3. MR 88-99 [REF 9.5.117]

D. Background/Reason

The AFW system piping shall be designed in accordance with the original piping specification [Source 2], which required use of the latest issue of USAS B31.1. The specification explains that the latest issue "means the issue (including latest published case rulings and addenda) in force at date of award of order." The requisition cover sheet indicates that the revised specification was issued for purchase 11-22-67 (for Unit 1) and 12-15-67 (for Unit 2). Therefore the 1967 revision of the code was adopted.

~~At least one section of pipe has been analyzed to a later version of piping code. Specifically, Source 3 indicates that the AFW pump recirculation piping was analyzed to ASME Section III Subsection NC of the B&PV Code 1977 Issue through Winter 1978 Addenda.~~

Refer to Section 4.2 for other system design code information.

(REMOVE

COMPONENT PARAMETERS SUMMARY
Section 3 4 (continued)

Component ID — Service

AF-4020,4021,4022,4023 — MDAFWP Discharge MOVs

PARAMETER	VALUE	REFER TO
SUPPORTING DESIGN REQUIREMENTS		
1. Stroke Time		3.4.1
Nominal Stroke Time	15 sec	
2. Operating Differential Pressure		3.4.2
Specified Design D/P	1560 psid	
Design Basis Maximum D/P		
• Opening D/P	1376 psid	
• Closing D/P	1288 psid	
3. Control Signals		3.4.3
Automatic Open to affected unit	Open	
Automatic Shut to unaffected unit	Shut	
Remote-Manual	Open/Shut	
~~4. Design Code~~	~~Unspecified~~	~~9.6.94~~ 4.2
OTHER DESIGN INFORMATION		
5. Valve Position		3.4.4
Normal Position	Shut	
Fail Position (Loss of Power)	As-Is	
6. Power Supply Requirements	Safeguards Supply	3.4.5
Voltage Level		
• Nominal	460 VAC	
• Minimum	364 VAC	
7. Size	3 inch	9.6.94
8. Material	Carbon Steel valve Stellite trim	9.6.94

REMOVE

COMPONENT PARAMETERS SUMMARY
Section 3.5 (continued)

Component ID	Service
1/2AF-4000, 4001	TDAFW Pump Discharge MOVs

PARAMETER	VALUE	REFER TO
SUPPORTING DESIGN REQUIREMENTS		
1. Stroke Time		3.5.1
Nominal	15 seconds	
Design Basis Maximum	None	
2. Operating Differential Pressure		3.5.2
Specified Design D/P	1560 psid	
Design Basis "Maximum D/P:		
• Opening D/P	1445 psid	
• Closing D/P	1294 psid	
3. Valve Position		3.5.3
Normal Position	Open (Throttled-Open) 17% to 21% (for 260 gpm @ 1085 psig in SGs)	
Failure Position	As-Is	
4. Operational Requirements	See Worksheet	3.5.4
5. Control Capability, Position Indication	Remote-Manual "jog" Control Local Handwheel Control	3.5.5
6. Power Supply Requirements	Independent of AC Power 125 VDC (nominal)	3.5.6
~~7. Design Code~~	~~Unspecified~~	9.6.94 ~~4.2~~
OTHER DESIGN INFORMATION		REMOVE
8. Size	3 inch	9.6.94
9. Material	Carbon Steel valve (Stellite Trim) Stellite Trim	9.6.94

COMPONENT PARAMETERS SUMMARY
Section 3 6 (continued)

Component ID	Service
AF-4009,4016 1/2AF-4006	AFW Pump Suction Valves from Service Water

PARAMETER	VALUE	REFER TO
SUPPORTING DESIGN REQUIREMENTS		
1. Stroke Time		3.6.1
Nominal	30 seconds	
Design Basis Maximum	None	
2. Operating Differential Pressure		3.6.2
Specified Design D/P	150 psid	
Design Basis Maximum D/P		
• Opening D/P	105 psid	
• Closing D/P	105 psid	
3. Valve Position		3.6.3
Normal Position	Closed	
Fail Position	As-Is	
4. Power Supply Requirements	Safeguards Supply	3.6.4 3.4.5
Voltage Level		
• Nominal	460 VAC	
• Minimum	364 VAC	
~~5. Design Code~~	~~Unspecified~~	~~9.6.94~~ ~~4.2~~
		REMOVE
OTHER DESIGN INFORMATION		
6. Size		9.6 94
AF-4009, 4016	4-inch	
1/2AF-4006	6-inch	
7. Material	Stainless Steel valve w/ Stainless Steel trim	9.6.94

COMPONENT PARAMETERS SUMMARY
Section 3.7 (continued)

Component ID	Service
1/2MS-2019, 2020	Steam Supply Valves to AFW Pump Turbines

PARAMETER	VALUE	REFER TO
SUPPORTING DESIGN REQUIREMENTS		
1. Stroke Time		3.7.1
Nominal	21 seconds	
Design Basis	See Worksheet	
2. Operating Differential Pressure		3.7.2
Specified Design D/P	1085 psid	
Design Basis Maximum D/P		
• Opening D/P	1159 psid	
• Closing D/P	1159 psid	
3. Valve Position		3.7.3
Normal Position	Closed	
Fail Position	As-Is	
4. Control Signals		3.7.4
Automatic	Per Worksheet	
Remote-Manual (Control Rm)	Open/Shut	
Local Handwheel	Open/Shut	
5. Power Requirements	Independent of AC Power 125 VDC (nominal)	3.7.5
~~6. Design Code~~	~~Unspecified~~	~~9.6.94~~ ~~4.2~~
OTHER DESIGN INFORMATION		REMOVE
7. Size	3-inch	9.6.94
8. Material	Carbon Steel valves w/ Stellite Trim	9.6 94

COMPONENT FUNCTIONS
Section 3.8

Component ID	Service
AF-4007,4014 1/2AF-4002	AFW Pump Recirc Flow Control Valves (AOV)

Safety-Related Functions

1. These valves shall close automatically to prevent the unnecessary diversion of AFW pump discharge during high-flow conditions where sufficient pump discharge flow is providing for inlet flow stability and removal of pump heat.

2. These valves shall passively maintain the AFW system pressure boundary integrity.

Non-Safety-Related Functions

Augmented Quality Functions

1. 1/2 AF-4002 shall be capable of being manually "gagged" in the open position to ensure minimum pump recirculation flow to Turbine-Driven AFW Pumps during plant fires. [REF 9.2.59, Section 6.8.4.6.1]

Non-QA Functions

1. These valves shall close automatically after the AFW pump is secured (and remain closed) to prevent a flowpath of MFW backleakage to the CST. This function is required only if the 1st off, 2nd off, and discharge check valves are leaking when backseated. [REF 9.5.118] ?

2. These valves shall open automatically and remain open to provide a recirculation flowpath from the AFW pump discharge to the CST when flow in the AFW discharge line is insufficient to prevent pump damage [REF 9.5.117]

MR IC-274 (canceled)

What about leakage through pump to CT?

COMPONENT PARAMETERS SUMMARY
Section 3.8 (continued)

Component ID	Service
AF-4007,4014 1/2AF-4002	AFW Pump Recirc Flow Control Valves (AOV)

PARAMETER	VALUE	REFER TO
SUPPORTING DESIGN REQUIREMENTS		
1. Controls		3.8.1
Automatic	Open/Shut	
Manual Handwheel	Open/Shut	
2. Stroke Time REMOVE	See Worksheet	3.8.2
~~2. Operating Differential Pressure~~		~~3.8.3~~
~~Specified "Available D/P"~~	~~195 psid~~	
~~Specified "Maximum D/P" (4007,4014)~~	~~1410 psid~~	
~~Specified "Maximum D/P" (4002)~~	~~1440 psid~~	
~~3. Design Flow at the "Available D/P"~~		~~3.8.4~~
~~AF-4007, 4014~~	~~≥70 gpm~~	
~~1/2AF-4002~~	~~≥100 gpm~~	
3 ~~4.~~ Design Pressure, Temperature REMOVE	1410 psig 100° F minimum specification	9.6.95
~~5. Design Code~~	~~Unspecified~~ ASME ~~Section III~~ - class 1	~~9.6.95~~ 4.2 REMOVE
Replace with Text 4 OTHER DESIGN INFORMATION		
~~6. Position~~		~~3 8.5~~
~~Normal Position~~	~~Closed~~	
~~Failure Position~~	~~Closed~~	
5 ~~7~~ Operational Requirements	Gagged Open during Plant Fires	3.8.6
6 ~~8~~ Material	Stainless Steel	2 2.14
~~9.~~ Valve Type	Globe	9 6 95
7 10 Operator Air Loading Pressure	45 psig	9 6 95

COMPONENT PARAMETER WORKSHEET

Section 3.8 3

Component ID	Service
AF-4007,4014 1/2AF-4002	AFW Pump Recirc Flow Control Valves (AOV)

A. Parameter Operating Differential Pressure

B. Value

Specified "Available D/P"	195 psid
Specified "Maximum D/P" (4007,4014)	1410 psid
Specified "Maximum D/P" (4002)	1440 psid

C. Source 1. AOV Spec M-181 [REF 9.6.95]

D. Background/Reason

This valve was originally specified with an "available" differential pressure of 195 psig, which was used in the vendor's design to achieve the design flowrate of 30 gpm specified on the original valve specification [Source 1].

This valve was originally specified with a "maximum" differential pressure of 1410 psig for the recirc valves on the motor-driven AFW pumps, and 1440 psig on the turbine-driven AFW Pump recirc valves. These values are probably derived from the values of shutoff head on each pump: 1305 psig (MDAFWP) and 1340 psig (TDAFWP) plus a maximum suction pressure of 100 psig attributable to the maximum operating pressure of the Service Water System.

REMOVE

COMPONENT PARAMETER WORKSHEET
Section 3.8.4

Component ID	Service
AF-4007,4014 1/2AF-4002	AFW Pump Recirc Flow Control Valves (AOV)

A. Parameter Design Flow at the "Available D/P"

B. Value

AF-4007, 4014	≥ 70 gpm
1/2AF-4002	≥100 gpm

C. Source 1. MR 88-99 [REF 9.5.117]

D. Background/Reason

These valves do not "control flow" by virtue of throttle-control capabilities, but rather, they open or close (at prescribed setpoints of AFW flow) to initiate or secure flow through the recirculation line. The amount of recirculation flow is determined by the flow resistance in the line, which is predominantly controlled by the restricting orifice.

Source 1 established the design flow through valves 4007 and 4014 as 80 gpm (measured flow ranges 85 to 90 gpm). This value of flow is based on the recirculation line design, and provides 10 gpm margin above the minimum recirculation value required by the Motor-Driven AFW Pump (70 gpm). Source 1 established the design flow through valves 1/2AF-4002 as 125 gpm (measured flow ranges 125 to 130 gpm), which provides an approximate 25 gpm margin to the minimum recirculation value required by the Turbine-Driven AFW Pump (100 gpm). Source 1 installed new valves to accommodate the increased design flow of the recirculation lines.

REMOVE

COMPONENT PARAMETER WORKSHEET
Section 3.8 5

Component ID	Service
AF-4007,4014 1/2AF-4002	AFW Pump Recirc Flow Control Valves (AOV)

A. Parameter Position

B. Value

Normal Position	Closed
Failure Position	Closed

REPLACE WITH TEXT C

C. Source
1. WE Calculation N-87-041 [REF 9.4.3]
2. MR 88-99 [REF 9.5.117]
3. MR IC-274 [REF 9.5.118]
4. MR 01-144 [REF 9.5.197]
5. MR02-001 [REF 9.5.198]
6. NMC Internal correspondence dated 4-25-02 [REF 9.5.200]

D. Background/Reason

Failure Position

Although no documented basis has been found for the selection of an air-operator in this application (as opposed to motor-operator), several facts support the design requirement to have an operator which fails to the closed position. Since this valve has a safety function to close, and a less significant function to open (long-term pump protection) it is most reliable therefore to have the valve fail (upon loss of power or instrument air) to the closed position. THIS INFORMATION HAS BEEN DERIVED LOGICALLY, BECAUSE NO DOCUMENTED BASIS COULD BE FOUND. THEREFORE, THE ABOVE IS PROVIDED FOR INFORMATION ONLY.

Interestingly, Source 1 concludes that "adequate minimum pump flow will exist for all auxiliary feed pumps under all design basis conditions with an assumed failure of the pneumatic recirculation control valves". This evaluation, however, did not consider the potential for instrument air loss (causing recirc valve closure) in combination with the single active failure (i.e., the associated discharge MOV fails shut).[1] The "worst case" recirculation flow would occur if the air-operated recirc valve(s) and the air-operated discharge valve(s) failed in the closed position.

Failure of one of these valves in the open position would cause a reduction in AFW System flow to the steam generators during an accident; however, the value of flow-reduction is bounded by the single failure condition created if the TDAFW Pump fails to start [Source 2].

TEXT D

Normal Position

When the AFW System is in a standby lineup, these valves are normally closed to limit backleakage (from MFW) to the CST. As discussed in Source 3, allowing such leakage would mask the failure of AFW discharge check valves by allowing flow and keeping AFW piping temperatures and pump suction pressures below levels that would otherwise be indicative of a problem.

[1] This concern is based on the NUREG-0800 assumption that all non-safety grade equipment may fail to its worst-case condition in addition to one limiting safety grade failure. In this case, such an assumption would result in no flow through the pump. As NUREG-0800 has not been incorporated into the PBNP licensing basis, this combination of failures appears to fall outside the system design and licensing basis.

COMPONENT PARAMETERS SUMMARY
Section 3.9 (continued)

Component ID	Service
AF-4012, 4019	MDAFW Pump Discharge Pressure Control Valves (AOVs)

PARAMETER	VALUE	REFER TO
SUPPORTING DESIGN REQUIREMENTS		
1. Operating Differential Pressure		3.9.1
Specified "Available D/P"	46.7 psid	
Specified "Maximum D/P"	1410 psid	
2. Design Flow at "Available D/P"	200 gpm	3.9.1
3. Position		3.9.2
Normal Position	Open as necessary to maintain 1200 psig at pump discharge	
Fail Position		
• Loss of Air	Automatic Control using Backup Nitrogen (N_2) ~~accumulators~~ bottles Local gagging of valve if flow requirements < 75 gpm	
• Loss of Nitrogen and Air	Full Open	
4. Valve response time	See worksheet	3.9.3
5. Range of Control Air Signals	3-15 psig	9.6.95
6. Design Code	Unspecified ?	9.6.95 ~~4.2~~
7. Design Pressure/Temperature	1410 psig/100°F(max of 220°F)	9.6.95
OTHER DESIGN INFORMATION		
8. Valve Type	Throttling Globe	9.6.95
9. Material	Carbon Steel ?	9.6.95
10 Operator Air Loading Pressure	20 psig (AF-4012) 40 psig (AF-4019)	9.6.95

COMPONENT PARAMETER WORKSHEET
Section 3.9.2

Component ID	Service
AF-4012, 4019	MDAFW Pump Discharge Pressure Control Valves (AOVs)

A. Parameter Position

B. Value

Normal Position	Throttled Open (pressure control set to 1200 psig)
Fail Position	
• Loss of Air	Automatic Control using Backup Nitrogen accumulators
• Loss of Nitrogen and Air	Full Open

C. Source
1. WE Internal Memo NEM-89-36 dated 1/17/89 [REF 9.5.25]
2. WE Ltr VPNPD-89-417 response to IEB 80-04 [REF 9.2.46]
3. WE Calculation P-87-001 [REF 9.4.1]
4. WE Calculation P-87-003 [REF 9.4.2]
5. NRC Ltr to WE dated 2/14/92 [REF 9.2.79]
6. WE Modification, MR 97-038*A [REF 9.5.134]
7. AOP-5B [REF 9.5.182]
8. CR 97-0930 [REF 9.5.192]
9. LER 97-014-00 [REF 9.2.108]
10. PBNP Inservice Test IT-10, Test of Electrically-Driven Auxiliary Feed Pumps and Valves (Quarterly) - Units 1 and 2, Revision 35, 01/08/99. [Ref 9.5.91]
11. WE Calc 2002-0005 [REF 9.4.49]
12. WE Mod MR01-144 [REF 9.5.197]

D. Background/Reason

Although no documented basis has been found for the selection of an air-operator in this application (as opposed to motor-operator), several facts can support the design requirement to have an operator which fails to the open position (with the exception that it is a detriment in the MSLB case). Since this valve has a safety function to open, and no significant closing function, it is most reliable (from a flow delivery standpoint) to have the valve fail (upon loss of power or instrument air) to the open position. Although failure to the full open position will cause a significant and deleterious increase in MDAFW pump flowrate, Source 3 concluded that the CSTs would provide sufficient NPSH (and flow restrictions would be adequate) to prevent MDAFW pump runout with these valves. More recent evaluations concluded that modifications were required to prevent MDAFW pump runout when Instrument Air (IA) was lost [Sources 8 and 9]. Source 6 modified the air supply to the discharge pressure control valves to be throttled with a safety-related backup nitrogen source when IA is lost (or when IA pressure was below minimum required to operate these valves) Source 4 calculated the necessary valve "gag" positions to achieve a 200 gpm pump flowrate at various steam generator pressures which were incorporated in Source 6 for automatic flow control on loss of IA.

COMPONENT PARAMETER WORKSHEET
Section 3.9.2 (continued)

Much analysis went into the failure position of this valve as a result of NRC Generic Letter 88-14 regarding Instrument Air Systems. **Source 1** determined that a motor-driven AFW pump could provide a depressurized steam generator as much as 616 gpm as a result of this failure (FOR ILLUSTRATIVE PURPOSES - this flow rate would trip the electrical breaker within 250 seconds based on generic breaker performance curves). This flow value exceeded that used in existing core and containment response analyses to the MSLB. However, a qualitative evaluation (**Source 2**) supported no further action to correct the existing failure mode. This evaluation was based on a low probability of occurrence, conservatism in existing analyses, the relatively small offsite dose consequences of a MSLB, and the risk associated with any modification that would tend to limit AFW System flow. Another consequence of the fail-open position of these valves is the potential for Emergency Diesel Generator overloading as the MDAFW pump demands more horsepower when the pump operates at these maximum flow conditions. This condition is addressed in **Source 5** and was recently re-evaluated. Because the Instrument Air System is non-safety related, these valves were modified per **Source 6**, which added a safety-related source of backup nitrogen, via accumulators, to support continued operation ~~for 1.5 hours for AF-4012 and 1 hour for AF-4019~~ after a loss of Instrument Air ~~[Source 7].~~ With the implementation of the safety related backup nitrogen accumulator modification per ~~Source 6~~, the runout potential, previously discussed, is precluded.

Testing of the nitrogen backup pressure supply performed as part of the installing modification [**Source 6**] verified that delivery of nitrogen from the accumulator to the discharge control valves provides adequate pressure to maintain control valve function. Testing performed in the inservice test program periodically verifies that the nitrogen supply provides adequate gas flow and pressure to operate the discharge control valves [**Source 10**].

Insert text E

COMPONENT PARAMETERS SUMMARY

Section 3.10 (continued)

Component ID	Service
AF-112, 113 1/2AF-111	AFW Pump Suction Check Valves

PARAMETER	VALUE	REFER TO
SUPPORTING DESIGN REQUIREMENTS		
1. Design Code	See Worksheet	3.10.1

REMOVE

COMPONENT PARAMETER WORKSHEET

Section 3 10.1

REMOVE

Component ID	Service
AF-112, 113 1/2AF-111	AFW Pump Suction Check Valves
AF-109, 110 1/2AF-108	AFW Pump Discharge Check Valves
1AF-102,104,106,107 2AF-103,105,106,107	Second-Off AFW Check Valves
1AF-100, 1AF-101 2AF-100, 2AF-101	First-Off AFW Check Valves

A. Parameter Design Codes

B. Value See Below

C. Source
1. MR 83-55, 56, 57 [REF 9.5.46, 9.5.47, 9.5.48]
2. WE Spec PB-156 AFW Check Valves [REF 9.5.60]
3. Bechtel Spec M-82 [REF 9.6.98]

D. Background/Reason

The original design codes for these check valves were not established in the original specification [Source 3].

The original AFW check valves AF-109, AF-110, 1AF-108 and 2AF-108 were replaced with soft seat, piston lift to minimize leakage [Source 1] These valves were designed in accordance with the requirements of the ASME Code, Section III, Class 2 requirements. 1980 Edition through the Winter 1980 Addenda [Source 2].

Note: MR 97-129 installation is not complete. Refer to MR Documentation on details for changes to 1AF-100, 1AF-101, 2AF-100, 2AF-101 First-Off AFW Check Valves.

REMOVE

COMPONENT FUNCTIONS
Section 3.11

Component ID	Service
AF-109, 110 1/2AF-108	AFW Pump Discharge Check Valves

Safety-Related Functions

1. These valves shall automatically open to provide a flowpath for auxiliary feedwater from the AFW pump discharge to the associated steam generators, when AFW is initiated [REF 9.6.21].

2. These valves shall passively maintain the AFW system pressure boundary integrity.

Non Safety-Related Functions

Augmented Quality Functions

These valves shall remain closed during normal AFW-standby operation to prevent backflow of high-pressure MFW discharge (or steam generator water) to the AFW lines. Such backflow may potentially disable AFW pumps through "steam binding", and may also cause AFW System temperatures in excess of nominal design temperatures [REF 9.2.69 and 9.2.70].

It is important to note that this function is redundant to backleakage prevention provided by the first-off and second-off check valves. Additionally, the discharge isolation MOVs, AF-4021/4022/4023/4024 and the discharge pressure control valves, AF-4012/4019, provide backleakage prevention for the MDAFW pumps.

Non-QA Functions

None

THERE IS NO COMPONENT PARAMETER SUMMARY SHEET FOR THESE VALVES.
~~(REFER TO DBD SECTION 3.10.1 FOR APPLICABLE DESIGN CODES)~~

REMOVE

COMPONENT FUNCTIONS
Section 3.12

Component ID	Service
1AF-102,104,106,107 2AF-103,105,106,107	Second-Off AFW Check Valves

Safety-Related Functions

1. These valves shall automatically open to provide a flowpath for auxiliary feedwater from the AFW pump discharge to the associated steam generators, when AFW is initiated [REF 9.6.21].

2. These valves shall automatically close whenever its respective line has achieved no-flow conditions. Backleakage through these valves into connected AFW piping that is at a lower pressure could result in reduced flow in the line which is at a higher pressure. In effect, this could be a flow diversion path for the functioning AFW line. [REF 9.5.119]

3. These valves shall passively maintain the AFW system pressure boundary integrity.

Non-Safety-Related Functions

Augmented Quality Functions

1. These valves shall remain closed during normal AFW-standby operation to prevent backflow of high-pressure MFW discharge (or steam generator water) to the AFW lines. Such backflow may potentially disable AFW pumps through "steam binding", and may also cause AFW System temperatures in excess of design temperatures [REF 9.2.69 and 9.2.70].

   This condition is further mitigated by the first-off check valves and the capability to close AFW Pump discharge MOVs in the unlikely event that all the discharge check valves leak excessively. [REF 9.5.119]

2. These valves shall be closed to prevent air or steam pockets from forming in the AFW lines thus precluding water hammer [REF 9.2.94, 9.3.57, 9.3.58, 9.3.59].

Non-QA Functions

None

THERE IS NO COMPONENT PARAMETER SUMMARY SHEET FOR THESE VALVES.
(REFER TO DBD SECTION 3.10.1 FOR APPLICABLE DESIGN CODES)

REMOVE

COMPONENT FUNCTIONS
Section 3.13

Component ID	Service
1/2AF-100, 1/2AF-101	AFW 1st Off Check Valves

Safety-Related Functions

1. These valves shall automatically open to provide a flowpath for auxiliary feedwater from the AFW pump discharge to the associated steam generators, when AFW is initiated [REF 9.6.21].

2. These valves shall close in order to protect an intact steam generator[1] from a loss of inventory from a fault condition in the opposite steam generator or the opposite steam generator's AFW or MFW line. [REFs 9.3.56, 9.3.97].

3. These valves shall passively maintain the AFW system pressure boundary integrity.

Non-Safety-Related Functions

Augmented Quality Functions

1. These valves shall remain closed during normal AFW-standby operation to prevent backflow of high-pressure MFW discharge (or steam generator water) to the AFW lines. Such backflow may potentially disable AFW pumps through "steam binding", and may also cause AFW System temperatures in excess of nominal design temperatures [REF 9.2.69, 9.2.70].

   It is important to note that this function is redundant to backleakage prevention provided by the second-off check valves and pump discharge check valves.

2. These valves shall be closed to prevent air or steam pockets from forming in the AFW lines thus precluding water hammer [REF 9.2.94, 9.3.57, 9.3.58, 9.3.59].

Non-QA Functions

1. These valves must close and remain closed to prevent cross leakage to the other S/G on the same unit for the TDAFW pumps [REF 9.6.21].

THERE IS NO COMPONENT PARAMETER SUMMARY SHEET FOR THESE VALVES.
(REFER TO DBD SECTION 3.10.1 FOR APPLICABLE DESIGN CODE) REMOVE

[1] The first off check valve for the intact steam generator will remain open as long as AFW is continued on that steam generator. Should AFW flow be shut off to control level, the first off check valve will then close providing the first isolation point to prevent inventory from the intact steam generator blowing down the TDAFW supply line back to the faulted steam generator. The second off check valve will close to prevent loss of flow through the TDAFW supply line while AFW flow is being supplied (see SR function #2 on worksheet 3.13).

COMPONENT PARAMETERS SUMMARY
Section 3.14 (continued)

Component ID	Service
AF-4027,4028 1/2AF-4026	AFW Pump Suction Relief Valves

PARAMETER	VALUE	REFER TO
SUPPORTING DESIGN REQUIREMENTS		
1. Set Pressure	100 psig	3.14.1
2. Capacity REMOVE	Minimal	3.14.2
~~3. Design Codes~~	~~Unspecified~~	~~9.6.96~~ 4.2
4. Seismic Requirements	Class I	9.6.96
OTHER DESIGN INFORMATION		
5. Size - Inlet	1 inch	9.6.96
6. Materials	bronze valves bronze trim	9.6.96

COMPONENT PARAMETERS SUMMARY
Section 3.15 (continued)

Component ID	Service
AF-4035	AFW Pump Recirculation Line Relief Valve

PARAMETER	VALUE	REFER TO
SUPPORTING DESIGN REQUIREMENTS		
1. Set Pressure	50 psig	3.15.1
2. Capacity		3.15.2
Design Capacity	200 gpm	
Required Capacity	Minimal, See Worksheet	REMOVE
~~3. Design Code~~	~~Unspecified~~	~~9.6.96~~ 4.2
4. Seismic Requirements	Non-Seismic	9.6.96
OTHER DESIGN INFORMATION		
5. Size	3 inch	9.5.117
6. Materials	Carbon Steel Valve Stainless Steel Trim	9.6.96

COMPONENT FUNCTIONS
Section 3.16

Component ID	Service
RO-4008,4015 1/2 RO-4003	AFW Pump Recirculation Line Orifice

REMOVE

Safety-Related Functions

leave tag

1. ~~These orifices shall provide passive flow resistance in the recirculation line of each AFW pump; thereby establishing the required mini-recirc flow and the pressure drop from AFW pump discharge pressure to CST pressure. These orifices must provide sufficient flow to prevent low-flow instabilities and excessive fluid temperature rise in the AFW pumps [REF 9.5.117].~~

1 ~~2.~~ These orifices shall limit the recirculation flow in the event that the recirculation control valve fails to close during the AFW operation response to an accident [REF 9.5.117].

2 ~~3.~~ These orifices shall passively maintain the AFW system pressure boundary integrity.

Non-Safety-Related Functions

Augmented Quality Functions

None

Non-QA Functions

None

MW

COMPONENT PARAMETERS SUMMARY
Section 3.16 (continued)

Component ID	Service
RO-4008,4015 1/2RO-4003	AFW Pump Recirculation Line Orifice

PARAMETER	VALUE		REFER TO
SUPPORTING DESIGN REQUIREMENTS			
1. Design Flow	Minimum	Maximum	3.16.1
TDAFWP Orifice	75 ~~100~~ gpm	126 gpm	
MDAFWP Orifice	50 ~~70~~ gpm	84 gpm	
~~2. Design Code~~	~~Unspecified~~		~~4.2~~

COMPONENT PARAMETER WORKSHEET

Section 3.16 1

Component ID	Service
RO-4008,4015 1/2RO-4003	AFW Pump Recirculation Line Orifice

A. Parameter Design Flow

B. Value

Minimum		Maximum		
TDAFWP	75 ~~100~~ gpm		TDAFP	124 gpm
MDAFWP	50 ~~70~~ gpm		MDAFP	59 gpm

C. Source
1. IEB 88-04 and WE Responses [REF 9.2.61, 9.2.62, 9.2.63]
2. MR 88-99 [REF 9.5.117]
3. ~~AFW DBD Validation Report [REF 9.3.32]~~ By Jackson letter dated 8/7/91 [REF 9.3.c
4. WE Calculation N-91-32 [REF 9.4.21]
5. ~~Flowserve letter~~ WE Calc N-91-042 [REF 9.4.22]
6. Flowserve letter dated 3-2-01 [REF 9.3.113]
7. MR99029 [REF 9.5.199]

D. Background/Reason

In response to the NRC IEB 88-04 concerns [Source 1], WE committed to increase the miniflow capacity of the AFW pumps to the flow rates recommended by the pump manufacturer. Source 2 upgraded the recirc orifice capacity to meet the AFW Pump minimum recirculation flow requirements stated in section 3.1.3.

Text

~~Source 3 determined that test data provided the following flow indications through the MDAFW Pump recirculation lines:~~

~~Pump P-38A 86.0 gpm~~
~~Pump P-38B 88.3 gpm~~

REMOVE

Source 4 and Source 5 estimated the effect of the increased recirculation line size on flow rates to the steam generators if the recirc valve stuck open. The calculation showed that minimum steam generator flow rate will still be achieved in these conditions. These calculations provide the basis for the maximum allowable flow through the recirculation lines during most design basis accidents that credit Aux Feed.

(which needs more? 4 pts ?)

Source 2 replaced the orifices. Post modification testing has verified the flows through the aux recirc lines are in the appropriate range. Approximately ...

COMPONENT FUNCTIONS
Section 3.20

Component ID	Service
AF-133, 153	First-Off ~~AFW~~ MDAFP Backup Nitrogen ~~Accumulator~~ Bottle Check Valves

Safety-Related Functions

1. These valves shall remain closed during a Loss of Instrument Air event to prevent backflow of nitrogen into the instrument air system, [REF 9.5.134] 9.5.197 prevent a loss of and the to ~~prevent~~ the safety related ~~source of~~ nitrogen for use ~~the MDAFP~~ the MDAFP AOV AF-4007/~~4008~~/4012/4014/ [REF 9.
2. These valves shall passively maintain the ~~AFW~~ IA system pressure boundary integrity.

Non-Safety-Related Functions

Augmented Quality Functions

None ~~Aug A~~ not yet

Non-QA Functions

None

All other components associated with these valves are within the boundary of the Instrument Air System and are addressed in DBD-06.

THERE IS NO COMPONENT PARAMETER SUMMARY SHEET FOR THESE VALVES.

** New Sheet to be added **

COMPONENT FUNCTIONS
Section 3.22

Component ID	Service
1/2AF-173	First-Off TDAFP Backup Air Accumulator Check Valves

Safety-Related Functions

1. These valves shall remain closed during a Loss of Instrument Air event to prevent a loss of the safety-related air supply for the TDAFP mini-recirc valves (1/2AF-4002) into the instrument air system. [REF 9.5.198]

2. These valves shall passively maintain the IA system pressure boundary integrity.

Non-Safety-Related Functions

Augmented Quality Functions

None

Non-QA Functions

None

All other components associated with these valves are within the boundary of the Instrument Air System and are addressed in DBD-06.

THERE IS NO COMPONENT PARAMETER SUMMARY SHEET FOR THESE VALVES.

4.1.9 Criterion 41, Engineered Safety Features Performance Capability

Engineered safety features, such as the emergency core cooling system and the containment heat removal system, shall provide sufficient performance capability to accommodate the failure of any single active component without resulting in undue risk to the health and safety of the public [REF 9.2.57 (Table 1.3-1)].

Applicability of Criterion 41 to AFW System

As an ESF-equivalent system, the AFW System is designed as a *safety-grade* system which meets single failure criteria. [REF 9.2.49] Specifically, the AFW System is designed with sufficient mechanical and electrical redundancy such that a single failure of an active component, either in the system or in a supporting system, can be accommodated without loss of the overall AFW System safety-related functions.

4.1.10 Criterion 42, Engineered Safety Feature Components Capability

Engineered safety features shall be designed so that the capability of these features to perform their required function is not impaired by the effects of a loss-of-coolant accident to the extent of causing undue risk to the health and safety of the public. **[REF 9.2.57 (Table 1.3-1)]**

Applicability of Criterion 42 to AFW System

As an ESF-equivalent system, the AFW System is designed to function following a loss-of-coolant accident AFW System safety-related functions can be accomplished in the harsh environments resulting from the loss-of-coolant accident.

4.2 Codes and Standards

Insert Text G →

REMOVE

- ~~American Society of Mechanical Engineers (ASME)~~

REMOVE

  - ~~ASME Code, Section III, 1980 Edition and 1980 Winter Addenda, Rules for Construction of Pressure Vessels [REF 9.5.60]. This code is applicable to AFW check valves AF-109, AF-110, 1AF-108 and 2AF-108 [REFs 9.5.46, 9.5.47 and 9.5.48].~~

REMOVE

  - ~~The ASME Boiler & Pressure Vessel Code is not applicable to vessels with a Maximum Allowable Working Pressure (MAWP) less than 15 psig.~~

REMOVE

  - ~~ASME Code, Section IX, "Welding and Brazing Qualifications". This code applies to the Condensate Storage Tanks [REF 9.6.91].~~
  - ASME Code, Section XI, 1986, Code for Inservice Inspection of Nuclear Power Plant Components [REF 9.5.85]. This code governs the inservice testing ~~of safety-related pumps and valves including those in the AFW System~~ and inservice inspection of the safety related portions of the AFW system
  - AWWA D100-67 (AWS D5.2-67), "Standard for Steel Tanks for Water Storage" [REF 9.6.91]. This code applies to CST design [REF 9.6.91].

REMOVE

- Institute of Electrical and Electronic Engineers (IEEE)
  - IEEE, Standard 279 - Proposed Criteria dated August 28, 1968, Criteria for Protection Systems for Nuclear Power Generating Stations [REF 9.2.31]. This standard applies to the protective system and engineered safety feature instrumentation, including applicable AFW System instruments.
  - IEEE, Standard 279-1971, Criteria for Protection Systems for Nuclear Power Generating Stations [REF 9.1.4]. This standard applies to the AFW automatic initiation design required by NUREG-0737.

  NOTE: IEEE standards related to the Environmental Qualification of Electrical Equipment are addressed in DBD-T-39.

- USA Standards Institute (USAS)
  - USAS Code B31.1-1967, Code for Pressure Piping [REF 9.6.93 (Section 6.1) and 9.2.57, Table 9.1-2]. This code applies to AFW System piping, and references numerous other codes and standards for components in the piping sys.

REMOVE

  - ASA B16.5, Pipe Flanges and Flanged Fittings: this code was specifically applied to the CST design [REF 9.6.91]. Further applicability to AFW system pipe flanges and valves could not be verified.

4.3 Regulatory Documentation

The regulatory documents associated with the Auxiliary Feedwater System are: Title 10 of the Code of Federal Regulations, [REF 9.1.2] Regulatory Guides, NUREGs, DOR guidelines, Generic Letters, I&E Bulletins and Notices, and NRC SERs. The following documents are directly applicable to the AFW System design.

4.3.1 10 CFR 50 48, Fire Protection

The AFW System is required to remove decay heat in the event of a fire. Refer to Section 2.2.16.

4.3.2 10 CFR 50 49, Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants

Some AFW System electrical equipment is required to be environmentally qualified. Refer to Section 2.2.11.

4.3 3 10 CFR 50 55a, Codes and Standards

The inservice inspection of the AFW System is governed by this regulation. Refer to Section 6 0.

4 3 4 10 CFR 50 63 Loss of All Alternating Current Power

The AFW System must be capable of providing feedwater to the steam generators in the event of the loss of all AC power (Station Blackout) Refer to Section 2.1.2.2.

TABLE 7-1

AFW MODIFICATIONS (continued)

MR	DESCRIPTION OF MODIFICATION AND DESIGN BASIS EFFECT		
97-099 *A, *B, *C, *D, *E, *F	**AFW Valve and Instrument Loop Modification (Low Suction Pressure Trip)** This modification was issued to correct the conditions described in CRs 97-1918, 97-2664, and CR 97-3486. It was determined that there was inadequate volume in the suction piping to the AFW pumps, following a low suction pressure trip, to prevent pump damage. Also, a single electrical failure could disable the low suction pressure trip for three of the four AFW pumps. Changes include replacing the existing Gimpel overspeed trip/throttle valve on the TDAFW pumps with a similar valve that has a solenoid trip and a motor operator for reset (remote-manual reset capability in the control room). Cable separation and power supply changes were made to ensure that no common mode or single electrical failure could affect more than 2 of 4 AFW pumps. The low suction pressure signal that was originally used to close the steam admission valves (1/2 MS-2019/2020) has been removed from these valves. *A - Installed new trip/throttle valve and low suction pressure trip circuitry (in AFW pump room) on Unit 2. *B/*D - Included upgrades to the design configuration of 3 pipe supports and the installation of one new support on the steam supply lines since the new trip/throttle valves weigh more than the old ones. *C - Installed new trip/throttle valve and low suction pressure trip circuitry (in AFW pump room) on Unit 1. *E – Replaced the existing Gimpel overspeed trip/throttle valves with a similar valve that has a DC solenoid trip and a motor operator for reset for unit 1 valve 1MS-2082. The solenoid trip was incorporated into the existing low suction pressure trip circuit. *F – Replaced the existing Gimpel overspeed trip/throttle valves with a similar valve that has a DC solenoid trip and a motor operator for reset for Unit 2 valve 2MS-2082. The solenoid trip was incorporated into the existing low suction pressure trip circuit. This modification changed the arrangement of the trip/throttle valves (1/2 MS-2082) and low suction pressure trip for the TDAFW pumps described in the FPER. The installed circuits associated with the new low suction pressure trip to the trip/throttle valves has been routed to ensure continued compliance with the PBNP Fire Protection/App R safe shutdown design basis and NRC approved App R exemptions for the AFW Pump Room and Cable Spreading Room.		
	Unit: 1,2	**Design Basis Impact:** Yes - sect. 3.1.7, 3.21	**REF:** 9.5.135
~~97-129 *A & *B~~	~~**Replace Check Valves ½ AF-100/101 With a New Style.** Activities to complete this MR were in progress when this revision was being prepared. Physical design of the check valves changed, but no functions were changed, therefore there is no design basis impact expected due to this change.~~		
	~~**Unit:** 1,2~~	~~**Design Basis Impact:** None~~	~~**REF:** see MR~~

REMOVE

TABLE 7-1

AFW MODIFICATIONS (continued)

MR	DESCRIPTION OF MODIFICATION AND DESIGN BASIS EFFECT		
00-077	**Upgrade Trip for AF-4019.** The internal trim (cage, plug, stem, roll pin) for AF-4019 was replaced with a trim design capable of providing increased stability at low flows (~35 gpm). This also increased air/back-up nitrogen consumption rates		
	Unit: 1, 2	**Design Basis Impact:** Yes - Sect. 3.9	**Ref:** N/A

Add new mods here

Kathy WPS
5809

*** New Modification Descriptions for Table 7-1 ***

MR 99-029*A/*B/*C/*D Aux Feed Water Pump Minimum Flow Recirc Line Orifice

Description:

Due to cavitation and vibration problems with the original orifices that caused the cracking of some welds on the minimum flow recirculation piping, the orifices were replaced with new models that prevent cavitation and vibration. The flow through these orifices did not change significantly. The orifices installed on the TDAFP recirculation line have the capability of being adjusted.

Unit: 1, 2

Design Basis Impact: Yes – Section

Ref: 9.5.199

MR 01-144 AFW Motor-Driven Pump Mini-Recirc Control Valve Modification

Description:

A backup supply of safety-related nitrogen was added to supply the AF-4007 / 4014 minimum flow recirculation valves to address LER 266/2001-005. This LER was submitted when it was discovered that a common mode failure of all the auxiliary feedwater pumps existed if instrument air was lost and all of the minimum flow recirculation valves failed closed. The existing backup nitrogen supply installed by MR 97-038 for the MDAFP discharge AOVs was tapped to supply nitrogen to the mini-recirc AOVs. Calculation 2002-0005 [REF 9.4.49] verified that the existing bottles provided an adequate supply of nitrogen for both AOVs simultaneously.

Unit: 1, 2

Design Basis Impact: Yes – Section

Ref: 9.5.197

MR 02-001 TDAFP Mini Recirc Valve (1/2AF-4002) Instrument Air Accumulator Addition

Description:

A backup supply of safety-related air was added to supply the 1/2AF-4002 minimum flow recirculation valves to address LER 266/2001-005. This LER was submitted when it was discovered that a common mode failure of all the auxiliary feedwater pumps existed if instrument air was lost and all of the minimum flow recirculation valves failed closed Accumulators were installed in the instrument air supply tubing to act as reservoirs for a safety-related supply of air for the valves. Calculation 2001-0056 [REF 9.5.xxx] verified that the tank size is adequate to provide 2 hours of air to the valves.

Unit: 1, 2

Design Basis Impact: Yes – Section

Ref: 9.5.198

Results and Conclusions:

(1) The Point Beach AFW model database, PBAFW.DBD, created using Proto-FLO™ Version 3.04 and the interactive schematic, PBAFW.VSD created using Visio 4.0 has been prepared, documented and independently verified. The model is complete and ready for use in QA calculations.

(2) The worst case for a steam line break inside containment scenario has a full CST and unit steam generators without the pump recalculation since faulted unit 2B steam generator receives the most flow when it is at 324 psia and the intact steam generator is at 824 psia. The flow rates to the unit 1 steam generators are 275.57 gpm (intact 1HX-1) and 775.57 gpm (faulted 1HS-1B) with the pump recirculation. The flow rates to the unit 2 steam generators are 271.52 gpm (intact 2HX-1A) and 773.03 gpm (faulted 2HX-1B) without the pump recirculation, and 120.96 gpm (intact 2HX-1A) and 705 04 gpm (faulted 2HX-1B) with the pump recirculation.

(3) Most of the flow from the turbine driven pump goes to the faulted steam generator and a motor pump becomes the only supplier for the intact steam generator as the pressure difference between the faulted and intact steam generator increases. The check valves 1AF-0107 and 2AF-0106 need to be closed to prevent the reverse flow when there is pump recalculation and the steam generator pressures are 324 psia for the faulted and 824 psia for the intact (500 psid).

(4) The detailed files for this model are on optical disk.

8.28 S&L Calculation ~~M-09334-266-IA-A, "AF Nitrogen Bottle Sizing"~~, Rev. 0 dated 5/3/2001 [Ref 9.4.49]

The original calculation determined the necessary size of nitrogen bottles to provide a backup motive forced for AF-4012 and AF-4019 (motor driven AFW pmp back pressure flow control valves). The siing was based on conservative assumptions of air system laeakage and valve usage, and established a mission time of 90 minutes with an assumed stroke rate of 10 strokes/hour.

This addendum reduced the mission time for AF-4019 to 60 minutes due to the increased nitrogen consumtion resulting from valve trim change (MR 00-077, Ref. 9.5.196]. The basis for acceptability of the 60 minute period was cited as the SBO coping period. It has since been noted however, that during an SBO there would be no power to the pump in any case, o this basis is not valid.

In late 2001, concerns with the failure mode of the AFW pump minimum recirculation line isolation valves prompted procedural changes, a root casue investigation, a special NRC investigation, and initiation of modifications to provide backup air or nitrogen to these valves. It is expected that this calculation will be revised significantly before the concerns are fully resolved.

Replace with text H

9.3.112 W WCAP-8404, "Anticipated Transient Without Trip Analysis for Westinghouse PWRs With 44 Series Steam Generators", September 1974.

9.3.113 Flowserve letter to PBNP "Aux Feed Water Pumps Minimum Flow Analysis" dated 3-2-01

9.4 Calculations

9.4.1 WE Calculation P-87-001, "Electric Auxiliary Feedwater Pump Runout Study", Original Calculation, dated 5/25/87.

9.4.2 WE Calculation P-87-003, "Electric Auxiliary Feedwater Pump Study - AOV Gagging", Original Calculation, dated 5/25/87.

9.4.3 WE Calculation N-87-041, "Auxiliary Feedwater Minimum Flow Evaluation", Original Calculation, dated 11/30/87.

9.4.4 WE Calculation N-89-001, "Maximum Auxiliary Feedwater Flow Rate to One Steam Generator", Revision 2, dated 5/31/90.

9.4.5 WE Calculation N-89-019, "Steam Generator Inventories During One Hour of Station Blackout", Revision 1, dated 10/30/90. This calculation is not referenced in the text or described in the calculation summary section.

9.4.6 WE Calculation N-90-028, "Auxiliary Feedwater Pump Flow-Head Characteristic Polynomials", Original Calculation, dated 5/7/90.

9.4.7 WE Calculation N-90-029, "Determination of Branch Resistance Coefficients in the AFW System", Original Calculation, dated 5/30/90.

9.4.8 WE Calculation N-90-095, "Minimum AFW Flow for Automatic Actuation to Both Units", Original Calculation, dated 12/17/90.

9.4.9 WE Calculation N-91-007, "Steam Generator Inventories 5 Minutes After An Earthquake", Revision 2, dated 11/7/91. This calculation is not referenced in the text or described in the calculation summary section.

9.4.10 WE Calculation PB-89-031, "Voltage Drop Across MOVs Power Lines", Revision 1, dated 3/28/90.

9.4.11 WE Calculation P-88-020, "MOV Maximum Undervoltage Stem Thrust", Original Calculation, dated 7/5/88 This calculation is superceded by calculation P-90-017

9.4.12 WE Calculation P-90-017, "MOV Undervoltage Stem Thrust and Torque", Superseding Calculation, dated 9/18/90.

9.4.13 WE Calculation 86-19, "MOV Design Basis Operation and D/P (IEB 85-03)", Rev 0, dated 4/29/86. Note, this calculation is superceded by calculation N-93-89 and others References to this calc are for historical purposes.

9.4.40 WE Calculation 85-008. "Environmental Conditions At Safety Related Equipment Due To A High Energy Line Break Outside Of Containment", Rev. 1, dated 10/29/96.

9.4.41 WE Calculation N-94-015. "Determination Of Fluid Level For Onset Of Vortexing In The Condensate Storage Tank", Rev 0, dated 2/10/94.

9.4.42 S&L Calculation M-09334-212-AF.1, "TDAFWP Low Pressure Capability", Rev. 1, dated 7/9/97.

9.4.43 Westinghouse Calculation CN-CRA-96-58, "Steam Generator Tube Rupture Analysis for the Point Beach Units 1 & 2 Power Uprating Program", Rev. 0, dated 7/17/96 and Rev. 1. dated 10/10/96

9.4.44 PBNP Calculation 89-042, "Evaluation of the PBNP Containment Pressure Response to a Steam Line Break, Based on the Results of Westinghouse Analysis for a Reference 2-Loop PWR", Revision 3, dated 7/30/96.

9.4.45 WE Calculation 98-0008, "Horsepower Calculation for 1P-29 at 560 gpm", Rev. 0, dated 1/26/98. This calculation is not referenced in the text or described in the calculation summary section.

9.4.46 WE Calculation N-93-117, "Appendix R Thermal Hydraulics Analysis", Rev. 0, dated 1/11/94.

9.4.47 Proto-Power Calculation 97-114, "Development and Analysis of Point Beach Auxiliary Feed Water System PROTO-FLO™ Thermal Hydraulic Model", Revision A, dated 12/2/97. This calculation is not referenced in the text or described in the calculation summary section.

9.4.48 WE Calculation N-97-0210, "Auxiliary Feedwater Pump Low Suction Pressure Trip Instrument Loop Uncertainty/Setpoint Calculation (Unit 1 Operation)", Rev. 0, dated 10/28/97. This calculation is related to N-97-0231 (9.4.30) and N-97-0155 (9.4.28). This calculation is not referenced in the text or described in the calculation summary section.

9.4.49 ~~S&L Calculation M-09334-266-LA.1-A. "AF Nitrogen Bottle Sizing", Rev. 0 dated 5/3/2001~~
9.4.50 WE Calculation 2002-0002, "Nitrogen Backup System for MDAFP Discharge Valve (AF-4012/4014) and Minimum Flow Recirculation Valves (AF-4017/4019)", Rev 0 dated 1-25-02.

9.5 WE Drawings, Specifications, Modifications, and Other Documents

9.5.1 Master List of Electrical Equipment to be Environmentally Qualified (EQML), Including Updates Through February 1991.

9.5.2 thru 9.5.4 Deleted.

9.5.5 WE Internal Memo (Nolan/Lipke to Zach). "IEN 84-06 Discussion". dated 10/1/84.

9.5.193 SPEED 98-075, Replacement for the AF Turbine, V2P-29-T, Inboard Cooler, dated 07/22/98

9.5.194 SPEED 99-073, Replacement for the AF Turbine, 1/2-P-T, Outboard Bearing Cooler, dated 04/07/00

9.5.195 Condition Report CR 00-2981 Re. Questions about Atmospheric Dump Capacity, closed 11/28/01

9.5.196 PBNP Modification Request MR 00-077: AF-4019 Valve Trim Upgrade

9.5.197 PBNP Modification Req MR 01-144: AFW Pump Mini Flow

9.5.198 PBNP Mod Req MR 02-[illegible] TDAFP Mini Flow Valve (1CAF4002) Inst. Air Accumulator Installation

9.5.199 PBNP Mod. Req MR 99-029 (1A, 1B, 1C, 1D) Aux Feed Water Pump Min Flow Recirc Line Orifice

9.6 Vendor Reports, Specifications, and Drawings

9.6.1 Deleted

9.6.2 Deleted.

9.6.3 Deleted.

9.6.4 Westinghouse Drawing 499B466, Sheet 369, Elementary Drawing AFW Pump.

9.6.5 Westinghouse Drawing 499B466, Sheet 370, Elementary Drawing AFW Pump.

9.6.6 Westinghouse Drawing 499B466, Sheet 372, Elementary Drawing AFW Pump.

9.6.7 Westinghouse Drawing 499B466, Sheet 812, Elementary Drawing AFW MOVs.

9.6.8 Westinghouse Drawing 499B466, Sheet 813, Elementary Drawing Turb. AFW Pump, MOVs.

9.6.9 Westinghouse Drawing 499B466, Sheet 816, Elementary Drawing Turb. AFW Pump Bypass Valve.

9.6.10 Westinghouse Drawing 499B466, Sheet 818, Elementary Drawing Service Water to Turb. AFW Pump MOV.

9.6.11 Westinghouse Drawing 499B466, Sheet 863, Elementary Drawing Serv. Water to Turb. AFW Pump MOV.

9.6.12 Westinghouse Drawing 499B466, Sheet 867, Elementary Drawing Turb. AFW Pump Disch. MOVs.

9.6.13 Westinghouse Drawing 499B466, Sheet 868, Elementary Drawings Steam to Turb AFW Pump MOVs.

9.6.14 Westinghouse Drawing 499B466, Sheet 899, Elementary Drawing Turb AFW Pump Bypass Valve

STATE CHANGE HISTORY

Initiate by RICHARD FLESSNER → Assign Work 2/5/2002 4 01:39 PM Owner LORI ARMSTRONG → Reassign by LORI ARMSTRONG → Assign Work 2/12/2002 12:14 00 PM Owner MICHAEL ROSSEAU → Assign by MICHAEL ROSSEAU → Conduct Work 2/17/2002 8·17.05 AM Owner MICHAEL ROSSEAU → Work Complete by MICHAEL ROSSEAU → Review & Approval 8/19/2002 6.56:32 AM Owner MICHAEL ROSSEAU → Approved by MICHAEL ROSSEAU → Quality Check 8/19/2002 6.57:05 AM Owner PBNP CAP Admin

SECTION 1

Activity Request Id:	CA003703		
Activity Type:	Corrective Action	**Submit Date:**	2/5/2002 4:01:39 PM
Site/Unit:	Point Beach - Common		
Activity Requested:	Revise the design process to include consideration of human action induced failure modes.		
CATPR:	N	**Initiator:**	FLESSNER, RICHARD
Initiator Department:	EX Engineering Processes PB	**Responsible Group Code:**	EDI Engineering Design I&C PB
Responsible Department:	Engineering	**Activity Supervisor:**	MICHAEL ROSSEAU
Activity Performer:	MICHAEL ROSSEAU		

SECTION 2

Priority:	3	**Due Date:**	8/19/2002
Mode Change Restraint:	(None)	**Management Exception From PI?:**	N
QA/Nuclear Oversight?:	N	**Licensing Review?:**	N
NRC Commitment?:	N	**NRC Commitment Date:**	

SECTION 3

Activity Completed:

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

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

8/19/2002 6:56:32 AM - MICHAEL ROSSEAU:
Revision 10 to form PBF-1584 "Design Input Checklist" was issued on 8/19/02. As part of this revision, step A.10.b, which is part of the failure modes and effects question, was revised to include a note to consider both equipment and human induced failures. Based on the above, this action is complete and no further actions are required.

SECTION 4

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

SECTION 5

Project:	CAP Activities & Actions		
State:	Quality Check	**Active/Inactive:**	Active
Owner:	PBNP CAP Admin	**AR Type:**	Daughter
Submitter:	RICHARD FLESSNER	**Assigned Date:**	2/17/2002
Last Modified Date:	8/19/2002 6:57:05 AM	**Last Modifier:**	MICHAEL ROSSEAU
Last State Change Date:	8/19/2002 6:57.05 AM	**Last State Changer:**	MICHAEL ROSSEAU
Close Date:			
One Line Description:	Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW		
NUTRK ID:	CR 01-3595		
Child Number:	1		
References:	CR 01-2278ÈRCE 01-069ÈGOOD CATCH		
Update:	Revised description of requested action based on the revised RCE. RAF		
Import Memo Field:			
CAP Admin:	PBNP CAP Admin	**Site:**	Point Beach
OLD_ACTION_NUM:			
Cartridge and Frame:			

ATTACHMENTS AND PARENT/CHILD LINKS

ACE000314: Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW

CAP001415: Probabilistic Risk Assessment PRA For Auxiliary Feedwater System AFW

Nuclear Power Business Unit
DOCUMENT REVIEW AND APPROVAL

Note: Refer to NP 1.1.3 for requirements.

I - INITIATION

Doc Number PBF-1584 Unit PB0 Usage Level NA Proposed Rev No 10

Title DESIGN INPUT CHECKLIST Classification NA

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

List Temporary Changes/Feedbacks Incorporated: N/A

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

See attached PBF-0026c

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

None

Document Preparer (print/sign) Michael Rosseau / Date 08/12/2002

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

II - TECHNICAL REVIEW

(Cannot be the Preparer or Approval Authority)

Technical Reviewer (print/sign) Michael L. Miller / Date 8/12/02

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

III – DOCUMENT OWNER REVIEW

Required Reviewers/Organizations: N/A

Validation Required? ☒ NO ☐ YES ☐ WAIVED (Group Head Approval and Reason Required)

Reason Validation Waived: N/A

Continue on PBF-0026c if necessary.

Validation Waiver Approval: _____

Group Head Signature

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

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

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

Training assistance desired? ☒ NO ☐ YES If YES, Training Coordinator contacted/date: _____ /

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

Document Owner (print/sign) Michael Rosseau / Date 8/14/02

Indicates document is technically correct, can be performed as written, does not adversely affect personnel or nuclear safety, appropriate reviews have been performed (i.e., technical, cross-disciplinary, validation and 50 59/72.48), comments have been resolved and incorporated as appropriate, affected documents/ training/briefing have been identified and word processing completed Document Control notified if emergent issuance required (e.g., may be less than 2 days for procedure issuance)

IV - APPROVAL

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

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

Indicates 50 59/72.48 applicability assessed, any necessary screenings/evaluations performed, determination made as to whether additional cross-disciplinary review required, and if required, performed

MSS Meeting No. N/A

Approval Authority (print/sign) Norman L. Hoefert / Date 8/15/02

V – RELEASE FOR DISTRIBUTION

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

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

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

Document Owner/Designee (print/sign) Michael Rosseau Date 8/15/02

Effective Date (to be entered by Document Control): AUG 19 2002

REC'D AUG 22 2002

AUG 1 9 2002

Point Beach Nuclear Plant
DOCUMENT REVIEW AND APPROVAL CONTINUATION

Doc Number PBF-1584 Revision 10 Unit PB0

Title DESIGN INPUT CHECKLIST

Temporary Change Number N/A

Description of Changes:

Step *	Change/Reason
A.6	Add "(Contact EPIX coordinator)". Editorial
A.10	Delete "Failure analysis is only required for maintenance rule sytems." This gets addressed for all mods.
A.10.b	Add "(Consider both equipment and human induced failures)". Reference CA003703.
A.11.a & b	Combine questions for efficiency.
C.17	Delete reference to DG-E06 which has been cancelled and add "Contact EDA group for guidance".
F.5.e & f	Change Rem to rem. Editorial.
End of F.5	Delete NP 4.2.3 ALARA Review Procedure and add NP 4.2.1 Plant ALARA Program. Editorial.
F.6.d	Add "control room habitability" and reference OE 11400, RG 1.78 and NP 3.1.6. Reference CA001796.
G.13	Add a new question "Require that equipment be grounded?" Reference OE 12765.

Other Comments

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

Point Beach Nuclear Plant

10 CFR 50.59/72.48 APPLICABILITY FORM

Brief Activity Title or Description: **Revise PBF-1584 Design Input Checklist.**

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

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

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

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

10 CFR 50.59/72.48 APPLICABILITY FORM

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

10 CFR 50.59/72.48 APPLICABILITY CONCLUSION

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

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

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

N/A

Performed By	Michael Rosseau	Michael Rosseau	Date	08/12/2002
	Name (Print)	Signature		
Reviewed By	Michael L. Miller	Michael L. Miller	Date	8/12/02
	Name (Print)	Signature		

Point Beach Nuclear Plant

DESIGN INPUT CHECKLIST

'fication or Temporary Modification Number: _____

Title: _____

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.)	☐	☐
2. Are any design requirements contained in commitments affected? (Reference CLB database and the Safety Evaluation/Screening associated with this change.)	☐	☐
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? (Contact EPIX coordinator.)	☐	☐
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 breaching a High Energy Line Break (HELB) barrier? (Reference NP 8.4.16) If yes, EQ engineer review required.	☐	☐
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.)	☐	☐

DESIGN INPUT CHECKLIST

	APPLIES TO DESIGN	
	YES	NO
10. Consider failure effects on structures, systems, and components: (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? (Consider both equipment and human induced 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 or zinc in containment? (Reference DG-G07 and FSAR Section 5.6.)	☐	☐
b. Introduce materials into containment that could affect sump performance or lead to equipment degradation? (Reference DG-G07.)	☐	☐
c. Decrease free volume of containment?	☐	☐
d. Require addition or modification of a containment penetration boundary? (Consult the containment system engineer.)	☐	☐
e. 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)	☐	☐
13. Meet requirements to abandon equipment if applicable. (Reference NP 7.1.5)	☐	☐

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-M16, and QA components should be reconciled with ANSI N45.2.)	☐	☐
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.)	☐	☐
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.)	☐	☐
4. Consider component performance requirements such as capacity, rating, output?	☐	☐
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?	☐	☐
6. Provide vents, drains, and sample points to accommodate operational, maintenance and testing needs?	☐	☐
7. Require service water? (Both essential and nonessential service water loads are modeled, and load changes must be evaluated. Contact the SWAP Coordinator.)	☐	☐
8. Require the addition of check valves? (Reference DG-M13 for selection guidance.)	☐	☐
9. Require and evaluate any additional loading on instrument or service air, circ, fire protection, or demineralized water, or other system?	☐	☐
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.)	☐	☐
11. Affect ventilation barriers, including containment, primary auxiliary building, or control room?	☐	☐
12. Require insulation? (Reference WE specification PB-485 for insulation, and NP 1.9.10 for asbestos control.)	☐	☐
13. Require lubrication? (Reference Lubrication Manual.)	☐	☐

DESIGN INPUT CHECKLIST

	APPLIES TO DESIGN	
	YES	NO
14. Require an independent means of pressure relief? (Reference B31.1.)	☐	☐
15. Affect the assigned system design pressure or temperature?	☐	☐
16. Involve cobalt-laden materials into the RCS or into systems that supply the RCS? (Reference NP 4.2.29, "Source Term Reduction Program.")	☐	☐
17. Are new materials and their coatings/plating compatible with system chemistry and disposal systems (NP 8.4.15)?	☐	☐
18. Affect embedded or buried piping?	☐	☐
C. Electrical requirements. (Contact Electrical Design Engineering for guidance.)		
1. Consider design conditions such as ampacity, voltage drop?	☐	☐
2. Consider component and system performance requirements, such as current, voltage, or power?	☐	☐
3. Consider redundancy, diversity and separation requirements of structures, systems and components? (Reference DG-E07 for separation of electrical circuits.)	☐	☐
4. Comply with protective relaying requirements of equipment and systems?	☐	☐
5. Selection of overcurrent devices for proper protection and coordination? (Reference DG-E04 for selection of molded case circuit breakers.)	☐	☐
6. Affect available fault current at any bus?	☐	☐
7. Assure that all added cables meet fire retardancy requirements? (Reference FPER Section 4.1.8, IEEE 383.)	☐	☐
8. Be compatible with existing electrical insulation and wiring?	☐	☐
9. Affect ampacity of existing cables?	☐	☐
10. Maintain UL (or equivalent) listings?	☐	☐

DESIGN INPUT CHECKLIST

	APPLIES TO DESIGN	
	YES	NO
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?	☐	☐
12. Add new raceways? (Reference DG-E03 for electrical raceway sizing and DG-E02.)	☐	☐
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? (Contact Electrical Design Analysis group for guidance.)	☐	☐
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?	☐	☐
22. Consider electromagnetic interference between new/existing equipment and electromagnetic coupling interactions between circuits?	☐	☐
23. Affect embedded conduits or buried cables, including the station grounding system?	☐	☐

DESIGN INPUT CHECKLIST

	APPLIES TO DESIGN	
	YES	NO
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?	☐	☐
8. Be capable of or require manual and/or automatic operation?	☐	☐
9. Require calibration and maintenance requirements for the instruments to be specified?	☐	☐
10. Have specified the instruments with proper range and accuracy?	☐	☐
11. Address solid state vulnerability to RFI?	☐	☐
12. Consider software and programming/programmable settings of digital or electronic equipment?	☐	☐
13. Affect logic circuits or associated GL 96-01 review/required testing? Contact I&C System Engineering group.	☐	☐

DESIGN INPUT CHECKLIST

	APPLIES TO DESIGN	
	YES	NO
Structural requirements. (Contact Civil Design Engineering for guidance.)		
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.")	☐	☐
2. Affect seismic boundaries?	☐	☐
3. Affect stress calculations of pipe? (Reference DG-M09.)	☐	☐
4. Affect the loading or require changes to existing equipment foundations?	☐	☐
5. Affect wall stress calculations for pressurized concrete cubicles or structures?	☐	☐
6. Require analysis of non-seismic components placed over or adjacent to seismic components?	☐	☐
7. Add items which span between two separate seismic areas/buildings? (The effect of the relative movement must be addressed.)	☐	☐
8. Require clearance review for seismic movement or thermal expansion considerations?	☐	☐
9. Require a floor or wall loading analysis? (Reference Bechtel C-dwgs.)	☐	☐
10. Require the addition of new supports, hangers, or foundations or add weight to or between existing supports, hangers, embeds, or foundations during installation or post-installation? (Reference DG-M09 and DG-M10 for pipe support.)	☐	☐
11. Add new or add load to seismically qualified raceways? (Reference NP 7.7.2, "Seismic Qualification of Equipment.")	☐	☐
12. Modify, attach to, or locate within the proximity of masonry block walls? (Reference IEB 80-11 Block Wall Program.)	☐	☐
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?	☐	☐

DESIGN INPUT CHECKLIST

	APPLIES TO DESIGN	
	YES	NO
16. Require protection from high energy line break jet? (Refer to FSAR Appendix A.2.)	☐	☐
17. Consider dynamic requirements such as live loading, vibration, and shock/impact?	☐	☐
F. Programs		
1. ASME Section XI and QA considerations:		
a. Affect IST acceptance criteria or calculations? (Contact Component Engineering.)	☐	☐
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 access to a fire zone, fire protection equipment or Appendix R safe shutdown equipment, including manual fire fighting activities? (Reference Section 5.2.1 of Design Guide DG-F01)	☐	☐
b. Affect a fire barrier? (Reference NP 8.4.11 and Fire Barrier Drawings WE PBC-218 Sheets 1-20, Section 5.2.2 of Design Guide DG-F01)	☐	☐
c. Affect a fire protection system or its performance? (Reference Section 5.2.3 of Design Guide DG-F01)	☐	☐
d. Increase or decrease permanent combustible loading in a room? (Reference Section 5.2.4 of Design Guide DG-F01)	☐	☐

	APPLIES TO DESIGN YES	APPLIES TO DESIGN NO
e. Based on Section 2 and Appendix A of the SSAR, will the change add to, delete from, or affect the performance of safe shutdown systems or equipment? (Reference Section 5.2.5.1 of Design Guide DG-F01)	☐	☐
f. Based on Sections 3, 4, and Appendix C of the SSAR, will the change affect a cable associated with safe shutdown equipment, a safe shutdown power supply, or the physical location of a safe shutdown cable? (Reference Section 5.2.5.2 of Design Guide DG-F01)	☐	☐
g. Based on Table 1-1, Section 5 and Appendix D of the SSAR, will the change affect fire area analysis and compliance with Appendix R separation criteria or the conditions of an approved Appendix R exemption for any PBNP Fire Area? (Reference Section 5.2.5.3 of Design Guide DG-F01, Table 3.2-2 of DBD T-40)	☐	☐
h. Will the change add, remove, or affect the performance of any emergency lighting required for compliance with Section III.J of Appendix R? (Reference Section 5.2.6 of Design Guide DG-F01)	☐	☐
i. Will the change add, remove, or affect the performance of any plant communications system relied upon for fire fighting or safe plant shutdown? (Reference Section 5.2.7 of Design Guide DG-F01)	☐	☐
j. Will the change affect the Reactor Coolant Pump Oil Collection System? (Reference Section 5.2.8 of Design Guide DG-F01)	☐	☐
k. Will the change affect the Fire Protection Manual?	☐	☐
l. Will the change affect any of the Supporting Documents listed in the SSAR (Section 6.0) or the FHAR (Section 4.0)?	☐	☐

If any of the questions a through j are answered "yes", an evaluation must be performed using the applicable sections of the FPCC checklist, PBF-2060 per Section 5 of Design Guide DG-F01.

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?	☐	☐
b. Degrade existing flood barriers or flood mitigation features providing unanalyzed pathway for flooding to propagate? (Reference Section 3.2 of DG-C02.)	☐	☐

DESIGN INPUT CHECKLIST

		APPLIES TO DESIGN	
		YES	NO
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.)	☐	☐
d.	Reduce the capacity to isolate or cope with flooding? (Reference Sect. 4.2 of DG-C02.)	☐	☐
e.	Change plant drainage/backfill requirements?	☐	☐
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."	☐	☐
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 BOP systems)?	☐	☐

DESIGN INPUT CHECKLIST

	APPLIES TO DESIGN YES	APPLIES TO DESIGN NO
d. Result in an anticipated increase in operational or maintenance exposures? (Consider equipment rearrangement to reduce plant life dose?)	☐	☐
e. Result in an expected exposure of greater than 1 rem for any individual during installation of the change?	☐	☐
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 4.2.1, Plant ALARA Program.)

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), Control Room habitability, CHES, critical applications, or special disposal requirements? (Contact Chemistry/Chemical Engineering.) Reference OE 11400, RG 1.78 and NP 3.1.6.	☐	☐

G. 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 WE lifting and rigging requirements? (Reference WE Safety Manual, PBNP Safe Load Path procedures, and NP 8.4.7.)	☐	☐
5. Consider ALARA for installation activities? (i.e., shielding, monitoring water level, etc.)	☐	☐

DESIGN INPUT CHECKLIST

	APPLIES TO DESIGN	
	YES	NO
6. Require special handling, shipping, or environmental conditions for storage or construction? (Reference NP 9.5.2 for material storage.)	☐	☐
7. Consider transportability requirements such as size and shipping weight limitations.	☐	☐
8. Require spare parts or special non-standard items or tools?	☐	☐
9. Will any added components introduce chemical contaminants to the system? (i.e., preservative coating on valves, coatings on weld rod can also introduce contaminants)	☐	☐
10. 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?	☐	☐
11. 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.)	☐	☐
b. Potentially impact other systems, components, or structures during installation?	☐	☐
c. Present installation impacts on plant operations (i.e., fire watches, etc.)?	☐	☐
12. Access and administrative requirements for plant security: If any security requirements are applicable, notify Security.		
a. Create an opening >96 in.^{2} in any wall, ceiling, or other barrier?	☐	☐
b. Require work within 20' of fence?	☐	☐
c. Affect security equipment and documents, including those containing safeguards information? (Contact Security for design development requirements and design concurrence.)	☐	☐
d. Affect access controls?	☐	☐
13. Safety requirements:		
a. Affect safety equipment and thereby create personnel hazards (i.e., removal of handrails)?	☐	☐
b. Introduce hazardous material into the plant? (Reference NP 1.9.1.)	☐	☐

DESIGN INPUT CHECKLIST

		APPLIES TO DESIGN	
		YES	NO
c.	Affect evacuation routes or escape provisions from enclosures?	☐	☐
d.	Meet OSHA regulations? (Reference Wisc. Electric Safety Manual and OSHA 29 CFR 1910.)	☐	☐
e.	Move any energy sources? If yes, verify installation document covers move, including transferring danger tags.	☐	☐
f.	Require that equipment be grounded?	☐	☐

Designed by: _____ Date: _____

Reviewed by: _____ Date: _____