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A WISCONSIN ENERGY COMPANY

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Ladies/Gentlemen:

DOCKETS 50-266 AND 50-301
SUPPLEMENT 1 TO TECHNICAL SPECIFICATIONS CHANGE REQUEST 206
SERVICE WATER SYSTEM OPERABILITY
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

On July 30, 1998, Wisconsin Electric Power Company (WE), licensee for the Point Beach Nuclear Plant (PBNP), submitted a proposal to amend Facility Operating Licenses DPR-24 and DPR-27 for PBNP Units 1 and 2, respectively (reference letter NPL 98-0613). The requested amendments reflected changes in Section 15.3 of the plant Technical Specifications (TS). The purpose of the proposed amendments was to incorporate changes to the Technical Specifications to more clearly define the requirements for Service Water (SW) System operability in accordance with the system configuration assumed in the SW System analysis.

Additional analyses of the SW System performed subsequent to the original submittal necessitated additional operational restrictions to assure system operability as assumed in the analyses. The purpose of this Supplement to Technical Specifications Change Request (TSCR) 206 is to reflect these changes and amend the original proposal.

The original submittal is hereby amended to:

1) Modify the original proposal to TS 15.3.3.D-2.b to specify additional allowed conditions for the service water header continuous flowpath;
2) Propose an amendment to the original TS 15.3.3.D-2.c to impose additional restrictions on service water automatic isolation valves; and
3) Propose an amendment to the original TS 15.3.3.D-2.d to specify an additional allowed condition for the containment fan cooler outlet motor operated valves.

This Supplement supercedes and replaces, in whole, the original proposed amendment request dated July 30, 1998.

A001 1/1

The new SW analyses take credit for SW flow isolation to certain non-essential loads during the design basis accident. The existing TS for SW isolation valves are not sufficiently conservative to support these flow isolation assumptions. As a result, administrative controls were placed on SW system operation that limit the allowed system lineups to be more restrictive than the current Technical Specifications. The proposed amendments will incorporate these administrative controls into the TS. These administrative controls are interim restrictions until the amendments are approved to incorporate these restrictions for the SW system into the Technical Specifications. These administrative controls do not conflict with any Technical Specification and have been evaluated to ensure that the controls do not result in an unreviewed safety question.

Attached is a description of changes, safety evaluation, no significant hazards, and edited Technical Specifications and related bases pages supporting the requested changes.

All modifications associated with the non-essential SW isolation valves are scheduled to be completed by the end of Unit 2's fall 2000 refueling outage.

We have determined that the proposed amendments do not involve a significant hazards consideration, authorize a significant change in the types or total amounts of effluent released, or result in any significant increase in individual or cumulative occupational radiation exposure. Therefore, we conclude that the proposed amendments meet the categorical exclusion requirements of 10 CFR 51.22(c)(9) and that an environmental impact appraisal need not be prepared.

Please contact us if you have any questions, or require additional information.

Sincerely,

Mark E. Reddemann
Site Vice President
Point Beach Nuclear Plant

Subscribed to and sworn before me
on this 21st day of December, 1999
Christine K. Pozorski
Notary Public, State of Wisconsin

My Commission expires on 8/25/2002.

LAS/tat

cc: NRC Regional Administrator
NRC Resident Inspector
NRC Project Manager
PSCW

DESCRIPTION OF CHANGES
SUPPLEMENT 1 TO TECHNICAL SPECIFICATIONS CHANGE REQUEST 206
SERVICE WATER SYSTEM OPERABILITY
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

Introduction

On July 30, 1998, Wisconsin Electric Power Company (WE), licensee for the Point Beach Nuclear Plant (PBNP), submitted a proposal to the NRC to amend Facility Operating Licenses DPR-24 and DPR-27 for PBNP Units 1 and 2, respectively (reference letter NPL 98-0613). The requested amendments reflected changes in Section 15.3 of the plant Technical Specifications (TS). The purpose of the proposed amendments was to incorporate changes to the Technical Specifications to more clearly define the requirements for Service Water (SW) System operability.

Recent changes to the SW system analyses resulted in the need to further change the Technical Specifications to ensure the inputs and assumptions of the analyses, which demonstrate system operability, are appropriately reflected as limiting conditions on system operation. The changes proposed in this Supplement 1 to Technical Specifications Change Request (TSCR) 206 reflect the revised analyses, including a clarification of requirements for redundant SW automatic isolation valves. A description of proposed changes and the basis for these changes follows.

Service Water Header Continuous Flowpath

Proposed Technical Specification 15.3.3.D-2.b provides Limiting Conditions for Operation of the SW flowpath. These Specifications define allowed header and related SW pump configurations supported by the analyses and provide for limiting time periods when the system is not fully operable as defined in TS 15.3.3.D-1. The following changes to this Specification are proposed:

b. The service water ring header continuous flowpath may be out of service for ~~a period of~~ up to 7 days, subject to the limitations of 15.3.3.D-2.a, provided that:

   i. At least five service water pumps are operable and aligned to all required portions of the service water header

   Or

   ii. Four service water pumps are operable and the flowpath is interrupted only between the service water pump bays or at one or more of the west header isolation valve locations.

   Or

iii. Service water pump and continuous flowpath alignment may be different from that defined in b.i or b.ii above, provided an evaluation is performed demonstrating required systems are operable prior to establishing the configuration.

If the alignment is different from that specified above and no evaluation has been completed, then the actions required by Section 15.3.0 apply.

Additionally, the following note, taken from the existing TS 15.3.3.D-2.b, is proposed for TS 15.3.3.D-2:

Note: If any equipment supported by service water will not receive sufficient flow, the applicable LCOs for the affected equipment shall be entered.

Basis for Change

The PBNP Service Water system consists of two trains of service water pumps (3 pumps per train), feeding a common loop header. Equipment and components supported by service water are connected at various points around the loop. Isolation valves are provided at intervals around the loop that can be used to interrupt the flow and isolate portions of the loop.

Analyses performed utilizing the PBNP SW model demonstrate that with five service water pumps operable, as allowed by TS 15.3.3.D-2.a, the loop header may be interrupted at any one of the isolation valves concurrent with any or all other limiting conditions in TS 15.3.3.D-2 and still perform its accident mitigation functions.

If only four service water pumps are operable, TS 15.3.3.D-2.a allows a 72 hour out-of-service time to ensure adequate SW flow to required equipment and components concurrent with the other conditions allowed by TS 15.3.3.D-2 when the loop header flowpath is interrupted between the pump bays or at one or more of the west header isolation valve locations. This also relaxes required single failure criteria.

When portions of the loop header are completely isolated from the flowpath, SW flow will be interrupted to those components supplied from the isolated section of the header, while adequate flows are provided to components served by the unisolated section. Without adequate SW flow, the affected components cannot perform their required functions and are therefore inoperable. When this occurs, the appropriate limiting conditions for operation for the affected system or equipment are entered and required action taken.

For some equipment and components, it is possible to realign the component to receive the required SW flow from the unisolated portion of the loop header. When realignment occurs, the equipment or component is operable and the related LCO exited. Direction to exit is not required in this Specification since the action is governed by the individual equipment Specifications and system procedures where applicable.

Provision TS 15.3.3.D-2.b.iii allows evaluation of other loop header and pump configurations as acceptable by this LCO prior to placing the system in that configuration. This provision is consistent with the licensing conditions on Service Water and Component Cooling Water System operation in Appendix C of the Facility Operating Licenses issued with Amendments 174 and 178 for Units 1 and 2, respectively, on July 9, 1997. That is, compliance with this provision ensures the system is operated in accordance with approved analyses. Requirements to enter applicable system and equipment LCOs and take required action for any systems and equipment rendered inoperable by the lineup are also applicable to this provision.

Service Water Automatic Isolation Valves

Technical Specification 15.3.3.D-2.c provides Limiting Conditions for Operation of the SW automatic isolation valves required during accident conditions. The Specification provides for limiting time periods when the system is not able to provide redundancy as defined in TS 15.3.3.D-1. The following changes to this Specification are proposed:

c. One or more ~~Any or all~~ required automatic non-essential load isolation valve(s) ~~required during accident conditions~~ may be inoperable ~~out of service~~ for up to 72 hours. If an affected line has a redundant required automatic isolation valve, then the redundant valve must be ~~provided at least four service water pumps are~~ operable. This LCO can be exited provided the affected lines are isolated with a seismically qualified isolation valve or the inoperable valves are restored to operable status.

Basis for Change

The PBNP Service Water system supports several non-essential loads that were designed to automatically isolate upon receipt of an accident signal to ensure that sufficient Service Water is available to all Safety Related accident loads. As originally designed, these isolations occurred only if the actuating logic detected less than four Service Water pumps operating after the automatic start signal to all the pumps had been processed (i.e., logic, power failure, or pump unavailability had rendered at least three of the six pumps non-functional).

Modifications to provide redundant automatic isolation of these non-essential loads will eliminate the "less than four of six" pump logic and will cause actuation on any Safety Injection signal (i.e., Train A or Train B SI signal on either unit). This simplifies the system design and provides consistency in plant accident response.

The modifications will make the automatic isolation of all non-essential SW loads following a safety injection signal independent of the number of operating pumps.

As currently written, Technical Specification 15.3.3.D-2.c permits any or all isolation valves to be inoperable whenever four or more Service Water Pumps are operable. This condition was adequate for the plant design prior to the modifications described above because the "less than four of six" pump permissive precluded these valves from operating during the four-pump condition described in the specification (whether the valves were operable or not). Therefore, automatic isolation of any of these non-essential loads was not credited in any analysis involving four, five, or six-pump operation.

At present, certain non-essential loads are isolated by a single valve actuated by one of the two safety injection trains. A single failure of one safeguards actuation logic train would render three SW pumps inoperable, thereby enabling the permissive; but, because of the failed train, only those valves actuated by the opposite train would isolate. Therefore, automatic isolation of all of these non-essential loads is not credited in any analysis involving a fully operable Service Water System and the most limiting single failure.

The analysis for this change assumes that non-essential service water flow is isolated prior to the transition to containment sump recirculation. Procedures verify that any of the non-essential loads required to be isolated in the recirculation calcs are isolated. In order to ensure that a non-essential flowpath will isolate when required and therefore be credited in the analysis, one of the following must be true for that load:

- two redundant valves, each actuated by an independent train must be operable to withstand a single failure

  or

- one of the redundant valves must be operable during a limited time period when single failure criteria is relaxed (i.e., LCO).

The proposed change to Technical Specification 15.3.3.D-2.c will ensure that the design intent of ensuring isolation of non-essential Service Water loads during an accident is maintained. This will permit taking credit for the isolation when performing Service Water accident analysis, which in turn will restore system operating margin that was intended by the original design and license basis.

For those modifications that have been completed, credit for redundant isolation capability is being taken by use of administrative controls equivalent to the proposed Technical Specification. These measures are considered as interim compensatory measures, in addition to existing Technical Specification controls. The proposed changes will ensure that the Technical Specifications include the limitations necessary to ensure safe operation of the facility.

Testing of the redundant valves is completed in accordance with ORT-3A and ORT-3B, Operations Refueling Test for SI Actuation With Loss of Engineered Safeguards AC, and the valves are stroked quarterly in accordance with IT-72, Service Water Valves Inservice Test.

Containment Fan Cooler Outlet Motor Operated Valves

In response to a safety injection signal, motor-operated valves at the SW outlet from the containment fan coolers open to increase cooling water flow to the fan coolers. As documented in the Technical Specification basis, when an MOV is open, the opposite unit is in an LCO for service water since a portion of service water flow will be diverted from that opposite unit in the event of a design basis accident. It is proposed that the LCO related to containment fan cooler MOVs be revised as follows:

d. The containment fan cooler outlet motor operated valves may be open for up to 72 hours provided that:

i. At least five service water pumps are operable.

Or

ii. At least three service water pumps are operable provided an evaluation is performed demonstrating required systems are operable prior to establishing the configuration.

This LCO can be exited provided the valves are returned to the closed position or the flowpath is isolated.

Basis for Change

The addition of condition TS 15.3.3.D-2.d.ii allows for testing of the service water pumps with only three or four pumps operable and the containment fan cooler outlet motor operated valves open.

Bases Changes

Technical Specification bases changes are being made to reflect the proposed Technical Specification changes.

SAFETY EVALUATION
SUPPLEMENT 1 TO TECHNICAL SPECIFICATIONS CHANGE REQUEST 206
SERVICE WATER SYSTEM OPERABILITY
POINT BEACH NUCLEAR PLANT UNITS 1 AND 2

Introduction

On July 30, 1998, Wisconsin Electric Power Company (WE), licensee for the Point Beach Nuclear Plant (PBNP), submitted a proposal to amend Facility Operating Licenses DPR-24 and DPR-27 for PBNP Units 1 and 2, respectively (reference letter NPL 98-0613). The requested amendments reflected changes in Section 15.3 of the plant Technical Specifications (TS). The purpose of the proposed amendments was to incorporate changes to the TS to more clearly define the requirements for Service Water (SW) System operability.

Additional analyses of the SW System performed subsequent to the original submittal necessitated additional operational restrictions to assure system operability as assumed in the analyses. The purpose of this Supplement to Technical Specifications Change Request (TSCR) 206 is to reflect these changes and amend the original proposal.

The original submittal is hereby amended to:

1) Modify the original proposal to TS 15.3.3.D-2.b to specify additional allowed conditions for the service water header continuous flowpath;
2) Propose an amendment to the original TS 15.3.3.D-2.c to impose additional restrictions on service water automatic isolation valves; and
3) Modify the original TS 15.3.3.D-2.d to specify an additional allowed condition for the containment fan cooler outlet motor operated valves.

System Description

The SW system is designed to provide cooling water supplies with isolation valves to AFW pump bearing cooling, the two Train A emergency diesel generators, air compressors, component cooling heat exchangers, spent fuel pool cooling system, the containment air recirculating cooling system, primary auxiliary building battery room coolers, and non-essential loads. The system provides a manually aligned seismic source of water to the AFW system in the event of a loss of the normal AFW suction source from the condensate storage tanks.

The system also supplies water for the fire protection sprinkler systems in the Train A emergency diesel generator (G01 and G02) rooms and the containment hose reels. The design includes provisions for automatic isolation of non-essential components following an accident.

The SW system provides accident mitigation support for the Train A emergency diesel generators, auxiliary feedwater system, component cooling water system, PAB battery room coolers and containment air recirculation cooling system. The spent fuel pool cooling system, air compressors, fire protection system and other non-essential equipment are not credited with providing an accident

mitigation function. Normal alignment, SW function, and applicable Technical Specifications for required accident mitigation equipment are provided in Table 1.

The SW system is supplied by six SW pumps, three per emergency power train, taking suction directly from Lake Michigan and discharging to a loop header supplying both units. The loop header is provided with isolation valves that may be used to isolate the north, south, east and west header sections and to split the east header. All essential SW loads may be manually aligned to either the north or south header as required with the exception of two containment fan coolers (CFC). Two CFCs on each unit are supplied from the west header. Two Unit 1 CFCs are supplied from the south header. Two Unit 2 CFCs are supplied from the North header. Cooling water from the essential and non-essential SW loads is discharged back to the lake via the circulating water discharge lines.

The SW pumps discharge to the east header. The east header is provided with redundant motor operated valves which may be used to divide the header between the pump bays into sets of three SW pumps. These valves are used to isolate sections of the pump header or to separate the header as necessary during pump inservice testing to obtain the required pump flows.

SW pumps are sequenced on in response to a safety injection signal as outlined in FSAR Section 8.8, and non-essential loads are automatically isolated as required. Emergency Operating Procedures verify isolation of non-essential loads prior to aligning the Residual Heat Removal (RHR) System (e.g., low head safety injection) for containment sump recirculation.

A detailed description of the SW system is provided in Section 9.6.2 of the FSAR.

System Evaluation Model

Engineering analyses for determining flow rates in the SW system are based on the use of a computer model of the SW system. The model is based on software which simulates water distribution systems and predicts steady state flow in pipes. Validation of the PBNP SW system model, by comparison of the computer program results with actual plant data and specifications, demonstrates that the program can be used to predict flows in the SW system.

The hydraulic model was developed by Wisconsin Electric from the as-built system and is intended to provide verification of SW system performance.

System Evaluation

Four sets of analyses were performed in support of the proposed Technical Specifications changes. The first two runs assume the SW system is fully operable prior to the design basis accident. One run models the injection phase of the accident, the other models the containment sump recirculation phase of the accident. These analyses demonstrate the ability of the SW System to perform its design basis functions with a single train (3 SW pumps) operating assuming a worst case single failure which disables one emergency power supply train.

Key assumptions of these first two evaluations include:

1. Both units are initially operating at 100% power prior to the accident.

2. The limiting accident, a large break Loss of Coolant Accident (LOCA) occurs in one unit. The other unit continues to operate at 100% power. Maintaining a unit at power maximizes the service water demands on the operating unit (minimizes SW availability to the accident unit), and bounds the PBNP design basis of an accident in one unit and maintaining hot shutdown in the non-accident unit.

3. No loss of offsite power (LOOP) occurs. Maintaining offsite power maintains Circulating Water system operation which minimizes the level in the forebay (the suction source for the SW pumps) thus minimizing SW pump suction head and discharge pressure.

4. All SW pumps are assumed degraded from their nominal pump curves, consistent with Inservice Test acceptance criteria. Actual performance of all SW pumps presently exhibits less degradation.

5. All component temperature control valves (TCV) are assumed in the maximum flow operating position due to high service water temperatures and/or a loss of Instrument Air. One CCW heat exchanger in each unit is operating on its TCV with both inlet and outlet blowdown valves open. The second heat exchanger in each unit is modeled with only its inlet and outlet blowdown valves open.

6. For the recirculation phase, manual action is taken, as required, to ensure that non-essential loads are verified isolated or isolated prior to transferring from injection to containment sump recirculation. Procedures have been validated by walkthroughs to ensure the required isolations can be accomplished within the time periods required. In addition, both CCW heat exchangers are placed into service to support containment sump recirculation.

7. Lake Michigan is assumed at its design basis low level and maximum assumed temperature.

8. Both main SW Zurn strainers are assumed to be blowing down.

9. The condensate storage tanks are the suction source for AFW consistent with system design and operation. For a design basis LOCA, AFW flow is not necessary to mitigate the consequences of the accident. This analyses bounds all FSAR Chapter 14 accidents where AFW suction is drawn from service water (e.g., Appendix R and Loss of Normal Feed).

10. Each unit has two Containment Fan Cooler Service Water outlet MOVs. Only one is required to open to ensure sufficient SW flow to the fan coolers for accident mitigation. Analyses were performed to ensure bounding cases for flow and pressure.

In the last two sets of analyses, evaluations were performed for the injection phase and recirculation phase of a LOCA to determine the acceptable limiting conditions of operation for the SW system. The initial assumptions for these evaluations are identical to the assumptions above with the following modifications and additional assumptions.

1. When in a Limiting Condition for Operation, no additional system or equipment failures are assumed concurrent with the accident.

2. Any or all SW pump, valve and header LCOs may be in effect at the same time subject to the limitations specified in the LCO.

Evaluation Results

The results of the current evaluations demonstrate that all systems and equipment supported by Service Water necessary to respond to and mitigate the consequences of the design basis accident (LOCA) perform their functions as described in the FSAR subject to the limitations of the analysis assumptions. This conclusion is based on the existing evaluation results:

- Analyses demonstrate that adequate flow exists to all required safety-related components to ensure the safety function is accomplished.
- Accident unit Containment Fan Coolers remove the design basis heat load for the allowable SW inlet temperature and range of cooler fouling factors. Analyses results demonstrate that at the minimum fouling factor (maximum heat transfer), boiling does not occur under steady state conditions at the outlet to the fan coolers as required by the PBNP design and license basis. Heat removal requirements are met for the allowable range of fouling.

The LOCA analysis bounds the consequences of all accidents analyzed for Point Beach. Procedure changes have been made to ensure the analysis assumptions remain valid. Thus the SW system is considered operable when operated within the bounds of these analyses.

Proposed Technical Specifications Changes

Changes are proposed to Technical Specifications 15.3.3.D-2 consistent with the above assumptions. These changes provide assurance that the SW system performs the required support functions for equipment necessary to mitigate the consequences of accidents as described in the FSAR.

Technical Specification 15.3.3.D-2.b provides for up to seven days inoperability of the SW header continuous flowpath. The Specification, as proposed, provides for interruption of the flowpath anywhere in the loop header provided five service water pumps are operable and available to supply all required portions of the service water header.

For interruption between the pump bays or at one or more of the west header isolation valve locations, four service water pumps are required to be operable. All accident mitigation functions are supported for these system lineups as demonstrated by the flow evaluations performed. These conditions are more restrictive than the existing Specifications.

Proposed TS 15.3.3.D-2.b also allows evaluation of other SW pump and loop header alignments prior to placing the system in that configuration. An acceptable evaluation is one that demonstrates that required systems and components supported by SW are operable, or identifies inoperable systems and components to ensure that a condition prohibited by specific system and component Technical Specifications does not

result. Operation in these other alignments is effectively time limited by TS 15.3.3.D-2.a for the SW pumps. This allowed outage time is consistent with PBNP Technical Specifications for other accident mitigation equipment.

This analysis requirement is consistent with, but more restrictive than the present requirement contained in existing Specification 15.3.3.D-2.b. The existing requirement allows up to 24 hours following entry into the condition to perform such an evaluation. By requiring the evaluation to be completed prior to placing the system in the desired lineup, additional assurance is provided that the SW system remains operable. This stipulation is consistent with license conditions added to the PBNP Facility Operating Licenses with Amendments 174 and 178 for Units 1 and 2 respectively, issued on July 9, 1997. These license conditions require the SW system to be operated in accordance with the system analyses except for short periods of time as necessary to affect procedurally controlled changes in system lineups and unit operating conditions. This stipulation provides some flexibility recognizing that evaluations of other operating conditions will continue and will support further improvements of analysis tools.

The proposed note to TS 15.3.3.D-2 retains the direction requiring entry into applicable system and equipment LCO if equipment is rendered inoperable due to the Service Water System header and pump configuration (due principally to the loss of SW flow to support the system or equipment operation). This requirement ensures that the safety significance of the inoperable equipment is appropriately accounted for in the time allowed in the configuration. In general, for accident mitigation systems, allowed outage time is limited to 72 hours. A statement that the LCO can be exited if system realignment is performed to regain required flows to the affected systems or equipment is being removed as this condition is unnecessary. This direction is redundant since operability is required for exiting any LCO consistent with standard Technical Specification usage.

Technical Specification 15.3.3.D-2.c provides for up to 72 hours inoperability of one or more SW automatic isolation valves required during accident conditions, provided the required redundant valve, if any, is operable. The proposed Specification is more restrictive than the existing Specification. This allowed outage time is consistent with PBNP Technical Specifications for other accident mitigation equipment.

The proposed change to TS 15.3.3.D-2.c ensures that the safety significance of the inoperable valve is appropriately accounted for in the time allowed in the configuration. In general, for accident mitigation systems, time is limited to 72 hours. Requiring the necessary redundant valves to be operable ensures that the non-essential flowpath will be isolated, thus supporting the assumptions in the analyses.

Technical Specification 15.3.3.D-2.d allows the containment fan cooler outlet motor operated valves to be open for up to 72 hours, provided at least five service water pumps are operable. Unit status and system configuration lineups may result in sufficient flow being provided with only three or four service water pumps operable. Proposed Technical Specification 15.3.3.D-2.d allows operation for 72 hours in this condition provided than an evaluation is performed to demonstrate system operability prior to placing the system in that configuration. Operation in these other alignments is effectively limited by TS 15.3.3.D-2.a for the SW pumps.

Conclusion

Analyses have been performed utilizing the Service Water System model for the Point Beach Nuclear Plant. The limiting assumptions in the analyses on SW System and component operation will be incorporated into plant operating and emergency procedures. These assumptions have also been translated into the proposed Technical Specifications to ensure the Specifications provide appropriate system alignments and limits on equipment operability. The Technical Specifications provide a high degree of confidence that the SW System will perform its functions as designed and analyzed consistent with the systems' overall importance to safety.

Table 1
Technical Specifications Equipment Supported by Service Water

EQUIPMENT	SERVICE WATER SUPPORT FUNCTION	SERVICE WATER SUPPLY	APPLICABLE TECHNICAL SPECIFICATIONS SECTIONS
G-01 Emergency Diesel Generator Train A (SHARED)	Engine cooling water supply.	Normally South header. North header alternate supply.	LCO §15.3.7 SURVEILLANCE §15.4.6
G-02 Emergency Diesel Generator Train A (SHARED)	Engine cooling water supply.	Normally North header. South header alternate supply.	LCO §15.3.7 SURVEILLANCE §15.4.6
1P-29 Unit 1 Turbine driven AFW Pump	Bearing cooling and alternate suction source.	Normally South header. North header alternate supply.	LCO §15.3.4 SURVEILLANCE §15.4.8
P-38A Train A Electric motor driven AFW Pump (SHARED)	Bearing cooling and alternate suction source.	Normally South header. North header alternate supply.	LCO §15.3.4 SURVEILLANCE §15.4.8
P-38B Train B Electric motor driven AFW Pump (SHARED)	Bearing cooling and alternate suction source.	Normally North header. South header alternate supply.	LCO §15.3.4 SURVEILLANCE §15.4.8
2P-29 Unit 2 Turbine Driven AFW Pump	Bearing cooling and alternate suction source.	Normally North header. South header alternate supply.	LCO §15.3.4 SURVEILLANCE §15.4.8
1HX-12A CCW Heat Exchangers	Cooling water for heat exchanger operation.	Normally South header. North header alternate supply.	LCO §15.3.3 SURVEILLANCE NONE
HX-12B and HX-12C CCW Heat Exchangers (SHARED)	Cooling water for heat exchanger operation.	Normally North header. South header alternate supply.	LCO §15.3.3 SURVEILLANCE NONE
2HX-12D CCW Heat Exchangers	Cooling water for heat exchanger operation.	Normally North header. South header alternate supply.	LCO §15.3.3 SURVEILLANCE NONE
1W-1B1 and 1W-1D1 Unit 1 Containment Fan Cooler Units and associated Heat Exchangers	Cooling water for heat exchanger operation and fan motor cooling.	South Header	LCO §15.3.3 SURVEILLANCE §15.4.5
1W-1A1 and 1W-1C1 Unit 1 Containment Fan Cooler Units and associated Heat Exchangers	Cooling water for heat exchanger operation and fan motor cooling.	West Header	LCO §15.3.3 SURVEILLANCE §15.4.5
2W-1B1 and 2W-1D1 Unit 2 Containment Fan Cooler Units and associated Heat Exchangers	Cooling water for heat exchanger operation and fan motor cooling.	North Header	LCO §15.3.3 SURVEILLANCE §15.4.5
2W-1A1 and 2W-1C1 Unit 2 Containment Fan Cooler Units and associated Heat Exchangers	Cooling water for heat exchanger operation and fan motor cooling.	West Header	LCO §15.3.3 SURVEILLANCE §15.4.5

NO SIGNIFICANT HAZARDS CONSIDERATION
SUPPLEMENT 1 TO TECHNICAL SPECIFICATIONS CHANGE REQUEST 206
SERVICE WATER SYSTEM OPERABILITY
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

On July 30, 1998, Wisconsin Electric Power Company (WE), licensee for the Point Beach Nuclear Plant (PBNP), submitted a proposal to the NRC to amend Facility Operating Licenses DPR-24 and DPR-27 for Point Beach Nuclear Plant, Units 1 and 2, respectively (reference letter NPL 98-0613). The requested amendments reflected changes in Section 15.3 of the plant Technical Specifications (TS). The purpose of the proposed amendments was to incorporate changes to the Technical Specifications to more clearly define the requirements for Service Water (SW) System operability.

Additional analyses of the SW System performed subsequent to the original submittal necessitated additional operational restrictions to assure system operability as assumed in the analyses. The purpose of this Supplement to Technical Specifications Change Request (TSCR) 206 is to reflect these changes and amend the original proposal.

Wisconsin Electric has evaluated the proposed amendments in accordance with 10 CFR 50.91 against the standards in 10 CFR 50.92 and has determined that the operation of the Point Beach Nuclear Plant in accordance with the proposed amendments presents no significant hazards. Our evaluation against each of the criteria in 10 CFR 50.92 follows.

1. **Operation of the Point Beach Nuclear Plant in accordance with the proposed amendments does not result in a significant increase in the probability or consequences of any accident previously evaluated.**

   The Service Water System is primarily a support system for systems required to be operable for accident mitigation. Portions of the SW system supplying the containment fan coolers also function as part of the containment pressure boundary under post accident conditions. Failures within the SW system are not an initiating condition for any analyzed accident.

   Analyses performed demonstrate that under the Technical Specifications allowable configurations, the SW system will continue to perform all required functions. The SW system is capable of supplying the required cooling water flow to systems required for accident mitigation. That is, the SW system removes the required heat from the containment fan coolers and residual heat removal heat exchangers ensuring containment pressure and temperature profiles following an accident are as evaluated in the FSAR. This in turn ensures that environmental qualification of equipment inside containment is maintained and thus functions as required post-accident.

   SW system response post accident is within all design limits for the system. Transient and steady state forces within the system remain within all design and operability limits, thereby maintaining the integrity of the system inside containment and the integrity of the containment pressure boundary. Assumptions dependent on the containment pressure profile for containment leakage assumed in the radiological consequence analyses remain valid.

In addition, removing required heat from containment ensures that cooling of the reactor core is accomplished for long-term accident mitigation.

Therefore, operation of the SW system as proposed will not result in a significant increase in the probability or consequences of any accident previously evaluated.

2. **Operation of the Point Beach Nuclear Plant in accordance with the proposed amendments does not result in a new or different kind of accident from any accident previously evaluated.**

The proposed changes do not alter the way in which the SW system performs its design functions nor the design criteria of the system. The proposed changes do not introduce any new or different normal operation or accident mitigation functions for the system. Therefore, no new accident initiators are introduced by the proposed changes. Operation of SW system as proposed cannot result in a new or different kind of accident from any accident previously evaluated.

3. **Operation of the Point Beach Nuclear Plant in accordance with the proposed amendments does not result in a significant reduction in a margin of safety.**

Analyses performed in support of the proposed amendments demonstrate that the SW system continues to perform its function as assumed and credited in the accident analyses and radiological consequence analyses performed for the Point Beach Nuclear Plant. The SW flow analyses conservatively assume limiting calculational parameters such as minimum allowed IST pump performance curves, minimum credible pump bay level, maximum postulated lake temperature, inclusion of system water leakage, maximum flow through system temperature control valves, bounding values for system throttle valve settings and the impacts of instrument inaccuracy. Therefore, the analyses and results are not changed. All analysis limits remain met. The SW system continues to be operated and responds within all design limits for the system. Therefore, operation of the Point Beach Nuclear Plant in accordance with the proposed amendments cannot result in a significant reduction in a margin of safety.

Conclusion

Operation of the Point Beach Nuclear Plant in accordance with the proposed amendments will not result in a significant increase in the probability or consequences of any accident previously analyzed; will not result in a new or different kind of accident from any accident previously analyzed; and, does not result in a reduction in any margin of safety. Therefore, operation of PBNP in accordance with the proposed amendments does not result in a significant hazards determination.

TECHNICAL SPECIFICATIONS PAGE MARKUPS
SUPPLEMENT 1 TO TECHNICAL SPECIFICATIONS CHANGE REQUEST 206
SERVICE WATER SYSTEM OPERABILITY
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

The attached page markups reflect the changes proposed to the current Point Beach Technical Specifications.

D. Service Water System

1. A reactor shall not be made critical unless the following conditions are met:

   a. Six service water pumps are operable.

   b. All necessary valves, interlocks and piping required for the functioning of the Service Water System during accident conditions for the unit which is to be made critical are also operable.

2. During power operation, the requirements of 15.3.3.D-1 may be modified to allow the following conditions. If the system is not restored to meet the conditions of 15.3.3.D-1 within the time period specified, the affected reactor(s) will be placed in the hot shutdown condition within six hours and in cold shutdown within 36 hours.

   Note: ~~If less than four service water pumps are operable, service water system flow shall be evaluated within 24 hours of less than four service water pumps being operable. If it is determined that~~ any equipment supported by service water will not receive sufficient flow, the applicable LCOs for the affected equipment shall be entered. ~~The LCOs can be exited if system realignment is completed to achieve the required flow rates for the affected equipment.~~

   a. One of the six required service water pumps may be out of service provided a pump is restored to operable status within 7 days. A second service water pump may be out of service provided a pump is restored to operable status within 72 hours. A third service water pump may be out of service provided two pumps are restored to operable status within 72 hours.

   b. The service water ring header continuous flowpath may be out of service for ~~a period of~~ up to 7 days, subject to the limitations of 15.3.3.D-2.a, provided that:

      i. At least five service water pumps are operable and aligned to all required portions of the service water header

      Or

      ii. Four service water pumps are operable and the flowpath is interrupted only between the service water pump bays or at one or more of the west header isolation valve locations.

      Or

iii. Service water pump and continuous flowpath alignment may be different from that defined in b.i or b.ii above, provided an evaluation is performed demonstrating required systems are operable prior to establishing the configuration.

If the alignment is different from that specified above and no evaluation has been completed, then the actions required by Section 15.3.0 apply.

c. One or more ~~Any or all~~ required automatic non-essential load isolation valve(s) ~~required during accident conditions~~ may be inoperable ~~out of service~~ for up to 72 hours. If an affected line has a required redundant automatic isolation valve, then the redundant valve must be ~~provided at least four service water pumps are~~ operable. This LCO can be exited provided the affected lines are isolated with a seismically qualified isolation valve or the inoperable valves are restored to operable status.

d. The containment fan cooler outlet motor operated valves may be open for up to 72 hours provided that:

i. At least five service water pumps are operable.

Or

ii. At least three service water pumps are operable provided an evaluation is performed demonstrating required systems are operable prior to establishing the configuration.

This LCO can be exited provided the valves are returned to the closed position or the flowpath is isolated.

Basis

The normal procedure for starting the reactor is, first, to heat the reactor coolant to near operating temperature, by running the reactor coolant pumps. The reactor is then made critical by withdrawing control rods and/or diluting boron in the coolant.(1) With this mode of start-up, the energy stored in the reactor coolant during the approach to criticality is substantially equal to that during power operation and therefore to be conservative most engineered safety system components and auxiliary cooling systems, shall be fully operable. During low temperature physics tests there is a negligible amount of stored energy in the reactor coolant, therefore an accident comparable in severity to the Design Basis Accident is not possible, and the engineered safety systems are not required.

A total of six service water pumps are installed, only three of which are required to operate during the injection and recirculation phases of a postulated loss-of-coolant accident,[6] in one unit together with a hot shutdown or normal operation condition in the other unit. For either reactor to be critical, six service water pumps must be operable.

The allowed outage time for a single service water pump is 7 days. The allowed outage time for two or three service water pumps is 72 hours. If more than one service water pump is inoperable, the 7 day allowed outage time starts when the first pump is declared inoperable and the 72 hour allowed outage time for the second and third pumps is cumulative starting from the time the second pump is declared inoperable. Therefore, the total time that two or three pumps are inoperable during the period that LCO 15.3.3.D-2.a is in effect must not exceed 72 hours. All pumps must be restored to operable status within 7 days of the first pump being declared inoperable.

The service water ring header continuous flowpath LCO requirement (TS 15.3.3.D-2.b) applies anytime continuity of the flowpath in the service water ring header is interrupted. This includes isolation of any part of the ring header. This LCO recognizes that one aspect of redundancy in the service water system is the ability to isolate a break in the system and still maintain ability to provide required flow to supported equipment. This capability is impaired anytime the continuous flowpath of the ring header is blocked. The ~~7 day~~ allowed outage time, up to 7 days, is based on ~~the fact that a piping failure must occur to cause a subsequent problem with system operability~~ the redundant capabilities afforded by the remaining operable equipment, and the low probability of a DBA or service water system line break occurring during this time period. Piping failures are not considered as the single failure for system functionality during an accident.

TS 15.3.3.D-2.b requires that service water system flow is evaluated ~~within 24 hours if less than four service water pumps are operable~~ prior to establishing other than the specified alignments. This is necessary to ensure that all required equipment will receive sufficient flow in this condition. If it is determined that any equipment will not receive sufficient flow, the applicable LCOs for the affected equipment shall be entered. These LCOs can be exited if system realignment is completed to achieve the required flow rates for the affected equipment.

Entry into the applicable LCOs for the affected equipment is also required when any part of the service water ring header is removed from service. For example, if the north header is removed from service, all Technical Specification required equipment required for operation should be or have already been switched to the south header. The containment accident fan cooler inoperability requires entry into the applicable LCO for Unit 2 (TS 15.3.3.B.2.a which is 72 hours) when the header is removed from service. If Unit 2 is already in a shutdown condition where containment accident fan cooler operability is not required, no LCO would apply. Unit 1 would be subject to the 7 day allowed outage time for the loss of the service water ring header continuous flowpath. The 7 day allowed outage time is based on approximate repair time for system piping and the possibility that a mechanical failure in another part of the system could result in a loss of service water system function.

TS 15.3.3.D-2.c ensures that isolation capability of non-essential service water loads during an accident is maintained per the service water analysis. In flowpaths where the service water analysis takes credit for redundant automatic non-essential load isolation valves, one of the required redundant valves must remain operable. If an evaluation demonstrates, based on existent unit status and system configuration, that isolation of the affected lines is not required during accident conditions, then this LCO would not apply to that line.

The containment fan cooler service water outlet motor operated valves consist of two fully redundant valves that are automatically opened in response to a safety injection signal. Either valve is capable of passing the full flow required for all four fan cooler units in accident mode. At various times, these valves are opened to allow testing of the containment fan coolers or adjustment of the system flow rates. If one or both of these motor operated valves are open in a unit, there may be insufficient service water flow if an accident occurs in the other unit and single failure occurs. Therefore, in this case, the other unit is in a limiting condition for operation because relaxation of single failure is necessary. That unit would be considered the "affected unit" and hence the valves must be closed within 72 hours or the affected unit must be shut down. If the valves are open in both units, they would both be considered "affected" until such time that the motor operated valves were closed for a unit, at which time the affected unit would be the unit with the closed valves. The 72 hour allowed time is consistent with the relaxation of single failure and allowed outage time associated with a loss of redundancy for the service water system. For the case of single unit operation, the valves for the operating unit may be open without limitation if the valves for the shutdown unit are in the shut position or the flowpath is isolated. The flowpath is considered isolated if total flow would not exceed the expected flowrate in the non-accident unit during accident conditions.

Specifications ~~15.3.3.D-2.c requires four and~~ 15.3.3.D-2.d require~~d~~s five service water pumps to be operable to provide sufficient flow for accident mitigation when ~~these~~ this specifications ~~are~~ is in effect. Unit status and system configuration lineups may result in sufficient flow being provided with only three or four service water pumps operable. Operation for 72 hours is allowed in this condition provided that an evaluation is performed to demonstrate system operability.

References

(1) FSAR Section 3.2.1
(2) FSAR Section 6.2
(3) FSAR Section 6.3.2
(4) FSAR Section 6.3
(5) FSAR Section 9.3.2
(6) FSAR Section 9.6.2

INCORPORATION OF PROPOSED CHANGES
SUPPLEMENT 1 TO TECHNICAL SPECIFICATIONS CHANGE REQUEST 206
SERVICE WATER SYSTEM OPERABILITY
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

The attached pages reflect the incorporation of changes proposed to the current Point Beach Technical Specifications. To facilitate page formatting, the beginning of Technical Specification 15.3.3.D-2 has been moved to the previous page within the Technical Specifications.

D. Service Water System

1. A reactor shall not be made critical unless the following conditions are met:

   a. Six service water pumps are operable.

   b. All necessary valves, interlocks and piping required for the functioning of the Service Water System during accident conditions for the unit which is to be made critical are also operable.

2. During power operation, the requirements of 15.3.3.D-1 may be modified to allow the following conditions. If the system is not restored to meet the conditions of 15.3.3.D-1 within the time period specified, the affected reactor(s) will be placed in the hot shutdown condition within six hours and in cold shutdown within 36 hours.

   Note: If any equipment supported by service water will not receive sufficient flow, the applicable LCOs for the affected equipment shall be entered.

   a. One of the six required service water pumps may be out of service provided a pump is restored to operable status within 7 days. A second service water pump may be out of service provided a pump is restored to operable status within 72 hours. A third service water pump may be out of service provided two pumps are restored to operable status within 72 hours.

   b. The service water ring header continuous flowpath may be out of service for up to 7 days, subject to the limitations of 15.3.3.D-2.a, provided that:

      i. At least five service water pumps are operable and aligned to all required portions of the service water header

      Or

      ii. Four service water pumps are operable and the flowpath is interrupted only between the service water pump bays or at one or more of the west header isolation valve locations.

      Or

      iii. Service water pump and continuous flowpath alignment may be different from that defined in b.i or b.ii above, provided an evaluation is performed demonstrating required systems are operable prior to establishing the configuration.

If the alignment is different from that specified above and no evaluation has been completed, then the conditions of Section 15.3.0 apply.

c. One or more required automatic non-essential load isolation valves may be inoperable for up to 72 hours. If an affected line has a required redundant automatic isolation valve, then the redundant valve must be operable. This LCO can be exited provided the affected lines are isolated with a seismically qualified isolation valve or the inoperable valves are restored to operable status.

d. The containment fan cooler outlet motor operated valves may be open for up to 72 hours provided that:

   i. At least five service water pumps are operable.

   Or

   ii. At least three service water pumps are operable provided an evaluation is performed demonstrating required systems are operable prior to establishing the configuration.

   This LCO can be exited provided the valves are returned to the closed position or the flowpath is isolated.

Basis

The normal procedure for starting the reactor is, first, to heat the reactor coolant to near operating temperature, by running the reactor coolant pumps. The reactor is then made critical by withdrawing control rods and/or diluting boron in the coolant.[1] With this mode of start-up, the energy stored in the reactor coolant during the approach to criticality is substantially equal to that during power operation and therefore to be conservative most engineered safety system components and auxiliary cooling systems, shall be fully operable. During low temperature physics tests there is a negligible amount of stored energy in the reactor coolant, therefore an accident comparable in severity to the Design Basis Accident is not possible, and the engineered safety systems are not required.

A total of six service water pumps are installed, only three of which are required to operate during the injection and recirculation phases of a postulated loss-of-coolant accident,[6] in one unit together with a hot shutdown or normal operation condition in the other unit. For either reactor to be critical, six service water pumps must be operable.

The allowed outage time for a single service water pump is 7 days. The allowed outage time for two or three service water pumps is 72 hours. If more than one service water pump is inoperable, the 7 day allowed outage time starts when the first pump is declared inoperable and the 72 hour allowed outage time for the second and third pumps is cumulative starting from the time the second pump is declared inoperable. Therefore, the total time that two or three pumps are inoperable during the period that LCO 15.3.3.D-2.a is in effect must not exceed 72 hours. All pumps must be restored to operable status within 7 days of the first pump being declared inoperable.

The service water ring header continuous flowpath LCO requirement (TS 15.3.3.D-2.b) applies anytime continuity of the flowpath in the service water ring header is interrupted. This includes isolation of any part of the ring header. This LCO recognizes that one aspect of redundancy in the service water system is the ability to isolate a break in the system and still maintain ability to provide required flow to supported equipment. This capability is impaired anytime the continuous flowpath of the ring header is blocked. The allowed outage time, up to 7 days, is based on the redundant capabilities afforded by the remaining operable equipment, and the low probability of a DBA or service water system line break occurring during this time period. Piping failures are not considered as the single failure for system functionality during an accident.

TS 15.3.3.D-2.b requires that service water system flow is evaluated prior to establishing other than the specified alignments. This is necessary to ensure that all required equipment will receive sufficient flow in this condition. If it is determined that any equipment will not receive sufficient flow, the applicable LCOs for the affected equipment shall be entered. These LCOs can be exited if system realignment is completed to achieve the required flow rates for the affected equipment.

Entry into the applicable LCOs for the affected equipment is also required when any part of the service water ring header is removed from service. For example, if the north header is removed from service, all Technical Specification required equipment required for operation should be or have already been switched to the south header. The containment accident fan cooler inoperability requires entry into the applicable LCO for Unit 2 (TS 15.3.3.B.2.a which is 72 hours) when the header is removed from service. If Unit 2 is already in a shutdown condition where containment accident fan cooler operability is not required, no LCO would apply. Unit 1 would be subject to the 7 day allowed outage time for the loss of the service water ring header continuous flowpath. The 7 day allowed outage time is based on approximate repair time for system piping and the possibility that a mechanical failure in another part of the system could result in a loss of service water system function.

TS 15.3.3.D-2.c ensures that isolation capability of non-essential service water loads during an accident is maintained per the service water analysis. In flowpaths where the service water analysis takes credit for redundant automatic non-essential load isolation valves, one of the required redundant valves must remain operable. If an evaluation demonstrates, based on existent unit status and system configuration, that isolation of the affected lines is not required during accident conditions, then this LCO would not apply to that line.

The containment fan cooler service water outlet motor operated valves consist of two fully redundant valves that are automatically opened in response to a safety injection signal. Either valve is capable of passing the full flow required for all four fan cooler units in accident mode. At various times, these valves are opened to allow testing of the containment fan coolers or adjustment of the system flow rates. If one or both of these motor operated valves are open in a unit, there may be insufficient service water flow if an accident occurs in the other unit and single failure occurs. Therefore, in this case, the other unit is in a limiting condition for operation because relaxation of single failure is necessary. That unit would be considered the "affected unit" and hence the valves must be closed within 72 hours or the affected unit must be shut down. If the valves are open in both units, they would both be considered "affected" until such time that the motor operated valves were closed for a unit, at which time the affected unit would be the unit with the closed valves. The 72-hour allowed time is consistent with the relaxation of single failure and allowed outage time associated with a loss of redundancy for the service water system. For the case of single unit operation, the valves for the operating unit may be open without limitation if the valves for the shutdown unit are in the shut position or the flowpath is isolated. The flowpath is considered isolated if total flow would not exceed the expected flowrate in the non-accident unit during accident conditions.

Specification 15.3.3.D-2.d requires five service water pumps to be operable to provide sufficient flow for accident mitigation when this specification is in effect. Unit status and system configuration lineups may result in sufficient flow being provided with only three or four service water pumps operable. Operation for 72 hours is allowed in this condition provided that an evaluation is performed to demonstrate system operability.

References

(1) FSAR Section 3.2.1
(2) FSAR Section 6.2
(3) FSAR Section 6.3.2
(4) FSAR Section 6.3
(5) FSAR Section 9.3.2
(6) FSAR Section 9.6.2