ATTACHMENT A-1

Beaver Valley Power Station, Unit No. 1
Proposed Technical Specification Change No. 213

The following is a list of the affected pages:

Affected Pages:	Index Page XII
	3/4 3-19a
	3/4 3-27a
	3/4 3-46
	3/4 3-52
	3/4 7-5
	3/4 7-6
	B 3/4 7-2

INDEX

BASES

(Proposed wording)

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

DPR-66

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
7. AUXILIARY FEEDWATER					
a. Steam Gen. Water Level-Low-Low (Loop Stop valves open)					
i. Start Turbine Driven Pump	3/stm. gen.	2/stm. gen. any stm. gen.	2/stm. gen.	1, 2, 3	14
ii. Start Motor Driven Pumps	3/stm. gen. any 2 stm. gen.	2/stm. gen. any 2 stm. gen.	2/stm. gen.	1, 2, 3	14
b. Undervoltage-RCP (Start Turbine Driven Pump)	(3)-1/bus	2	2	1	14
c. S.I. (Start ~~Motor-Driven~~ Pumps)	See 1 above (all S.I. initiating functions and requirements)				
d. Emergency Bus Under voltage (Start Motor Driven Pumps)	1/bus	1	1	1, 2, 3	18
e. Trip of Main Feedwater Pumps - (Start Motor Driven Pumps)	1/pump	1	1	1, 2, 3	18

All Auxiliary Feedwater

(Proposed Wording)

TABLE 3.3-5 (Continued)

ENGINEERED SAFETY FEATURES RESPONSE TIMES

INITIATING SIGNAL AND FUNCTION	RESPONSE TIME IN SECONDS
11. Steam Generator Water Level-Low-Low	
a. Motor-driven Auxiliary Feedwater Pumps**	60.0
b. Turbine-driven Auxiliary Feedwater Pumps***	60.0
12. Undervoltage RCP	
a. Turbine-driven Auxiliary Feedwater Pumps	60.0
13. Emergency Bus Undervoltage	
a. Motor-driven Auxiliary Feedwater Pumps	60.0
14. Trip of Main Feedwater Pumps	
a. Motor-driven Auxiliary Feedwater Pumps	60.0
NOTE: Response time for ~~Motor-driven~~ Auxiliary Feedwater Pumps on all S.I. signal starts	60.0

DELETE

*** on 2/3 any Steam Generator
** on 2/3 in 2/3 Steam Generators

(Proposed Wording)

TABLE 4.3-6

REMOTE SHUTDOWN PANEL MONITORING INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

DPR-66

INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION
1. Intermediate Range Nuclear Flux	M	N.A.
2. Intermediate Range Startup Rate	M	N.A.
3. Source Range Nuclear Flux (1)	M (4)	N.A.
4. Source Range Startup Rate (1)	M (4)	N.A.
5. Reactor Coolant Temperature - Hot Leg	M	R
6. Reactor Coolant Temperature - Cold Leg	M	R
7. Pressurizer Pressure	M	R
8. Pressurizer Level	M	R
9. Steam Generator Pressure	M	R
10. Steam Generator Level	M	R
11. RHR Temperature - HX Outlet (3)	M (5)	R
12. Auxiliary Feedwater Flow Rate	S/U (2)	R

Notation

(1) Operability required in accordance with Specification 3.3.1.1.
(2) Channel check to be performed in conjunction with Surveillance Requirement 4.7.1.2.~~a~~ following an extended plant outage. (7)
(3) Operability required in accordance with Specification 3.4.1.3.
(4) Below P-6.
(5) Channel check to be performed in conjunction with Surveillance Requirement 4.4.1.3.1.

(Proposed Wording)

TABLE 4.3-7

ACCIDENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

		CHANNEL CHECK	CHANNEL CALIBRATION
1.	Pressurizer Water Level	M	R
2.	Auxiliary Feedwater Flow Rate	S/U(1)	R
3.	Reactor Coolant System Subcooling Margin	M	R
4.	Deleted		
5.	PORV Limit Switch Position Indicator	M	R
6.	PORV Block Valve Limit Switch Position Indicator	M	R
7.	Safety Valve Acoustical Detector Position Indicator	M	R
8.	Deleted		
9.	Deleted		
10.	Containment Sump Wide-Range Water Level	M	R
11.	Containment Wide-Range Pressure	N/A	R
12.	In-Core Thermocouples (Core-Exit Thermocouples)	M	R
13.	Reactor Vessel Level Indicating System	M	R

(1) Channel check to be performed in conjunction with Surveillance Requirement 4.7.1.2.~~a~~ (7) following an extended plant outage.

(Proposed Wording)

PLANT SYSTEMS

AUXILIARY FEEDWATER SYSTEM

REPLACE WITH INSERT "A"

LIMITING CONDITION FOR OPERATION

3.7.1.2 At least three steam generator auxiliary feedwater pumps and associated flow paths shall be OPERABLE with:

a. Two feedwater pumps, each capable of being powered from separate emergency busses, and

b. One feedwater pump capable of being powered from an OPERABLE steam supply system.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

a. With one auxiliary feedwater pump inoperable, restore at least three auxiliary feedwater pumps (two capable of being powered from separate emergency busses and one capable of being powered by an OPERABLE steam supply system) to OPERABLE status within 72 hours or be in HOT SHUTDOWN within the next 12 hours.

b. With the motor driven auxiliary feedwater pump supplying the redundant header inoperable, realign the two remaining auxiliary feedwater pumps to separate headers within 2 hours.

c. With two auxiliary feedwater pumps inoperable, be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

d. With three auxiliary feedwater pumps inoperable, immediately initiate corrective action to restore at least one auxiliary feedwater pump to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.7.1.2 Each auxiliary feedwater pump shall be demonstrated OPERABLE:

a. When tested pursuant to Specification 4.0.5:

1. By verifying, that the pump's developed head at the flow test point is greater than or equal to the required developed head as specified in the Inservice Testing Program. The provisions of Specification 4.0.4 are not applicable for entry into Mode 3 for the steam turbine driven pump testing.(1)

(1) Secondary side steam pressure shall be greater than 600 psig when performing this surveillance requirement for the steam turbine driven pump.

(Proposed Wording)

REPLACE WITH INSERT "A"

SURVEILLANCE REQUIREMENTS (Continued)

b. At least once per 31 days by:

1. Verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

2. Reverifying the requirements of Technical Specification Surveillance 4.7.1.2.b.1 by a second and independent operator.

3. Establish and maintain constant communications between the control room and the auxiliary feed pump room while any normal discharge valve is closed during surveillance testing.

4. Verifying operability of each River Water Auxiliary Supply valve by cycling each manual River Water to Auxiliary Feedwater System valve through one complete cycle.

c. Verify Auxiliary Feedwater flow from WT-TK-10 to the Steam Generators with the Auxiliary Feedwater Valves in their normal alignment.(2)

d. At least once per 18 months during shutdown by:

1. Cycling each power operated (excluding automatic) valve in the flow path that is not testable during plant operation, through at least one complete cycle of full travel.

2. Verifying that each automatic valve in the flow path actuates to its correct position on a test signal.

3. Verifying that each pump starts automatically upon receipt of a test signal.

(2) This surveillance is required to be performed prior to entry into Mode 2 whenever the plant has been in Modes 5 or 6 for greater than 30 continuous days.

(Proposed Wording)

Attachment to Auxiliary Feedwater System
INSERT "A"

3.7.1.2 Three Auxiliary Feedwater (AFW) trains shall be OPERABLE and consist of the following:(1)

a. One motor driven AFW pump with a flow path from WT-TK-10 to each feedwater injection header via the train "A" supply header.

b. One motor driven AFW pump with a flow path from WT-TK-10 to each feedwater injection header via the train "B" supply header.

c. One turbine driven AFW pump capable of being powered from two steam supplies with a flow path from WT-TK-10 to each feedwater injection header via the designated train supply header.

d. One feedwater injection header to each steam generator.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator(s) is relied upon for heat removal.

ACTION:

a. With one of the two steam supplies to the turbine driven AFW pump inoperable, restore two steam supplies to OPERABLE status within 7 days and within 10 days from discovery of failure to meet the LCO or be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. With one feedwater injection header inoperable in MODE 1, 2, or 3, be in HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

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(1) Only one AFW train (capable of providing flow to the steam generator[s] relied upon for heat removal), which includes a motor driven pump, is required to be OPERABLE in MODE 4.

Attachment to Auxiliary Feedwater System
INSERT "A" (Continued)

ACTION (Continued)

c. With one AFW train inoperable in MODE 1, 2, or 3 for reasons other than one of the two steam supplies or one feedwater injection header inoperable, realign the two AFW pumps to separate train supply headers within 2 hours if both train supply headers are operable, and restore the AFW train to OPERABLE status within 72 hours and within 10 days from discovery of failure to meet the LCO or be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.(2)

d. With two AFW trains inoperable in MODE 1, 2, or 3 for reasons other than one of the two steam supplies inoperable, be in HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

e. With three AFW trains inoperable in MODE 1, 2, or 3 for reasons other than one of the two steam supplies inoperable, immediately initiate action to restore one AFW train to OPERABLE status.(3)

f. With the required AFW train inoperable in MODE 4, immediately initiate action to restore one AFW train to OPERABLE status.

SURVEILLANCE REQUIREMENTS

- - - - - - - - - - - - - - - - GENERAL NOTE - - - - - - - - - - - - - - -

Establish and maintain constant communications between the control room and the auxiliary feed pump room while any normal AFW pump discharge valve is closed during surveillance testing.

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(2) This time period may be extended for up to 90 hours for the turbine driven AFW pump provided that the plant has not entered MODE 2 following a refueling outage.

(3) LCO 3.0.3 and all other LCO Required Actions requiring MODE changes are suspended until one AFW train is restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS (Continued)

4.7.1.2.1 Verify each AFW manual, power operated, and automatic valve in each water flow path, and in both steam supply flow paths to the steam turbine driven AFW pump, that is not locked, sealed, or otherwise secured in position, is in the correct position at least once per 31 days.(4)

4.7.1.2.2 Verify operability of each River Water Auxiliary Supply valve by cycling each manual River Water to Auxiliary Feedwater System valve through one complete cycle at least once per 31 days.

4.7.1.2.3 Verify, at the frequency specified in the Inservice Testing Program, on a STAGGERED TEST BASIS that the developed head of each AFW pump at the flow test point is greater than or equal to the required developed head as specified in the Inservice Testing Program. The provisions of Specification 4.0.4 are not applicable for entry into MODE 3 for the steam turbine driven pump testing.(5)

4.7.1.2.4 Verify each AFW automatic valve that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal at least once per 18 months.(6)

4.7.1.2.5 Verify each AFW pump starts automatically on an actual or simulated actuation signal at least once per 18 months.(5)(6)

4.7.1.2.6 Cycle each power operated (excluding automatic) valve in the flow path that is not testable during plant operation, through at least one complete cycle at least once per 18 months during shutdown.

4.7.1.2.7 Verify AFW flow from WT-TK-10 to the Steam Generators with the AFW valves in their normal alignment.(7)

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(4) Reverify these requirements by a second and independent operator.

(5) Not required to be performed for the turbine driven AFW pump until 24 hours after establishing the minimum required secondary side steam pressure of greater than 600 psig.

(6) Not applicable in MODE 4.

(7) This surveillance is required to be performed prior to entry into MODE 2 whenever the plant has been in MODES 5 or 6 for greater than 30 continuous days.

SAFETY VALVES (Continued)

U = maximum number of inoperable safety valves per operating steam line

(109) = Power Range Neutron Flux-High Trip Setpoint for (N) loop operation

(W) = 71 percent of RATED THERMAL POWER permissible by P-8 Setpoint for 2 loop operation with stop valves open

(W) = 66 percent of RATED THERMAL POWER permissible by P-8 Setpoint for 2 loop operation with stop valves closed

X = Total relieving capacity of all safety valves per steam line in lbs/hour (4,261,666)

Y = Maximum relieving capacity of one safety valve in lbs/hour (873,600)

SYSTEM (AFW) REPLACE WITH INSERT "B"

3/4.7.1.2 AUXILIARY FEEDWATER ~~PUMPS~~

The OPERABILITY of the auxiliary feedwater pumps ensures that the Reactor Coolant System can be cooled down to less than 350°F from normal operatirg conditions in the event of a total loss of off-site power.

The capacity of each auxiliary feedwater pump is sufficient to ensure that adequate feedwater flow is available to remove decay heat and reduce the Reactor Coolant System temperature to less than 350°F when the Residual Heat Removal System may be placed into operation.

3/4.7.1.3 PRIMARY PLANT DEMINERALIZED WATER

The OPERABILITY of the PPDW storage tank with the minimum water volume ensures that sufficient water is available for cooldown of the Reactor Coolant System to less than 350°F in the event of a total loss of off-site power. The minimum water volume is sufficient to maintain the RCS at HOT STANDBY conditions for 9 hours with steam discharge to atmosphere.

(Proposed Wording)

Attachment to Auxiliary Feedwater System
INSERT "B"

BACKGROUND

The AFW System automatically supplies feedwater to the steam generators to remove decay heat from the Reactor Coolant System upon the loss of normal feedwater supply. The AFW system consists of two motor driven pumps and one steam turbine driven pump. The pumps are equipped with independent recirculation lines to prevent pump operation against a closed system. Each motor driven AFW pump is powered from an independent Class 1E power supply and each pump feeds all three steam generators. The steam turbine driven AFW pump receives steam from two of the three main steam lines upstream of the main steam isolation valves. Each of the steam feed lines will supply 100 percent of the steam requirements for the turbine driven AFW pump. The steam feed lines from each of the main steam lines combine to form one main header. The main header then splits into two parallel paths with one Train "A" operated and one Train "B" operated isolation valve on each pathway. These two parallel paths then combine into one header which supplies the turbine driven AFW pump.

The flow path from the demineralized water storage tank (WT-TK-10) to the steam generators consists of individual supply lines to each of the three AFW pumps. Each motor driven AFW pump has an individual line that connects to its train related supply header. In addition, each motor driven AFW pump has the ability to be aligned to the opposite train header. The turbine driven pump has an individual line that can be aligned to either the Train "A" or "B" supply header as necessary. Both the Train "A" and "B" supply headers each contain three normally open remotely operated valves arranged in parallel. Each of these valves then provides a flow path to one of the three common feedwater injection headers. Each of the feedwater injection headers then supplies its designated steam generator via the normal feedwater header downstream of the feedwater isolation valves. The steam generators function as a heat sink for core decay heat. The heat load is dissipated by releasing steam to the atmosphere from the steam generators via the main steam safety valves (MSSVs) or atmospheric dump valves (ADVs). If the main condenser is available, steam may be released via the steam dump valves.

The AFW System is capable of supplying feedwater to the steam generators during normal unit startup, shutdown, and hot standby conditions.

During a normal plant cooldown, one pump at full flow is sufficient to remove decay heat and cool the unit to residual heat removal (RHR) entry conditions. Thus, the requirement for diversity in motive power sources for the AFW System is met.

BACKGROUND (Continued)

The AFW System is designed to supply sufficient water to the steam generator(s) to remove decay heat with steam generator pressure at the setpoint of the MSSVs. Subsequently, the AFW System supplies sufficient water to cool the unit to RHR entry conditions, with steam released through the ADVs.

The AFW System actuates automatically on steam generator water level-low-low by the Engineered Safety Feature Actuation System (ESFAS). The system also actuates on loss of offsite power, safety injection, and trip of all operating main feedwater (MFW) pumps.

APPLICABLE SAFETY ANALYSES

The AFW System mitigates the consequences of any event with loss of normal feedwater.

The design basis of the AFW System is to supply water to the steam generator to remove decay heat and other residual heat by delivering at least the minimum required flow rate to the steam generators at pressures corresponding to the lowest steam generator safety valve set pressure plus 1%.

In addition, the AFW System must supply enough makeup water to replace steam generator secondary inventory lost as the unit cools to MODE 4 conditions. Sufficient AFW flow must also be available to account for flow losses such as pump recirculation and line breaks.

The limiting Design Basis Accident (DBA) for the AFW System is the small break loss of coolant accident (SBLOCA).

For a SBLOCA, the analyses are performed assuming loss of offsite power coincident with reactor trip with a limiting single active failure of the loss of one train of Emergency Core Cooling System (ECCS) on a failure to start of a diesel generator. The diesel failure is presumed to render one motor driven AFW pump inoperable, which results in one motor driven and one turbine driven AFW pump being operable.

The AFW System design is such that it can perform its function following a feedwater line break (FWLB) between the MFW isolation valves and containment, combined with a loss of offsite power following turbine trip, and a single active failure of the steam turbine driven AFW pump. Sufficient flow would be delivered to the two intact steam generators following isolation of the break. The analysis assumes a ten minute delay on AFW flow to the steam generator to allow for isolation of the break.

APPLICABLE SAFETY ANALYSES (Continued)

With one feedwater injection header inoperable, an insufficient number of steam generators are available to meet the feedline break analysis. This analysis assumes AFW flow will be provided to the two remaining intact feedwater lines. Should a feedline break occur on one of the operable feedwater headers with one feedwater injection header already inoperable, the plant could no longer meet its safety analysis.

The ESFAS automatically actuates the AFW turbine driven pump and associated power operated valves and controls when required to ensure an adequate feedwater supply to the steam generators during loss of power. Power operated valves are provided for each AFW line to control the AFW flow to each steam generator.

LCO

This LCO provides assurance that the AFW System will perform its design safety function to mitigate the consequences of accidents that could result in overpressurization of the reactor coolant pressure boundary. Three AFW pumps in three diverse trains are required to be OPERABLE to ensure the availability of RHR capability for all events accompanied by a loss of offsite power and a single failure. This is accomplished by powering two of the pumps from independent emergency buses. The third AFW pump is powered by a different means, a steam driven turbine supplied with steam from a source that is not isolated by closure of the main steam isolation valves (MSIVs).

The AFW System is configured into three trains. The AFW System is considered OPERABLE when the components and flow paths required to provide redundant AFW flow to the steam generators are OPERABLE. This requires that the two motor driven AFW pumps be OPERABLE in two diverse paths, each supplying AFW to each steam generator. The turbine driven AFW pump is required to be OPERABLE with redundant steam supplies from two of the three main steam lines upstream of the MSIVs, and shall be capable of supplying AFW to the steam generators via the designated train supply header. The piping, valves, instrumentation, and controls in the required flow paths also are required to be OPERABLE.

The LCO is modified by a note. Note (1) indicates that one AFW train (capable of providing flow to the steam generator[s] relied upon for heat removal), which includes a motor driven pump, is required to be OPERABLE in MODE 4. This is because of the reduced heat removal requirements and short period of time in MODE 4 during which the AFW may be required and the insufficient steam available in MODE 4 to power the turbine driven AFW pump.

APPLICABILITY

In MODES 1, 2, and 3, the AFW System is required to be OPERABLE in the event that it is called upon to function when the MFW is lost. In addition, the AFW System is required to supply enough makeup water to replace the steam generator secondary inventory lost as the unit cools to MODE 4 conditions.

In MODE 4, the AFW System may be used for heat removal via the steam generators.

In MODE 5 or 6, the steam generators are not normally used for heat removal, and the AFW System is not required.

ACTIONS

a. If one of the two steam supplies to the turbine driven AFW train is inoperable, action must be taken to restore OPERABLE status within 7 days. The 7 day completion time is reasonable, based on the following reasons:

   1. The redundant OPERABLE steam supply to the turbine driven AFW pump;

   2. The availability of redundant OPERABLE motor driven AFW pumps; and

   3. The low probability of an event occurring that requires the inoperable steam supply to the turbine driven AFW pump.

   The second completion time for Required Action a establishes a limit on the maximum time allowed for any combination of Conditions to be inoperable during any continuous failure to meet this LCO.

   The 10 day completion time provides a limitation time allowed in this specified Condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Actions a and c are entered concurrently. The AND connector between 7 days and 10 days dictates that both completion times apply simultaneously, and the more restrictive must be met.

b. With one feedwater injection header inoperable in MODES 1, 2, or 3, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 4 within the following 6 hours.

ACTIONS (Continued)

The allowed completion times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

In MODE 4 with one feedwater injection header inoperable, operation is allowed to continue because only two steam generators are required to remove decay heat per LCO 3.4.1.3, "RCS-SHUTDOWN."

c. With one of the required AFW trains (pump or flow path) inoperable in MODE 1, 2, or 3 for reasons other than Actions a or b, action must be taken to restore OPERABLE status within 72 hours. This Condition includes the loss of two steam supply lines to the turbine driven AFW pump. The 72 hour completion time is reasonable, based on redundant capabilities afforded by the AFW System, time needed for repairs, and the low probability of a DBA occurring during this time period.

The second completion time for Required Action c establishes a limit on the maximum time allowed for any combination of Conditions to be inoperable during any continuous failure to meet this LCO.

The 10 day completion time provides a limitation time allowed in this specified Condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Actions a and c are entered concurrently. The AND connector between 72 hours and 10 days dictates that both completion times apply simultaneously, and the more restrictive must be met.

Required action c is modified by a note. Note (2) states that the completion time of 6 hours to reach HOT SHUTDOWN may be extended for an additional 90 hours for the turbine driven AFW pump provided that the plant has not entered MODE 2 following a refueling outage. This extension of the required completion time to reach MODE 4 from MODE 3 to 96 hours, allows additional time to complete any necessary repairs and/or testing of the turbine driven AFW pump prior to initiating a plant cooldown to MODE 4.

d. When two AFW trains are inoperable in MODE 1, 2, or 3 for reasons which may include the feedwater injection headers, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 4 within the following 6 hours.

ACTIONS (Continued)

The allowed completion times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

In MODE 4 with two AFW trains inoperable, operation is allowed to continue because only one motor driven pump AFW train is required in accordance with the Note (1) that modifies the LCO. Although not required, the unit may continue to cool down and initiate RHR.

e. If all three AFW trains are inoperable in MODE 1, 2, or 3 for reasons which may include the feedwater injection headers, the unit is in a seriously degraded condition with no safety related means for conducting a cooldown, and only limited means for conducting a cooldown with nonsafety related equipment. In such a condition, the unit should not be perturbed by any action, including a power change, that might result in a trip. The seriousness of this condition requires that action be started immediately to restore one AFW train to OPERABLE status.

Required Action e is modified by a Note (3) indicating that all required MODE changes or power reductions are suspended until one AFW train is restored to OPERABLE status. In this case, LCO 3.0.3 is not applicable because it could force the unit into a less safe condition.

f. With one required AFW train inoperable, action must be taken to immediately restore the inoperable train to OPERABLE status. The immediate completion time is appropriate due to the need to ensure that a safety related means of providing flow to the steam generator(s), for the purpose of core decay heat removal, is available.

SURVEILLANCE REQUIREMENTS (SR)

The Surveillance Requirements are modified by a General Note which requires that constant communications be established and maintained when any normal AFW pump discharge valve is closed during surveillance testing.

SURVEILLANCE REQUIREMENTS (SR) (Continued)

SR 4.7.1.2.1

Verifying the correct alignment for manual, power operated, and automatic valves in the AFW System water and steam supply flow paths provides assurance that the proper flow paths will exist for AFW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to locking, sealing, or securing. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position.

The 31 day frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions. Note (4) ensures valve position verification is reverified by a second and independent operator.

SR 4.7.1.2.2

Verifying the operability of each river water auxiliary supply valve by operating the valves through one complete cycle at least once per 31 days, ensures that an alternate water source will be available if the water volume in the demineralized water storage tank is depleted during system operation as a result of a DBA.

SR 4.7.1.2.3

Verifying that each AFW pump's developed head at the flow test point is greater than or equal to the required developed head ensures that AFW pump performance has not degraded during the cycle. The term "required developed head" refers to the value that is assumed in the AFW safety analysis for developed head at a flow point. This value for required developed head at a flow point is defined as the Minimum Operating Point (MOP) in the Inservice Testing Program. Flow and differential head are normal test parameters of centrifugal pump performance required by Section XI of the ASME Code. Because it is undesirable to introduce cold AFW into the steam generators while they are operating, this testing is normally performed on recirculation flow. The recirculation flow rate is assumed to be a fixed value since the recirculation line flow resistance remains constant. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. Performance of inservice testing as required in the ASME Code, Section XI, satisfies this requirement.

SURVEILLANCE REQUIREMENTS (SR) (Continued)

This SR is modified by a Note (5) indicating that the SR should be deferred until suitable test conditions are established for testing the turbine driven AFW pump. This deferral is required because there is insufficient steam pressure to perform the test.

SR 4.7.1.2.4

This SR verifies that AFW can be delivered to the appropriate steam generator in the event of any accident or transient that generates an ESFAS, by demonstrating that each automatic valve in the flow path actuates to its correct position on the actual or simulated actuation signal. The 18 month Frequency is based on the need to perform this surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the surveillance were performed with the reactor at power. The 18 month Frequency is acceptable based on operating experience and the design reliability of the equipment.

This SR is modified by a Note (6) that states the SR is not required in MODE 4. In MODE 4, the heat removal requirements would be less providing more time for operator action to manually align the flow path.

SR 4.7.1.2.5

This SR verifies that the AFW pumps will start in the event of any accident or transient that generates an ESFAS by demonstrating that each AFW pump starts automatically on an actual or simulated actuation signal. The 18 month Frequency is based on the need to perform this surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the surveillance were performed with the reactor at power.

This SR is modified by two notes. Note (5) indicates that the SR be deferred until suitable test conditions are established for testing the turbine driven AFW pump. This deferral is required because there is insufficient steam pressure to perform the test. Note (6) states that the SR is not required in MODE 4. In MODE 4, the heat removal requirements would be less providing more time for operator action to manually start the required AFW pump.

SR 4.7.1.2.6

Cycling each power operated valve (excluding automatic) in the flow path that is not testable during plant operation, ensures that the valves will function when required. The 18 month Frequency is based on the need to perform this surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the surveillance were performed with the reactor at power.

SURVEILLANCE REQUIREMENTS (SR) (Continued)

SR 4.7.1.2.7

This SR verifies that the AFW is properly aligned by verifying the flow from WT-TK-10 to the steam generators prior to entering MODE 2 after more than 30 continuous days in MODE 5 or 6 per Note (7). OPERABILITY of AFW flow paths must be verified before sufficient core heat is generated that would require the operation of the AFW System during a subsequent shutdown. The Frequency is reasonable, based on engineering judgement and other administrative controls that ensure that flow paths remain OPERABLE. To further ensure AFW System alignment, flow path OPERABILITY is verified following extended outages to determine no misalignment of valves has occurred. This SR ensures that the flow path from the WT-TK-10 to the steam generators is properly aligned.

ATTACHMENT A-2

Beaver Valley Power Station, Unit No. 2
Proposed Technical Specification Change No. 80

The following is a list of the affected pages:

Affected Pages:

3/4 3-20
3/4 3-27
3/4 3-36
3/4 3-37
3/4 3-54
3/4 3-59
3/4 7-4
3/4 7-5
B 3/4 7-2

TABLE 3.3-3 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
7. AUXILIARY FEEDWATER (Continued)					
b. Steam Gen. Water Level--Low-Low					
1. Start Turbine Driven Pump	3/stm. gen.	2/stm gen. any stm. gen.	2/stm. gen.	1, 2, 3	14
2. Start Motor Driven Pumps	3/stm. gen.	2/stm gen. any 2 stm. gen.	2/stm. gen.	1, 2, 3	14
c. Undervoltage-RCP (Start Turbine Driven Pump)	(3)-1/bus	2	2	1, 2	14
d. Safety Injection (Start ~~Motor-Driven~~ Pumps)	See 1 above (all SI initiating functions and requirements)				
e. Trip of Main Feedwater Pumps (Start Motor Driven Pumps)	1/pump	2	2	1, 2, 3	18
8. ENGINEERED SAFETY FEATURE INTERLOCKS					
a. Reactor Trip, P-4	2	1	2	1, 2, 3	45
b. Pressurizer Pressure, P-11	3	2	2	1, 2, 3	38
c. Low-Low T_{avg}, P-12	3	2	2	1, 2, 3	38

All Auxiliary Feedwater

(Proposed Wording)

TABLE 3.3-4 (Continued)

ENGINEERED SAFETY FEATURES ACTUATION SYSTEM INSTRUMENTATION TRIP SETPOINTS

FUNCTIONAL UNIT	TOTAL ALLOWANCE (TA)	Z	SENSOR DRIFT (S)	TRIP SETPOINT	ALLOWABLE VALUE
7. AUXILIARY FEEDWATER (Continued)					
b. Steam Generator Water Level--Low-Low					
1. Start Turbine Driven Pump	11.5	10.18	1.67	≥ 11.5% of narrow range instrument span	≥ 10.7% of narrow range instrument span
2. Start Motor Driven Pumps	11.5	10.18	1.67	≥ 11.5% of narrow range instrument span	≥ 10.7% of narrow range instrument span
c. Undervoltage - RCP (Start Turbine Driven Pump)	27.7	1.39	0.0	≥ 75% of nominal bus voltage	≥ 73% of nominal bus voltage
d. Safety Injection (Start ~~Motor-Driven~~ Pumps)	See Item 1. above for all Safety Injection Trip Setpoints and Allowable Values.				
e. Trip of Main Feedwater Pumps (Start Motor-Driven Pumps)	N.A.	N.A.	N.A.	N.A.	N.A.

All Auxiliary Feedwater

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
6. LOSS OF POWER				
a. 4.16kv Emergency Bus				
1. Undervoltage (Trip Feed)	N.A.	R	M	1, 2, 3, 4
2. Undervoltage (Start Diesel)	N.A.	R	M	1, 2, 3, 4
b. 4.16kv Emergency Bus (Degraded Voltage)	N.A.	R	M	1, 2, 3, 4
c. 480v Emergency Bus (Degraded Voltage)	N.A.	R	M	1, 2, 3, 4
7. AUXILIARY FEEDWATER[4]				
a. Automatic Actuation Logic and Actuation Relays	N.A	N.A.	M[2]	1, 2, 3
b. Steam Generator Water Level-Low-Low				
1. Start Turbine Driven Pump	S	R	Q	1, 2, 3
2. Start Motor Driven Pumps	S	R	Q	1, 2, 3

(4) Manual initiation is included in Specification ~~4~~ (3) .7.1.2.

(Proposed Wording)

TABLE 4.3-2 (Continued)

ENGINEERED SAFETY FEATURE ACTUATION SYSTEM INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
7. AUXILIARY FEEDWATER (continued)				
c. Undervoltage - RCP (Start Turbine-Driven Pump)	S	R	M	1, 2
d. Safety Injection (Start ~~Motor-Driven~~ Pumps)	See 1 above (all SI surveillance requirements)			
e Trip of Main Feedwater Pumps (Start Motor-Driven Pumps)	N.A.	N.A.	R	1, 2, 3
8. ENGINEERED SAFETY FEATURE INTERLOCKS				
a. Reactor Trip, P-4	N.A	N.A.	R(3)	1, 2, 3
b. Pressurizer Pressure, P-11	N.A.	R	Q	1, 2, 3
c. Low-Low T_{avg}, P-12	N.A.	R	Q	1, 2, 3

All Auxiliary Feedwater

(Proposed wording)

TABLE 4.3-6

REMOTE SHUTDOWN MONITORING INSTRUMENTATION
SURVEILLANCE REQUIREMENTS

	INSTRUMENTS*	CHANNEL CHECK	CHANNEL CALIBRATION
1.	Intermediate Range Nuclear Flux	M	N.A.
2.	Intermediate Range Startup Rate	M	N.A.
3.	Source Range Nuclear Flux (2)	M(4)	N.A.
4.	Source Range Startup Rate (2)	M(4)	N.A.
5.	Reactor Coolant Temperature - Hot Leg	M	R
6.	Reactor Coolant Temperature - Cold Leg	M	R
7.	Pressurizer Pressure	M	R
8.	Pressurizer Level	M	R
9.	Steam Generator Pressure	M	R
10.	Steam Generator Level	M	R
11.	RHR Temperature - HX Outlet (3)	M	R
12.	Auxiliary Feedwater Flow Rate	S/U(1)	R

*Emergency Shutdown Panel

(1) Channel check to be performed in conjunction with Surveillance Requirement 4.7.1.2.~~b~~ (7) following an extended plant outage.

(2) Operability required in accordance with Specification 3.3.1.1.

(3) Operability required in accordance with Specification 3.4.1.3.

(4) Below P-6.

(Proposed wording)

TABLE 4.3-7

ACCIDENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

	INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION
1.	Pressurizer Water Level	M	R
2.	Auxiliary Feedwater Flow Rate	S/U*	R
3.	Reactor Coolant System Subcooling Margin Monitor	M	R
4.	PORV Limit Switch Position Indicator	M	R
5.	PORV Block Valve Limit Switch Position Indicator	M	R
6.	Safety Valve Position Indicator	M	R
7.	Deleted		
8.	Containment Sump Wide-Range Water Level	M	R
9.	Containment Wide-Range Pressure	N/A	R
10.	Reactor Vessel Level Indication System	M	R
11.	Core Exit Thermocouples	M	R

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* Channel check to be performed in conjunction with Surveillance Requirement 4.7.1.2.~~b~~ (7) following an extended plant outage.

(Proposed Wording)

PLANT SYSTEMS

AUXILIARY FEEDWATER SYSTEM

REPLACE WITH INSERT "C"

LIMITING CONDITION FOR OPERATION

3.7.1.2 At least three steam generator auxiliary feedwater pumps and associated flow paths shall be OPERABLE with:

a. Two motor-driven auxiliary feedwater pumps, each capable of being powered from separate emergency busses, and

b. One steam turbine-driven auxiliary feedwater pump capable of being powered from an OPERABLE steam supply system.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

a. With one auxiliary feedwater pump inoperable, restore at least three auxiliary feedwater pumps (two capable of being powered from separate emergency busses and one capable of being powered by an OPERABLE steam supply system) to OPERABLE status within 72 hours or be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. With two auxiliary feedwater pumps inoperable, be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

c. With three auxiliary feedwater pumps inoperable, immediately initiate corrective action to restore at least one auxiliary feedwater pump to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.7 1.2 Each auxiliary feedwater pump shall be demonstrated OPERABLE:

a. At least once per 31 days on a STAGGERED TEST BASIS by:

1. Verifying that:

a. Each motor driven pump develops a differential pressure of $\geq$ 1290 psid on recirculation flow of $\geq$ 100 gpm, and

b. The steam turbine driven pump develops a differential pressure of $\geq$ 1310 psid on recirculation flow of $\geq$ 220 gpm when the secondary steam pressure is greater than 600 psig. The provisions of Specification 4.0.4 are not applicable for entry into MODE 3.

(Proposed Wording)

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

2. Verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

3. Reverifying the requirements of Tech Spec. surveillance 4.7.1.2.a.2 by a second and independent operator.

4. Establish and maintain constant communications between the control room and the auxiliary feed pump room while any normal discharge valve is closed during surveillance testing.

5. Verifying operability of each Service Water auxiliary supply valve by cycling each manual Service Water to Auxiliary Feedwater System valve through one complete cycle.

b. Following a plant outage of 30 days or greater, verify Auxiliary Feedwater Flow from TK-210 to the Steam Generators with the Auxiliary Feedwater Valves in their normal alignment.

c. At least once per 18 months during shutdown by:

1. Cycling each power operated (excluding automatic) valve in the flow path that is not testable during plant operation, through at least one complete cycle of full travel.

2. Verifying that each automatic valve in the flow path actuates to its correct position on an auxiliary feedwater actuation test signal.

3. Verifying that each auxiliary feedwater pump starts automatically upon receipt of an auxiliary feedwater actuation test signal.

REPLACE WITH INSERT "C"

Attachment to Auxiliary Feedwater System
INSERT "C"

3.7.1.2 Three Auxiliary Feedwater (AFW) trains shall be OPERABLE and consist of the following:(1)

a. One motor driven AFW pump with a flow path from TK-210 to each feedwater injection header via the train "A" supply header.

b. One motor driven AFW pump with a flow path from TK-210 to each feedwater injection header via the train "B" supply header.

c. One turbine driven AFW pump capable of being powered from two steam supplies with a flow path from TK-210 to each feedwater injection header via the designated train supply header.

d. One feedwater injection header to each steam generator.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator(s) is relied upon for heat removal.

ACTION:

a. With one of the two steam supplies to the turbine driven AFW pump inoperable, restore two steam supplies to OPERABLE status within 7 days and within 10 days from discovery of failure to meet the LCO or be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. With one feedwater injection header inoperable in MODE 1, 2, or 3, be in HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

---

(1) Only one AFW train (capable of providing flow to the steam generator[s] relied upon for heat removal), which includes a motor driven pump, is required to be OPERABLE in MODE 4.

ACTION (Continued)

c. With one AFW train inoperable in MODE 1, 2, or 3 for reasons other than one of the two steam supplies or one feedwater injection header inoperable, realign the two AFW pumps to separate train supply headers within 2 hours if both train supply headers are operable, and restore the AFW train to OPERABLE status within 72 hours and within 10 days from discovery of failure to meet the LCO or be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6(2) hours.

d. With two AFW trains inoperable in MODE 1, 2, or 3 for reasons other than one of the two steam supplies inoperable, be in HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

e. With three AFW trains inoperable in MODE 1, 2, or 3 for reasons other than one of the two steam supplies inoperable, immediately initiate action to restore one AFW train to OPERABLE status.(3)

f. With the required AFW train inoperable in MODE 4, immediately initiate action to restore one AFW train to OPERABLE status.

SURVEILLANCE REQUIREMENTS

- - - - - - - - - - - - - - - - GENERAL NOTE - - - - - - - - - - - - - - -

Establish and maintain constant communications between the control room and the auxiliary feed pump room while any normal AFW pump discharge valve is closed during surveillance testing.

- -

(2) This time period may be extended for up to 90 hours for the turbine driven AFW pump provided that the plant has not entered MODE 2 following a refueling outage.

(3) LCO 3.0.3 and all other LCO Required Actions requiring MODE changes are suspended until one AFW train is restored to OPERABLE status.

Attachment to Auxiliary Feedwater System
INSERT "C" (Continued)

SURVEILLANCE REQUIREMENTS (Continued)

4.7.1.2.1 Verify each AFW manual, power operated, and automatic valve in each water flow path, and in both steam supply flow paths to the steam turbine driven AFW pump, that is not locked, sealed, or otherwise secured in position, is in the correct position at least once per 31 days.(4)

4.7.1.2.2 Verify operability of each Service Water Auxiliary Supply valve by cycling each manual Service Water to Auxiliary Feedwater System valve through one complete cycle at least once per 31 days.

4.7.1.2.3 Verify, at the frequency specified in the Inservice Testing Program, on a STAGGERED TEST BASIS that the developed head of each AFW pump at the flow test point is greater than or equal to the required developed head as specified in the Inservice Testing Program. The provisions of Specification 4.0.4 are not applicable for entry into MODE 3 for the steam turbine driven pump testing.(5)

4.7.1.2.4 Verify each AFW automatic valve that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal at least once per 18 months.(6)

4.7.1.2.5 Verify each AFW pump starts automatically on an actual or simulated actuation signal at least once per 18 months.(5)(6)

4.7.1.2.6 Cycle each power operated (excluding automatic) valve in the flow path that is not testable during plant operation, through at least one complete cycle at least once per 18 months during shutdown.

4.7.1.2.7 Verify AFW flow from TK-210 to the Steam Generators with the AFW valves in their normal alignment.(7)

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(4) Reverify these requirements by a second and independent operator.

(5) Not required to be performed for the turbine driven AFW pump until 24 hours after establishing the minimum required secondary side steam pressure of greater than 600 psig.

(6) Not applicable in MODE 4.

(7) This surveillance is required to be performed prior to entry into MODE 2 whenever the plant has been in MODES 5 or 6 for greater than 30 continuous days.

DELETE

~~3/4.7~~ PLANT SYSTEMS

BASES

3/4.7.1.1 SAFETY VALVES (Continued)

X = Total relieving capacity of all safety valves per steam line in lbs/hour (4,242,375)

Y = Maximum relieving capacity of one safety valve in lbs/hour (848,475)

(AFW)

REPLACE WITH INSERT "D"

3/4.7.1.2 AUXILIARY FEEDWATER SYSTEM

The OPERABILITY of the Auxiliary Feedwater System ensures that the Reactor Coolant System can be cooled down to less than 350°F from normal operating conditions in the event of a total loss of offsite power.

Each electric driven auxiliary feedwater pump is capable of delivering a total feedwater flow of 350 gpm at a pressure of 1133 psig to the entrance of the steam generators. The steam driven auxiliary feedwater pump is capable of delivering a total feedwater flow of 700 gpm at a pressure of 1133 psig to the entrance of the steam generators. This capacity is sufficient to ensure that adequate feedwater flow is available to remove decay heat and reduce the Reactor Coolant System temperature to less than 350°F when the Residual Heat Removal System may be placed into operation.

3/4.7.1.3 PRIMARY PLANT DEMINERALIZED WATER (PPDW)

The OPERABILITY of the PPDW storage tank with the minimum water volume ensures that sufficient water is available to maintain the RCS at HOT STANDBY conditions for 9 hours with steam discharge to atmosphere.

3/4.7.1.4 ACTIVITY

The limitations on secondary system specific activity ensure that the resultant offsite radiation dose will be limited to a small fraction of 10 CFR Part 100 limits in the event of a steam line rupture. This dose also includes the effects of a coincident 0.35 gpm primary-to-secondary tube leak in the steam generator of the affected steam line. These values are consistent with the assumptions used in the accident analyses.

(Proposed Wording)

Attachment to Auxiliary Feedwater System
INSERT "D"

BACKGROUND

The AFW System automatically supplies feedwater to the steam generators to remove decay heat from the Reactor Coolant System upon the loss of normal feedwater supply. The AFW system consists of two motor driven pumps and one steam turbine driven pump. The pumps are equipped with independent recirculation lines to prevent pump operation against a closed system. Each motor driven AFW pump is powered from an independent Class 1E power supply and each pump feeds all three steam generators. The steam turbine driven AFW pump receives steam from at least two main steam lines upstream of the main steam isolation valves. Each of the steam feed lines will supply 100 percent of the steam requirements for the turbine driven AFW pump. The steam feed lines from each of the main steam lines contain two in-line series solenoid operated isolation valves. Downstream of the series isolation valves, the three lines combine to form one main header. The main header then supplies the turbine driven AFW pump.

The flow path from the demineralized water storage tank (TK-210) to the steam generators consists of individual supply lines to each of the three AFW pumps. Each motor driven AFW pump has an individual line that connects to its train related supply header. The turbine driven pump has an individual line that can be aligned to either the Train "A" or "B" supply header as necessary. Both the Train "A" and "B" supply headers each contain three normally open remotely operated valves arranged in parallel. Each of these valves then provides a flow path to one of the three common feedwater injection headers. Each of the feedwater injection headers then supplies its designated steam generator via the normal feedwater header downstream of the feedwater isolation valves. The steam generators function as a heat sink for core decay heat. The heat load is dissipated by releasing steam to the atmosphere from the steam generators via the main steam safety valves (MSSVs) or atmospheric dump valves (ADVs). If the main condenser is available, steam may be released via the steam valves.

The AFW System is capable of supplying feedwater to the steam generators during normal unit startup, shutdown, and hot standby conditions.

During a normal plant cooldown, one pump at full flow is sufficient to remove decay heat and cool the unit to residual heat removal (RHR) entry conditions. Thus, the requirement for diversity in motive power sources for the AFW System is met.

The AFW System is designed to supply sufficient water to the steam generator(s) to remove decay heat with steam generator pressure at the setpoint of the MSSVs. Subsequently, the AFW System supplies sufficient water to cool the unit to RHR entry conditions, with steam released through the ADVs.

BACKGROUND (Continued)

The AFW System actuates automatically on steam generator water level-low-low by the Engineered Safety Feature Actuation System (ESFAS). The system also actuates on loss of offsite power, safety injection, and trip of all operating main feedwater (MFW) pumps.

APPLICABLE SAFETY ANALYSES

The AFW System mitigates the consequences of any event with loss of normal feedwater.

The design basis of the AFW System is to supply water to the steam generator to remove decay heat and other residual heat by delivering at least the minimum required flow rate to the steam generators at pressures corresponding to the lowest steam generator safety valve set pressure plus 1%.

In addition, the AFW System must supply enough makeup water to replace steam generator secondary inventory lost as the unit cools to MODE 4 conditions. Sufficient AFW flow must also be available to account for flow losses such as pump recirculation and line breaks.

The limiting Design Basis Accident (DBA) for the AFW System is the small break loss of coolant accident (SBLOCA).

For a SBLOCA, the analyses are performed assuming loss of offsite power coincident with reactor trip with a limiting single active failure of the loss of one train of Emergency Core Cooling System (ECCS) on a failure to start of a diesel generator. The diesel failure is presumed to render one motor driven AFW pump inoperable, which results in one motor driven and one turbine driven AFW pump being operable.

The AFW System design is such that it can perform its function following a feedwater line break (FWLB) between the MFW isolation valves and containment, combined with a loss of offsite power following turbine trip, and a single active failure of the steam turbine driven AFW pump. Sufficient flow would be delivered to the two intact steam generators by the AFW pump(s). No pump runout occurs due to the cavitating venturis. The design bases flow to the intact steam generators during a feedwater line break can be delivered by either two motor driven, the turbine driven, or one motor driven and the turbine driven pump. The flow is delivered without operator action to isolate the break.

APPLICABLE SAFETY ANALYSES (Continued)

With one feedwater injection header inoperable, an insufficient number of steam generators are available to meet the feedline break analysis. This analysis assumes AFW flow will be provided to the two remaining intact feedwater lines. Should a feedline break occur on one of the operable feedwater headers with one feedwater injection header already inoperable, the plant could no longer meet its safety analysis.

The ESFAS automatically actuates the AFW turbine driven pump and associated power operated valves and controls when required to ensure an adequate feedwater supply to the steam generators during loss of power. Power operated valves are provided for each AFW line to control the AFW flow to each steam generator.

LCO

This LCO provides assurance that the AFW System will perform its design safety function to mitigate the consequences of accidents that could result in overpressurization of the reactor coolant pressure boundary. Three AFW pumps in three diverse trains are required to be OPERABLE to ensure the availability of RHR capability for all events accompanied by a loss of offsite power and a single failure. This is accomplished by powering two of the pumps from independent emergency buses. The third AFW pump is powered by a different means, a steam driven turbine supplied with steam from a source that is not isolated by closure of the main steam isolation valves (MSIVs).

The AFW System is configured into three trains. The AFW System is considered OPERABLE when the components and flow paths required to provide redundant AFW flow to the steam generators are OPERABLE. This requires that the two motor driven AFW pumps be OPERABLE in two diverse paths, each supplying AFW to each steam generator. The turbine driven AFW pump is required to be OPERABLE with redundant steam supplies from at least two of the three main steam lines upstream of the MSIVs, and shall be capable of supplying AFW to the steam generators via the designated train supply header. The piping, valves, instrumentation, and controls in the required flow paths also are required to be OPERABLE.

The LCO is modified by a note. Note (1) indicates that one AFW train (capable of providing flow to the steam generator[s] relied upon for heat removal), which includes a motor driven pump, is required to be OPERABLE in MODE 4. This is because of the reduced heat removal requirements and short period of time in MODE 4 during which the AFW may be required and the insufficient steam available in MODE 4 to power the turbine driven AFW pump.

APPLICABILITY

In MODES 1, 2, and 3, the AFW System is required to be OPERABLE in the event that it is called upon to function when the MFW is lost. In addition, the AFW System is required to supply enough makeup water to replace the steam generator secondary inventory lost as the unit cools to MODE 4 conditions.

In MODE 4, the AFW System may be used for heat removal via the steam generators.

In MODE 5 or 6, the steam generators are not normally used for heat removal, and the AFW System is not required.

ACTIONS

a. If one of the two steam supplies to the turbine driven AFW train is inoperable, action must be taken to restore OPERABLE status within 7 days. The 7 day completion time is reasonable, based on the following reasons:

1. The redundant OPERABLE steam supply to the turbine driven AFW pump;

2. The availability of redundant OPERABLE motor driven AFW pumps; and

3. The low probability of an event occurring that requires the inoperable steam supply to the turbine driven AFW pump.

The second completion time for Required Action a establishes a limit on the maximum time allowed for any combination of Conditions to be inoperable during any continuous failure to meet this LCO.

The 10 day completion time provides a limitation time allowed in this specified Condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Actions a and c are entered concurrently. The AND connector between 7 days and 10 days dictates that both completion times apply simultaneously, and the more restrictive must be met.

ACTIONS (Continued)

b. With one feedwater injection header inoperable in MODES 1, 2, or 3, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 4 within the following 6 hours.

The allowed completion times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

In MODE 4 with one feedwater injection header inoperable, operation is allowed to continue because only two steam generators are required to remove decay heat per LCO 3.4.1.3, "RCS-SHUTDOWN."

c. With one of the required AFW trains (pump or flow path) inoperable in MODE 1, 2, or 3 for reasons other than Actions a or b, action must be taken to restore OPERABLE status within 72 hours. This Condition includes the loss of two steam supply lines to the turbine driven AFW pump. The 72 hour completion time is reasonable, based on redundant capabilities afforded by the AFW System, time needed for repairs, and the low probability of a DBA occurring during this time period.

The second completion time for Required Action c establishes a limit on the maximum time allowed for any combination of Conditions to be inoperable during any continuous failure to meet this LCO.

The 10 day completion time provides a limitation time allowed in this specified Condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Actions a and c are entered concurrently. The AND connector between 72 hours and 10 days dictates that both completion times apply simultaneously, and the more restrictive must be met.

Required action c is modified by a note. Note (2) states that the completion time of 6 hours to reach HOT SHUTDOWN may be extended for an additional 90 hours for the turbine driven AFW pump provided that the plant has not entered MODE 2 following a refueling outage. This extension of the required completion time to reach MODE 4 from MODE 3 to 96 hours, allows additional time to complete any necessary repairs and/or testing of the turbine driven AFW pump prior to initiating a plant cooldown to MODE 4.

ACTIONS (Continued)

d. When two AFW trains are inoperable in MODE 1, 2, or 3 for reasons which may include the feedwater injection headers, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 4 within the following 6 hours.

The allowed completion times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

In MODE 4 with two AFW trains inoperable, operation is allowed to continue because only one motor driven pump AFW train is required in accordance with the Note (1) that modifies the LCO. Although not required, the unit may continue to cool down and initiate RHR.

e. If all three AFW trains are inoperable in MODE 1, 2, or 3 for reasons which may include the feedwater injection headers, the unit is in a seriously degraded condition with no safety related means for conducting a cooldown, and only limited means for conducting a cooldown with nonsafety related equipment. In such a condition, the unit should not be perturbed by any action, including a power change, that might result in a trip. The seriousness of this condition requires that action be started immediately to restore one AFW train to OPERABLE status.

Required Action e is modified by a Note (3) indicating that all required MODE changes or power reductions are suspended until one AFW train is restored to OPERABLE status. In this case, LCO 3.0.3 is not applicable because it could force the unit into a less safe condition.

f. With one required AFW train inoperable, action must be taken to immediately restore the inoperable train to OPERABLE status. The immediate completion time is appropriate due to the need to ensure that a safety related means of providing flow to the steam generator(s), for the purpose of core decay heat removal, is available.

SURVEILLANCE REQUIREMENTS (SR)

The Surveillance Requirements are modified by a General Note which requires that constant communications be established and maintained when any normal AFW pump discharge valve is closed during surveillance testing.

SR 4.7.1.2.1

Verifying the correct alignment for manual, power operated, and automatic valves in the AFW System water and steam supply flow paths provides assurance that the proper flow paths will exist for AFW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to locking, sealing, or securing. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position.

The 31 day frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions. Note (4) ensures valve position verification is reverified by a second and independent operator.

SR 4.7.1.2.2

Verifying the operability of each service water auxiliary supply valve by operating the valves through one complete cycle at least once per 31 days, ensures that an alternate water source will be available if the water volume in the demineralized water storage tank is depleted during system operation as a result of a DBA.

SR 4.7.1.2.3

Verifying that each AFW pump's developed head at the flow test point is greater than or equal to the required developed head ensures that AFW pump performance has not degraded during the cycle. The term "required developed head" refers to the value that is assumed in the AFW safety analysis for developed head at a flow point. This value for required developed head at a flow point is defined as the Minimum Operating Point (MOP) in the Inservice Testing Program. Flow and differential head are normal test parameters of centrifugal pump performance required by Section XI of the ASME Code. Because it is undesirable to introduce cold AFW into the steam generators while they are operating, this testing is normally performed on recirculation flow. This test confirms one point on the pump design

SURVEILLANCE REQUIREMENTS (SR) (Continued)

curve and is indicative of overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and detect incipient failures by indicating abnormal performance. Performance of inservice testing as required in the ASME Code, Section XI, satisfies this requirement.

This SR is modified by a Note (5) indicating that the SR should be deferred until suitable test conditions are established for testing the turbine driven AFW pump. This deferral is required because there is insufficient steam pressure to perform the test.

SR 4.7.1.2.4

This SR verifies that AFW can be delivered to the appropriate steam generator in the event of any accident or transient that generates an ESFAS, by demonstrating that each automatic valve in the flow path actuates to its correct position on the actual or simulated actuation signal. The 18 month Frequency is based on the need to perform this surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the surveillance were performed with the reactor at power. The 18 month Frequency is acceptable based on operating experience and the design reliability of the equipment.

This SR is modified by a Note (6) that states the SR is not required in MODE 4. In MODE 4, the heat removal requirements would be less providing more time for operator action to manually align the flow path.

SR 4.7.1.2.5

This SR verifies that the AFW pumps will start in the event of any accident or transient that generates an ESFAS by demonstrating that each AFW pump starts automatically on an actual or simulated actuation signal. The 18 month Frequency is based on the need to perform this surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the surveillance were performed with the reactor at power.

This SR is modified by two notes. Note (5) indicates that the SR be deferred until suitable test conditions are established for testing the turbine driven AFW pump. This deferral is required because there is insufficient steam pressure to perform the test. Note (6) states that the SR is not required in MODE 4. In MODE 4, the heat removal requirements would be less providing more time for operator action to manually start the required AFW pump.

SURVEILLANCE REQUIREMENTS (SR) (Continued)

SR 4.7.1.2.6

Cycling each power operated valve (excluding automatic) in the flow path that is not testable during plant operation, ensures that the valves will function when required. The 18 month Frequency is based on the need to perform this surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the surveillance were performed with the reactor at power.

SR 4.7.1.2.7

This SR verifies that the AFW is properly aligned by verifying the flow from TK-210 to the steam generators prior to entering MODE 2 after more than 30 continuous days in MODE 5 or 6 per Note (7). OPERABILITY of AFW flow paths must be verified before sufficient core heat is generated that would require the operation of the AFW System during a subsequent shutdown. The Frequency is reasonable, based on engineering judgement and other administrative controls that ensure that flow paths remain OPERABLE. To further ensure AFW System alignment, flow path OPERABILITY is verified following extended outages to determine no misalignment of valves has occurred. This SR ensures that the flow path from the TK-210 to the steam generators is properly aligned.

ATTACHMENT B

Beaver Valley Power Station, Unit Nos. 1 and 2
Proposed Technical Specification Change No. 213 and 80
REVISION OF TECHNICAL SPECIFICATIONS RELATED TO
AUXILIARY FEEDWATER SYSTEM AND ASSOCIATED BASES

A. DESCRIPTION OF AMENDMENT REQUEST

The proposed amendment would revise Table 3.3-3, titled "Engineered Safety Feature Actuation System Instrumentation," Item 7.c for Beaver Valley Power Station (BVPS) Unit No. 1 and Item 7.d for BVPS Unit No. 2 to reflect that a Safety Injection (SI) signal starts all Auxiliary Feedwater (AFW) pumps. For BVPS Unit No. 1, the note on page 3/4 3-27a, Table 3.3-5, titled "Engineered Safety Features Response Times," would be revised to state that the response time is for all AFW pumps on all SI signal starts. For BVPS Unit No. 2, Table 3.3-4, titled "Engineered Safety Features Actuation System Instrumentation Trip Setpoints," Item 7.d and Table 4.3-2, titled "Engineered Safety Feature Actuation System Instrumentation Surveillance Requirements," Item 7.d would be revised to reflect that an SI signal starts all AFW pumps.

The proposed amendment would revise Limiting Condition for Operation (LCO) 3.7.1.2, titled "Auxiliary Feedwater System" to more closely resemble the wording contained in NUREG-1431, Rev. 0, titled "Standard Technical Specifications for Westinghouse Plants" (ISTS). Specifically, the LCO would require three AFW trains to be operable and state what each operable train must consist of to be considered operable. The Mode Applicability would be revised to include plant operational Mode 4 when the steam generator(s) is relied upon for heat removal. The proposed LCO would contain a footnote. Footnote (1) would state that only one AFW train (capable of providing flow to the steam generator[s] relied upon for heat removal), which includes a motor driven pump, is required to be operable in Mode 4.

A new action statement "a" would limit plant operation to 7 days with one of the two steam supplies to the turbine driven AFW pump inoperable. A new action statement "b" would require that the unit be placed in Mode 4 within 12 hours of declaring one feedwater injection header inoperable. For BVPS Unit No. 1, the existing action statements "a" and "b" would be modified and combined into the proposed action statement "c." For BVPS Unit No. 2, the existing action statement "a" would be modified to include the requirement to realign the two remaining AFW pumps to separate headers within two hours if both train supply headers are operable. Proposed action statement "d" replaces the current action statement "c" for BVPS Unit No. 1 and the current action statement "b" for BVPS Unit No. 2. Proposed action "d" requires a plant shutdown to Mode 4 when two AFW trains are inoperable.

Proposed action statement "e" is consistent with the requirements contained in the current action statement "d" for BVPS Unit No. 1 and the current action statement "c" for BVPS Unit No. 2. The proposed action statement "e" would be modified by footnote (3)

which requires LCO 3.0.3 and all other LCO required actions requiring Mode changes be suspended until one AFW train is restored to operable status. Proposed action statement "f" states new required actions to be taken when the required AFW train is inoperable in Mode 4.

The existing surveillance requirements (SR) would be reformatted to more closely resemble the surveillance requirements contained in ISTS. A new General Note would replace the existing SR 4.7.1.2.b.3 for BVPS Unit No. 1 and SR 4.7.1.2.a.4 for BVPS Unit No. 2. The existing SR 4.7.1.2.b.1 (Unit No. 1) and SR 4.7.1.2.a.2 (Unit No. 2) would become SR 4.7.1.2.1, and would be modified to include both steam supply flow paths. This SR would contain a new footnote (4). This footnote contains the requirements contained in the existing SR 4.7.1.2.b.2 (Unit No. 1) and SR 4.7.1.2.a.3 (Unit No. 2). Therefore, these two surveillance requirements would be deleted. The existing SR 4.7.1.2.b.4 (Unit No. 1) and SR 4.7.1.2.a.5 (Unit No. 2) would be renumbered and become SR 4.7.1.2.2. For BVPS Unit No. 1, the existing SR 4.7.1.2.a would become SR 4.7.1.2.3. This SR would be modified by deleting the words "When tested pursuant to Specification 4.0.5." A new requirement to test the pumps at the frequency specified in the Inservice Testing Program would be added to this surveillance requirement. A new footnote (5) would be added to proposed SR 4.7.1.2.3 which would allow testing of the turbine driven AFW pump to be delayed for 24 hours once the minimum required secondary side steam pressure has been established. For BVPS Unit No. 2, the existing SR 4.7.1.2.a would be replaced with a new SR 4.7.1.2.3. This new SR reflects the same wording that is proposed for BVPS Unit No. 1's SR 4.7.1.2.3. The existing SR 4.7.1.2.d.2 (Unit No. 1) and SR 4.7.1.2.c.2 (Unit No. 2) would be modified and become proposed SR 4.7.1.2.4. The proposed modifications to SR 4.7.1.2.d.2 (Unit No. 1) and SR 4.7.1.2.c.2 (Unit No. 2) would include adding an exception to actuating automatic AFW valves which are locked, sealed, or otherwise secured in position. In addition, a new footnote (6) would state that this surveillance requirement is not applicable in Mode 4. The existing SR 4.7.1.2.d.3 (Unit No. 1) and SR 4.7.1.2.c.3 (Unit No. 2) would become proposed SR 4.7.1.2.5 and be modified by two footnotes. The two new footnotes were previously discussed in reference to proposed SR 4.7.1.2.3 and 4.7.1.2.4. The existing SR 4.7.1.2.d.1 (Unit No. 1) and SR 4.7.1.2.c.1 (Unit No. 2) would be renumbered and become SR 4.7.1.2.6. For BVPS Unit No. 1, existing SR 4.7.1.2.c would be renumbered and become SR 4.7.1.2.7. The existing footnote (2) would be renumbered to become proposed footnote (7). For BVPS Unit No. 2, existing SR 4.7.1.2.b would be modified to reflect the wording presently contained in SR 4.7.1.2.c for BVPS Unit No. 1 and renumbered to become proposed SR 4.7.1.2.7.

The Bases section for 3/4.7.1.2, titled "Auxiliary Feedwater System" would be expanded to reflect the applicable wording contained in ISTS.

For BVPS Unit No. 1 only, table notation (2) for Table 4.3-6 titled, "Remote Shutdown Panel Monitoring Instrumentation Surveillance Requirements" and table notation (1) for Table 4.3-7, titled "Accident Monitoring Instrumentation Surveillance Requirements," would be revised to reference SR 4.7.1.2.7 instead of SR 4.7.1.2.c.

For BVPS Unit No. 2 only, table notation (4) for Table 4.3-2, titled "Engineered Safety Feature Actuation System Instrumentation Surveillance Requirements," would be revised to reference Specification 3.7.1.2 instead of Specification 4.7.1.2. Table notation (1) for Table 4.3-6, titled "Remote Shutdown Monitoring Instrumentation Surveillance Requirements," and the table notation designated by a single asterisk for Table 4.3-7, titled "Accident Monitoring Instrumentation Surveillance Requirements," would be revised to reference SR 4.7.1.2.7 instead of SR 4.7.1.2.b.

For BVPS Unit No. 1 only, Index Page XII would be revised to reflect the title of Specification 3/4.7.1.2 and the shifting of text due to the addition of wording to the Bases section. This change is editorial in nature and does not affect plant safety.

B. BACKGROUND

The AFW system automatically supplies feedwater to the steam generators to remove decay heat from the Reactor Coolant System upon the loss of normal feedwater supply. The AFW system consists of two motor driven pumps and one steam turbine driven pump. The pumps are equipped with independent recirculation lines to prevent pump operation against a closed system. Each motor driven AFW pump is powered from an independent Class 1E power supply and each pump feeds all three steam generators. The steam turbine driven AFW pump receives steam from at least two main steam lines upstream of the main steam isolation valves. Each of the steam feed lines will supply 100 percent of the steam requirements of the turbine driven AFW pump. For BVPS Unit No. 1, each steam feed line from each of the main steam lines combines to form one main header. The main header then splits into two parallel paths with one Train "A" operated and one Train "B" operated isolation valve on each pathway. These two parallel paths then combine into one header which supplies the turbine driven AFW pump. For BVPS Unit No. 2, each steam feed line from each of the main steam lines contain two in-line series solenoid operated isolation valves. Downstream of the series isolation valves, the three lines combine to form one main header. The main header then supplies the turbine driven AFW pump.

The flow path from the demineralized water storage tank (WT-TK-10 for Unit No. 1 and TK-210 for Unit No. 2) to the steam generators consists of individual supply lines to each of the three AFW pumps. Each motor driven AFW pump has an individual line that

connects to its train related supply header. The turbine driven AFW pump has an individual line that can be aligned to either the Train "A" or "B" supply header as necessary. Both the Train "A" and "B" supply headers each contain three normally open remotely operated valves arranged in parallel. Each of these valves then provides a flow path to one of the three common feedwater injection headers. Each of the feedwater injection headers then supplies its designated steam generator via the normal feedwater header downstream of the feedwater isolation valves.

The AFW pumps for BVPS Unit No. 2 are equipped with minimum flow recirculation lines which include orifices large enough to ensure that the pumps will not overheat when run with all other flow paths closed. This minimum flow was the basis for the current pump developed differential pressure specified in SR 4.7.1.2.a.

The value for pump developed differential pressure specified in the current wording for SR 4.7.1.2.a for BVPS Unit No. 2 is derived by first determining the minimum operating point (MOP) for the required pump head and flow as assumed in applicable safety analysis for the AFW pumps. Once the MOP is determined, a value for pump developed differential pressure is determined for the full recirculation conditions specified in SR 4.7.1.2.a by following the shape of pump performance curve of record from the MOP to that specific point on the curve. Once this value for pump developed differential pressure for full recirculation conditions has been determined and incorporated into SR 4.7.1.2.a, the pump(s) must always be run at this test point for the purpose of demonstrating pump operability.

C. JUSTIFICATION

The proposed changes to Tables 3.3-3 and 3.3-5 for BVPS Unit No. 1 and Tables 3.3-3, 3.3-4, and 4.3-2 for BVPS Unit No. 2 to reflect the start of the steam turbine driven AFW pump on an SI signal is necessary to support the small break Loss of Coolant Accident (LOCA) analyses which were revised as part of analyses to reflect an increased steam generator tube plugging limit on both units. The SI start of the steam turbine driven AFW pump on SI signal is part of current BVPS plant design. This change to the previous plant design, to include this start feature on an SI, was accomplished under the 10 CFR 50.59 process during plant modifications made during the 1993 operating cycle. The Updated Final Safety Analysis Report (UFSAR) Chapter 14 (Unit 1) and Chapter 15 (Unit 2) small break LOCA analysis is based on feedwater flow from one motor driven and from one turbine driven pump. The turbine driven pump, prior to the addition of a start signal from an SI, received a start signal from a steam generator Lo-Lo water level and on a reactor coolant pump (RCP) bus undervoltage. The analysis performed in 1993 to support an increase in the steam generator tube plugging limit originally

assumed the turbine driven AFW pump started on undervoltage. Since the undervoltage detector design was found not to be IEEE-279 qualified, it was necessary to initiate the automatic start of the turbine driven AFW pump upon receipt of an SI signal. The 1993 analysis for increased steam generator tube plugging was then revised, prior to implementation, to reflect the start of the turbine driven AFW pump on an SI signal. The 50.59 review performed as part of this design change determined no unreviewed safety question existed as a result of this plant modification. The BVPS Unit No. 1 and Unit No. 2 UFSARs currently reflect that the turbine driven pump starts on an SI signal.

The proposed changes to LCO 3.7.1.2 will clarify the specific components which are required to be operable. These changes will also make the LCO wording more closely resemble ISTS which is based on the concept of three trains being operable. The revisions to the LCO wording will allow the required actions and associated Bases contained in ISTS to be incorporated as close as possible into the specifications for BVPS Unit Nos. 1 and 2. The specific electrical power requirements, i.e., separate emergency busses, has been relocated to the Bases section. This change is consistent with ISTS.

The proposed LCO wording would require three trains which consist of a flow path from the demineralized water storage tank WT-TK-10 (Unit 1) and TK-210 (Unit 2) through an AFW pump to each feedwater injection header via the train related supply header. Since BVPS Unit Nos. 1 and 2 do not have three separate headers to each steam generator, unlike some other Westinghouse plants, it is necessary to specify what comprises each of the three trains. Since the turbine driven AFW pump will be aligned to either the "A" or "B" train supply header depending on the other AFW equipment availability, the words "designated train" are required to be used in the LCO wording in reference to the turbine driven AFW pump. In addition, the words "capable of being powered from two steam supplies" have been added to designate that two steam supplies are required. This requirement will ensure that adequate redundancy of steam supplies are available to power the steam driven AFW pump. The proposed LCO is modified by footnote (1) indicating that one AFW train (capable of providing flow to the steam generator[s] relied upon for heat removal), which includes a motor driven pump, is required to be operable in Mode 4. This new footnote is necessary since the Mode Applicability has been modified to include Mode 4. In Mode 4, there is insufficient steam available to power the turbine driven AFW pump, therefore this pump is excluded from the LCO requirements. Since other means are available, such as Residual Heat Removal System to remove core decay heat and due to reduced heat removal requirements, it is sufficient to require only one train of AFW while in Mode 4 when the steam generator(s) is relied upon for heat removal. A

clarification has been added to proposed footnote (1). The words "capable of providing flow to the steam generator[s] relied upon for heat removal" were incorporated into footnote (1) to clearly state that a flow path is only required to the steam generators used for heat removal. This additional wording is justified since there is no reason to require AFW flow be provided to steam generator(s) which are not used for decay heat removal.

The addition of proposed item "d" to the LCO wording is necessary to reflect that all three AFW pumps feed into one specific feedwater injection header for each steam generator. Therefore, employing the concept of three trains, each feedwater injection header can be considered an individual train.

The Mode applicability has been modified to include Mode 4 when the steam generator(s) is relied upon for heat removal. This addition is necessary to ensure that a safety related means is available in Mode 4 to supply enough makeup water to replace the steam generator secondary side inventory lost as the unit cools to Mode 5 conditions.

The proposed action statements have been modified to include a specific action when one of the two steam supplies to the turbine driven AFW pump is inoperable. The 7 day completion time is justified based on the fact that the redundant steam supply is operable, the availability of the two operable motor driven AFW pumps, and the low probability of an event occurring that requires the inoperable steam supply to the turbine driven AFW pump. The 10 day completion time establishes a limit on the maximum time allowed for any combination of action statement entries due to inoperable equipment for which there is a continuous failure to meet LCO 3.7.1.2. Therefore, this statement limits the maximum time period to 10 continuous days from the point in time when this LCO was initially not met. The requirement to place the plant in Hot Standby within the next 6 hours and Hot Shutdown within the following 6 hours is consistent with the current action statements' requirements.

Proposed action statement "b" will ensure that the unit is placed in Mode 4 when one feedwater injection header is inoperable. With one feedwater injection header inoperable, an insufficient number of steam generators are available to meet the feedline break analysis. This analysis assumes AFW flow will be provided to the two remaining intact feedwater lines. Should a feedline break occur on one of the operable feedwater headers with one feedwater injection header already inoperable, the plant could no longer meet its safety analysis. Therefore, proposed action statement "b" is required to place additional restrictions on plant operation than would be required under proposed action statement "c" that allows plant operation for 72 hours with one AFW train inoperable.

Proposed action statement "c" is consistent with the allowable outage time of 72 hours with one AFW pump inoperable that is contained in the current action statement "a." For BVPS Unit No. 1, the current action statement "b" has been incorporated into proposed action statement "c" since this action is more relevant to the condition where one AFW pump is inoperable than as a stand alone action. For BVPS Unit No. 2, this same action to realign two AFW pumps to separate train supply headers would be added to proposed action statement "c" to ensure that each operable train related supply has one pump aligned to it to provide flow. This will ensure adequate redundancy is maintained when one motor driven AFW pump is declared inoperable. The proposed footnote (2), which applies to action statement "c," is necessary since the turbine driven AFW pump cannot be performance tested for the purpose of demonstrating pump operability until the plant is in Mode 3. During a refueling outage, AFW pump inspections, overhauls, and necessary adjustments are typically performed. These maintenance activities could affect pump operability. Both BVPS Unit Nos. 1 and 2 have requested and were granted waivers of compliance from being required to cooldown to Mode 4 when the turbine driven AFW pump was inoperable. In both cases, repairs to the turbine driven AFW pump were performed in Mode 3 and required longer than 72 hours which is the current allowable outage time. Turbine driven AFW pump inoperability generally occurs only after a refueling outage. The pump is tested in Mode 3 when secondary side steam pressure is above 600 psig. If the specific problem cannot be resolved in the 72 hours allowable outage time, then the plant must be cooled down to Mode 4. Additional corrective actions to resolve the pump problem are then performed. The plant must then enter Mode 3 with 600 psig steam pressure in order to test the pump. With the proposed footnote (2), if this situation occurs, then the plant will have to cooldown only after a seven day period from the initial time of turbine driven AFW pump inoperability. An additional 90 hours would be permitted to resolve any pump performance problems and retest the pump. This additional time should be sufficient to resolve turbine driven AFW pump inoperability concerns and avoid a plant thermal cycle.

The two motor driven AFW pumps can be tested and determined to be operable while the plant is in Mode 5 which is outside of the Mode applicability for LCO 3.7.1.2. The time period to repair the motor driven AFW pumps is unlimited in Mode 5. For this reason, footnote (2) is not being applied for the motor driven AFW pumps. Therefore, footnote (2) would reduce the amount of thermal cycling of the plant when the turbine driven AFW pump is inoperable.

Proposed action statements "d" and "e" are consistent with the current action statements for two and three AFW pumps inoperable with the following two exceptions. The proposed action statements reflect the addition of wording contained in proposed

action "a." Since the turbine driven AFW pump is still capable of providing the required flow rate to the steam generators with one of the two steam supplies inoperable, this pump can be considered operable for a limited time period (7 days). Therefore, the loss of one steam supply does not constitute the conditions applicable under actions "d" and "e." Proposed action "e" has been modified by footnote (3). This footnote indicates that all required mode changes or power reductions are suspended until one AFW train is restored to operable status. This footnote is necessary to minimize the possibility of a plant trip by not requiring a power change. The plant is in a seriously degraded condition with no safety related means for conducting a cooldown and only limited means for conducting a cooldown with nonsafety related equipment.

Proposed action statement "f" provides guidance for the loss of the single train of AFW while in Mode 4. When the steam generators are relied upon in lieu of the residual heat removal system, the loss of one AFW train will require immediate action to restore a safety related means of providing flow to the steam generators for the purpose of core decay heat removal. The ability to remove core decay heat via the steam generators can still be accomplished in this condition by use of normal feedwater makeup to the steam generators. LCO 3.4.1.3 provides guidance of appropriate actions should the steam generator heat removal capability be lost. Therefore, the immediate action time is appropriate in this condition.

The proposed General Note under the surveillance requirements reflects the wording contained in the current surveillance requirement to maintain constant communications. The proposed General Note will ensure this required action is performed, in Modes 1, 2, 3 or 4, during any of the required surveillance tests whether they are performed on a 31 day, 92 day, or 18 month frequency. The current requirement is listed only under the 31 day frequency.

Proposed SR 4.7.1.2.1 will continue to verify that each valve in the AFW water and steam flow paths, that are not locked, sealed, or otherwise secured in position, are in the correct position at least once per 31 days. This surveillance is modified by footnote (4). This footnote contains the requirements which are specified in the current surveillance requirements related to independent verification. These requirements are better suited as a footnote on the surveillance requirements to which they pertain.

For BVPS Unit No. 1, the proposed SR 4.7.1.2.3 contains the same wording as currently stated in SR 4.7.1.2.a with the following two exceptions. The words "tested pursuant to Specification 4.0.5" have been replaced with "at the frequency specified in the Inservice Testing Program, on a STAGGERED TEST BASIS." The

proposed change is consistent with the intent of Generic Letter (GL) 93-05, "Line-Item Technical Specification Improvement to Reduce Surveillance Requirements for Testing During Power Operation," dated September 27, 1993. GL 93-05 permits AFW pump testing to be conducted on a 92 day frequency. The current ASME XI requirements, which are reflected in the Inservice Testing (IST) Program, also specify a 92 day test frequency. This change is editorial in nature for BVPS Unit No. 1 since the requirements of Specification 4.0.5 reflect the same requirements specified in the IST Program. They are both based on ASME XI. Therefore, there will be no change to the current BVPS Unit No. 1 test frequency for the AFW pumps as a result of this proposed change. The proposed addition of footnote (5), which provides for the 24 hour surveillance deferral once secondary side steam pressure reaches greater than 600 psig, allows the plant to be placed in a stable condition suitable for turbine driven AFW pump testing. It also provides guidance on what is the time constraint to successfully complete AFW pump testing once proper conditions have been established.

For BVPS Unit No. 2, the proposed SR 4.7.1.2.3 would permit the testing frequency of the AFW pumps to become quarterly testing instead of the current monthly test frequency. This change from monthly to quarterly is consistent with the intent of Generic Letter 93-05 and ASME XI. Current cycle operating and testing experience has indicated that monthly performance testing of the AFW pumps is not necessary to adequately ensure the pumps will perform their intended function. The quarterly test frequency should reduce the AFW system unavailability since the number of times per year that an AFW pump is unavailable due to closing of the pump discharge valve for routine surveillance testing will be reduced by a factor of three per pump.

The proposed change to SR 4.7.1.2.a for BVPS Unit No. 2 would delete the reference to a specific test point for the purpose of demonstrating pump operability. The proposed wording allows the AFW pumps to be tested at a specific reference value required by the IST Program. The curve which will define whether the AFW pumps develop the specific head and flow required to meet safety analyses at a specific reference value will be the individual MOP curve for each AFW pump. Each MOP curve is currently contained in the IST Program and controlled in accordance with program requirements. Future changes to these MOP curves, if this amendment request is approved, will be made as necessary through the 10 CFR 50.59 process and will be sent to the Nuclear Regulatory Commission (NRC) as part of 10 CFR 50.59 reporting requirements and selected updates to the IST Program. This will reduce the need to submit a request for a technical specification change on this surveillance requirement due to changes in plant analyses or changes in pump performance characteristics due to pump overhaul. This is consistent with ISTS. It should be noted that this same concept of not specifying a test point in the

surveillance requirement is consistent with what was previously approved for BVPS Unit No. 1 AFW pump testing by Amendment No. 171.

The proposed change to the current SR 4.7.1.2.a for BVPS Unit No. 2 will also allow the AFW pumps to be tested for the purposes of satisfying this surveillance requirement at full flow conditions as plant conditions allow. Full flow pump testing is similar to conditions when the pump(s) are performing their safety function. With the current wording contained in SR 4.7.1.2.a, the AFW pumps must be run in full recirculation conditions since the surveillance specifies only one flow test point. In certain cases, the AFW pump testing must be performed more than once per specific surveillance interval due to the specific test conditions which must be met when performing the current SR 4.7.1.2.a. With the proposed wording of SR 4.7.1.2.3 when an AFW pump is running in full recirculation or full flow conditions, SR 4.7.1.2.3 can be performed as necessary at that flow condition. This will result in less AFW pump running time for the purpose of satisfying SR 4.7.1.2.3. AFW pump run time and wear would be reduced due to this added testing flexibility.

The addition of footnote (5) to proposed SR 4.7.1.2.3 for BVPS Unit No. 2 is justified for the same reasons as described previously for BVPS Unit No. 1.

Proposed SR 4.7.1.2.4 is consistent with the current surveillance requirement with the exception that automatic valves which are locked, sealed, or otherwise secured in position would be exempt from this surveillance requirement. It is not necessary to verify an automatic valve which cannot change position actuates to the correct position. In addition, SR 4.7.1.2.4 is modified by footnote (6). This footnote is necessary to denote that automatic actuation is not required in Mode 4. The heat removal requirements are less in Mode 4 providing more time for operator action to manually align the required AFW pump than in Modes 1, 2, and 3. This is consistent with the Residual Heat Removal (RHR) system operability requirements in Mode 4 where manual operator action is required to initiate system operation. Therefore, the automatic actuation is not required.

Proposed SR 4.7.1.2.5 is consistent with the current surveillance requirement with the exception that it is modified by footnotes (5) and (6). The bases for addition of these two footnotes is as previously stated for SR 4.7.1.2.3 and SR 4.7.1.2.4. Proposed SR 4.7.1.2.6 is consistent with the current surveillance requirement. SR 4.7.1.2.7 is consistent with the current surveillance requirement for BVPS Unit No. 1. For BVPS Unit No. 2, the proposed SR 4.7.1.2.7 is consistent with the current surveillance requirement with the exception that the words "Following a plant outage of 30 days or greater" have been modified and incorporated into footnote (7). The proposed

footnote (7) would clarify that this surveillance requirement applies when the plant is in Mode 5 or 6 for greater than 30 continuous days and must be performed prior to entry into Mode 2. The existing wording only states the surveillance is applicable following an extended plant outage and does not define what length of time an extended plant outage involves. The proposed wording will clearly specify when this surveillance must be performed and is consistent with ISTS.

The proposed revision to the table notations for Tables 4.3-6 and 4.3-7 to reference SR 4.7.1.2.7 is necessary since the surveillance requirements contained in the proposed LCO 3.7.1.2 were renumbered. The surveillance requirement will continue to be referenced in these two tables. Therefore, this change is editorial in nature and does not affect plant safety.

For BVPS Unit No. 2 only, the proposed revision to table notation (4) contained in Table 4.3-2 is necessary since the specific SR number 4.7.1.2 has been deleted. The proposed reference to Specification 3.7.1.2 will make this table notation reference consistent with two other references to Specification 3.7.1.2. These two references are contained in table notation (3) of Table 3.3-3, titled "Engineered Safety Feature Actuation System Instrumentation," and the table notation designated by a single asterisk in Table 3.3-4, titled "Engineered Safety Features Actuation System Instrumentation Trip Setpoints." These two table notations both reference the fact that manual initiation of AFW is included in Specification 3.7.1.2. Therefore, this proposed change will make the wording contained in table notation (4) consistent with the two other table notations which reference Specification 3.7.1.2. This change is editorial in nature and does not affect plant safety since the surveillance requirement currently referenced in table notation (4) is part of Specification 3.7.1.2.

D. SAFETY ANALYSIS

The proposed revisions to reflect that an SI signal starts the turbine driven AFW pump, in addition to both motor driven AFW pumps, will ensure that plant operability requirements for the AFW system actuation signals are maintained at a level consistent with the current safety analyses. The current small break LOCA analysis assumes the start of both the motor driven and turbine driven AFW pumps on an SI signal. Therefore, the proposed addition of the SI start signal for the turbine driven AFW pump will reflect the current plant design and maintain the level of plant safety consistent with safety analyses.

The proposed revisions to LCO 3.7.1.2 will ensure that three AFW pumps with their respective flow paths are operable in Modes 1, 2, and 3. A sufficient level of redundancy will therefore be

maintained to ensure that the AFW system mitigates the consequences of a Design Basis Accident (DBA) with a loss of normal feedwater. The addition of the Mode 4 applicability, when the steam generator(s) is relied upon for heat removal, will ensure that a safety related source of cooling water is available to remove decay heat.

Proposed action statement "a" will limit plant operation to seven days when one of the two steam supplies to the turbine driven AFW pump is inoperable. During this seven day period, the turbine driven AFW pump will still be capable of performing as assumed in the safety analyses.

Proposed action statement "b" will ensure that the plant is placed in Mode 4 when the number of operable feedwater injection headers is insufficient to ensure that at least two steam generators are supplied during a feedline break accident. The feedline break analyses assumes at least two steam generators are supplied during this event.

Proposed action statement "c" will limit plant operation to 72 hours with one AFW train inoperable. Based on the redundant capabilities of the two remaining trains of AFW, the system will still be capable of providing sufficient flow to remove core decay heat should a DBA occur during this time period assuming no single active failures. Aligning the two remaining AFW pumps to separate headers will ensure that adequate redundancy is maintained when one motor driven AFW pump is inoperable.

The proposed addition of footnote (2) to action statement "c" will limit plant thermal cycles following a refueling outage due to turbine driven AFW pump inoperability. The extension of the required completion time to reach Mode 4 from Mode 3 to 96 hours, allows additional time to complete any necessary repairs and/or testing on the turbine driven AFW pump prior to completing a plant cooldown to Mode 4. Since there is negligible decay heat following a refueling outage, the extension of the action time requirement by 90 hours has minimal effect on plant safety. The two remaining motor driven AFW pumps can provide sufficient flow to mitigate the consequences of a DBA assuming no single failure during this time period. In addition, since this footnote only applies prior to the plant going critical following a refueling outage, the potential radioactivity releases due to the uncontrolled heatup of reactor coolant system are enveloped by the releases postulated in the DBA LOCA analysis in the UFSAR. The DBA LOCA analysis assumes 102% power operation prior to the event and assumes that a core melt occurs. Therefore, there is no increase in the radiological consequences as a result of allowing additional time to repair/test the turbine driven AFW pump.

The addition of footnote (3) to proposed action statement "e" will minimize the possibility of a plant transient for the period of time when no safety related means for conducting a plant cooldown are available. Proposed action statement "f" will ensure that immediate actions are initiated to restore a safety related means of providing cooling water to the steam generator(s) in Mode 4 when it is relied upon for heat removal.

For BVPS Unit No. 2, the AFW pumps will continue to be tested in a manner and at a frequency which will demonstrate that they will deliver sufficient feedwater to the steam generators to remove decay heat from the reactor coolant system upon the loss of normal feedwater supply. The proposed changes to current SR 4.7.1.2 will not affect the ability of the AFW system to perform this function. Changes to the AFW pump head and flow requirements will be made under the 10 CFR 50.59 process and controlled under the IST Program administrative requirements. Allowable pump degradation will continue to be limited by the ASME Boiler and Pressure Vessel Code Section XI requirements or the pump MOP which is based on accident analysis assumptions, whichever is more limiting. Therefore, changes to these specific pump parameters will be controlled under a process which will continue to ensure safe plant operation. The added flexibility of allowing the AFW pumps to be run at IST Program controlled flow conditions for the purposes of satisfying the current SR 4.7.1.2.a will reduce the times the pumps are run on recirculation flow and total pump running time. This will reduce pump wear as a result of these two factors. The proposed change to allow testing, at the frequency specified in the IST Program, of the AFW pumps is adequate to ensure that the pumps are capable of performing their intended function. The reduction in test frequency of the AFW pumps at power has been examined and accepted by the NRC staff in Generic Letter 93-05, Item 9.1. The staff found that while the majority of testing at power is important, safety can be improved, equipment degradation decreased, and an unnecessary burden on personnel resources eliminated by reducing the amount of testing at power that is required by technical specifications.

Therefore, this change is considered safe based on the fact that the AFW pumps will continue to perform as assumed in the safety analysis to automatically deliver the required flow to the steam generators in order to remove decay heat from the reactor coolant system.

E. NO SIGNIFICANT HAZARDS EVALUATION

The no significant hazard considerations involved with the proposed amendment have been evaluated, focusing on the three standards set forth in 10 CFR 50.92(c) as quoted below:

The Commission may make a final determination, pursuant to the procedures in paragraph 50.91, that a proposed amendment to an operating license for a facility licensed under paragraph 50.21(b) or paragraph 50.22 or for a testing facility involves no significant hazards consideration, if operation of the facility in accordance with the proposed amendment would not:

(1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or

(2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or

(3) Involve a significant reduction in a margin of safety.

The following evaluation is provided for the no significant hazards consideration standards.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

The proposed revisions to reflect that a Safety Injection (SI) signal starts the turbine driven Auxiliary Feedwater (AFW) pump, in addition to both motor driven AFW pumps, will ensure that plant operability requirements for the AFW system actuation signals are maintained at a level consistent with current safety analyses. The proposed revisions to Limiting Condition for Operation (LCO) 3.7.1.2 will require that the AFW pumps and associated flow paths are maintained operable to ensure that the AFW system can mitigate the consequences of a Design Basis Accident (DBA) with a loss of normal feedwater. The addition of the Mode 4 applicability will ensure that a safety related source of cooling water is available to remove decay heat.

The proposed change will ensure that the plant is placed in Mode 4 when the number of operable feedwater injection headers is insufficient to ensure that at least two steam generators are supplied during a feedline break accident.

The proposed addition of footnote (2) to action statement "c" will limit plant thermal cycles following a refueling outage due to turbine driven AFW pump inoperability. During the additional time period provided by footnote (2) to reach Hot Shutdown, the two remaining motor driven AFW pumps will provide sufficient flow to the steam generators to mitigate the consequences of a DBA assuming no single failures during this time period. Since there is negligible decay heat following a refueling outage prior to entry into Mode 2, the performance capabilities of the two remaining motor driven AFW pumps to remove decay heat will not be challenged.

Changing the AFW pump surveillance test frequencies for Beaver Valley Power Station (BVPS) Unit No. 2 to quarterly, as specified in the Inservice Testing (IST) Program, will continue to assure that the AFW system will be capable of performing its intended functions.

The proposed change to the current Surveillance Requirement 4.7.1.2, for BVPS Unit No. 2 only, will not lower the pump performance operability criteria for the AFW pumps. The required values for developed pump head and flow will continue to satisfy accident mitigation requirements and will be maintained and controlled in the BVPS Unit No. 2 IST Program. Future changes to the AFW pump head and flow requirements will be made under the 10 CFR 50.59 process to ensure that the AFW design requirement to remove sufficient decay heat continues to be met.

Based on the above factors, the probability of an accident previously evaluated is not significantly increased.

The proposed changes do not affect the ability of the AFW system to perform as assumed in the safety analyses. The proposed changes will not result in any additional challenges to plant equipment. Because the plant design limits will continue to be met, the fuel and reactor coolant system pressure boundary integrity is not challenged for the assumptions employed in the calculation of the offsite radiological doses. The additional time to reach Mode 4 from Mode 3 provided by footnote (2) does not result in increased radiological consequences. The potential for a radioactivity release due to the uncontrolled heatup of reactor coolant system are enveloped by the releases postulated in the DBA Loss of Coolant Accident (LOCA) analysis in the Updated Final Safety Analysis Report. The DBA LOCA analysis assumes 102% power operation prior to the event and assumes that core melt occurs. Therefore, there is no increase in the radiological consequences as a result of allowing additional time to repair/test the turbine driven AFW pump. Hence, the consequences of a DBA previously evaluated is not significantly increased.

Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed change does not alter the method of operating the plant. The AFW system is an accident mitigation system and is normally in standby. System operation is initiate in response to a DBA. The AFW pumps will continue

provide sufficient flow to mitigate the consequences of a DBA. AFW operation continues to fulfill the safety function for which it was designed and no changes to plant equipment will occur. As a result, an accident which is new or different than any already evaluated in the Updated Final Safety Analysis Report will not be created due to this change.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the change involve a significant reduction in a margin of safety?

The proposed changes will not affect the heat removal capability of the AFW system to a value less than assumed in the safety analysis. The proposed changes will not result in any additional challenges to the plant equipment including the fuel and reactor coolant system pressure boundary. The additional time period to reach Hot Shutdown provided by footnote (2) will not significantly reduce the decay heat removal capability provided by the AFW system. The two remaining motor driven AFW pumps will continue to provide sufficient flow to the steam generators as assumed in the safety analysis to mitigate the consequences of a DBA assuming no single failure during this time period. The plant will continue to operate within the bounds of the safety analysis.

The AFW system will continue to be tested in a manner and at a frequency which will ensure acceptable system performance should it be relied upon to remove decay heat following a DBA.

The AFW pumps' performance requirements will continue to be controlled in a manner to ensure safety analysis assumptions are met.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

F. NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

Based on the considerations expressed above, it is concluded that the activities associated with this license amendment request satisfies the no significant hazards consideration standards of 10 CFR 50.92(c) and, accordingly, a no significant hazards consideration finding is justified.