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L-02-024

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Subject: Beaver Valley Power Station, Unit No. 1 and No. 2
BV-1 Docket No. 50-334, License No. DPR-66
BV-2 Docket No. 50-412, License No. NPF-73
License Amendment Request Nos. 285 and 156

Pursuant to 10 CFR 50.90, FirstEnergy Nuclear Operating Company (FENOC) requests an amendment to the above licenses in the form of changes to Technical Specification 3/4.5.1, "Emergency Core Cooling Systems - Accumulators." Specifically, the proposed changes will extend the allowed outage time (AOT), or completion time, associated with an inoperable accumulator. The proposed changes are based on the methodology described in Topical Report WCAP-15049-A, "Risk-Informed Evaluation of an Extension to Accumulator Completion Times," Revision 1. In addition to the AOT extension, other changes are proposed to make Technical Specification 3/4.5.1 consistent with the content of the Improved Standard Technical Specifications; i.e., NUREG-1431, "Standard Technical Specifications – Westinghouse Plants," Revision 2.

Since the proposed changes are "risk-informed," the guidance in Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment In Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," and 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," has been followed.

The proposed technical specification changes for Unit No. 1 and Unit No. 2 are presented in Attachments A-1 and A-2, respectively. The safety analysis and no significant hazard evaluation is presented in Attachment B. The proposed changes to the Bases are presented in Attachment C-1 and C-2, respectively. The Bases changes are provided for information only and do not require NRC approval.

This change has been reviewed by the Beaver Valley review committees. The change was determined to be safe and does not involve a significant hazard consideration as defined in 10 CFR 50.92 based on the attached safety analysis and no significant hazard

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evaluation. An implementation period of up to 60 days is requested following the effective date of this amendment.

If there are any questions concerning this matter, please contact Mr. Larry R. Freeland, Manager, Regulatory Affairs/Corrective Action at 724-682-5284.

I declare under penalty of perjury that the foregoing is true and correct. Executed on March 14, 2002.

Sincerely,

Lew W. Myers

c: Mr. D. S. Collins, Project Manager
Mr. D. M. Kern, Sr. Resident Inspector
Mr. H. J. Miller, NRC Region I Administrator
Mr. D. A. Allard, Director BRP/DEP
Mr. L. E. Ryan (BRP/DEP)

ATTACHMENT A-1

Beaver Valley Power Station, Unit No. 1
License Amendment Request No. 285

The following is a list of the affected pages:

Affected Pages: 3/4 5-1
3/4 5-2

3/4.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3/4.5.1 ACCUMULATORS

LIMITING CONDITION FOR OPERATION

3.5.1 Each reactor coolant system accumulator shall be OPERABLE with:

a. The isolation valve open,

b. Between 7664 and 7816 gallons of borated water,

c. Between 2300 and 2600 ppm of boron, and

d. A nitrogen cover-pressure of between 605 and 661 psig.

APPLICABILITY: MODES 1, 2 and 3.*

ACTION:

~~a. With one accumulator inoperable, except as a result of a closed isolation valve, restore the inoperable accumulator to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.~~

~~b. With one accumulator inoperable due to the isolation valve being closed, either immediately open the isolation valve or be in HOT STANDBY within one hour and be in HOT SHUTDOWN within the next 12 hours.~~

a. With one accumulator inoperable due to boron concentration not within limits, restore the inoperable accumulator to OPERABLE status within 72 hours.

b. With one accumulator inoperable for reasons other than Action a, restore the inoperable accumulator to OPERABLE status within 24 hours.

c. With either Action a or b not being completed within the specified completion time, be in at least HOT STANDBY within the next 6 hours and reduce pressurizer pressure to ≤ 1000 psig within 12 hours.

SURVEILLANCE REQUIREMENTS

4.5.1 Each accumulator shall be demonstrated OPERABLE:

a. At least once per 12 hours by:

1. Verifying~~, by the absence of alarms,~~ the contained borated water volume and nitrogen cover-pressure in the tanks are within limits, and

2. Verifying that each accumulator isolation valve is open.

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* Pressurizer Pressure above 1000 psig.

SURVEILLANCE REQUIREMENTS (Continued)

b. At least once per 31 days and, for only the affected accumulator, within 6 hours after each solution volume increase that is not the result of addition from the refueling water storage tank of greater than or equal to 1 percent of ~~tank~~ accumulator volume, by verifying the boron concentration of the accumulator solution.

c. At least once per 31 days when the RCS pressure is above 2000 psig by verifying that power to the isolation valve operator control circuit is disconnected by removal of the plug in the lock out jack from the circuit.

~~4.5.1.2 Each accumulator water level and pressure alarm channel shall be demonstrated OPERABLE:~~

~~a. At least once per 31 days by the performance of a CHANNEL FUNCTIONAL TEST.~~

~~b. At least once per 18 months by the performance of a CHANNEL CALIBRATION.~~

ATTACHMENT A-2

Beaver Valley Power Station, Unit No. 2
License Amendment Request No. 156

The following is a list of the affected pages:

Affected Pages: 3/4 5-1
3/4 5-2

3/4.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

ACCUMULATORS

LIMITING CONDITION FOR OPERATION

3.5.1 Each Reactor Coolant System accumulator shall be OPERABLE with:

a. The isolation valve open,

b. Between 7532 and 7802 gallons of borated water,

c. Between 2300 and 2600 ppm of boron, and

d. A nitrogen cover-pressure of between 585 and 665 psig.

APPLICABILITY: MODES 1, 2 and 3.*

ACTION:

~~a. With one accumulator inoperable, except as a result of a closed isolation valve, restore the inoperable accumulator to OPERABLE status within one hour or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.~~

~~b. With one accumulator inoperable due to the isolation valve being closed, either immediately open the isolation valve or be in HOT STANDBY within one hour and be in HOT SHUTDOWN within the next 12 hours.~~

a. With one accumulator inoperable due to boron concentration not within limits, restore the inoperable accumulator to OPERABLE status within 72 hours.

b. With one accumulator inoperable for reasons other than Action a, restore the inoperable accumulator to OPERABLE status within 24 hours.

c. With either Action a or b not being completed within the specified completion time, be in at least HOT STANDBY within the next 6 hours and reduce pressurizer pressure to ≤ 1000 psig within 12 hours.

SURVEILLANCE REQUIREMENTS

4.5.1 Each accumulator shall be demonstrated OPERABLE:

a. At least once per 12 hours by:

1. Verifying~~, by the absence of alarms,~~ the contained borated water volume and nitrogen cover-pressure in the tanks are within limits, and

2. Verifying that each accumulator isolation valve is open.

~~b. At least once per 31 days and within 6 hours after each solution volume increase of greater than or equal to 1% of tank volume by verifying the boron concentration of the accumulator solution.~~

*Pressurizer Pressure above 1000 psig.

SURVEILLANCE REQUIREMENTS (Continued)

b. At least once per 31 days and, for only the affected accumulator, within 6 hours after each solution volume increase that is not the result of addition from the refueling water storage tank of greater than or equal to 1% of accumulator volume, by verifying the boron concentration of the accumulator solution.

c. At least once per 31 days when the RCS pressure is above 1000 psig by verifying that power to the isolation valve operator control circuit is disconnected by removal of the plug in the lock out jack from the circuit.

~~4.5.1.2 Each accumulator water level and pressure alarm channel shall be demonstrated OPERABLE:~~

~~a. At least once per 31 days by the performance of a CHANNEL FUNCTIONAL TEST.~~

~~b. At least once per 18 months by the performance of a CHANNEL CALIBRATION.~~

ATTACHMENT B

Beaver Valley Power Station, Unit Nos. 1 and 2
License Amendment Request No. 285 and 156
EXTENSION OF ACCUMULATOR ALLOWED OUTAGE TIMES

A. DESCRIPTION OF AMENDMENT REQUEST

The proposed amendments will revise Technical Specifications 3/4.5.1, "Accumulators", for both Beaver Valley Power Station (BVPS) units. The revisions are being made to reflect the required actions and surveillance requirements of LCO 3.5.1, Accumulators, contained in NUREG-1431, "Standard Technical Specifications– Westinghouse Plants", Revision 2. An additional change is proposed to incorporate a risk-informed extension to accumulator allowed outage, i.e., completion, times justified by WCAP-15049-A, Revision 1, "Risk-Informed Evaluation of an Extension to Accumulator Completion Times", dated April 1999. The proposed changes are detailed by the following.

Change No. 1

Action "a" is replaced with "With one accumulator inoperable due to boron concentration not within limits, restore the inoperable accumulator to OPERABLE status within 72 hours." This proposed change replaces the existing action (applicable to an accumulator being inoperable due to reasons other than a closed isolation valve) with a new action (applicable to an accumulator being inoperable due to solely the boron concentration not being within limits). The proposed change to Action "a" also includes changing the completion time from 1 hour to 72 hours. This change is consistent with the actions of NUREG-1431 and is justified in Section C of this license amendment request.

Change No. 2

Action "b" is replaced with "With one accumulator inoperable for reasons other than Action a, restore the inoperable accumulator to OPERABLE status within 24 hours." This proposed change replaces the existing single action (applicable to an accumulator being inoperable due to the isolation valve being closed) with a new single action (applicable to an accumulator being inoperable due to reasons other than boron concentration). The proposed change also includes changing the completion times (immediately for the valve and 1 hour for the volume and pressure) to 24 hours. The change to action "b" is consistent with the action of NUREG-1431. The change to the completion time is consistent with WCAP-15049-A, Revision 1. The change is justified in Section C of this license amendment request.

Change No. 3

A new Action "c" is created by adding "With either Action a or b not being completed within the specified completion time, be in at least HOT STANDBY within the next 6 hours and reduce pressurizer pressure to ≤ 1000 psig within 12 hours." This proposed change adds a new action that removes the plant from the Applicability of the Technical Specification when the completion time of either action "a" or "b" can not be met. The new action combines the existing common failure to restore actions into a single action. This change is consistent with the action of NUREG-1431 and is justified in Section C of this license amendment request.

Change No. 4

Surveillance Requirement 4.5.1.a.1 is revised by removing the phrase "by the absence of alarms" and adding "are within limits." This change is consistent with the intent of NUREG-1431 and is justified in Section C of this license amendment request.

Change No. 5

Surveillance Requirement 4.5.1.b is revised to state that the 6 hour frequency is only applicable to accumulators that have undergone a specified volume increase and the 6 hour surveillance is not required when the source of the volume increase is the refueling water storage tank. The change is consistent with the intent of NUREG-1431 and is justified in Section C of this license amendment request.

Change No. 6

Surveillance Requirement 4.5.1.2 is deleted. This proposed change removes the requirement to conduct a CHANNEL FUNCTIONAL TEST and a CHANNEL CALIBRATION of the accumulator water level and pressure alarm channels. This change is consistent with the intent of NUREG-1431 and is justified in Section C of this license amendment request.

Bases Changes – Provided for Information Only

The Bases is modified by adding a reference to WCAP-15049-A, Revision 1, to justify the completion time of 24 hours for the proposed Action "b". This change

is consistent with WCAP-15049-A, Revision 1 and is justified in Section C of this license amendment request.

The Bases is also expanded to include a discussion of the completion times associated with required actions "a" and "b". The completion time information is added to be consistent with NUREG-1431.

The proposed Technical Specification Bases changes provided in Attachments C-1 and C-2, do not require NRC approval. The BVPS Technical Specification Bases Control Program controls the review, approval and implementation of Technical Specification Bases changes. They are provided for information only.

The proposed changes to the Technical Specifications and Bases have been prepared electronically. Deletions are shown with a strike-through and insertions are shown double-underlined. This presentation allows the reviewer to readily identify the information that has been deleted and added.

Following these changes the BVPS accumulator Technical Specifications and the associated Bases will be more consistent with the intent of NUREG-1431 and with completion time extension justified by WCAP-15049-A.

B. DESIGN BASES

The design bases for the Emergency Core Cooling System (ECCS) are:

1. To protect the station personnel and the public by maintaining clad integrity, thus minimizing the release of fission products from the fuel during the unlikely event of a loss-of-coolant accident (LOCA).

2. To protect the core for a range of possible mishaps, evaluated as less unlikely, thereby minimizing loss of power generation capability.

The ECCS is designed to cool the reactor core and provide additional shutdown capability following initiation of the following accident conditions:

1. Pipe breaks and spurious relief or safety valve lifting in the reactor coolant system (RCS) which cause a discharge larger than that which can be made up by the normal system, up to and including the instantaneous circumferential rupture of the largest pipe in the RCS.

2. Rupture of a control rod drive mechanism causing a rod cluster control assembly (RCCA) ejection accident.

3. Pipe breaks and spurious relief or safety valve lifting in the steam system, up to and including the instantaneous circumferential rupture of the largest pipe in the steam system.

4. A steam generator tube rupture.

The primary function of the ECCS for the ruptures described above is to remove the stored and fission product decay heat from the core such that fuel damage, to the extent that would impair effective cooling of the core, is prevented. This implies that the core remains intact and in place, with its essential heat transfer geometry preserved. To ensure effective cooling of the core, limits on peak clad temperature and local metal-water reaction, as defined by 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light Water Power Reactors," will not be exceeded.

The principle components of the ECCS which provide emergency core cooling immediately following a LOCA are the accumulators, the high head safety injection (charging) pumps, and the low head safety injection pumps. The high head safety injection pumps also perform the charging function during normal operations.

The BVPS design has three accumulators, one for each loop of the Reactor Coolant System (RCS). The accumulators are equipped with redundant level and pressure indicators with readouts on the control board. Each channel is equipped with high and low level alarms. The margin between the minimum operating pressure and design pressure provides a range of acceptable operating conditions within which the accumulators met their design core cooling objectives.

The accumulators, which are passive components, discharge into the cold legs of the reactor coolant piping when RCS pressure decreases below accumulator pressure thus ensuring rapid core cooling during a LOCA. They are located inside the containment and are protected against possible missiles. They are

pressure vessels filled with borated water and pressurized with nitrogen gas. During normal operation, each accumulator is isolated from the RCS by two check valves in series. If the RCS pressure falls below the accumulator pressure, the check valves open and borated water is forced into the RCS. Mechanical operation of the swing-disk check valves by means of differential pressure is the only action required to open the injection path from the accumulators to the core via the cold leg. The level of borated water in each accumulator is adjusted remotely as required during normal station operation. Makeup water from the refueling water storage tank is added using the hydrotest pump. Draining to the primary drain transfer tank reduces water level. Samples of the solution in the accumulators are taken at the sampling station for periodic checks of boron concentration.

The accumulators are passive engineered safety features because the nitrogen gas pressure forces injection. No external source of power or signal transmission is needed to obtain fast acting, high flow capability when the need arises. The isolation valve at each accumulator is normally open with power to the motor operator locked out via a banana type lock out jack located on the main control board. Redundant position indicating lights located at the control room switch are provided for each valve. In addition, an indicating light is provided on each control circuit to show grounding or shorting of the lock out jack. An alarm annunciator point is activated by both a valve motor operator limit switch and a valve position limit switch. The valve position limit switch is activated by stem travel whenever an accumulator valve is not fully open for any reason with the system at pressure; i.e., the pressure at which the safety injection block is unblocked. A separate annunciator point is used for each accumulator valve. The isolation valve is closed when the RCS is intentionally depressurized or to test the check valves in the line to the accumulator while the RCS is pressurized. With the isolation valve open and its power removed the only moving parts in the accumulator injection train are in the two check valves.

C. JUSTIFICATION

Change No. 1

Change number 1 consists of replacing the existing Action "a" with a new action for boron concentration not within limits. This new action is consistent with NUREG-1431 and allows 72 hours to restore the boron concentration to within limits. The existing action allows 1 hour. This increase in the completion time is

acceptable because the maximum boron concentration in the accumulators is not specifically evaluated in the injection phase of a loss-of-coolant accident (LOCA) analysis. Although the boron concentration of the accumulators is considered in the LOCA analysis during the recirculation phase, the impact of a single accumulator's borated water volume is not significant when compared to the total borated water volume present during the recirculation phase of the accident. A review of the Updated Final Safety Analysis Report (UFSAR) transient curves for both BVPS units indicates that RCS pressure never reaches the accumulator discharge pressure of 600 psia during a main steamline break accident. Therefore, although the accumulators can provide an additional source of borated water during this accident, this additional source is not realized nor is it needed to meet Departure from Nucleate Boiling (DNB) design limits.

The proposed change is also acceptable based on the small probability of an event; i.e., a LOCA, occurring during the completion time of 72 hours that would require the accumulators to function. The completion time of 72 hours is also consistent with the completion time to restore one inoperable ECCS subsystem as specified in Technical Specification 3.5.2, "ECCS Subsystems - $T_{avg} \geq 350°F$". In addition, the current 1 hour completion time does not provide a reasonable time in which to restore and verify boron concentration if it is found out of limits. The proposed change allows sufficient time to correct a problem and therefore reduces the potential for a plant transient due to boron concentration being outside the Technical Specifications limits.

Change No. 2

Change number 2 consists of replacing the existing Action "b" with a new action that consolidates all inoperable accumulator conditions except boron concentration into one action. The creation of this new action is consistent with the content of NUREG-1431. The revised action covers all inoperable accumulator conditions other than boron concentration, including the condition of a closed isolation valve addressed by existing Action "b". The effect of this change results in the completion time for a closed isolation valve being increased from immediately to 1 hour. This change is consistent with the NUREG-1431 policy of applying a reasonable completion time where possible to avoid requiring the initiation of a plant shutdown and limit the risk introduced by unnecessary plant transients. The proposed change allows a reasonable time to take corrective actions such as closing a breaker or replacing fuses prior to requiring a plant to initiate a shutdown. The proposed completion time of 1 hour

is a sufficient restriction to avoid an undue risk to public health and safety, considering the small likelihood of a severe transient occurring in this time.

By revising Action "b" as proposed, all the completion times for the covered actions are 1 hour and thus can be addressed by a single action statement. At this point the proposed revised action is consistent with NUREG-1431. However, this action is further revised to change the completion time to 24 hours. The completion time extension justification is provided by WCAP-15049-A "Risk-Informed Evaluation of an Extension to Accumulator Completion", which was approved by the NRC on February 19, 1999.

The Westinghouse Owner's Group (WOG) submitted WCAP-15049 specifically to evaluate the risk associated with extending the accumulator completion time from 1 hour to 24 hours for reasons other than boron concentration out of specification. The WOG requested this change because 1 hour is not a sufficient amount of time to correct accumulator mechanical problems or to restore parameters to within limits.

LCO 3.5.1 of NUREG-1431 allows for one accumulator to be inoperable for 1 hour for reasons other than boron concentration not being within limits during Modes 1, 2, and in Mode 3 with pressurizer pressure greater than a plant-specific pressure. For BVPS this specific pressure is 1000 psig. The proposed completion time of 24 hours is an extension of the current completion time and, as concluded by the NRC, has no impact on the safety analysis. Therefore, the current safety analysis remains valid and it is concluded that there is no difference in the deterministic safety significance of a 1 hour completion time for one accumulator and a 24 hour completion time.

The NRC used a three-tiered approach, consistent with Regulatory Guide 1.177 "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications" (August 1998), to evaluate the risk associated with the proposed accumulator completion time extension from 1 hour to 24 hours. The need for the proposed change was that the current 1 hour completion time would not be sufficient in most cases for licensees to take a reasonable action when an accumulator was found to be inoperable.

As documented in WCAP-15049-A, Westinghouse used a reasonable approach to assess the risk impact of the proposed accumulator completion time extension. The approach was generally consistent with the intent of the applicable NRC

Regulatory Guides; i.e., 1.174 "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis" (July 1998) and 1.177. The quantitative risk measures addressed in WCAP-15049-A included the change in core damage frequency (CDF) and incremental conditional core damage probability (CCDP) for a single completion time. The change in large early release frequency (LERF) and incremental conditional large early probability (CLERP) for a single completion time were qualitatively addressed in WCAP-15049-A. Representative calculations were performed to determine the risk impact of the proposed change. Various accumulator success criteria were considered in these calculations to encompass the whole spectrum of Westinghouse plants; e.g., two, three and four loop plants. A reasonable effort was also made to address the differences in other components of risk analysis such as initiating event (IE) frequency and accumulator unavailability among Westinghouse plants.

In WCAP-15049-A Westinghouse considered a comprehensive range of IEs in the risk analysis. Loss of coolant accidents (LOCAs) in all sizes (large, medium and small) were included, and reactor vessel failure and interfacing system LOCA were also considered. Modeling of accumulators for mitigation of events other than large, medium and small LOCAs was identified to have insignificant risk impact. Therefore, the analysis was performed only on accumulator injection in response to large, medium and small LOCA events.

As documented in WCAP-15049-A, Westinghouse performed a comprehensive risk analysis to support the proposed completion time extension. The quality of the risk analysis was reasonable and generally conservative. By using the conservative approach, Westinghouse intended to encompass all of the various vintages of Westinghouse plants. The NRC agreed that this was accomplished. The key elements in the Probabilistic Safety Analysis (PSA) modeling, such as LOCA IE frequency, accumulator success criteria, and accumulator unavailability, were evaluated and found to be reasonable. The results of the risk analysis indicated that the impact on risk would be small, and the NRC found that the results met the intent of the guidance in the applicable risk-informed Regulatory Guides; i.e., 1.174 and 1.177.

A completion time of 1 hour for an inoperable accumulator could potentially introduce unnecessary plant risk associated with a forced plant shutdown and ensuing startup. The averted risk associated with avoiding forced plant transitions could be significant in comparison with the risk impact due to the

proposed completion time extension. Therefore, the NRC concluded that the risk analysis supports the proposed accumulator completion time extension to 24 hours.

The NRC reviewed the WCAP submittal proposing to increase the accumulator completion time and concluded that because (1) there is no change to the Limiting Condition for Operation (LCO) and consequently no change to the safety analysis, and (2) this is an extension of a condition for which the plant has already been analyzed, the deterministic aspect of this change is acceptable.

As suggested by the WCAP-15049-A Implementation Guidelines, Tables 1, 2 and 3 are attached to provide plant-specific justification for change number 2. The Beaver Valley specific comparison to the generic PSA model shows that the generic analysis model assumptions are consistent with the Beaver Valley model. The plant-specific initiating event frequencies are smaller than the generic model frequencies for large, medium and small LOCA events. The Beaver Valley model also includes depressurization and low pressure injection as alternate success paths for a small LOCA. The accumulators are not taken out of service for testing or preventative maintenance and have not had to be taken out of service for any corrective maintenance. Therefore, the generic justification proposed in WCAP-15049-A for extending the accumulator completion time, can be used to justify the same relaxations in the Beaver Valley Technical Specifications.

Change No. 3

Change number 3 consists of creating a new action, i.e., "c", to specify the required actions necessary to remove the unit from the applicability of the Technical Specification. This new action is consistent with LCO 3.5.1 of NUREG-1431. The applicability of the accumulator Technical Specification is based on pressurizer pressure being above 1000 psig in Mode 3. To be consistent with the current limit and NUREG-1431, the action to place the unit in Hot Shutdown is replaced with the action to reduce pressurizer pressure to ≤ 1000 psig. Therefore, the proposed action removes the unit from the applicability of the Technical Specification (Mode 3 with pressurizer pressure > 1000 psig). This change is consistent with the general rules of Technical Specifications regarding the applicability of Technical Specification actions. Once the unit is removed from the applicability of the affected Technical Specification, further action under that Technical Specification is not required.

Action "d" of LCO 3.5.1 of NUREG-1431 is not included in the changes being proposed because it would conflict with the format of the existing BVPS Technical Specifications and is not required. The existing BVPS Technical Specifications require entry into LCO 3.0.3 when two or more accumulators are inoperable.

Change No. 4

Change number 4 consists of removing the phrase "by the absence of alarms" from Surveillance Requirement 4.5.1.a.1 and adding "are within limits." The phrase "by absence of alarms" was eliminated because this is specifying a method of determining accumulator pressure and volume. The method used to determine such parameters is utility-specific and should not be dictated by the Technical Specifications. It is necessary to add the phrase "are within limits" to specify what is being verified by the surveillance. The BVPS Technical Specification provides the accumulator parameter limits in the Limiting Condition for Operation (LCO). NUREG-1431 provides these limits in the Surveillance Requirements. This change is not technical in nature. It is necessitated because of the difference in the format of the BVPS and NUREG-1431 Technical Specifications. This proposed change would result in Surveillance Requirement 4.5.1.a.1 being more consistent with NUREG-1431.

Change No. 5

Change 5 consists of adding qualifying phrases to Surveillance Requirement 4.5.1.b. The two phrases are applicable to the surveillance frequency of 6 hours and are consistent with NUREG-1431. The first phrase, "for only the affected accumulator," is added to make it clear that the 6 hour surveillance is only applicable to an accumulator that has undergone a specified volume increase. It is not necessary to verify the boron concentration of an accumulator that has not had a volume increase since the previous 31 day surveillance because its boron concentration has not undergone any mechanism of change. Verifying such a slight volume increase (1% of accumulator volume), that might dilute the concentration of the contained water assures that the accumulator's boron concentration remains within limits. It is not necessary to check the concentration following a volume decrease since this action would not cause a dilution of the boron concentration. The accumulator water volume is verified to be within limits every 12 hours by surveillance requirement 4.5.1.a. The second phrase "that is not the result of addition from the refueling water storage tank," is added

to make it clear that the 6 hour surveillance is not required if the refueling water storage tank was used to increase the accumulator volume. Adding water from the refueling water storage tank would not cause a decrease in the accumulator's boron concentration because the boron concentration of the refueling water storage tank is maintained at or above what is required for the accumulators. This is assured by Technical Specification 3.1.2.8, "Borated Water Sources-Operating", on a weekly basis.

Change No. 6

Change number 6 consists of deleting Surveillance Requirement 4.5.1.2. The deleted surveillance requirement consists of a CHANNEL FUNCTIONAL TEST performed every 31 days and a CHANNEL CALIBRATION performed every 18 months. These surveillances are used to verify the operability of the channel alarms associated with accumulator pressure and level. In keeping with the policy of NUREG-1431, the precise method used to verify operability is, in most cases, a utility-specific item that is not dictated by the Technical Specifications. In general, the Technical Specifications do not require surveillances for instrumentation that does not provide safety analysis protection/actuation. Some examples of plant parameters verified within the Technical Specifications without instrument surveillances are pressurizer spray water temperature, primary plant demineralized water level, and refueling water storage tank level and temperature. Operability of the instrumentation associated with these parameters is assured through compliance with plant procedures. The parameters associated with the alarmed channels; i.e., pressure and level, will continue to be verified to be within limits every 12 hours by Surveillance Requirement 4.5.1.a. In addition, since proposed change 4 removes the phrase "by absence of alarms" from Surveillance Requirement 4.5.1.a, there is no longer a need to specify verification of the operability of the accumulator alarm channels in this Technical Specification.

Bases Changes – Provided for Information Only

The Bases changes include adding a reference to WCAP-15049-A, Revision 1, expanding to include a discussion of the completion times associated with required actions "a" and "b" and addressing the extended completion times. The completion time information is added to be consistent with NUREG-1431. These changes are consistent with WCAP-15049-A, Revision 1 and LCO 3.5.1 of NUREG-1431. The Bases changes are provided for information only.

D. SAFETY ANALYSIS

The BVPS safety analysis, specified by 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light Water Power Reactors," is presented in the BVPS UFSARs. The results of the loss-of-coolant accident (LOCA) analysis are presented in UFSAR tables and show compliance with the Acceptance Criteria. The analytical techniques used are in compliance with Appendix K, "ECCS EVALUATION MODELS", of 10 CFR 50 and are described in various UFSAR references.

Should a large break LOCA occur, depressurization of the RCS results in a pressure decrease in the pressurizer. A reactor trip occurs when the pressurizer low pressure trip setpoint is reached. A safety injection signal is actuated when the appropriate setpoint is reached. These countermeasures will limit the consequences of the accident in two ways:

1. Reactor trip and borated water injection complement void formation in causing rapid reduction of power to a residual level corresponding to fission product decay heat.

2. Injection of borated water provides heat transfer from the core and prevents excessive clad temperatures.

At the beginning of the blowdown phase, the entire RCS contains subcooled liquid which transfers heat from the core by forced convection with some fully developed nucleate boiling. After the break develops, the time to departure from nucleate boiling is calculated, consistent with Appendix K of 10 CFR 50. Thereafter, the core heat transfer is based on local conditions with transition boiling and forced convection to steam as the major heat transfer mechanisms. During the refill period rod-to-rod radiation is the only heat transfer mechanism.

A safety injection signal opens the boron injection header isolation valves, starts the safety injection charging pumps and provides a confirmatory open signal to the normally open accumulator isolation valves. The high head safety injection pumps (charging) deliver borated water to the three cold legs of the reactor coolant loops during the injection phase. These pumps provide for the makeup of coolant and add negative reactivity following a small break LOCA which does not immediately depressurize the RCS to the accumulator discharge pressure. For large break LOCAs, they start delivery through separate lines after the accumulators start their discharge.

When the RCS pressure falls below 600 psia the accumulators begin to inject borated water. A conservative assumption is made that water injected from the accumulator in the broken loop bypasses the core and goes out through the break until the termination of bypass. This conservatism is consistent with Appendix K of 10 CFR 50. The termination of bypass is defined as the commencement of a continuous flow of water down the downcomer into the lower plenum. The blowdown phase of the transient ends when the RCS pressure falls to a value approaching that of the containment atmosphere and termination of bypass has occurred. After blowdown, the Safety Injection System and accumulators begin to fill the lower plenum, which is the refill phase. Refill is complete when emergency core cooling water has filled the lower plenum up to the bottom of the active fuel rods. During this period, no borated water reaches the active fuel region and the fuel undergoes adiabatic heating. The reflood phase of the transient is defined as the time period lasting from the end-of-refill until the reactor vessel has been filled with water to the extent that the core temperature rise and cladding oxidation has been terminated.

The proposed changes to the accumulator Technical Specifications and associated Bases will not change any of the associated accident analysis assumptions or consequences. The changes being proposed will not affect the operation or accident analysis parameters associated with the accumulators. The accumulator volume, boron concentration, nitrogen cover pressure and valve position will all remain the same after the proposed changes are made. The proposed changes extend completion times, remove specifying how various parameters are verified to be within limits, and delete unnecessary surveillance requirements. Extending a completion time only affects how much time is available to restore an accumulator to operable status, not the limits set for the parameters. Based on the BVPS specific PSA model being consistent with the assumptions of WCAP-15049-A, these extensions have been shown not to have an effect on the Core Damage Frequency of either Beaver Valley unit. Removing specifying how various parameters are verified to be within limits, and deleting unnecessary surveillance requirements, also do not change the accumulator parameter limits specified by Technical Specifications or the accident analysis.

Therefore, none of the proposed changes will affect the design bases or operation of the accumulators or the ECCS. The accumulators will continue to be maintained, operated and modeled in the same manner after approval of the proposed changes as they were prior to the changes.

E. NO SIGNIFICANT HAZARDS EVALUATION

The proposed changes being evaluated will revise Technical Specifications 3/4.5.1, "Accumulators", and the associated Bases for both Beaver Valley Power Station (BVPS) units. The proposed changes consist of: extending the allowed outage (completion) times for an inoperable accumulator, removing specifying how certain parameters are verified to be within limits, and deleting unnecessary surveillance requirements. The revisions are being made to reflect the Technical Specification required actions, the allowed outage times for the isolation valve and boron concentration, and the surveillance requirements of NUREG-1431 LCO 3.5.1, "Accumulators". The proposed changes also incorporate an extension to the accumulator allowed outage times to restore an inoperable accumulator for reasons other than boron not being within limits. This allowed outage time extension is justified by a NRC approved generic analysis for Westinghouse plants and is applicable to BVPS. The Technical Specification and Bases pages will be repaginated as necessary to meet format requirements.

The no significant hazard considerations involved with the proposed amendment have been evaluated. The evaluation focused 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?

   No. The proposed changes consist of extending allowed outage times for required accumulator Technical Specification actions, elimination of alarm surveillance requirements associated with the accumulators, verifying boron concentration and editorial changes. These changes are independent of the probability or consequences of accidents previously evaluated in either of the Beaver Valley Power Station (BVPS) Updated Final Safety Analysis Reports (UFSARs). Since the accumulators are not accident initiators, they do not affect the probability of accidents. An NRC approved generic analysis for Westinghouse plants, which is applicable to BVPS, concludes that extending the accumulator allowed outage time for reasons other than boron concentration out of limit is acceptable because the impact of core damage frequency has been shown to be within acceptable limits. The extension to the allowed outage time for boron not being within limits is consistent with NUREG-1431 and acceptable because the boron is not assumed in the injection phase of a loss of coolant accident (LOCA).

   The accumulators, however, do perform an accident mitigation function. Their mitigation function is also not affected by the proposed changes since none of the associated accident mitigation parameters are changed. The accumulator volume available for injection remains the same as before the proposed changes, as does the boron concentration of the contained water. The accumulator valve position requirement to be open with its power removed, and the nitrogen cover pressure limit are also not changed by this request. As a result the same amount of water, at the same boron concentration, will be injected into the Reactor Coolant System (RCS) in the same amount of time after the proposed changes are made as it was before the proposed changes. Due to the fact that the accident mitigation function of the accumulators is not affected by the proposed changes, the consequences of an accident previously evaluated is also not changed.

   Since the duration of the allowed outage times is not an input into the safety analysis (i.e., the safety analysis assumes that all of the accumulators

are operable), the extension of the allowed outage times has no impact on the safety analysis. 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?

   No. Extending allowed outage times for required Technical Specification actions and eliminating alarm surveillance requirements associated with the accumulators would not affect the operation or maintenance of the accumulators. The accumulators will not be operating in any different manner following the proposed changes than they were before the proposed changes are made. They will not be subjected to any new environmental conditions or operational modes, or placed into any new configurations that could lead to any new failure mechanisms. The role of the accumulators following a LOCA is not altered by adopting the proposed changes. Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated for BVPS.

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

   No. The proposed changes do not involve any changes to accumulator parameters utilized in the accident analysis. There are no changes being made to the accumulator's water volume, boron concentration, nitrogen cover pressure or the position of the isolation valve. As a result, the assumptions made regarding the performance of the accumulators during an accident are unchanged. An NRC approved generic analysis for Westinghouse plants concludes that extending the accumulator allowed outage time for reasons other than boron concentration out of limit is acceptable because the impact of core damage frequency has been shown to be within acceptable limits. A plant specific risk assessment confirms that this generic analysis is applicable to BVPS. The extension to the allowed outage time for boron not being within limits is consistent with NUREG-1431 and acceptable because the boron is not assumed in the injection phase of a LOCA. 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 satisfy the requirements of 10 CFR 50.92(c) and, accordingly, a no significant hazards consideration finding is justified.

G. ENVIRONMENTAL CONSIDERATION

This license amendment request changes the required Technical Specification action allowed outage times and alarm surveillance requirements of components located within the restricted area as defined by 10 CFR Part 20. It has been determined that this license amendment request involves no significant increase in the amounts, and no significant change in the types of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. Although this license amendment request changes the allowed outage times and alarm surveillance testing of components located within the restricted area, the category of this licensing action does not individually or cumulatively have a significant effect on the human environment. Accordingly, this license amendment request meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this license amendment request.

F. References

1. NUREG-1431, "Standard Technical Specifications – Westinghouse Plants", Revision 2, April 2001.

2. WCAP-15049-A, Revision 1, "Risk-Informed Evaluation of an Extension to Accumulator Completion Times", dated April 1999.

3. NRC Letter dated February 19, 1999, Acceptance for Referencing of Westinghouse Owners Group Topical Report WCAP-15049, "Risk-Informed Evaluation of an Extension to Accumulator Completion Times".

4. Regulatory Guide 1.177 "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications" (August 1998).

5. Regulatory Guides 1.174 "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis" (July 1998).

6. 10 CFR 50, Appendix K, "ECCS EVALUATION MODELS".

Table 1
BVPS-Specific/WCAP-15049 Comparison Summary
Initiating Events and Success Criteria
3-Loop Plant

Initiating Event	Model	Initiating Event Frequency (/yr)	Accumulator Success Criteria	Comments
Large LOCA	WCAP-15049	3.0E-04, Base Case 3.0E-04, Sens. Case	0, 1, or 2 accumulators to 2 intact legs	Cases were run with accumulator requirements from 2 accumulators to 2 intact legs to no accumulators required.
	BVPS-Specific Information	2.01E-04 (U-1) 5.00E-06 (U-2)	2 accumulators to 2 intact legs	Consistent with WCAP
Medium LOCA	WCAP-15049	8.0E-04, Base Case 1.0E-03, Sens. Case	2 accumulators to 2 intact legs for alternate success path	WCAP PSA model requires depressurization, accumulator injection, and low pressure injection as alternate success path following failure of high pressure injection. Primary success path, high pressure injection, does not require accumulator injection.
	BVPS-Specific Information	4.59E-04 (U-1) 3.99E-05 (U-2)	2 accumulators out of 3 (U1) 2 accumulators to 2 intact legs (U2)	The PSA model is more conservative than the WCAP in that it requires both high pressure and low pressure injection in addition to 2 accumulators injecting as the only success path.
Small LOCA	WCAP-15049	7.1E-03, Base Case 2.0E-02, Sens. Case	2 accumulators to 2 intact legs for alternate success path.	WCAP PSA model requires depressurization, accumulator injection, and low pressure injection as alternate success path following failure of high pressure injection. Primary success path, high pressure injection, does not require accumulator injection.
	BVPS-Specific Information	4.41E-03 (U-1) 1.56E-03 (U-2)	2 accumulators out of 3 required for alternate success path.	Consistent with WCAP.
Other Events	N.A.	N.A.	None	

Table 2 BVPS-Specific/WCAP-15049 Comparison Summary General Parameters		
Parameter	**WCAP-15049 Analysis**	**BVPS-Specific Parameter**
Number of RCS loops	Covered 2, 3, and 4-loop plants	3 Loops
At-power accumulator test frequency	No test activities done at-power	None
At-power accumulator preventive maintenance frequency	No preventive maintenance activities done at-power	None
At-power accumulator corrective maintenance frequency	0.1/yr	None
Total CDF from Internal Events (current PSA model)	---	6.24E-5 (U-1) 1.79E-5 (U-2)
Total CDF from Internal Events (IPE)	---	2.1E-4 (U-1) 1.9E-4 (U-2)

Table 3 PSA Model Changes Between the Current PSA Model and the IPE Model	
Both units	• Credit for operator action to depressurize the RCS during a small break LOCA so that low head safety injection can be used for accident mitigation • Credit for the cross-tie between the Unit 1 and Unit 2 4KV normal busses • Full credit for PORV pressure relief capacity during ATWS events
Unit 1	• Credit for batteries or battery charger to start standby components • Spare river water pump out of service assumption decreased from 1 year to 1/2 year • Credit for an alternate nitrogen backup system to allow PORV opening on all 3 valves
Unit 2	• Elimination of the emergency switchgear room ventilation system based on actual room heatup characteristics • Spare service water pump out of service assumption decreased from 1 year to 1/2 year • Credit for operator action to use the Steam Generator Common Atmospheric Steam Relief Valve for alternate secondary side cooldown for SGTR mitigation

ATTACHMENT C-1

Beaver Valley Power Station, Unit No. 1
License Amendment Request No. 285

The following is a list of the affected TS Bases pages:

Affected Pages: B 3/4 5-1

3/4.5.1 ACCUMULATORS

The OPERABILITY of each of the RCS accumulators ensures that a sufficient volume of borated water will be immediately forced into the reactor core through each of the cold legs in the event the RCS pressure falls below the pressure of the accumulators. This initial surge of water into the core provides the initial cooling mechanism during large RCS pipe ruptures.

The limits on accumulator volume, boron concentration and pressure ensure that the assumptions used for accumulator injection in the accident analysis are met. ~~The limit of one hour for operation with an inoperable accumulation minimizes the time exposure of the plant to a LOCA event occurring concurrent with failure of an additional accumulator which may result in unacceptable peak cladding temperatures.~~ If the boron concentration of one accumulator is not within limits (Action a), it must be returned to within the limits within 72 hours. In this condition, ability to maintain subcriticality or minimum boron precipitation time may be reduced. The boron in the accumulators contributes to the assumption that the combined ECCS water in the partially recovered core during the early reflooding phase of a large break LOCA is sufficient to keep that portion of the core subcritical. One accumulator below the minimum boron concentration limit, however, will have no effect on available ECCS water and an insignificant effect on core subcriticality during reflood. Boiling of ECCS water in the core during reflood concentrates boron in the saturated liquid that remains in the core. In addition, current analysis techniques demonstrate that the accumulators do not discharge following a large main steam line break. Thus, 72 hours is allowed to return the boron concentration to within limits.

If one accumulator is inoperable for a reason other than boron concentration (Action b), it must be returned to OPERABLE status within 24 hours. In this condition the required contents of two accumulators cannot be assumed to reach the core during a LOCA. Due to the severity of the consequences should a LOCA occur under these conditions, the 24 hour completion time to open the valve, remove power to the valve, or restore the proper water volume or nitrogen cover pressure ensures that prompt action will be taken to return the inoperable accumulator to OPERABLE status. The completion time minimizes the potential for exposure of the plant to a LOCA under these conditions. The 24 hours allowed to restore an inoperable accumulator to OPERABLE status is justified by WCAP-15049-A, Revision 1, "Risk-Informed Evaluation of an Extension to Accumulator Completion Times", dated April 1999.

If the accumulator cannot be returned to OPERABLE status within the associated completion time (Action c), the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to HOT STANDBY within 6 hours and the reactor coolant system pressure reduced to ≤ 1000 psig within 12 hours. The

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

The RCS accumulators are isolated when RCS pressure is reduced to 1000 ± 100 psig to prevent borated water from being injected into the RCS during normal plant cooldown and depressurization conditions and also to prevent inadvertent overpressurization of the RCS at reduced RCS temperature. With the accumulator pressure reduced to less than the reactor vessel low temperature overpressure protection setpoint, the accumulator pressure cannot challenge the cold overpressure protection system or exceed the 10 CFR 50 Appendix G limits. Therefore, the accumulator discharge isolation valves may be opened to perform the accumulator discharge check valve testing specified in the IST program.

3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS

The OPERABILITY of two separate and independent ECCS subsystems ensures that sufficient emergency core cooling capability will be available in the event of a LOCA assuming the loss of one subsystem through any single failure consideration. Either subsystem operating in conjunction with the accumulators is capable of supplying sufficient core cooling to limit the peak cladding temperatures within acceptable limits for all postulated break sizes ranging from the double-ended break of the largest RCS cold leg pipe downward. In addition, each ECCS subsystem provides long-term core cooling capability in the recirculation mode during the accident recovery period.

The Surveillance Requirements provided to ensure OPERABILITY of each component ensure that at a minimum, the assumptions used in the accident analyses are met and that subsystem OPERABILITY is maintained.

ATTACHMENT C-2

Beaver Valley Power Station, Unit No. 2
License Amendment Request No. 157

The following is a list of the affected TS Bases pages:

Affected Pages: B 3/4 5-1

3/4.5.1 ACCUMULATORS

The OPERABILITY of each of the RCS accumulators ensures that a sufficient volume of borated water will be immediately forced into the reactor core through each of the cold legs in the event the RCS pressure falls below the pressure of the accumulators. This initial surge of water into the core provides the initial cooling mechanism during large RCS pipe ruptures.

The limits on accumulator volume, boron concentration and pressure ensure that the assumptions used for accumulator injection in the accident analysis are met. If the boron concentration of one accumulator is not within limits (Action a), it must be returned to within the limits within 72 hours. In this condition, ability to maintain subcriticality or minimum boron precipitation time may be reduced. The boron in the accumulators contributes to the assumption that the combined ECCS water in the partially recovered core during the early reflooding phase of a large break LOCA is sufficient to keep that portion of the core subcritical. One accumulator below the minimum boron concentration limit, however, will have no effect on available ECCS water and an insignificant effect on core subcriticality during reflood. Boiling of ECCS water in the core during reflood concentrates boron in the saturated liquid that remains in the core. In addition, current analysis techniques demonstrate that the accumulators do not discharge following a large main steam line break. Thus, 72 hours is allowed to return the boron concentration to within limits.

If one accumulator is inoperable for a reason other than boron concentration (Action b), it must be returned to OPERABLE status within 24 hours. In this condition the required contents of two accumulators cannot be assumed to reach the core during a LOCA. Due to the severity of the consequences should a LOCA occur under these conditions, the 24 hour completion time to open the valve, remove power to the valve, or restore the proper water volume or nitrogen cover pressure ensures that prompt actions will be taken to return the inoperable accumulator to OPERABLE status. The completion time minimizes the potential for exposure of the plant to a LOCA under these conditions. The 24 hours allowed to restore an inoperable accumulator to OPERABLE status is justified by WCAP-15049-A, Revision 1, "Risk-Informed Evaluation of an Extension to Accumulator Completion Times", dated April 1999.

If the accumulator cannot be returned to OPERABLE status within the associated completion time (Action c), the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to HOT STANDBY within 6 hours and the reactor coolant system pressure reduced to ≤ 1000 psig within 12 hours. The allowed completion times are reasonable, based on operating experience, to reach the required plant condition from full power in an orderly manner and without challenging plant systems.

~~The limit of one hour for operation with an inoperable accumulator minimizes the time exposure of the plant to a LOCA event occurring concurrent with failure of an additional accumulator which may result in unacceptable peak cladding temperatures.~~

The RCS accumulators are isolated when RCS pressure is reduced to 1000 ± 100 psig to prevent borated water from being injected into the RCS during normal plant cooldown and depressurization conditions and also to prevent inadvertent overpressurization of the RCS at reduced RCS temperature. With the accumulator pressure reduced to less than the reactor vessel low temperature overpressure protection setpoint, the accumulator pressure cannot challenge the cold overpressure protection system or exceed the 10 CFR 50 Appendix G limits. Therefore, the accumulator discharge isolation valves may be opened to perform the accumulator discharge check valve testing specified in the IST program.

3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS

The OPERABILITY of two separate and independent ECCS subsystems ensures that sufficient emergency core cooling capability will be available in the event of a LOCA assuming the loss of one subsystem through any single failure consideration. Either subsystem operating in conjunction with the accumulators is capable of supplying sufficient core cooling to limit the peak cladding temperatures within acceptable limits for all postulated break sizes ranging from the double ended break of the largest RCS cold leg pipe downward. In addition, each ECCS subsystem provides long term core cooling capability in the recirculation mode during the accident recovery period.

The surveillance requirements provided to ensure OPERABILITY of each component ensure that at a minimum, the assumptions used in the accident analyses are met and that subsystem OPERABILITY is maintained.