

September 6, 1985

Mr. J. J. Carey, Vice President
Nuclear Group
Duquesne Light Company
Post Office Box 4
Shippingport, PA 15077

Dear Mr. Carey:

SUBJECT: ISSUANCE OF AMENDMENT (LICENSING ACTION TAC #56620 and 6714)

The Commission has issued the enclosed Amendment No.⁹⁶ to Facility Operating License No. DPR-66 for the Beaver Valley Power Station, Unit No. 1. The amendment consists of changes to the Technical Specifications in response to your application dated December 12, 1984 and revised by letter dated June 27, 1985.

The amendment changes the Technical Specifications for Beaver Valley Unit No. 1 to impose requirements to protect the reactor coolant system from overpressure events under low temperature conditions. The revised technical specifications comply with the guidelines contained in Standard Review Plan Section 5.2.2, "Overpressure Protection" and Branch Technical Position RSB 5-2, "Overpressurization Protection of PWRs While Operating At Low Temperatures".

A copy of the related Safety Evaluation is enclosed. The Notice of Issuance will be included in the Commission's next regular bi-weekly Federal Register notice.

Sincerely,

/s/PTam

Peter S. Tam, Project Manager
Operating Reactors Branch No. 1
Division of Licensing

Enclosures:

1. Amendment No.96 to DPR-66
2. Safety Evaluation

cc w/enclosures:
See next page

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Mr. J. J. Carey
Duquesne Light Company

Beaver Valley 1 Power Station

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Duquesne Light Company

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Beaver Valley 1 Power Station

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

DUQUESNE LIGHT COMPANY

OHIO EDISON COMPANY

PENNSYLVANIA POWER COMPANY

DOCKET NO. 50-334

BEAVER VALLEY POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 96
License No. DPR-66

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Duquesne Light Company, Ohio Edison Company, and Pennsylvania Power Company (the licensees) dated December 12, 1984 and revised by letter dated June 27, 1985, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-66 is hereby amended to read as follows:

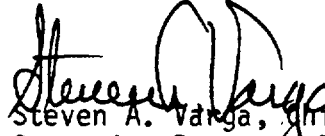
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(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 96, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This amendment is effective on issuance, to be implemented no later than 30 days after issuance.

FOR THE NUCLEAR REGULATORY COMMISSION


Steven A. Varga, Chief
Operating Reactors Branch #1
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: September 6, 1985

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 96 TO FACILITY OPERATING LICENSE NO. DPR-66

DOCKET NO. 50-334

Revise Appendix A as follows:

<u>Remove Pages</u>	<u>Insert Pages</u>
3/4 1-7	3/4 1-7
3/4 1-11	3/4 1-11
3/4 1-12	3/4 1-12
B3/4 1-2	B3/4 1-2
_____	B3/4 1-2a
3/4 4-2c	3/4 4-2c
_____	3/4 4-4a
B3/4 4-1a	B3/4 4-1a
_____	3/4 4-27a
_____	3/4 4-27b
B3/4 4-10	B3/4 4-10
3/4 5-2	3/4 5-2
3/4 5-6	3/4 5-6
_____	3/4 5-7a
B3/4 5-1	B3/4 5-1

REACTIVITY CONTROL SYSTEMS

3/4.1.2 BORATION SYSTEMS

FLOW PATHS - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.1 As a minimum, one of the following boron injection flow paths shall be OPERABLE:

- a. A flow path from the boric acid storage system via a boric acid transfer pump to a charging pump to the Reactor Coolant System if only the boric acid storage tank in Specification 3.1.2.7a is OPERABLE, or
- b. The flow path from the refueling water storage tank via a charging pump or a low head safety injection pump (with an open RCS vent of greater than or equal to 3.14 square inches) to the Reactor Coolant System if only the refueling water storage tank in Specification 3.1.2.7b is OPERABLE.

APPLICABILITY: MODES 5 and 6

ACTION

With none of the above flow paths OPERABLE, suspend all operations involving CORE ALTERATIONS or positive reactivity changes until at least one injection path is restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

4.1.2.1 At least one of the above required flow paths shall be demonstrated OPERABLE:

- a. At least once per 7 days by:
 1. Cycling each testable power operated or automatic valve in the flow path through at least one complete cycle of full travel.

REACTIVITY CONTROL SYSTEMS

CHARGING PUMP SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.3 One charging pump in the boron injection flow path~~s~~ required by Specification (3.1.2.1) or Low Head Safety Injection Pump (with an open reactor coolant system vent of greater than or equal to 3.14 square inches) shall be OPERABLE and capable of being powered from an OPERABLE emergency bus.

APPLICABILITY: MODES 5 and 6

ACTION:

With none of the above pumps OPERABLE, suspend all operations involving CORE ALTERNATIONS or positive reactivity changes until one charging pump or Low Head Safety Injection pump is restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

4.1.2.3.1 The above required charging pump shall be demonstrated OPERABLE at least once per 31 days by:

- a. Starting (unless already operating) the pump from the control room,
- b. Verifying, that on recirculation flow, the pump develops a discharge pressure of ≥ 2402 psig, and
- c. Verifying pump operation for at least 15 minutes.

4.1.2.3.2 All pumps, except the above required charging or Low Head Safety Injection pump, shall be demonstrated inoperable at least once per 12 hours by verifying that the control switches are placed in the PULL-TO-LOCK position and tagged.

4.1.2.3.3 When the Low Head Safety Injection pump is used in lieu of a charging pump, the Low Head Safety Injection pump shall be demonstrated OPERABLE by:

- a. Verification of an operable RWST pursuant to 4.1.2.7
- b. Verification of an operable Low Head Safety Injection Pump pursuant to Specification 4.5.2.b.2,
- c. Verification of power available* to MOV-1SI-890C with the plug inserted in its control circuit and an operable Low Head Safety Injection flow path from the RWST to the Reactor Coolant System once per shift, and
- d. Verification that the vent is open at least once per 12 hours.**

* Emergency backup power need not be available

** Except when the vent path is provided with a valve which is locked or provided with remote position indication, or sealed, or otherwise secured in the open position, then verify these valves open at least once per 7 days.

REACTIVITY CONTROL SYSTEMS

CHARGING PUMPS OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.4 At least two charging pumps shall be OPERABLE

APPLICABILITY: MODES 1, 2, 3, and 4#

ACTION:

With only one charging pump OPERABLE, restore at least two charging pumps to OPERABLE status within 72 hours or be in at least HOT STANDBY and borated to a SHUTDOWN MARGIN equivalent to at least 1% $\Delta k/k$ at 200°F within the next 6 hours; restore at least two charging pumps to OPERABLE status within the next 7 days or be in COLD SHUTDOWN within the next 30 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.4.1 At least two charging pumps shall be demonstrated OPERABLE at least once per 31 days on a STAGGERED TEST BASIS by:

- a. Starting (unless already operating) each pump from the control room,
- b. Verifying, that on recirculation flow, each pump develops a discharge pressure of ≥ 2402 psig, and
- c. Verifying pump operation for at least 15 minutes.

4.1.2.4.2 All charging pumps, except the above required OPERABLE pump, shall be demonstrated inoperable at least once per 12 hours whenever the temperature of one or more of the in-service RCS cold legs is $< 275^\circ\text{F}$ by verifying that the control switches are placed in the PULL-TO-LOCK position and tagged.

A maximum of one centrifugal charging pump shall be OPERABLE whenever the temperature of one or more of the non-isolated RCS cold legs is $\leq 275^\circ\text{F}$.

3/4.1 REACTIVITY CONTROL SYSTEMS

BASES

3/4.1.1.4 MODERATOR TEMPERATURE COEFFICIENT (MTC) (Continued)

fuel cycle. The surveillance requirement for measurement of the MTC at the beginning and near the end of each fuel cycle is adequate to confirm the MTC value since this coefficient changes slowly due principally to the reduction in RCS boron concentration associated with fuel burnup.

3/4.1.1.5 MINIMUM TEMPERATURE FOR CRITICALITY

This specification ensures that the reactor will not be made critical with the Reactor Coolant System average temperature less than 541°F. This limitation is required to ensure 1) the moderator temperature coefficient is within its analyzed temperature range, 2) the pressurizer is capable of being in an OPERABLE status with a steam bubble, 3) the reactor pressure vessel is above its minimum NDTT temperature and 4) the protective instrumentation is within its normal operating range.

3/4.1.2 BORATION SYSTEMS

The boron injection system ensures that negative reactivity control is available during each mode of facility operation. The components required to perform this function include 1) borated water sources, 2) charging pumps, 3) separate flow paths, 4) boric acid transfer pumps, 5) associated heat tracing systems, and 6) an emergency power supply from OPERABLE diesel generators.

With the RCS average temperature above 200°F, a minimum of two separate and redundant boron injection systems are provided to ensure single functional capability in the event an assumed failure renders one of the systems inoperable. Allowable out-of-service periods ensure that minor component repair or corrective action may be completed without undue risk to overall facility safety from injection system failures during the repair period.

With the RCS average temperature less than 200°F, Low Head Safety Injection pump may be used in lieu of the operable charging pump with a minimum open RCS vent of 3.14 square inches. This will provide latitude for maintenance and ISI examinations on the charging system for repair or corrective action and will ensure that boration and makeup are available when the charging pumps are out-of-service. An open vent insures that the RCS pressure will not exceed the shutoff head of the Low Head Safety Injection pumps.

MOV-1SI-890C is the Low Head Safety Injection Pump discharge isolation valve to the RCS coldlegs, the valve must be closed prior to reducing RCS pressure below the RWST head pressure to prevent draining into the RCS. Emergency backup power is not required since this valve is outside containment and can be manually operated if required, this will allow the associated diesel generator to be taken out of service for maintenance and testing.

3/4.1 REACTIVITY CONTROL SYSTEMS

BASES

3/4.1.2 BORATION SYSTEMS, (Continued)

The required volume of water in the refueling water storage tank for reactivity considerations while operating is 424,000 gallons. The associated technical specification limit on the refueling water storage tank has been established at 441,100 gallons to account for reactivity considerations and the NPSH requirements of the ECCS system.

The limitations for a maximum of one centrifugal charging pump to be OPERABLE and the Surveillance Requirement to verify all charging pumps except the required OPERABLE pump to be inoperable below 275°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV. Substituting a Low Head Safety Injection pump for a charging pump in Modes 5 and 6 will not increase the probability of an overpressure event since the shutoff head of the Low Head Safety Injection pumps is below the setpoint of the overpressure protection system.

REACTOR COOLANT SYSTEM

SHUTDOWN

LIMITING CONDITION FOR OPERATION

- 3.4.1.3 a. At least two of the coolant loops listed below shall be OPERABLE:
1. Reactor Coolant Loop (A) and its associated steam generator and reactor coolant pump,
 2. Reactor Coolant Loop (B) and its associated steam generator and reactor coolant pump,
 3. Reactor Coolant Loop (C) and its associated steam generator and reactor coolant pump.
 4. Residual Heat Removal Pump (A) and a heat exchanger,**
 5. Residual Heat Removal Pump (B) and a second heat exchanger.**
- b. At least one of the above coolant loops shall be in operation.***

APPLICABILITY: MODES 4 and 5

ACTION:

- a. With less than the above required loops OPERABLE, immediately initiate corrective action to return the required loops to OPERABLE status as soon as possible; be in COLD SHUTDOWN within 20 hours.
- b. With no coolant loop in operation, suspend all operation involving a reduction in boron concentration of the Reactor Coolant system and immediately initiate corrective action to return the required coolant loop to operation. Refer to Specification 3.4.1.6 for additional limitations.

** The normal or emergency power source may be inoperable in MODE 5.

*** All reactor coolant pumps and Residual Heat Removal pumps may be deenergized for up to 1 hour provided: 1) no operations are permitted that would cause dilution of the reactor coolant system boron concentration and 2) core outlet temperature is maintained at least 10°F below saturation temperature.

REACTOR COOLANT SYSTEM

REACTOR COOLANT PUMP STARTUP

LIMITING CONDITION FOR OPERATION

3.4.1.6 If both OPPS PORV's are not OPERABLE, an idle reactor coolant pump in a non-isolated loop shall not be started, unless:

1. The actual pressurizer water level is less than 60 percent (840 ft³), or
2. The secondary water temperature* of each steam generator is less than 25°F above each of the in-service RCS cold leg temperatures.

APPLICABILITY: When the temperature of one or more of the non-isolated loop cold legs is $\leq 275^{\circ}\text{F}$.

ACTION:

With the pressurizer water level greater than 60 percent or the temperature of the steam generator in the loop associated with the reactor coolant pump being started greater than 25° above the cold leg temperature of the other non-isolated loops, suspend the startup of the reactor coolant pump.

SURVEILLANCE REQUIREMENTS:

4.4.1.6.1 The pressurizer water volume or the secondary water temperature of the non-isolated steam generators shall be determined within ten minutes prior to starting a reactor coolant pump.

* The secondary water temperature is to be verified by direct measurement of the fluid temperature, or contact temperature readings on the steam generator secondary, or blowdown piping after purging of stagnant water within the piping.

3/4.4 REACTOR COOLANT SYSTEM

BASES

3/4.4.1 REACTOR COOLANT LOOPS, (continued)

of Appendix G by either (1) restricting the water level in the pressurizer and thereby providing a volume for the primary coolant to expand into or (2) by restricting starting of the RCPs to when the secondary water temperature of each steam generator is less than 25°F above each of the RCS cold leg temperatures.

The requirement to maintain the boron concentration of an isolated loop greater than or equal to the boron concentration of the operating loops ensures that no reactivity addition to the core could occur during startup of an isolated loop. Verification of the boron concentration in an idle loop immediately prior to opening the stop valves provides a reassurance of the adequacy of the boron concentration in the isolated loop. Operating the isolated loop on recirculating flow for at least 90 minutes prior to opening its stop valves ensures adequate mixing of the coolant in this loop and prevents any reactivity effects due to boron concentration stratifications.

Startup of an idle loop will inject cool water from the loop into the core. The reactivity transient resulting from this cool water injection is minimized by delaying isolated loop startup until its temperature is within 20°F of the operating loops. Making the reactor subcritical prior to loop startup prevents any power spike which could result from this cool water induced reactivity transient.

3/4.4.2 and 3/4.4.3 SAFETY VALVES

The pressurizer code safety valves operate to prevent the RCS from being pressurized above its Safety Limit of 2735 psig. Each safety valve is designed to relieve 345,000 lbs. per hour of saturated steam at the valve set point. The relief capacity of a single safety valve is adequate to

REACTOR COOLANT SYSTEM

OVERPRESSURE PROTECTION SYSTEMS

LIMITING CONDITION FOR OPERATION

3.4.9.3 At least one of the following overpressure protection systems shall be OPERABLE:

- a. Two power operated relief valves (PORVs) with a nominal trip setpoint of ≤ 350 psig, or
- b. A reactor coolant system vent of ≥ 3.14 square inches.

APPLICABILITY: When the temperature of one or more of the non-isolated RCS cold legs is $\leq 275^{\circ}\text{F}$.

ACTION:

- a. With one PORV inoperable, either restore the inoperable PORV to OPERABLE status within 7 days or depressurize and vent the RCS through a 3.14 square inch vent(s) within the next 12 hours; maintain the RCS in a vented condition until both PORVs have been restored to OPERABLE status. Refer to Technical Specification 3.4.1.6 for further limitations.
- b. With both PORV's inoperable, depressurize and vent the RCS through a 3.14 square inch vent(s) within 12 hours; maintain the RCS in a vented condition until both PORVs have been restored to OPERABLE status.
- c. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENT

4.4.9.3.1 Each PORV shall be demonstrated OPERABLE BY:

REACTOR COOLANT SYSTEM

SURVEILLANCE REQUIREMENTS (Continued)

- a. Performance of a CHANNEL FUNCTIONAL TEST on the PORV actuation channel, but excluding valve operation, within 31 days prior to entering a condition in which the PORV is required OPERABLE and at least once per 31 days thereafter when the PORV is required OPERABLE.
- b. Performance of a CHANNEL CALIBRATION on the PORV actuation channel at least once per 18 months.
- c. Verifying the PORV isolation valve is open at least once per 72 hours when the PORV is being used for overpressure protection.
- d. Stroking the operable PORV(s) each time the plant enters Mode 5, unless tested within the preceding three months.

4.4.9.3.2 The ≥ 3.14 square inch RCS vent(s) shall be verified to be open at least once per 12 hours* when the vent(s) is being used for overpressure protection.

* Except when the vent pathway is provided with a valve which is locked, or provided with remote position indication, sealed, or otherwise secured in the open position, then verify these valves open at least once per 7 days.

REACTOR COOLANT SYSTEM

BASES

vessel inside radius are essentially identical, the measured transition shift for a sample can be applied with confidence to the adjacent section of the reactor vessel. The heatup and cooldown curves must be recalculated when the ΔRT_{NDT} determined from the surveillance capsule is different from the calculated ΔRT_{NDT} for the equivalent capsule radiation exposure.

The pressure-temperature limit lines shown on Figure 3.4-2 for reactor criticality and for inservice leak and hydrostatic testing have been provided to assure compliance with the minimum temperature requirements of Appendix G to 10 CFR 50 for reactor criticality and for inservice leak and hydrostatic testing.

The number of reactor vessel irradiation surveillance specimens and the frequencies for removing and testing these specimens are provided in Table 4.4-3 to assure compliance with the requirements of Appendix H to 10 CFR Part 50.

The limitations imposed on the pressurizer heatup and cooldown rates and spray water temperature differential are provided to assure that the pressurizer is operated within the design criteria assumed for the fatigue analysis performed in accordance with the ASME Code requirements.

The OPERABILITY of two PORVs or an RCS vent opening of greater than 3.14 square inches ensures that the RCS will be protected from pressure transients which could exceed the limits of Appendix G to 10 CFR Part 50 when one or more of the RCS cold legs are $< 275^{\circ}\text{F}$. Either PORV has adequate relieving capability to protect the RCS from overpressurization when the transient is limited to either (1) the start of an idle RCP with the secondary water temperature of the steam generator $\leq 25^{\circ}\text{F}$ above the RCS cold leg temperature or (2) the start of a charging pump and its injection into a water solid RCS.

3/4.4.10 STRUCTURAL INTEGRITY

The inservice inspection and testing programs for ASME Code Class 1, 2 and 3 components ensure that the structural integrity and operational readiness of these components will be maintained at an acceptable level throughout the life of the plant. These programs are in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10 CFR Part 50.55a(g) except where specific written relief has been granted by the Commission pursuant to 10 CFR Part 50.55a(g)(6)(i).

3/4.4.11 RELIEF VALVES

The relief valves have remotely operated block valves to provide a positive shutoff capability should a relief valve become inoperable. The electrical power for both the relief valves and the block valves is capable of being supplied from an emergency power source to ensure the ability to seal this possible RCS leakage path.

EMERGENCY CORE COOLING SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

- 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.
- c. At least once per 31 days when the RCS pressure is above 2000 psig be 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.
- d. Verifying at least once per 18 months that each accumulator isolation valve opens automatically under each of the following conditions:
 - 1. When the RCS pressure exceeds 2000 psig.
 - 2. Upon receipt of a Safety Injection test signal

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.

4.5.1.3 During normal plant cooldown and depressurization, each accumulator discharge isolation valve [MOV-1SI-865A, B and C] shall be verified to be closed and de-energized when RCS pressure is reduced to $1,000 \pm 100$ psig.

EMERGENCY CORE COOLING SYSTEMS

ECCS SUBSYSTEMS $T_{avg} < 350^{\circ}\text{F}$

LIMITING CONDITION FOR OPERATION

3.5.3 As a minimum, one ECCS subsystem comprised of the following shall be OPERABLE:

- a. One OPERABLE centrifugal charging pump,#
- b. One OPERABLE Low Head Safety Injection Pump, and
- c. An OPERABLE flow path capable of taking suction from the refueling water storage tank upon being manually realigned and transferring suction to the containment sump during the recirculation phase of operation.

APPLICABILITY: MODE 4.

ACTION:

- a. With no ECCS subsystem OPERABLE because of the inoperability of either the centrifugal charging pump or the flow path from the refueling water storage tank, restore at least one ECCS subsystem to OPERABLE status within 1 hour or be in COLD SHUTDOWN within the next 20 hours.
- b. In the event the ECCS is actuated and injects water into the Reactor Coolant System, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 90 days describing the circumstances of the actuation and the total accumulated actuation cycles to date.

SURVEILLANCE REQUIREMENTS

4.5.3.1 The ECCS subsystem shall be demonstrated OPERABLE per the applicable Surveillance Requirements of 4.5.2.

4.5.3.2 All charging pumps except the above required OPERABLE pumps, shall be demonstrated inoperable at least once per 12 hours whenever the temperature of one or more of the non-isolated RCS cold legs is $< 275^{\circ}\text{F}$ by verifying that the control switches are placed in the PULL-TO-LOCK position and tagged.

A maximum of one centrifugal charging pump shall be OPERABLE whenever the temperature of one or more of the non-isolated RCS cold legs is $\leq 275^{\circ}\text{F}$.

EMERGENCY CORE COOLING SYSTEMS

3/4.5.4 BORON INJECTION SYSTEM

BORON INJECTION TANK <350°F

LIMITING CONDITION FOR OPERATION

3.5.4.1.2 The boron injection tank flow path shall be isolated and power removed from the inlet or outlet valves.

APPLICABILITY: When the temperature of one or more of the non-isolated RCS cold legs is $\leq 275^{\circ}\text{F}$.

ACTION:

With the boron injection tank not isolated, isolate the tank flow path and remove power from the inlet or outlet valves.

SURVEILLANCE REQUIREMENTS

4.5.4.1.2 The boron injection tank flow path shall be verified isolated by verifying at least once per 7 days that the Boron Injection Tank inlet or outlet valves are closed and de-energized except for purposes of flow testing or valve stroke testing.

3/4.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

BASES

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 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.

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 ensures that at a minimum, the assumptions used in the accident analyses are met and that subsystem OPERABILITY is maintained.

The limitation for a maximum of one charging pump to be OPERABLE and the Surveillance Requirement to verify all charging pumps except the required OPERABLE pump to be inoperable below 275°F provides assurance that a mass addition pressure transient can be relieved by the operation of a single PORV.

3/4.5.4 BORON INJECTION SYSTEM

The OPERABILITY of the boron injection system as part of the ECCS ensures that sufficient negative reactivity is injected into the core to limit any positive increase in reactivity caused by RCS system cooldown. RCS cooldown can be caused by inadvertent depressurization, a loss-of-coolant accident or a steam line rupture.

The boron injection tank is required to be isolated when RCS temperature is less than 350°F to prevent a potential overpressurization due to an inadvertent safety injection signal.