UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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. 195
License No. DPR-66

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Duquesne Light Company, et al. (the licensee) dated July 10, 1995, 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:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 195, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance, to be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

John F. Stolz, Director
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: February 12, 1996

ATTACHMENT TO LICENSE AMENDMENT NO. 195

FACILITY OPERATING LICENSE NO. DPR-66

DOCKET NO. 50-334

Replace the following pages of Appendix A Technical Specifications, with the enclosed pages as indicated. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

Remove	Insert
III	III
V	V
---	3/4 1-17a
3/4 3-6	3/4 3-6
3/4 4-1	3/4 4-1
3/4 4-2	----
3/4 4-2a	----
3/4 4-3	3/4 4-3
---	3/4 4-3a
3/4 4-4	3/4 4-4
B 3/4 1-2a	B 3/4 1-2a
---	B 3/4 1-2b
B 3/4 4-1	B 3/4 4-1
B 3/4 4-1a	B 3/4 4-1a
---	B 3/4 4-1b
---	B 3/4 4-1c
---	B 3/4 4-1d
---	B 3/4 4-1e
---	B 3/4 4-1f
---	B 3/4 4-1g

INDEX

BASES

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

INDEX

LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

REACTIVITY CONTROL SYSTEMS

ISOLATION OF UNBORATED WATER SOURCES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.9 The following valves shall be locked, sealed or otherwise secured in the closed position except during planned boron dilution or makeup activities:

a. 1CH-90, or

b. 1CH-91 and 1CH-93

APPLICABILITY: MODES 4, 5 and 6.

ACTION:

With the requirements of the above specification not satisfied, perform the following:

1. Immediately suspend all operations involving positive reactivity changes, CORE ALTERATIONS or any use of the Primary Grade Water System with the Charging System,

2. Immediately initiate actions to lock, seal or otherwise secure the required valve(s) in the closed position as soon as possible, and

3. Verify within 1 hour(1) that the SHUTDOWN MARGIN is greater than or equal to the minimum required as per the applicable specification listed below and follow the applicable specification ACTIONs as necessary:

Specification	Applicable MODE
3.1.1.1	4
3.1.1.2	5
3.9.1	6

SURVEILLANCE REQUIREMENTS

4.1.2.9 The above listed valve(s) shall be verified to be locked, sealed or otherwise secured in the closed position:

a. Within 15 minutes after a planned boron dilution or makeup activity, and

b. At least once per 31 days.

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(1) This action is required to be completed regardless of when the requirements of the above specification are satisfied.

TABLE 3.3-1 (Continued)

ACTION 3 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. Below P-6, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 setpoint.

b. Above P-6 but below 5 percent of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 5 percent of RATED THERMAL POWER.

c. Above 5 percent of RATED THERMAL POWER, POWER OPERATION may continue.

ACTION 4 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. Below P-6, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 setpoint.

b. Above P-6, operation may continue.

ACTION 5 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 or Specification 3.1.1.2, as applicable within 1 hour, and at least once per 12 hours thereafter, and verify valves (1CH-90) or (1CH-91 and 1CH-93) are closed and secured in position within the next hour.

ACTION 6 - Not applicable.

ACTION 7 - With the number of OPERABLE channels(6) one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours, and

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.1.

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(6) An OPERABLE hot leg channel consists of: 1) three RTDs per hot leg, or 2) two RTDs per hot leg with the failed RTD disconnected and the required bias applied.

3/4.4 REACTOR COOLANT SYSTEM

3/4.4.1 REACTOR COOLANT LOOPS

NORMAL OPERATION

LIMITING CONDITION FOR OPERATION

3.4.1.1 All reactor coolant loops shall be in operation.

APPLICABILITY: MODES 1 and 2.

ACTION:

With less than the above required reactor coolant loops in operation, be in at least HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

4.4.1.1 All reactor coolant loops shall be verified in operation and circulating reactor coolant at least once per 12 hours.

LOOP ISOLATION VALVES - OPERATING

LIMITING CONDITION FOR OPERATION

3.4.1.4.1 Each RCS hot and cold leg loop isolation valve shall be open with power removed from each isolation valve operator.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With one or more RCS loop isolation valve(s) closed, maintain the valve(s) closed, be in MODE 3 within the next 6 hours, and be in MODE 5 within the following 30 hours.

b. With power available to one or more loop isolation valve operators, remove power from the loop isolation valve operators within 30 minutes.(1)

SURVEILLANCE REQUIREMENTS

4.4.1.4.1 Verify at least once per 31 days that each RCS loop isolation valve is open and power is removed from each isolation valve operator.

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(1) Separate condition entry is allowed for each RCS loop isolation valve.

LOOP ISOLATION VALVES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.4.1.4.2 The loop isolation valves in an isolated RCS loop shall have power removed from the associated loop isolation valve operators(1).

APPLICABILITY:

Whenever an RCS loop has been isolated, MODES 5 and 6(2).

ACTION:

With the requirements of the above specification not satisfied, remove power from the isolated loop isolation valve operators(1) within 1 hour.

SURVEILLANCE REQUIREMENTS

4.4.1.4.2 Verify at least once per 7 days that power is removed from the RCS isolated loop isolation valve operators(1).

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(1) Power may be restored to the associated RCS isolated loop isolation valve operators provided the requirements of Surveillance Requirement 4.4.1.5.2 have been satisfied.

(2) With fuel in the vessel.

ISOLATED LOOP STARTUP

LIMITING CONDITION FOR OPERATION

3.4.1.5 Each RCS isolated loop shall remain isolated with:

a. The hot and cold leg isolation valve closed until the isolated portion of tne loop has been drained and refilled from the refueling water storage tank or Reactor Coolant System, and

b. The hot and cold leg isolation valves closed if the boron concentration in the isolated loop is less than the minimum required to satisfy the applicable requirements of Specification 3.1.1.2 for MODE 5 or Specification 3.9.1 for MODE 6.

APPLICABILITY: Whenever an RCS loop has been isolated greater than 4 hours or drained(1).

ACTION:

With the requirements of the above specification not satisfied, immediately close the hot and cold leg isolation valves.

SURVEILLANCE REQUIREMENTS

4.4.1.5.1 Verify that the isolated loop has been drained and refilled with water from the refueling water storage tank or Reactor Coolant System prior to opening the hot or cold leg isolation valve in the isolated loop.

4.4.1.5.2 Verify that the isolated loop boron concentration is greater than or equal to the minimum required to satisfy the applicable requirements of Specification 3.1.1.2 for MODE 5 or Specification 3.9.1 for MODE 6 within 2 hours prior to opening the hot or cold leg isolation valve in the isolated loop.

4.4.1.5.3 Verify that the hot or cold leg isolation valve in the isolated loop is opened within 4 hours following completion of refilling the isolated loop.

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(1) With fuel in the vessel.

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 OPERABILITY of the RWST as part of the ECCS ensures that a sufficient supply of borated water is available for injection by the ECCS in the event of a LOCA. The limits on RWST minimum volume and boron concentration ensure that 1) sufficient water is available within containment to permit recirculation cooling flow to the core, and 2) the reactor will remain subcritical in the cold condition following mixing of the RWST and the RCS water volumes with all control rods inserted except for the most reactive control assembly. These assumptions are consistent with the LOCA analysis.

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 less than or equal to the enable temperature set forth in Specification 3.4.9.3 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 less than or equal to the setpoint of the overpressure protection system.

Isolation of the primary grade water flow path during MODES 4, 5 and 6 precludes an unplanned boron dilution at these conditions since the sole source of unborated water to the charging pumps is isolated. This eliminates the design basis boron dilution event in MODES 4, 5 and 6. During planned boron dilution events, operator attention will be focused on the boron dilution process and any inappropriate blender operation would be readily identified through various indications which includes the output from the source range nuclear instrumentation.

Closing either a) 1CH-90 or b) 1CH-91 and 1CH-93 will ensure that all possible flow paths are isolated from the Primary Grade Water System to the operating Reactor Coolant System flow path via the charging pumps, thus preventing any potential inadvertent boron dilution event by injection of unborated water.

The ACTION to suspend all operations involving positive reactivity changes or CORE ALTERATIONS is intended to provide assurance that no other activity will mask any potential unintentional boron dilution event. Maintaining the Primary Grade

3/4.1.2 BORATION SYSTEMS (Continued)

Water System isolated is necessary to ensure that the design basis boron dilution event is not credible. Thus, immediate corrective action is needed to restore positive isolation as soon as possible when not conducting planned boron dilution or makeup activities. Lack of continuous corrective action to restore the Limiting Condition for Operation (LCO) would then make a potential inadvertent boron dilution credible and require performing additional analysis to verify acceptable consequences if it should occur.

Verifying the SHUTDOWN MARGIN within one hour ensures that no unacceptable reduction of SHUTDOWN MARGIN occurred when the LCO requirements were not satisfied. The SHUTDOWN MARGIN need only be verified once since the cessation of any activities involving positive reactivity changes, CORE ALTERATIONS or use of the Primary Grade Water System with the Charging System will prevent any future potential injection of primary grade water into the Reactor Coolant System. The verification of SHUTDOWN MARGIN needs to be completed anytime that the ACTION is entered even if the LCO is subsequently satisfied before the verification is completed to ensure that no unacceptable reduction of SHUTDOWN MARGIN occurred when the LCO requirements were not satisfied.

The primary function of the surveillance is to ensure that the valve(s) used to isolate the Primary Grade Water System are locked, sealed or otherwise secured. The frequency of 31 days to ensure that the Primary Grade Water System is properly isolated is based on engineering judgment, and has proven to be acceptable. Operating experience has shown that the failure rate is so low that the 31 day frequency is justified. A time frame of 15 minutes provides a minimum reasonable time for an operator to isolate the Primary Grade Water System following a planned activity requiring its use.

BASES

3/4.4.1.1, 2, 3 REACTOR COOLANT LOOPS

The plant is designed to operate with all reactor coolant loops in operation and maintain DNBR above the design DNBR limit during all normal operations and anticipated transients. In Modes 1 and 2, with one reactor coolant loop not in operation, THERMAL POWER is restricted to less than or equal to 31 percent of RATED THERMAL POWER until the Overtemperature ΔT trip is reset. Either action ensures that the DNBR will be maintained above the design DNBR limit. A loss of flow in two loops will cause a reactor trip if operating above P-7 (11 percent of RATED THERMAL POWER) while a loss of flow in one loop will cause a reactor trip if operating above P-8 (31 percent of RATED THERMAL POWER).

In MODE 3, a single reactor coolant loop provides sufficient heat removal capability for removing decay heat; however, due to the initial conditions assumed in the analysis for the control rod bank withdrawal from a subcritical condition, two operating coolant loops are required to meet the DNB design basis for this Condition II event.

In MODES 4 and 5, a single reactor coolant loop or RHR subsystem provides sufficient heat removal capability for removing decay heat; but single failure considerations require that at least two loops be OPERABLE. Thus, if the reactor coolant loops are not OPERABLE, this specification requires two RHR loops to be OPERABLE.

The operation of one Reactor Coolant Pump or one RHR pump provides adequate flow to ensure mixing, prevent stratification and produce gradual reactivity changes during boron concentration reductions in the Reactor Coolant System. The reactivity change rate associated with boron reduction will, therefore, be within the capability of operator recognition and control.

The restrictions on starting a Reactor Coolant Pump with one or more RCS cold legs less than or equal to 275°F are provided to prevent RCS pressure transients, caused by energy additions from the secondary system, which could exceed the limits of Appendix G to 10 CFR Part 50. The RCS will be protected against overpressure transients and will not exceed the limits 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.

BASES

3/4.4.1.4 LOOP ISOLATION VALVES

BACKGROUND

The RCS may be operated with loops isolated in order to perform maintenance. While operating with a loop isolated, there is a potential for inadvertently opening the isolation valves in the isolated loop. In this event, the coolant in the isolated loop would suddenly begin to mix with the coolant in the operating loops. This situation has the potential for causing a positive reactivity addition with a corresponding reduction of SHUTDOWN MARGIN if the boron concentration in the isolated loop is less than the required SHUTDOWN MARGIN.

As discussed in the UFSAR, the startup of an isolated loop is performed in a controlled manner that virtually eliminates any inappropriate sudden positive reactivity addition from unborated water because:

a. LCO 3.4.1.5, "Isolated Loop Startup," and plant operating procedures require that the boron concentration in the isolated loop be maintained higher than the SHUTDOWN MARGIN requirement for the operating loops, thus eliminating the potential for introducing coolant from the isolated loop that could dilute the boron concentration in the operating loops below the required SHUTDOWN MARGIN; and

b. The loop isolation valves cannot be opened unless the loop has been drained and refilled with water supplied from the refueling water storage tank or from the Reactor Coolant System. This would include water from the refueling cavity. This ensures adequate boron concentration in the water to refill the isolated loop, adequate mixing of the coolant in the isolated loop, and prevents any reactivity effects due to boron concentration stratification; and

c. Removing the power from the loop isolation valve operator ensures that a loop isolation valve will not be moved unless specifically intended by a procedure.

APPLICABLE SAFETY ANALYSES

Isolated loop startup is limited to MODES 5 and 6 in accordance with the NRC SER on N-1 loop operation.

During startup of an isolated loop in accordance with LCO 3.4.1.5, operating procedures prevent the opening of the loop isolation valve until the isolated loop is drained and refilled with water supplied from the refueling water storage tank or Reactor

BASES

3/4.4.1.4 LOOP ISOLATION VALVES (Continued)

APPLICABLE SAFETY ANALYSES (Continued)

Coolant System, and the isolated loop boron concentration is verified. Verification of the isolated loop boron concentration prior to opening the isolated loop isolation valves provides a reassurance of the adequacy of the SHUTDOWN MARGIN. This ensures that any undesirable reactivity effect from the isolated loop does not occur. The safety analyses assume a minimum SHUTDOWN MARGIN as an initial condition for Design Basis Accidents (DBAs). Violation of the LCO, combined with mixing of the isolated loop coolant into the operating loops, could result in the SHUTDOWN MARGIN being less than that assumed in the safety analyses.

LCO

LCO 3.4.1.4.1 ensures that a loop isolation valve that becomes closed in MODES 1 through 4 is fully closed and the plant placed in MODE 5.

LCO 3.4.1.4.2 ensures that power is removed from isolated loop isolation valve operators when closed to perform maintenance in MODES 5 or 6 to prevent an inadvertent loop startup.

APPLICABILITY

LCO 3.4.1.4.1 is applicable in MODES 1 through 4 and LCO 3.4.1.4.2 is applicable whenever an RCS loop has been isolated in MODES 5 and 6 with fuel in the reactor vessel. LCO 3.4.1.4.2 is not applicable when there is no fuel in the reactor vessel. In MODES 5 and 6, controlled startup of isolated loops is possible without significant risk of inadvertent criticality.

An RCS loop is considered isolated in MODES 5 and 6 whenever the hot and cold leg isolation valves on one RCS loop are both in a fully closed position at the same time. One isolation valve may be stroked for testing in MODES 5 and 6 and the loop will not be considered isolated when either the hot leg or cold leg loop isolation valve remains open.

3/4.4.1.4 LOOP ISOLATION VALVES (Continued)

ACTION

For LCO 3.4.1.4.1

a. Should a loop isolation valve be closed in MODES 1 through 4, the affected loop isolation valve(s) must be maintained closed and the plant placed in MODE 5 to preclude inadvertent startup of the loop and the subsequent potential inadvertent positive reactivity insertion or criticality. The completion time of the ACTIONs allow time for borating the operating loops to a shutdown boration level such that the plant can be brought to MODE 3 within 6 hours and MODE 5 within 36 hours. The allowed completion times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

b. If power is inadvertently restored to one or more loop isolation valve operators, the potential exists for accidental isolation of a loop with a subsequent inadvertent startup of the isolated loop. The loop isolation valves have motor operators. Therefore, these valves will maintain their last position when power is removed from the valve operator. With power applied to the valve operators, only administrative controls prevent the valve from being operated. Although operating procedures make the occurrence of this event unlikely, the prudent action is to remove power from the loop isolation valve operators. The completion time of 30 minutes to remove power from the loop isolation valve operators is sufficient considering the complexity of the task.

For LCO 3.4.1.4.2.

If power is inadvertently restored to one or more loop isolation valve operators, the potential exists for accidental isolation of a loop with a subsequent inadvertent startup of the isolated loop. The loop isolation valves have motor operators. Therefore, these valves will maintain their last position when power is removed from the valve operator. With power applied to the valve operators, only administrative controls prevent the valve from being operated. Although operating procedures make the occurrence of this event unlikely, the prudent action is to remove power from the loop isolation valve operators. The completion time of 1 hour to remove power from the loop isolation valve operators is sufficient considering the complexity of the task.

3/4.4.1.4 LOOP ISOLATION VALVES (Continued)

SURVEILLANCE REQUIREMENTS (SR)

SR 4.4.1.4.1

SR 4.4.1.4.1 is performed at least once per 31 days to ensure that the RCS loop isolation valves are open, with power removed from the loop isolation valve operators. The primary function of this surveillance is to ensure that power is removed from the valve operators, since SR 4.4.1.1 ensures that the loop isolation valves are open by verifying every 12 hours that all loops are operating and circulating reactor coolant. The frequency of 31 days ensures that the required flow can be made available, is based on engineering judgment, and has proven to be acceptable. Operating experience has shown that the failure rate is so low that the 31 day frequency is justified.

SR 4.4.1.4.2

SR 4.4.1.4.2 is performed at least once per 7 days to ensure that the RCS loop isolation valves have power removed from the loop isolation valve operators. The frequency of 7 days which ensures that the power is removed from loop isolation valve operators, is based on engineering judgment, and has proven to be acceptable. Operating experience has shown that the failure rate is so low that the 7 day frequency is justified.

3/4.4.1.5 ISOLATED LOOP STARTUP

BACKGROUND

The RCS may be operated with loops isolated in order to perform maintenance. While operating with a loop isolated, there is a potential for inadvertently opening the isolation valves in the isolated loop. In this event, the coolant in the isolated loop would suddenly begin to mix with the coolant in the operating loops. This situation has the potential for causing a positive reactivity addition with a corresponding reduction of SHUTDOWN MARGIN if the boron concentration in the isolated loop is less than the required SHUTDOWN MARGIN.

As discussed in the UFSAR, the startup of an isolated loop is performed in a controlled manner that virtually eliminates any inappropriate sudden positive reactivity addition from unborated water because:

a. LCO 3.4.1.5, "Isolated Loop Startup," and plant operating procedures require that the boron concentration in the isolated loop be maintained higher than the SHUTDOWN MARGIN

3/4.4.1.5 ISOLATED LOOP STARTUP (Continued)

BACKGROUND (Continued)

requirement for the operating loops, thus eliminating the potential for introducing coolant from the isolated loop that could dilute the boron concentration in the operating loops below the required SHUTDOWN MARGIN; and

b. The loop isolation valves cannot be opened unless the loop has been drained and refilled with water supplied from the refueling water storage tank or from the Reactor Coolant System. This would include water from the refueling cavity. This ensures adequate boron concentration in the water to refill the isolated loop, adequate mixing of the coolant in the isolated loop, and prevents any reactivity effects due to boron concentration stratification; and

c. Removing the power from the loop isolation valve operator ensures that a loop isolation valve will not be moved unless specifically intended by a procedure.

APPLICABLE SAFETY ANALYSES

Isolated loop startup is limited to MODES 5 and 6 in accordance with the NRC SER on N-1 loop operation.

During startup of an isolated loop in accordance with LCO 3.4.1.5, operating procedures prevent the opening of the loop isolation valve until the isolated loop is drained and refilled with water supplied from the refueling water storage tank or Reactor Coolant System, and the isolated loop boron concentration is verified. Verification of the isolated loop boron concentration prior to opening the isolated loop isolation valves provides a reassurance of the adequacy of the SHUTDOWN MARGIN. This ensures that any undesirable reactivity effect from the isolated loop does not occur. The safety analyses assume a minimum SHUTDOWN MARGIN as an initial condition for Design Basis Accidents (DBAs). Violation of the LCO, combined with mixing of the isolated loop coolant into the operating loops, could result in the SHUTDOWN MARGIN being less than that assumed in the safety analyses.

LCO

Loop isolation valves are used for performing maintenance when the plant is in MODES 5 or 6. LCO 3.4.1.5 ensures that the loop isolation valves remain closed on an isolated loop until the SHUTDOWN MARGIN in the isolated loop is within acceptable limits.

3/4.4.1.5 ISOLATED LOOP STARTUP (Continued)

APPLICABILITY

In MODES 5 and 6, the SHUTDOWN MARGIN of the operating loops is large enough to permit operation with isolated loops. In these MODES, controlled startup of isolated loops is possible without significant risk of inadvertent criticality.

An RCS loop is considered isolated in MODES 5 and 6 whenever the hot and cold leg isolation valves on one RCS loop are both in a fully closed position at the same time. One isolation valve may be stroked for testing in MODES 5 and 6 and the loop will not be considered isolated when either the hot leg or cold leg loop isolation valve remains open.

ACTION

The ACTION for LCO 3.4.1.5 assumes that the prerequisites of the LCO are not met and a loop isolation valve has been inadvertently opened. Therefore, the ACTION requires immediate closure of isolation valves to preclude a potential boron dilution event.

SURVEILLANCE REQUIREMENTS (SR)

SR 4.4.1.5.1 and 4.4.1.5.3

As an additional measure to ensure that the boron concentration in an isolated loop remains within acceptable limits, SR 4.4.1.5.1 requires that an isolated loop is drained and refilled with borated water supplied from the refueling water storage tank or Reactor Coolant System prior to opening the hot or cold leg isolation valve in the isolated loop. The 4 hour time limit ensures that there is no unacceptable boron concentration stratification in an isolated loop. These surveillance frequencies have been shown to be acceptable through operating experience.

SR 4.4.1.5.2

To ensure that the boron concentration of the isolated loop meets acceptable limits, SR 4.4.1.5.2 is performed within 2 hours prior to opening either the hot or cold leg isolation valve. This provides reasonable assurance that the boron concentration will stay within acceptable limits until the loop is unisolated.

BASES

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 relieve any overpressure condition which could occur during shutdown. In the event that no safety valves are OPERABLE, an operating RHR loop, connected to the RCS, provides overpressure relief capability and will prevent RCS overpressurization.

During operation, all pressurizer code safety valves must be OPERABLE to prevent the RCS from being pressurized above its safety limit of 2735 psig. The combined relief capacity of all of these valves is greater than the maximum surge rate resulting from a complete loss of load assuming no reactor trip until the first Reactor Protective System trip set point is reached (i.e., no credit is taken for a direct reactor trip on the loss of load) and also assuming no operation of the power operated relief valves or steam dump valves.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

DUQUESNE LIGHT COMPANY

OHIO EDISON COMPANY

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

THE TOLEDO EDISON COMPANY

DOCKET NO. 50-412

BEAVER VALLEY POWER STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 78
License No. NPF-73

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Duquesne Light Company, et al. (the licensee) dated July 10, 1995, 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. NPF-73 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 78 , and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto are hereby incorporated in the license. DLCO shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance, to be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

John F. Stolz, Director
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: February 12, 1996

ATTACHMENT TO LICENSE AMENDMENT NO. 78

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DOCKET NO. 50-412

Replace the following pages of Appendix A, Technical Specifications, with the enclosed pages as indicated. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

Remove	Insert
V	V
VI	VI
3/4 1-17	3/4 1-17
3/4 3-6	3/4 3-6
3/4 4-1	3/4 4-1
3/4 4-5	3/4 4-5
---	3/4 4-5a
3/4 4-6	3/4 4-6
3/4 9-1	3/4 9-1
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---	B 3/4 1-5
---	B 3/4 1-6
B 3/4 4-1	B 3/4 4-1
---	B 3/4 4-1a
---	B 3/4 4-1b
---	B 3/4 4-1c
---	B 3/4 4-1d
---	B 3/4 4-1e
---	B 3/4 4-1f

INDEX

LIMITING CONDITION FOR OPERATION AND SURVEILLANCE REQUIREMENTS

INDEX

LIMITING CONDITION FOR OPERATION AND SURVEILLANCE REQUIREMENTS

ISOLATION OF UNBORATED WATER SOURCES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.9 The following valves shall be locked, sealed or otherwise secured in the closed position except during planned boron dilution or makeup activities:

a. 2CHS-37 and 2CHS-828, or

b. 2CHS-91, 2CHS-96 and 2CHS-138

APPLICABILITY: MODES 4, 5 and 6.

ACTION:

With the requirements of the above specification not satisfied, perform the following:

1. Immediately suspend all operations involving positive reactivity changes, CORE ALTERATIONS or any use of the Primary Grade Water System with the Charging System,

2. Immediately initiate actions to lock, seal or otherwise secure the required valve(s) in the closed position as soon as possible, and

3. Verify within 1 hour(1) that the SHUTDOWN MARGIN is greater than or equal to the minimum required as per the applicable specification listed below and follow the applicable specification ACTIONs as necessary:

Specification	Applicable MODE
3.1.1.1	4
3.1.1.2	5
3.9.1	6

SURVEILLANCE REQUIREMENTS

4.1.2.9 The above listed valve(s) shall be verified to be locked, sealed or otherwise secured in the closed position:

a. Within 15 minutes after a planned boron dilution or makeup activity, and

b. At least once per 31 days.

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(1) This action is required to be completed regardless of when the requirements of the above specification are satisfied.

TABLE 3.3-1 (Continued)

ACTION 3 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. Below P-6, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 setpoint.

b. Above P-6 but below 5 percent of RATED THERMAL POWER, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 5 percent of RATED THERMAL POWER.

c. Above 5 percent of RATED THERMAL POWER, POWER OPERATION may continue.

ACTION 4 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. Below P-6, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above the P-6 setpoint and suspend positive reactivity operations.

b. Above P-6, operation may continue.

ACTION 5 - With the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or open the Reactor Trip System breakers, suspend all operations involving positive reactivity changes and verify valves (2CHS-91, 2CHS-96 and 2CHS-138) or (2CHS-37 and 2CHS-828) are closed and secured in position within the next hour.

ACTION 6 - This Action is not used.

ACTION 7 - With the number of OPERABLE channels(6) one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours, and

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.1.

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(6) An OPERABLE hot leg channel consists of: 1) three RTDs per hot leg, or 2) two RTDs per hot leg with the failed RTD disconnected and the required bias applied.

3/4.4 REACTOR COOLANT SYSTEM

3/4.4.1 REACTOR COOLANT LOOPS AND COOLANT CIRCULATION

NORMAL OPERATION

LIMITING CONDITION FOR OPERATION

3.4.1.1 All reactor coolant loops shall be in operation.

APPLICABILITY: MODES 1 and 2.

ACTION:

With less than the above required reactor coolant loops in operation, be in at least HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

4.4.1.1 All reactor coolant loops shall be verified in operation and circulating reactor coolant at least once per 12 hours.

LOOP ISOLATION VALVES - OPERATING

LIMITING CONDITION FOR OPERATION

3.4.1.4.1 Each RCS hot and cold leg loop isolation valve shall be open with power removed from each isolation valve operator.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With one or more RCS loop isolation valve(s) closed, maintain the valve(s) closed, be in MODE 3 within the next 6 hours, and be in MODE 5 within the following 30 hours.

b. With power available to one or more loop isolation valve operators, remove power from the loop isolation valve operators within 30 minutes(1).

SURVEILLANCE REQUIREMENTS

4.4.1.4.1 Verify at least once per 31 days that each RCS loop isolation valve is open and power is removed from each isolation valve operator.

---

(1) Separate condition entry is allowed for each RCS loop isolation valve.

LOOP ISOLATION VALVES - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.4.1.4.2 The loop isolation valves in an isolated RCS loop shall have power removed from the associated loop isolation valve operators(1).

APPLICABILITY:

Whenever an RCS loop has been isolated, MODES 5 and 6(2).

ACTION:

With the requirements of the above specification not satisfied, remove power from the isolated loop isolation valve operators(1) within 1 hour.

SURVEILLANCE REQUIREMENTS

4.4.1.4.2 Verify at least once per 7 days that power is removed from the RCS isolated loop stop valve operators(1).

---

(1) Power may be restored to the associated RCS isolated loop isolation valve operators provided the requirements of Surveillance Requirement 4.4.1.5.2 have been satisfied.

(2) With fuel in the vessel.

ISOLATED LOOP STARTUP

LIMITING CONDITION FOR OPERATION

3.4.1.5 Each RCS isolated loop shall remain isolated with:

a. The hot and cold leg isolation valve closed until the isolated portion of the loop has been drained and refilled from the refueling water storage tank or Reactor Coolant System, and

b. The hot and cold leg isolation valves closed if the boron concentration in the isolated loop is less than the minimum required to satisfy the applicable requirements of Specification 3.1.1.2 for MODE 5 or Specification 3.9.1 for MODE 6.

APPLICABILITY: Whenever an RCS loop has been isolated greater than 4 hours or drained(1).

ACTION:

With the requirements of the above specification not satisfied, immediately close the hot and cold leg isolation valves.

SURVEILLANCE REQUIREMENTS

4.4.1.5.1 Verify that the isolated loop has been drained and refilled with water from the refueling water storage tank or Reactor Coolant System prior to opening the hot or cold leg isolation valve in the isolated loop.

4.4.1.5.2 Verify that the isolated loop boron concentration is greater than or equal to the minimum required to satisfy the applicable requirements of Specification 3.1.1.2 for MODE 5 or Specification 3.9.1 for MODE 6 within 2 hours prior to opening the hot or cold leg isolation valve in the isolated loop.

4.4.1.5.3 Verify that the hot or cold leg isolation valve in the isolated loop is opened within 4 hours following completion of refilling the isolated loop.

---

(1) With fuel in the vessel.

3/4.9 REFUELING OPERATIONS

BORON CONCENTRATION

LIMITING CONDITION FOR OPERATION

3.9.1 With the reactor vessel head unbolted or removed, the boron concentration of all filled portions of the Reactor Coolant System and the refueling canal shall be maintained uniform and sufficient to ensure that the more restrictive of the following reactivity conditions is met:

a. Either a K_{eff} of 0.95 or less, which includes a 1% $\Delta k/k$ conservative allowance for uncertainties, or

b. A boron concentration of greater than or equal to 2000 ppm, which includes a 50 ppm conservative allowance for uncertainties.

APPLICABILITY: MODE 6(1).

ACTION:

With the requirements of the above specification not satisfied, immediately suspend all operations involving CORE ALTERATIONS or positive reactivity changes and initiate and continue boration at $\geq$ 30 gpm of greater than or equal to 7000 ppm boric acid solution or its equivalent until K_{eff} is reduced to $\leq$ 0.95 or the boron concentration is restored to $\geq$ 2000 ppm, whichever is the more restrictive. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.1.1 The more restrictive of the above two reactivity conditions shall be determined prior to:

a. Removing or unbolting the reactor vessel head, and

b. Withdrawal of any full length control rod in excess of 3 feet from its fully inserted position.

4.9.1.2 The boron concentration of the Reactor Coolant System and the refueling canal shall be determined by chemical analysis at least 3 times per 7 days with a maximum time interval between samples of 72 hours.

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(1) The reactor shall be maintained in MODE 6 when the reactor vessel head is unbolted or removed.

3/4.1.2 BORATION SYSTEMS (Continued)

The boration capability required below 200°F is sufficient to provide a SHUTDOWN MARGIN of 1% $\Delta k/k$ after xenon decay and cooldown from 200°F to 140°F. This condition requires either 2315 gallons of 7000 ppm borated water from the boric acid storage tanks or 10,196 gallons of 2000 ppm borated water from the refueling water storage tank.

Isolation of the primary grade water flow path during MODES 4, 5 and 6 precludes an unplanned boron dilution at these conditions since the sole source of unborated water to the charging pumps is isolated. This eliminates the design basis boron dilution event in MODES 4, 5 and 6. During planned boron dilution events, operator attention will be focused on the boron dilution process and any inappropriate blender operation would be readily identified through various indications which includes the output from the source range nuclear instrumentation.

Closing either a) 2CHS-37 and 2CHS-828 or b) 2CHS-91, 2CHS-96, and 2CHS-138 will ensure that all possible flow paths are isolated from the Primary Grade Water System to the operating Reactor Coolant System flow path via the charging pumps, thus preventing any potential inadvertent boron dilution event by injection of unborated water.

The ACTION to suspend all operations involving positive reactivity changes or CORE ALTERATIONS is intended to provide assurance that no other activity will mask any potential unintentional boron dilution event. Maintaining the Primary Grade Water System isolated is necessary to ensure that the design basis boron dilution event is not credible. Thus, immediate corrective action is needed to restore positive isolation as soon as possible when not conducting planned boron dilution or makeup activities. Lack of continuous corrective action to restore the Limiting Condition for Operation (LCO) would then make a potential inadvertent boron dilution credible and require performing additional analysis to verify acceptable consequences if it should occur.

Verifying the SHUTDOWN MARGIN within one hour ensures that no unacceptable reduction of SHUTDOWN MARGIN occurred when the LCO requirements were not satisfied. The SHUTDOWN MARGIN need only be verified once since the cessation of any activities involving positive reactivity changes, CORE ALTERATIONS or use of the Primary Grade Water System with the Charging System will prevent any future potential injection of primary grade water into the Reactor Coolant System. The verification of SHUTDOWN MARGIN needs to be completed anytime that the ACTION is entered even if the LCO is subsequently

3/4.1.2 BORATION SYSTEMS (Continued)

satisfied before the verification is completed to ensure that no unacceptable reduction of SHUTDOWN MARGIN occurred when the LCO requirements were not satisfied.

The primary function of the surveillance is to ensure that the valve(s) used to isolate the Primary Grade Water System are locked, sealed or otherwise secured. The frequency of 31 days to ensure that the Primary Grade Water System is properly isolated is based on engineering judgment, and has proven to be acceptable. Operating experience has shown that the failure rate is so low that the 31 day frequency is justified. A time frame of 15 minutes provides a minimum reasonable time for an operator to isolate the Primary Grade Water System following a planned activity requiring its use.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

The specifications of this section ensure that 1) acceptable power distribution limits are maintained, 2) the minimum SHUTDOWN MARGIN is maintained, and 3) the potential effects of rod misalignment on associated accident analyses are limited. OPERABILITY of the movable control assemblies is established by observing rod motion and determining that rods are positioned within $\pm$ 12 steps (indicated position), of the respective group demand counter position. The OPERABILITY of the control rod position indication system is required to determine control rod positions and thereby ensure compliance with the control rod alignment and insertion limits.

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original design criteria are met. Misalignment of a rod requires measurement of peaking factors and a restriction in THERMAL POWER. These restrictions provide assurance of fuel rod integrity during continued operation. In addition, those safety analyses affected by a misaligned rod are reevaluated to confirm that the results remain valid during future operation.

Continuous monitoring of rod position with respect to insertion limits and rod deviation is provided by the rod insertion limit monitor and rod deviation monitor, respectively. If the rod deviation monitor or the rod insertion limit monitor is inoperable, the frequency of manual comparison of indicated rod position is increased to an interval of at least once per 4 hours.

The maximum rod drop time restriction is consistent with the assumed rod drop time used in the safety analyses. Measurement with T_{avg} greater than or equal to 541°F and with all reactor coolant

3/4.1.3 MOVABLE CONTROL ASSEMBLIES (Continued)

pumps operating ensures that the measured drop times will be representative of insertion times experienced during a reactor trip at operating conditions.

For Specification 3.1.3.1 ACTIONS c. and d., it is incumbent upon the plant to verify the trippability of the inoperable control rod(s). Trippability is defined in Attachment C to a letter dated December 21, 1984, from E. P. Rahe (Westinghouse) to C. O. Thomas (NRC). This may be by verification of a control system failure, usually electrical in nature, or that the failure is associated with the control rod stepping mechanism. In the event the plant is unable to verify the rod(s) trippability, it must be assumed to be untrippable and thus falls under the requirements of ACTION a.

BASES

3/4.4.1.1, 2, 3 REACTOR COOLANT LOOPS AND COOLANT CIRCULATION

The plant is designed to operate with all reactor coolant loops in operation and maintain DNBR above the design DNBR limit during all normal operations and anticipated transients. In MODES 1 and 2, with one reactor coolant loop not in operation, this specification requires that the plant be in at least HOT STANDBY within 6 hours.

In MODE 3, a single reactor coolant loop provides sufficient heat removal capability for removing decay heat; however, due to the initial conditions assumed in the analysis for the control rod bank withdrawal from a subcritical condition, two operating coolant loops are required to meet the DNB design basis for this Condition II event when the rod control system is capable of control bank rod withdrawal.

In MODES 4 and 5, a single reactor coolant loop or RHR subsystem provides sufficient heat removal capability for removing decay heat; but single failure considerations require that at least two loops be OPERABLE. Thus, if the reactor coolant loops are not OPERABLE, this specification requires two RHR loops to be OPERABLE.

The operation of one Reactor Coolant Pump or one RHR pump provides adequate flow to ensure mixing, prevent stratification and produce gradual reactivity changes during boron concentration reductions in the Reactor Coolant System. The reactivity change rate associated with boron reduction will, therefore, be within the capability of operator recognition and control.

The restrictions on starting a Reactor Coolant Pump with one or more RCS cold legs less than or equal to 350°F are provided to prevent RCS pressure transients, caused by energy additions from the secondary system, which could exceed the limits of Appendix G to 10 CFR Part 50. The RCS will be protected against overpressure transients and will not exceed the limits of Appendix G by restricting starting of the RCPs to when the secondary water temperature of each steam generator is less than 50°F above each of the RCS cold leg temperatures.

3/4.4.1.4 LOOP ISOLATION VALVES

BACKGROUND

The RCS may be operated with loops isolated in order to perform maintenance. While operating with a loop isolated, there is a potential for inadvertently opening the isolation valves in the isolated loop. In this event, the coolant in the isolated loop would suddenly begin to mix with the coolant in the operating loops.

3/4.4.1.4 LOOP ISOLATION VALVES (Continued)

BACKGROUND (Continued)

This situation has the potential for causing a positive reactivity addition with a corresponding reduction of SHUTDOWN MARGIN if the boron concentration in the isolated loop is less than the required SHUTDOWN MARGIN.

As discussed in the UFSAR, the startup of an isolated loop is performed in a controlled manner that virtually eliminates any inappropriate sudden positive reactivity addition from unborated water because:

a. LCO 3.4.1.5, "Isolated Loop Startup," and plant operating procedures require that the boron concentration in the isolated loop be maintained higher than the SHUTDOWN MARGIN requirement for the operating loops, thus eliminating the potential for introducing coolant from the isolated loop that could dilute the boron concentration in the operating loops below the required SHUTDOWN MARGIN; and

b. The loop isolation valves cannot be opened unless the loop has been drained and refilled with water supplied from the refueling water storage tank or from the Reactor Coolant System. This would include water from the refueling cavity. This ensures adequate boron concentration in the water to refill the isolated loop, adequate mixing of the coolant in the isolated loop, and prevents any reactivity effects due to boron concentration stratification; and

c. Removing the power from the loop isolation valve operator ensures that a loop isolation valve will not be moved unless specifically intended by a procedure.

APPLICABLE SAFETY ANALYSES

Isolated loop startup is limited to MODES 5 and 6 in accordance with the NRC SER on N-1 loop operation.

During startup of an isolated loop in accordance with LCO 3.4.1.5, operating procedures prevent the opening of the loop isolation valve until the isolated loop is drained and refilled with water supplied from the refueling water storage tank or Reactor Coolant System, and the isolated loop boron concentration is verified. Verification of the isolated loop boron concentration prior to opening the isolated loop isolation valves provides a reassurance of the adequacy of the SHUTDOWN MARGIN. This ensures that any undesirable reactivity effect from the isolated loop does

3/4.4.1.4 LOOP ISOLATION VALVES (Continued)

APPLICABLE SAFETY ANALYSES (Continued)

not occur. The safety analyses assume a minimum SHUTDOWN MARGIN as an initial condition for Design Basis Accidents (DBAs). Violation of the LCO, combined with mixing of the isolated loop coolant into the operating loops, could result in the SHUTDOWN MARGIN being less than that assumed in the safety analyses.

LCO

LCO 3.4.1.4.1 ensures that a loop isolation valve that becomes closed in MODES 1 through 4 is fully closed and the plant placed in MODE 5.

LCO 3.4.1.4.2 ensures that power is removed from isolated loop isolation valve operators when closed to perform maintenance in MODES 5 or 6 to prevent an inadvertent loop startup.

APPLICABILITY

LCO 3.4.1.4.1 is applicable in MODES 1 through 4 and LCO 3.4.1.4.2 is applicable whenever an RCS loop has been isolated in MODES 5 and 6 with fuel in the reactor vessel. LCO 3.4.1.4.2 is not applicable when there is no fuel in the reactor vessel. In MODES 5 and 6, controlled startup of isolated loops is possible without significant risk of inadvertent criticality.

An RCS loop is considered isolated in MODES 5 and 6 whenever the hot and cold leg isolation valves on one RCS loop are both in a fully closed position at the same time. One isolation valve may be stroked for testing in MODES 5 and 6 and the loop will not be considered isolated when either the hot leg or cold leg loop isolation valve remains open.

ACTION

For LCO 3.4.1.4.1

a. Should a loop isolation valve be closed in MODES 1 through 4, the affected loop isolation valve(s) must be maintained closed and the plant placed in MODE 5 to preclude inadvertent startup of the loop and the subsequent potential inadvertent positive reactivity insertion or criticality. The completion time of the ACTIONs allow time

3/4.4.1.4 LOOP ISOLATION VALVES (Continued)

ACTION (Continued)

for borating the operating loops to a shutdown boration level such that the plant can be brought to MODE 3 within 6 hours and MODE 5 within 36 hours. The allowed completion times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

b. If power is inadvertently restored to one or more loop isolation valve operators, the potential exists for accidental isolation of a loop with a subsequent inadvertent startup of the isolated loop. The loop isolation valves have motor operators. Therefore, these valves will maintain their last position when power is removed from the valve operator. With power applied to the valve operators, only administrative controls prevent the valve from being operated. Although operating procedures make the occurrence of this event unlikely, the prudent action is to remove power from the loop isolation valve operators. The completion time of 30 minutes to remove power from the loop isolation valve operators is sufficient considering the complexity of the task.

For LCO 3.4.1.4.2

If power is inadvertently restored to one or more loop isolation valve operators, the potential exists for accidental isolation of a loop with a subsequent inadvertent startup of the isolated loop. The loop isolation valves have motor operators. Therefore, these valves will maintain their last position when power is removed from the valve operator. With power applied to the valve operators, only administrative controls prevent the valve from being operated. Although operating procedures make the occurrence of this event unlikely, the prudent action is to remove power from the loop isolation valve operators. The completion time of 1 hour to remove power from the loop isolation valve operators is sufficient considering the complexity of the task.

SURVEILLANCE REQUIREMENTS (SR)

SR 4.4.1.4.1

SR 4.4.1.4.1 is performed at least once per 31 days to ensure that the RCS loop isolation valves are open, with power removed

3/4.4.1.4 LOOP ISOLATION VALVES (Continued)

SURVEILLANCE REQUIREMENTS (SR) (Continued)

from the loop isolation valve operators. The primary function of this surveillance is to ensure that power is removed from the valve operators, since SR 4.4.1.1 ensures that the loop isolation valves are open by verifying every 12 hours that all loops are operating and circulating reactor coolant. The frequency of 31 days ensures that the required flow can be made available, is based on engineering judgment, and has proven to be acceptable. Operating experience has shown that the failure rate is so low that the 31 day frequency is justified.

SR 4.4.1.4.2

SR 4.4.1.4.2 is performed at least once per 7 days to ensure that the RCS loop isolation valves have power removed from the loop isolation valve operators. The frequency of 7 days which ensures that the power is removed from loop isolation valve operators, is based on engineering judgment, and has proven to be acceptable. Operating experience has shown that the failure rate is so low that the 7 day frequency is justified.

3/4.4.1.5 ISOLATED LOOP STARTUP

BACKGROUND

The RCS may be operated with loops isolated in order to perform maintenance. While operating with a loop isolated, there is a potential for inadvertently opening the isolation valves in the isolated loop. In this event, the coolant in the isolated loop would suddenly begin to mix with the coolant in the operating loops. This situation has the potential for causing a positive reactivity addition with a corresponding reduction of SHUTDOWN MARGIN if the boron concentration in the isolated loop is less than the required SHUTDOWN MARGIN.

As discussed in the UFSAR, the startup of an isolated loop is performed in a controlled manner that virtually eliminates any inappropriate sudden positive reactivity addition from unborated water because:

a. LCO 3.4.1.5, "Isolated Loop Startup," and plant operating procedures require that the boron concentration in the isolated loop be maintained higher than the SHUTDOWN MARGIN requirement for the operating loops, thus eliminating the potential for introducing coolant from the isolated loop that could dilute the boron concentration in the operating loops below the required SHUTDOWN MARGIN; and

BASES

3/4.4.1.5 ISOLATED LOOP STARTUP (Continued)

BACKGROUND (Continued)

b. The loop isolation valves cannot be opened unless the loop has been drained and refilled with water supplied from the refueling water storage tank or from the Reactor Coolant System. This would include water from the refueling cavity. This ensures adequate boron concentration in the water to refill the isolated loop, adequate mixing of the coolant in the isolated loop, and prevents any reactivity effects due to boron concentration stratification; and

c. Removing the power from the loop isolation valve operator ensures that a loop isolation valve will not be moved unless specifically intended by a procedure.

APPLICABLE SAFETY ANALYSES

Isolated loop startup is limited to MODES 5 and 6 in accordance with the NRC SER on N-1 loop operation.

During startup of an isolated loop in accordance with LCO 3.4.1.5, operating procedures prevent the opening of the loop isolation valve until the isolated loop is drained and refilled with water supplied from the refueling water storage tank or Reactor Coolant System, and the isolated loop boron concentration is verified. Verification of the isolated loop boron concentration prior to opening the isolated loop isolation valves provides a reassurance of the adequacy of the SHUTDOWN MARGIN. This ensures that any undesirable reactivity effect from the isolated loop does not occur. The safety analyses assume a minimum SHUTDOWN MARGIN as an initial condition for Design Basis Accidents (DBAs). Violation of the LCO, combined with mixing of the isolated loop coolant into the operating loops, could result in the SHUTDOWN MARGIN being less than that assumed in the safety analyses.

LCO

Loop isolation valves are used for performing maintenance when the plant is in MODES 5 or 6. LCO 3.4.1.5 ensures that the loop isolation valves remain closed on an isolated loop until the SHUTDOWN MARGIN in the isolated loop is within acceptable limits.

BASES

3/4.4.1.5 ISOLATED LOOP STARTUP (Continued)

APPLICABILITY

In MODES 5 and 6, the SHUTDOWN MARGIN of the operating loops is large enough to permit operation with isolated loops. In these MODES, controlled startup of isolated loops is possible without significant risk of inadvertent criticality.

An RCS loop is considered isolated in MODES 5 and 6 whenever the hot and cold leg isolation valves on one RCS loop are both in a fully closed position at the same time. One isolation valve may be stroked for testing in MODES 5 and 6 and the loop will not be considered isolated when either the hot leg or cold leg loop isolation valve remains open.

ACTION

The ACTION for LCO 3.4.1.5 assumes that the prerequisites of the LCO are not met and a loop isolation valve has been inadvertently opened. Therefore, the ACTION requires immediate closure of isolation valves to preclude a potential boron dilution event.

SURVEILLANCE REQUIREMENTS (SR)

SR 4.4.1.5.1 and 4.4.1.5.3

As an additional measure to ensure that the boron concentration in an isolated loop remains within acceptable limits, SR 4.4.1.5.1 requires that an isolated loop is drained and refilled with borated water supplied from the refueling water storage tank or Reactor Coolant System prior to opening the hot or cold leg isolation valve in the isolated loop. The 4 hour time limit ensures that there is no unacceptable boron concentration stratification in an isolated loop. These surveillance frequencies have been shown to be acceptable through operating experience.

SR 4.4.1.5.2

To ensure that the boron concentration of the isolated loop meets acceptable limits, SR 4.4.1.5.2 is performed within 2 hours prior to opening either the hot or cold leg isolation valve. This provides reasonable assurance that the boron concentration will stay within acceptable limits until the loop is unisolated.