Mr. J. E. Cross
Senior Vice President and
Chief Nuclear Officer
Nuclear Power Division
Duquesne Light Company
Post Office Box 4
Shippingport, PA 15077

May 1995

SUBJECT: BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2 (TAC NOS. M77328, M77329, M77400, AND M77401)

Dear Mr. Cross:

The Commission has issued the enclosed Amendment No. 187 to Facility Operating License No. DPR-66 and Amendment No. 69 to Facility Operating License No. NPF-73 for the Beaver Valley Power Station, Unit Nos. 1 and 2. These amendments consist of changes to the Technical Specifications (TSs) in response to your application dated April 19, 1994, as supplemented March 31, 1995.

These amendments revise the Appendix A TSs 3.4.9.3 and 3.4.11 to incorporate changes to the power operated relief valve TSs in accordance with the guidance in Generic Letter 90-06, "Resolution of Generic Issue 70, "Power-Operated Relief Valve and Block Valve Reliability," and Generic Issue 94, "Additional Low-Temperature Overpressure Protection for Light-Water Reactors," Pursuant to 10 CFR 50.54(f)," as implemented in the NRC's Improved Standard Technical Specifications (NUREG-1431) with some exceptions and modifications to reflect plant-specific design features. The amendment includes several administrative changes (e.g., renumbering sections, spelling out mathematical symbols, changes in nomenclature for consistency, and relocation of sentences and paragraphs).

A copy of our Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,
Original signed by
Donald S. Brinkman, Senior Project Manager
Project Directorate I-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-334/412
Enclosures: 1. Amendment No. 187 to License No. DPR-66
2. Amendment No. 69 to License No. NPF-73
3. Safety Evaluation
cc w/encls: See next page

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JStolz	JLinville, RGN-I	*See previous concurrence	

OFC	:PDI-2/LA	:PDI-2/PM	:*BC:SRXB:BC:EMEB	:OGC	:PDI-2/D:
NAME	:MO'Brien	:DBrinkman:mw:RJones	:RWessman	:	:JStolz :
DATE	:4/18/95	:4/18/95 :4/3/95	:4/21/95	:5/5/95	:4/27/95

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*Recommend OTSB concur

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

May 15, 1995

Mr. J. E. Cross
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Post Office Box 4
Shippingport, PA 15077

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Docket Nos. 50-334/412

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cc w/encls: See next page

J. E. Cross
Duquesne Light Company

Beaver Valley Power Station
Units 1 & 2

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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. 187
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 April 19, 1994, as supplemented March 31, 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.

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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. 187, 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: May 15, 1995

ATTACHMENT TO LICENSE AMENDMENT NO. 187

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
3/4 1-11	3/4 1-11
3/4 3-50	3/4 3-50
3/4 3-52	3/4 3-52
3/4 4-27a	3/4 4-27a
3/4 4-27b	3/4 4-27b
----	3/4 4-27c
3/4 4-29	3/4 4-29
----	3/4 4-29a
3/4 5-2	3/4 5-2
B 3/4 4-10	B 3/4 4-10
----	B 3/4 4-10b
----	B 3/4 4-10c
----	B 3/4 4-10d
----	B 3/4 4-10e
----	B 3/4 4-10f
----	B 3/4 4-10g
----	B 3/4 4-10h
----	B 3/4 4-10i
----	B 3/4 4-10j
B 3/4 4-11	B 3/4 4-11
----	B 3/4 4-11a
----	B 3/4 4-11b
----	B 3/4 4-11c
----	B 3/4 4-11d
----	B 3/4 4-11e
----	B 3/4 4-11f

CHARGING PUMP - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.3 At least one charging pump[1] in the boron injection flow path 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 bus.

APPLICABILITY: MODES 5 and 6.

ACTION:

With none of the above pumps OPERABLE, suspend all operations involving CORE ALTERATIONS 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 by verifying, on recirculation flow, that the pump develops a discharge pressure greater than or equal to 2402 psig when tested pursuant to Specification 4.0.5.

4.1.2.3.2 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 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 in accordance with 4.4.9.3.3.

---

(1) With two charging pumps OPERABLE, follow Specification 3.4.9.3.

ACCIDENT MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.8 The accident monitoring instrumentation channels shown in Table 3.3.11 shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

a. With the number of OPERABLE accident monitoring instrumentation channels less than the Total Number of Channels shown in Table 3.3.11, either restore the inoperable channel(s) to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours (follow Specification 3.4.11 when determining ACTIONS for Items 4, 5, and 6).

b. With the number of OPERABLE accident monitoring instrumentation channels less than the MINIMUM CHANNELS OPERABLE requirements of Table 3.3.11, either restore the inoperable channel(s) to OPERABLE status within 48 hours or be in at least HOT SHUTDOWN within the next 12 hours (follow Specification 3.4.11 when determining ACTIONS for Item 4).

c. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.8 Each accident monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK and CHANNEL CALIBRATION operations at the frequencies shown in Table 4.3-7.

TABLE 4.3-7

ACCIDENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

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

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

OVERPRESSURE PROTECTION SYSTEMS

LIMITING CONDITION FOR OPERATION

3.4.9.3 An overpressure protection system shall be OPERABLE with a maximum of one charging pump[1] capable of injecting into the RCS and the accumulators isolated[2] and either a or b below:

a. Two power operated relief valves (PORVs) with a lift setting less than or equal to 432 psig, or

b. The RCS depressurized and an RCS vent of greater than or equal to 3.14 square inches.

APPLICABILITY: Mode 4 when any RCS cold leg temperature is less than or equal to an enable temperature of 329°F,
Mode 5,
Mode 6 when the reactor vessel head is on.

ACTION:

a. With two or more charging pumps capable of injecting into the RCS, immediately initiate action to verify a maximum of one charging pump is capable of injecting into the RCS or depressurize and vent the RCS through a 3.14 square inch or larger vent within 12 hours.

b. With an accumulator not isolated when the accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed by the heatup and cooldown curves, isolate the affected accumulator within 1 hour or increase the RCS cold leg temperature above the enable temperature within the next 12 hours or depressurize the affected accumulator to less than the maximum RCS pressure for the existing cold leg temperature allowed by the heatup and cooldown curves within the next 12 hours.

c. With one PORV inoperable in MODE 4 (when any RCS cold leg temperature is less than or equal to the enable temperature), restore the inoperable PORV to OPERABLE status within 7 days or depressurize and vent the RCS through a 3.14 square inch or larger vent within the next 12 hours.

(1) Two charging pumps may be capable of injecting into the RCS for pump swap operation for less than or equal to 15 minutes.

(2) Accumulator isolation with power removed from the discharge isolation valves is only required when the accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed by the heatup and cooldown curves.

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

d. With one PORV inoperable in MODES 5 or 6, restore the inoperable PORV to OPERABLE status within 24 hours or depressurize and vent the RCS through a 3.14 square inch or larger vent within the next 12 hours.

e. With two PORVs inoperable, depressurize and vent the RCS through a 3.14 square inch or larger vent within 12 hours.

SURVEILLANCE REQUIREMENTS

4.4.9.3.1 Verify at least once per 12 hours that:

a. A maximum of one charging pump is capable of injecting into the RCS, and

b. Each accumulator is isolated; however, with the accumulator pressure less than the low temperature overpressure protection setpoint, the accumulator discharge isolation valves may be opened to perform accumulator discharge check valve testing.

4.4.9.3.2 When PORVs are being used for overpressure protection, demonstrate each PORV is OPERABLE by:

a. Verifying each PORV block valve is open for each required PORV at least once per 72 hours, and

b. 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 to be OPERABLE and placed in operation after decreasing the RCS cold leg temperature to less than or equal to the enable temperature and at least once per 31 days, and

c. Performance of a CHANNEL CALIBRATION on each required PORV actuation channel at least once per 18 months.

SURVEILLANCE REQUIREMENTS (Continued)

4.4.9.3.3 When a vent is being used for overpressure protection, verify the required vent is open:

a. At least once per 12 hours for an open vent or unlocked open vent valve(s), except

b. At least once per 31 days for a valve which is locked or provided with remote position indication, or sealed, or otherwise secured in the open position.

3/4.4.11 RELIEF VALVES

LIMITING CONDITION FOR OPERATION

3.4.11 Each power operated relief valve (PORV) and associated block valve shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

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

Separate ACTION statement entry is allowed for each PORV and block valve.

- -

a. With one or more PORVs inoperable and capable of being manually cycled, within 1 hour either restore the PORV(s) to OPERABLE status or close the associated block valve(s) with power maintained to the block valve(s); otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. With one or two PORV(s) inoperable and not capable of being manually cycled, within 1 hour either restore the PORV(s) to OPERABLE status or close the associated block valves and remove power from the block valve(s); a minimum of two PORVs are to be OPERABLE within the following 72 hours or be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. With one PORV inoperable and isolated, power operation may continue until the next refueling outage.

c. With three PORVs inoperable and not capable of being manually cycled, within 1 hour either restore at least one PORV to OPERABLE status or close the associated block valves and remove power from the block valves and be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

d. With one block valve inoperable and open, within 1 hour either restore the block valve to OPERABLE status or place the associated PORV in manual control. Restore the block valve to OPERABLE status within the following 72 hours or be in HOT STANDBY within the next 6 hours and in HOT

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

SHUTDOWN within the following 6 hours. With one block valve inoperable, restore the block valve to OPERABLE status within 1 hour or close it, power operation may continue until the next refueling outage.

e. With more than one block valve inoperable, within 1 hour either restore the block valves to OPERABLE status or place the associated PORVs in manual control. Restore at least one block valve to OPERABLE status within the next hour if three block valves are inoperable; restore a minimum of two block valves to OPERABLE status within 72 hours; otherwise, be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

SURVEILLANCE REQUIREMENTS

4.4.11.1 Each PORV shall be demonstrated OPERABLE at least once per 18 months by operating the PORV through one complete cycle of full travel using:

a) The normal air supply system, and

b) The backup nitrogen supply system.

4.4.11.2 Each block valve shall be demonstrated OPERABLE at least once per 92 days by operating the valve through one complete cycle of full travel unless the block valve is closed to meet required ACTIONS b or c.

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 percent 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 by verifying that power to the isolation valve operator control circuit is disconnected by removal of the plug in the lock out jack from the circuit.

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

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

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

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

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 UFSAR Table 4.5-3 to assure compliance with the requirements of Appendix H to 10 CFR 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.

Pressure-temperature limit curves shown in Figure B 3/4 4-3 were developed for the limiting ferritic steel component within an isolated reactor coolant loop. The limiting component is the steam generator channel head to tubesheet region. This figure provides the ASME III, Appendix G limiting curve which is used to define operational bounds, such that when operating with an isolated loop the analyzed pressure-temperature limits are known. The temperature range provided bounds the expected operating range for an isolated loop.

OVERPRESSURE PROTECTION SYSTEMS

BACKGROUND

The overpressure protection system (OPPS) controls RCS pressure at low temperatures so the integrity of the reactor coolant pressure boundary (RCPB) is not compromised by violating the pressure and temperature (P/T) limits of 10 CFR 50, Appendix G. The reactor vessel is the limiting RCPB component for demonstrating such protection. The maximum setpoint for the power operated relief valves (PORVs) and the maximum RCS pressure for the existing RCS cold leg temperature during cooldown, shutdown, and heatup meet the 10 CFR 50, Appendix G requirements during the OPPS MODES.

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

BACKGROUND (Continued)

The reactor vessel material is less tough at low temperatures than at normal operating temperature. As the vessel neutron exposure accumulates, the material toughness decreases and becomes less resistant to pressure stress at low temperatures. RCS pressure, therefore, is maintained low at low temperatures and is increased only as temperature is increased.

The potential for vessel overpressurization is most acute when the RCS is water solid, occurring only during shutdown; a pressure fluctuation can occur more quickly than an operator can react to relieve the condition. Exceeding the RCS P/T limits by a significant amount could cause brittle cracking of the reactor vessel. LCO 3.4.9.1, "Pressure/Temperature Limits," requires administrative control of RCS pressure and temperature during heatup and cooldown to prevent exceeding the limits.

This LCO provides RCS overpressure protection by having a minimum coolant input capability and having adequate pressure relief capacity. Limiting coolant input capability requires deactivating all but one charging pump and isolating the accumulators. The pressure relief capacity requires either two redundant RCS relief valves or a depressurized RCS and an RCS vent of sufficient size. One RCS relief valve or the open RCS vent is the overpressure protection device that acts to terminate an increasing pressure event.

With minimum coolant input capability, the ability to provide core coolant addition is restricted. The LCO does not require the makeup control system deactivated or the safety injection (SI) actuation circuits blocked. Due to the lower pressures in the OPPS MODES and the expected core decay heat levels, the makeup system can provide adequate flow via the makeup control valve and, if needed, until the charging pump is actuated by SI.

The OPPS for pressure relief consists of two PORVs with reduced lift settings or a depressurized RCS and an RCS vent of sufficient size. Two RCS relief valves are required for redundancy. One RCS relief valve has adequate relieving capability to keep from overpressurization for the required coolant input capability.

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

PORV REQUIREMENTS

As designed for the OPPS System, each PORV is signaled to open if the RCS pressure approaches a limit determined by the OPPS actuation circuit. The OPPS actuation circuit monitors RCS pressure and determines when a condition not acceptable is approached. If the indicated pressure meets or exceeds the OPPS actuation setpoint, a PORV is signaled to open. Having the setpoints of both valves within the limits ensures that the Appendix G limits will not be exceeded in any analyzed event. When a PORV is opened in an increasing pressure transient, the release of coolant will cause the pressure increase to slow and reverse. As the PORV releases coolant, the RCS pressure decreases until a reset pressure is reached and the valve is signaled to close. The pressure continues to decrease below the reset pressure as the valve closes.

RCS VENT REQUIREMENTS

Once the RCS is depressurized, a vent exposed to the containment atmosphere will maintain the RCS at containment ambient pressure in an RCS overpressure transient, if the relieving requirements of the transient do not exceed the capabilities of the vent. Thus, the vent path must be capable of relieving the flow resulting from the limiting OPPS mass or heat input transient, and maintaining pressure below the P/T limits. The required vent capacity may be provided by one or more vent paths.

For an RCS vent to meet the flow capacity requirement, it may be satisfied by removing a pressurizer safety valve or establishing an opening between the RCS and the containment atmosphere of the required size through any positive means available which cannot be inadvertently defeated. The vent path(s) must be above the level of reactor coolant, so as not to drain the RCS when open.

APPLICABLE SAFETY ANALYSES

Safety analyses demonstrate that the reactor vessel is adequately protected against exceeding the P/T limits when low RCS temperature conditions exist. At the enable temperature and below, overpressure prevention is provided by two OPERABLE RCS relief valves or a depressurized RCS and a sufficient sized RCS vent.

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

APPLICABLE SAFETY ANALYSES (Continued)

The actual temperature at which the pressure in the P/T limit curve falls below the OPPS setpoint increases as the reactor vessel material toughness decreases due to neutron embrittlement. Each time the heatup and cooldown curves are revised, the OPPS must be re-evaluated to ensure its functional requirements can still be met.

The heatup and cooldown curves represent the Appendix G limits that define OPPS operation. Setpoint calculations correlated to RCS temperature define acceptable OPPS setpoints for steady-state pressure-temperature limits based on Revision 2 of NRC Regulatory Guide 1.99. Any change to the RCS that may affect OPPS operation must be evaluated against the analyses to determine the impact of the change on the OPPS acceptance limits.

Transients that are capable of overpressurizing the RCS are categorized as either mass or heat input transients, examples of which follow:

MASS INPUT TYPE TRANSIENTS

a. Inadvertent safety injection; or

b. Charging/letdown flow mismatch.

HEAT INPUT TYPE TRANSIENTS

a. Inadvertent actuation of pressurizer heaters;

b. Loss of RHR cooling; or

c. Reactor coolant pump (RCP) startup with temperature asymmetry within the RCS or between the RCS and steam generators.

The following are required during the OPPS MODES to ensure that mass and heat input transients do not occur, which either of the OPPS overpressure protection means cannot handle:

a. Deactivating all but one charging pump OPERABLE;

b. Deactivating the accumulator discharge isolation valves in their closed positions; and

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

HEAT INPUT TYPE TRANSIENTS (Continued)

c. Disallowing start of an RCP if secondary temperature is more than 25°F above primary temperature in any one loop. LCO 3.4.1.6, "Reactor Coolant Pump Startup," provides this protection.

The analyses demonstrate that either one RCS relief valve or the depressurized RCS and RCS vent can maintain the RCS pressure below the limits when only one charging pump is actuated by SI. Thus, the LCO allows only one charging pump OPERABLE during the OPPS MODES. Since neither one RCS relief valve nor the RCS vent can handle a full SI actuation, the LCO also requires the accumulators isolated.

The isolated accumulators must have their discharge valves closed with power removed. Fracture mechanics analyses established the temperature of OPPS Applicability at the enable temperature.

PORV PERFORMANCE

The fracture mechanics analyses show that the vessel is protected when the PORVs are set to open at or below the limit. The setpoint is derived by analyses that model the performance of the OPPS assuming the limiting OPPS transient of SI actuation of one charging pump. These analyses consider pressure overshoot and undershoot beyond the PORV opening and closing, resulting from signal processing and valve stroke times. The PORV setpoints at or below the derived limit ensures the P/T limits will be met.

The PORV setpoint will be updated when the revised P/T limits conflict with the OPPS analysis limits. The P/T limits are periodically modified as the reactor vessel material toughness decreases due to neutron embrittlement caused by neutron irradiation. Revised limits are determined using neutron fluence projections and the results of examinations of the reactor vessel material irradiation surveillance specimens. The Bases for LCO 3.4.9.1, "Pressure/Temperature Limits," discuss these examinations.

The PORVs are considered active components. Thus, the failure of one PORV is assumed to represent the worst case, single active failure.

RCS VENT PERFORMANCE

With the RCS depressurized, analyses show that a PORV or equivalent opening with a vent size of 3.14 square inches is capable of mitigating the allowed OPPS overpressure transient. The capacity of

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

RCS VENT PERFORMANCE (Continued)

a vent this size is greater than the flow of the limiting transient for the OPPS configuration, SI actuation with one charging pump OPERABLE, maintaining RCS pressure less than the maximum pressure on the P/T limit curve.

The RCS vent size is based on the PORV size, therefore, the vent is bounded by the PORV analysis.

The RCS vent is passive and is not subject to active failure.

LCO

This LCO requires that the OPPS is OPERABLE. The OPPS is OPERABLE when the minimum coolant input and pressure relief capabilities are OPERABLE. Violation of this LCO could lead to the loss of low temperature overpressure mitigation and violation of the limits as a result of an operational transient.

To limit the coolant input capability, the LCO requires one charging pump capable of injecting into the RCS and all accumulator discharge isolation valves closed and immobilized. The LCO is qualified by a note that permits two pumps capable of RCS injection for less than or equal to 15 minutes to allow for pump swaps.

The LCO is also qualified by a note stating that accumulator isolation with power removed from the discharge isolation valves is only required when the accumulator pressure is greater than or at the maximum RCS pressure for the existing temperature, as allowed by the P/T limit curves. This note permits the accumulator discharge isolation valve surveillance to be performed only under these pressure and temperature conditions.

The elements of the LCO that provide low temperature overpressure mitigation through pressure relief are:

a. Two OPERABLE PORVs; a PORV is OPERABLE for OPPS when its block valve is open, its lift setpoint is set to the limit and testing proves its ability to open at this setpoint, and motive power is available to the two valves and their control circuits; or

b. A depressurized RCS and an RCS vent.

BASES (Continued)

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

LCO (Continued)

An RCS vent is OPERABLE when open with an area of 3.14 square inches.

Each of these methods of overpressure prevention is capable of mitigating the limiting OPPS transient.

APPLICABILITY

This LCO is applicable in MODE 4 when any RCS cold leg temperature is less than or equal to the enable temperature, in MODE 5, and in MODE 6 when the reactor vessel head is on. When the reactor vessel head is off, overpressurization cannot occur.

Low temperature overpressure prevention is most critical during shutdown when the RCS is water solid, and a mass or heat input transient can cause a very rapid increase in RCS pressure when little or no time allows operator action to mitigate the event.

ACTION

a. With two or more charging pumps capable of injecting into the RCS, RCS overpressurization is possible.

   To immediately initiate action to restore restricted coolant input capability to the RCS reflects the urgency of removing the RCS from this condition.

b. An unisolated accumulator requires isolation within 1 hour. This is only required when the accumulator pressure is at or more than the maximum RCS pressure for the existing temperature allowed by the P/T limit curves.

   If isolation is needed and cannot be accomplished in 1 hour, the ACTION provides two options, either of which must be performed in the next 12 hours. By increasing the RCS temperature to more than the enable temperature, the accumulator pressure cannot exceed the OPPS limits if the accumulators are fully injected. Depressurizing the accumulators below the OPPS limit also gives this protection.

   The completion times are based on operating experience that these activities can be accomplished in these time periods indicating that an event requiring OPPS is not likely in the allowed times.

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

ACTION (Continued)

c. In MODE 4 when any RCS cold leg temperature is less than or equal to the enable temperature, with one required RCS relief valve inoperable, the RCS relief valve must be restored to OPERABLE status within a completion time of 7 days. Two RCS relief valves are required to provide low temperature overpressure mitigation while withstanding a single failure of an active component.

The completion time considers the facts that only one of the RCS relief valves is required to mitigate an overpressure transient and that the likelihood of an active failure of the remaining valve path during this time period is very low. If plant operation results in transitioning to MODE 5, the completion time to restore an inoperable PORV may not exceed 7 days as required by this ACTION.

d. The consequences of operational events that will overpressurize the RCS are more severe at lower temperature. Thus, with one of the two RCS relief valves inoperable in MODE 5 or in MODE 6 with the head on, the completion time to restore two valves to OPERABLE status is 24 hours.

The completion time represents a reasonable time to investigate and repair several types of relief valve failures without exposure to a lengthy period with only one OPERABLE RCS relief valve to protect against overpressure events. If a PORV is inoperable when the plant enters MODE 5 from MODE 4, the completion time to restore an inoperable PORV changes to 24 hours but the cumulative inoperable time may not exceed 7 days before taking action to depressurize and vent.

e. The RCS must be depressurized and a vent must be established within 12 hours when both required RCS relief valves are inoperable. The vent must be sized greater than or equal to 3.14 square inches to ensure that the flow capacity is greater than that required for the worst case mass input transient reasonable during the applicable MODES. This action is needed to protect the RCPB from a low temperature overpressure event and a possible brittle failure of the reactor vessel.

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

ACTION (Continued)

The completion time considers the time required to place the plant in this condition and the relatively low probability of an overpressure event during this time period due to increased operator awareness of administrative control requirements.

SURVEILLANCE REQUIREMENTS (SR)

SR 4.4.9.3.1

To minimize the potential for a low temperature overpressure event by limiting the mass input capability, a maximum of one charging pump is OPERABLE with the others verified deactivated with power removed and the accumulator discharge isolation valves are verified closed and locked out.

The frequency of 12 hours is sufficient, considering other indications and alarms available to the operator in the control room, to verify the required status of the equipment.

SR 4.4.9.3.1.b allows opening the accumulator discharge isolation valves to perform accumulator discharge check valve testing.

SR 4.4.9.3.2

The PORV block valve must be verified open every 72 hours to provide the flow path for each required PORV to perform its function when actuated. The valve must be remotely verified open in the main control room. This surveillance is performed if the PORV satisfies the LCO.

The block valve is a remotely controlled, motor operated valve. The power to the valve operator is not required removed, and the manual operator is not required locked in the inactive position. Thus, the block valve can be closed in the event the PORV develops excessive leakage or does not close (sticks open) after relieving an overpressure situation.

The 72 hour frequency is considered adequate in view of other administrative controls available to the operator in the control room, such as valve position indication, that verify that the PORV block valve remains open.

BASES (Continued)

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

SURVEILLANCE REQUIREMENTS (SR) (Continued)

The SR is required to be performed prior to entering the condition for the OPPS to be OPERABLE. This assures low temperature overpressure protection is available when the RCS cold leg temperature is less than or equal to the enable temperature. Performing the surveillance every 31 days on each required PORV permits verification and adjustment, if necessary, of its lift setpoint, and considers instrumentation reliability which has been shown through operating experience to be acceptable. The CHANNEL FUNCTIONAL TEST will verify the setpoint is within the allowed maximum limits. PORV actuation could depressurize the RCS and is not required.

Performance of a CHANNEL CALIBRATION on each required PORV actuation channel is required every 18 months to adjust the whole channel so that it responds and the valve opens within the required range and accuracy to known input.

SR 4.4.9.3.3

The RCS vent of greater than or equal to 3.14 square inches is proven OPERABLE by verifying its open condition either:

a. Once every 12 hours for an open vent or valve that cannot be locked, except

b. Once every 31 days for a valve that is locked, or provided with remote position indication, or sealed, or secured in position. A removed pressurizer safety valve fits this category.

The passive vent arrangement must only be open to be OPERABLE. This surveillance is required to be performed if the vent is being used to satisfy the pressure relief requirements of the LCO.

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

BACKGROUND

The Pressurizer is equipped with two types of devices for pressure relief: pressurizer safety valves and PORVs. The PORVs are air operated valves that are controlled to open at a specific set pressure when the pressurizer pressure increases and close when the pressurizer pressure decreases. The PORVs may also be manually operated from the control room.

Block valves, which are normally open, are located between the pressurizer and the PORVs. The block valves are used to isolate the PORVs in case of excessive leakage or a stuck open PORV. Block valve closure is accomplished manually using controls in the control room. A stuck open PORV is, in effect, a small break loss of coolant accident (LOCA). As such, block valve closure terminates the RCS depressurization and coolant inventory loss.

The PORVs and their associated block valves may be used by plant operators to depressurize the RCS to recover from certain transients if normal pressurizer spray is not available. Additionally, the series arrangement of the PORVs and their block valves permit performance of certain surveillances on the valves during power operation.

The PORVs may also be used for feed and bleed core cooling in the case of multiple equipment failure events that are not within the design basis, such as a total loss of feedwater.

The PORVs, their block valves, and their controls are powered from emergency power sources in the event of a loss of offsite power. Two PORVs and their associated block valves are powered from two separate safety trains.

BASES (Continued)

3/4.4.11 RELIEF VALVES (Continued)

BACKGROUND (Continued)

The plant has three PORVs, each having a relief capacity of 210,000 lb/hr at 2350 psig. The functional design of the PORVs is based on maintaining pressure below the high pressure reactor trip setpoint. In addition, the PORVs minimize challenges to the pressurizer safety valves and also may be used for low temperature overpressure protection (OPPS). See LCO 3.4.9.3, "Overpressure Protection System."

APPLICABLE SAFETY ANALYSES

Plant operators employ the PORVs to depressurize the RCS in response to certain plant transients if normal pressurizer spray is not available. For the Steam Generator Tube Rupture (SGTR) event, the safety analysis assumes that manual operator actions are required to mitigate the event. A loss of offsite power is assumed to accompany the event, and thus, normal pressurizer spray is unavailable to reduce RCS pressure. The PORVs are assumed to be used for RCS depressurization, which is one of the steps performed to equalize the primary and secondary pressures in order to terminate the primary to secondary break flow and the radioactive releases from the affected steam generator.

The PORVs are used in safety analyses for events that result in increasing RCS pressure for which departure from nucleate boiling ratio (DNBR) criteria are critical. Certain analyses have been performed to study the effects on primary pressure assuming PORV actuation. The results of the loss of external load and/or a turbine trip event indicate the primary pressure remains within the design limits and the DNBR is maintained within the acceptance criteria.

LCO

The LCO requires the PORVs and their associated block valves to be OPERABLE for manual operation to mitigate the effects associated with an SGTR.

By maintaining at least two PORVs and their associated block valves OPERABLE, redundancy has been provided. The block valves are available to isolate the flow path through either a failed open PORV or a PORV with excessive leakage. Satisfying the LCO helps minimize challenges to fission product barriers.

3/4.4.11 RELIEF VALVES (Continued)

APPLICABILITY

In MODES 1, 2, and 3, the PORV and its block valve are required to be OPERABLE to limit the potential for a small break LOCA through the flow path. The most likely cause for a PORV small break LOCA is a result of a pressure increase transient that causes the PORV to open. Imbalances in the energy output of the core and heat removal by the secondary system can cause the RCS pressure to increase to the PORV opening setpoint. The most rapid increases will occur at the higher operating power and pressure conditions of MODES 1 and 2. The PORVs are also required to be OPERABLE in MODES 1, 2, and 3 to minimize challenges to the pressurizer safety valves.

Pressure increases are less prominent in MODE 3 because the core input energy is reduced, but the RCS pressure is high. Therefore, the LCO is applicable in MODES 1, 2, and 3. The LCO is not applicable in MODE 4 when both pressure and core energy are decreased and the pressure surges become much less significant. The PORV setpoint is reduced for OPPS in MODES 4 (below the enable temperature), 5, and 6 with the reactor vessel head in place. LCO 3.4.9.3 addresses the PORV requirements in these MODES.

ACTION

A General Note provides clarification that all pressurizer PORVs and block valves are treated as separate entities, each with separate completion times (i.e., the completion time is on a component basis).

a. With the PORVs inoperable and capable of being manually cycled, either the PORVs must be restored or the flow path isolated within 1 hour. The block valves should be closed but power must be maintained to the associated block valves, since removal of power would render the block valve inoperable. Although a PORV may be designated inoperable, it may be able to be manually opened and closed, and therefore, able to perform its function. PORV inoperability may be due to seat leakage, instrumentation problems related to PORV accident monitoring instruments identified in LCO 3.3.3.8, or other causes that do not prevent manual use and do not create a possibility for a small break LOCA. If the position indication is inoperable, then the PORVs are inoperable. For these reasons, the block valve shall be closed but the ACTION requires power be maintained to the valve. Automatic control problems and related instrumentation problems would not render the PORVs inoperable. Accident analyses assume manual operation of

BASES (Continued)

3/4.4.11 RELIEF VALVES (Continued)

ACTION (Continued)

the PORVs and does not take credit for automatic actuation. This condition is only intended to permit operation of the plant for a limited period of time not to exceed the next refueling outage (MODE 6) so that maintenance can be performed on the PORVs to eliminate the seat leakage condition. Normally, the PORVs should be available for automatic mitigation of overpressure events and should be returned to OPERABLE status prior to entering startup (MODE 2).

Quick access to the PORV for pressure control can be made when power remains on the closed block valve. The completion time of 1 hour is based on plant operating experience that has shown that minor problems can be corrected or closure accomplished in this time period.

b. With one or two PORV(s) inoperable and not capable of being manually cycled, the PORV(s) must be either restored or isolated by closing the associated block valve and removing the power to the associated block valve. The completion time of 1 hour is reasonable, based on challenges to the PORVs during this time period, and provides the operator adequate time to correct the situation. If the inoperable valve(s) cannot be restored to OPERABLE status, the PORV(s) must be isolated within the specified time. Because there is at least one PORV that remains OPERABLE, an additional 72 hours is provided to restore a minimum of two PORVs to OPERABLE status. If a minimum of two PORVs cannot be restored within this additional time, the plant must be brought to a MODE in which the LCO does not apply. Two OPERABLE PORVs provide redundancy to allow continued operation until the next refueling outage to perform maintenance on the inoperable valve and return it to OPERABLE status.

c. If three PORVs are inoperable and not capable of being manually cycled, it is necessary to either restore at least one valve within the completion time of 1 hour or isolate the flow path by closing and removing the power to the associated block valves. The completion time of 1 hour is reasonable, based on the small potential for challenges to the system during this time and provides the operator time to correct the situation. If one PORV is restored, then the

BASES (Continued)

3/4.4.11 RELIEF VALVES (Continued)

ACTION (Continued)

plant will be in a less limiting ACTION statement with the time clock started at the original declaration of having three PORVs inoperable. If no PORVs are restored within the completion time, then the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 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. In MODES 4 and 5, maintaining PORV OPERABILITY may be required. See LCO 3.4.9.3.

d. If one block valve is inoperable and open, then it is necessary to either restore the block valve to OPERABLE status within the completion time of 1 hour or place the associated PORV in manual control. The prime importance for the capability to close the block valve is to isolate a stuck open PORV. Therefore, if the block valve cannot be restored to OPERABLE status within 1 hour, the required action is to place the PORV in manual control to preclude its automatic opening for an overpressure event and to avoid the potential for a stuck open PORV at a time that the block valve is inoperable. If the block valve in inoperable, it is necessary to restore the block valve to OPERABLE status within 1 hour or close it. If block valve instrumentation related to accident monitoring instrumentation identified in LCO 3.3.3.8 is determined to be inoperable, then the block valve shall be declared inoperable. Closing the block valve precludes the need to place the PORV in manual control since it is isolated from the system. The completion time of 1 hour is reasonable, based on the small potential for challenges to the system during this time period, and provides the operator time to correct the situation. Because at least one PORV remains OPERABLE, the operator is permitted a completion time of 72 hours to restore the inoperable open block valve to OPERABLE status. If it cannot be restored within this additional time, the plant must be brought to a MODE in which the LCO does not apply in order to avoid continuous operation without a redundant ability to isolate this PORV flow path. If the block valve is restored within the completion time of 72 hours, the power will be restored and the PORV restored to OPERABLE status. With one block valve inoperable and closed, there

3/4.4.11 RELIEF VALVES (Continued)

ACTION (Continued)

still remains two PORV flow paths. This redundancy will allow continued operation until the next refueling outage to perform maintenance on the inoperable valve and return it to OPERABLE status.

e. If more than one block valve is inoperable, it is necessary to either restore the block valves within the completion time of 1 hour, or place the associated PORVs in manual control and restore at least one block valve within 2 hours [and restore a minimum of two block valves within 72 hours]. Two OPERABLE PORVs provide redundancy to allow continued operation until the next refueling outage to perform maintenance on the inoperable valve and return it to OPERABLE status. The completion times are reasonable, based on the small potential for challenges to the system during this time and provide the operator time to correct the situation. If the required actions are not met, then the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 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. In MODES 4 and 5, maintaining PORV OPERABILITY may be required. See LCO 3.4.9.3.

SURVEILLANCE REQUIREMENTS (SR)

SR 4.4.11.1

This surveillance requires a complete cycle of each PORV. Operating a PORV through one complete cycle ensures that the PORV can be manually actuated for mitigation of an SGTR. The frequency of 18 months is based on a typical refueling cycle and industry accepted practice. Cycling the PORVs using both the normal air supply system and the backup nitrogen supply system actuates the solenoid control valves and check valves to ensure the PORV control system will actuate properly when called upon. Testing in this manner assures each component within the PORV control system necessary to support PORV operation has been determined to function satisfactorily.

3/4.4.11 RELIEF VALVES (Continued)

SURVEILLANCE REQUIREMENTS (SR) (Continued)

SR 4.4.11.2

Block valve cycling verifies that the valve(s) can be closed if needed. The basis for the frequency of 92 days is the ASME Code, Section XI. If the block valve is closed to isolate a PORV that is capable of being manually cycled, the OPERABILITY of the block valve is of importance, because opening the block valve is necessary to permit the PORV to be used for manual control of reactor pressure. If the block valves are closed to isolate otherwise inoperable PORVs, the maximum completion time to restore one PORV and open the block valve is 72 hours, which is well within the allowable limits (25%) to extend the block valve frequency of 92 days. Furthermore, these test requirements would be completed by the reopening of a recently closed block valve upon restoration of the PORV to OPERABLE status (i.e., completion of the required actions fulfills the SR).

This SR is not required to be met with the block valve closed, in accordance with required ACTION b or c of this LCO.

3/4.4.12 REACTOR COOLANT SYSTEM VENTS

Reactor Coolant System Vents are provided to exhaust noncondensible gases and/or steam from the primary system that could inhibit natural circulation core cooling. The OPERABILITY of at least one reactor coolant system vent path from the reactor vessel head and the pressurizer steam space, ensures the capability exists to perform this function.

The valve redundancy of the reactor coolant system vent paths serves to minimize the probability of inadvertent or irreversible actuation while ensuring that a single failure of a vent valve, power supply or control system does not prevent isolation of the vent path.

The function, capabilities, and testing requirements of the reactor coolant system vent systems are consistent with the requirements of Item II.B.1 of NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1980.

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.69
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 April 19, 1994, as supplemented March 31, 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. 69 , 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: May 15, 1995

ATTACHMENT TO LICENSE AMENDMENT NO. 69

FACILITY OPERATING LICENSE NO. NPF-73

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
3/4 1-10	3/4 1-10
3/4 1-11	3/4 1-11
3/4 3-57	3/4 3-57
3/4 4-35	3/4 4-35
3/4 4-36	3/4 4-36
----	3/4 4-36a
3/4 4-39	3/4 4-39
----	3/4 4-39a
3/4 5-2	3/4 5-2
B 3/4 4-14	B 3/4 4-14
B 3/4 4-15	B 3/4 4-15
----	B 3/4 4-15a
----	B 3/4 4-15b
----	B 3/4 4-15c
----	B 3/4 4-15d
----	B 3/4 4-15e
----	B 3/4 4-15f
----	B 3/4 4-15g
----	B 3/4 4-15h
----	B 3/4 4-15i
B 3/4 4-16	B 3/4 4-16
----	B 3/4 4-16a
----	B 3/4 4-16b
----	B 3/4 4-16c
----	B 3/4 4-16d
----	B 3/4 4-16e
----	B 3/4 4-16f
6-19	6-19

CHARGING PUMP-SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.1.2.3 At least one charging pump[1] in the boron injection flow path 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 4, 5 and 6.

ACTION:

With none of the above pumps OPERABLE, suspend all operations involving CORE ALTERATIONS 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 by verifying, that on recirculation flow, the pump develops a differential pressure of greater than or equal to 2437 psid when tested pursuant to Specification 4.0.5.

4.1.2.3.2 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 and 4.1.2.8,

b. Verification of an OPERABLE low head safety injection pump pursuant to Specification 4.5.2.b.2,

c. Verification of 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 in accordance with 4.4.9.3.3.

(1) With two charging pumps OPERABLE, follow Specification 3.4.9.3.

CHARGING PUMPS-OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.4 At least two charging pumps shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3[1].

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 percent Δk/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 HOT SHUTDOWN within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.2.4.1 At least two charging pumps shall be demonstrated OPERABLE by verifying, that on recirculation flow, each pump develops a differential pressure of greater than or equal to 2437 psid when tested pursuant to Specification 4.0.5.

(1) The provisions of Specifications 3.0.4 and 4.0.4 are not applicable for entry into MODE 3 for the centrifugal charging pump declared inoperable pursuant to Specification 3.4.9.3 provided that the centrifugal charging pump is restored to OPERABLE status within 4 hours or prior to the temperature of one or more of the RCS cold legs exceeding 375°F, whichever comes first.

ACCIDENT MONITORING INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.3.8 The accident monitoring instrumentation channels shown in Table 3.3-11 shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

a. With the number of OPERABLE accident monitoring instrumentation channels less than the Total Number of Channels shown in Table 3.3-11, either restore the inoperable channel(s) to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours (follow Specification 3.4.11 when determining ACTIONS for Items 4 and 5).

b. With the number of OPERABLE accident monitoring instrumentation channels less than the Minimum Channels OPERABLE requirements of Table 3.3-11, either restore the inoperable channel(s) to OPERABLE status within 48 hours or be in at least HOT SHUTDOWN within the next 12 hours.

c. With the number of OPERABLE Reactor Coolant System Subcooling Margin Monitor instrumentation channels less than the Minimum Channels OPERABLE requirements of Table 3.3-11, either restore the inoperable channel(s) to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours.

d. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.3.3.8 Each accident monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK and CHANNEL CALIBRATION operations at the frequencies shown in Table 4.3-7.

OVERPRESSURE PROTECTION SYSTEMS

LIMITING CONDITION FOR OPERATION

3.4.9.3 An overpressure protection system shall be OPERABLE with a maximum of one charging pump[1] capable of injecting into the RCS and the accumulators isolated[2] and either a or b below:

a. Two power-operated relief valves (PORVs) with nominal maximum lift settings which vary with the RCS temperature and which do not exceed the limits established in Figure 3.4-4, or

b. The RCS depressurized and an RCS vent of greater than or equal to 3.14 square inches.

APPLICABILITY: MODE 4 when any RCS cold leg temperature is less than or equal to an enable temperature of 350°F,
MODE 5,
MODE 6 when the reactor vessel head is on.

ACTION:

a. With two or more charging pumps capable of injecting into the RCS, immediately initiate action to verify a maximum of one charging pump is capable of injecting into the RCS or depressurize and vent the RCS through a 3.14 square inch or larger vent within 12 hours.

b. With an accumulator not isolated when the accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed by the heatup and cooldown curves, isolate the affected accumulator within 1 hour or increase the RCS cold leg temperature above the enable temperature within the next 12 hours or depressurize the affected accumulator to less than the maximum RCS pressure for the existing cold leg temperature allowed by the heatup and cooldown curves within the next 12 hours.

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(1) Two charging pumps may be capable of injecting into the RCS for pump swap operation for less than or equal to 15 minutes. All charging pumps may be capable of injecting into the RCS for less than or equal to 4 hours immediately following a change from MODE 3 to MODE 4 or prior to the temperature of one or more of the RCS cold legs decreasing below 325°F, whichever comes first.

(2) Accumulator isolation with power removed from the discharge isolation valves is only required when the accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed by the heatup and cooldown curves.

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

c. With one PORV inoperable in MODE 4 (when any RCS cold leg temperature is less than or equal to the enable temperature), restore the inoperable PORV to OPERABLE status within 7 days or depressurize and vent the RCS through a 3.14 square inch or larger vent within the next 12 hours. The provisions of Specification 3.0.4 are not applicable when in this action.

d. With one PORV inoperable in MODES 5 or 6, restore the inoperable PORV to OPERABLE status within 24 hours or depressurize and vent the RCS through a 3.14 square inch or larger vent within the next 12 hours.

e. With two PORVs inoperable, depressurize and vent the RCS through a 3.14 square inch or larger vent within 12 hours.

SURVEILLANCE REQUIREMENTS

4.4.9.3.1 Verify at least once per 12 hours that:

a. A maximum of one charging pump is capable of injecting into the RCS, and

b. Each accumulator is isolated; however, with the accumulator pressure less than the low temperature overpressure protection setpoint, the accumulator discharge isolation valves may be opened to perform accumulator discharge check valve testing.

4.4.9.3.2 When PORVs are being used for overpressure protection, demonstrate each PORV is OPERABLE by:

a. Verifying each PORV block valve is open for each required PORV at least once per 72 hours, and

b. 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 to be OPERABLE and placed in operation after decreasing the RCS cold leg temperature to less than or equal to the enable temperature and at least once per 31 days, and

c. Performance of a CHANNEL CALIBRATION on each required PORV actuation channel at least once per 18 months.

SURVEILLANCE REQUIREMENTS (Continued)

4.4.9.3.3 When a vent is being used for overpressure protection, verify the required vent is open:

a. At least once per 12 hours for an open vent or unlocked open vent valve(s), except

b. At least once per 31 days for a valve which is locked, or provided with remote position indication, or sealed, or otherwise secured in the open position.

3/4.4.11 RELIEF VALVES

LIMITING CONDITION FOR OPERATION

3.4.11 Each power-operated relief valve (PORV) and associated block valve shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

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

Separate ACTION statement entry is allowed for each PORV and block valve.

- -

a. With one PORV inoperable, within 1 hour either restore the PORV to OPERABLE status or close the associated block valve and remove power from the block valve; otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. Power operation may continue until the next refueling outage.

b. With two PORVs inoperable, within 1 hour either restore the PORVs to OPERABLE status or close the associated block valves and remove power from the block valves; restore at least one PORV to OPERABLE status within the following 72 hours or be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

c. With three PORVs inoperable, within 1 hour either restore at least one PORV to OPERABLE status or close the associated block valves and remove power from the block valves and be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

d. With one block valve inoperable and open, within 1 hour either restore the block valve to OPERABLE status or place the associated PORV in manual control. Restore the block valve to OPERABLE status within the following 72 hours or be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. With one block valve inoperable, restore the block valve to OPERABLE status within 1 hour or close it, power operation may continue until the next refueling outage.

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

e. With more than one block valve inoperable, within 1 hour either restore the block valves to OPERABLE status or place the associated PORVs in manual control. Restore at least one block valve to OPERABLE status within the next hour if three block valves are inoperable; restore a minimum of two block valves to OPERABLE status within 72 hours; otherwise, be in HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

SURVEILLANCE REQUIREMENTS

4.4.11.1 Each PORV shall be demonstrated OPERABLE at least once per 18 months by operating the PORV through one complete cycle of full travel.

4.4.11.2 Each block valve shall be demonstrated OPERABLE at least once per 92 days by operating the valve through one complete cycle of full travel unless the block valve is closed to meet required ACTIONS a, b, or c.

SURVEILLANCE REQUIREMENTS (Continued)

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

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

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

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

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

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 UFSAR Table 5.3-6 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 auxiliary 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.

Pressure-temperature limit curves shown in figure B 3/4 4-3 were developed for the limiting ferritic steel component within an isolated reactor coolant loop. The limiting component is the steam generator channel head to tubesheet region. This figure provides the ASME III, Appendix G limiting curve which is used to define operational bounds, such that when operating with an isolated loop the analyzed pressure-temperature limits are known. The temperature range provided bounds the expected operating range for an isolated loop.

OVERPRESSURE PROTECTION SYSTEMS

BACKGROUND

The overpressure protection system (OPPS) controls RCS pressure at low temperatures so the integrity of the reactor coolant pressure boundary (RCPB) is not compromised by violating the pressure and temperature (P/T) limits of 10 CFR 50, Appendix G. The reactor vessel is the limiting RCPB component for demonstrating such protection. The maximum setpoint for the power operated relief valves (PORVs) and the maximum RCS pressure for the existing RCS cold leg temperature during cooldown, shutdown, and heatup meet the 10 CFR 50, Appendix G requirements during the OPPS MODES.

The reactor vessel material is less tough at low temperatures than at normal operating temperature. As the vessel neutron exposure accumulates, the material toughness decreases and becomes less resistant to pressure stress at low temperatures. RCS pressure, therefore, is maintained low at low temperatures and is increased only as temperature is increased.

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

BACKGROUND (Continued)

The potential for vessel overpressurization is most acute when the RCS is water solid, occurring only during shutdown; a pressure fluctuation can occur more quickly than an operator can react to relieve the condition. Exceeding the RCS P/T limits by a significant amount could cause brittle cracking of the reactor vessel. LCO 3.4.9.1, "Pressure/Temperature Limits," requires administrative control of RCS pressure and temperature during heatup and cooldown to prevent exceeding the limits.

This LCO provides RCS overpressure protection by having a minimum coolant input capability and having adequate pressure relief capacity. Limiting coolant input capability requires deactivating all but one charging pump and isolating the accumulators. The pressure relief capacity requires either two redundant RCS relief valves or a depressurized RCS and an RCS vent of sufficient size. One RCS relief valve or the open RCS vent is the overpressure protection device that acts to terminate an increasing pressure event.

With minimum coolant input capability, the ability to provide core coolant addition is restricted. The LCO does not require the makeup control system deactivated or the safety injection (SI) actuation circuits blocked. Due to the lower pressures in the OPPS MODES and the expected core decay heat levels, the makeup system can provide adequate flow via the makeup control valve and, if needed, until the charging pump is actuated by SI.

The OPPS for pressure relief consists of two PORVs with reduced lift settings or a depressurized RCS and an RCS vent of sufficient size. Two RCS relief valves are required for redundancy. One RCS relief valve has adequate relieving capability to keep from overpressurization for the required coolant input capability.

PORV REQUIREMENTS

As designed for the OPPS System, each PORV is signaled to open if the RCS pressure approaches a limit determined by the OPPS actuation logic. The OPPS actuation logic monitors both RCS temperature and RCS pressure and determines when a condition not acceptable in the limits is approached. The wide range RCS temperature indications are auctioneered to select the lowest temperature signal. The lowest temperature signal is processed through a function generator that calculates a pressure limit for that temperature. The calculated pressure limit is then compared with the indicated RCS pressure from

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

PORV REQUIREMENTS (Continued)

a wide range pressure channel. If the indicated pressure meets or exceeds the calculated value, a PORV is signaled to open. Having the setpoints of both valves within the limits ensures that the Appendix G limits will not be exceeded in any analyzed event. When a PORV is opened in an increasing pressure transient, the release of coolant will cause the pressure increase to slow and reverse. As the PORV releases coolant, the RCS pressure decreases until a reset pressure is reached and the valve is signaled to close. The pressure continues to decrease below the reset pressure as the valve closes.

RCS VENT REQUIREMENTS

Once the RCS is depressurized, a vent exposed to the containment atmosphere will maintain the RCS at containment ambient pressure in an RCS overpressure transient, if the relieving requirements of the transient do not exceed the capabilities of the vent. Thus, the vent path must be capable of relieving the flow resulting from the limiting OPPS mass or heat input transient, and maintaining pressure below the P/T limits. The required vent capacity may be provided by one or more vent paths.

For an RCS vent to meet the flow capacity requirement, it may be satisfied by removing a pressurizer safety valve or establishing an opening between the RCS and the containment atmosphere of the required size through any positive means available which cannot be inadvertently defeated. The vent path(s) must be above the level of reactor coolant, so as not to drain the RCS when open.

APPLICABLE SAFETY ANALYSES

Safety analyses demonstrate that the reactor vessel is adequately protected against exceeding the P/T limits when low RCS temperature conditions exist. At the enable temperature and below, overpressure prevention is provided by two OPERABLE RCS relief valves or a depressurized RCS and a sufficient sized RCS vent.

The actual temperature at which the pressure in the P/T limit curve falls below the OPPS setpoint increases as the reactor vessel material toughness decreases due to neutron embrittlement. Each time the heatup and cooldown curves are revised, the OPPS must be re-evaluated to ensure its functional requirements can still be met.

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

APPLICABLE SAFETY ANALYSES (Continued)

The heatup and cooldown curves represent the Appendix G limits that define OPPS operation. Any change to the RCS that may affect OPPS operation must be evaluated against the analyses to determine the impact of the change on the OPPS acceptance limits.

Transients that are capable of overpressurizing the RCS are categorized as either mass or heat input transients, examples of which follow:

MASS INPUT TYPE TRANSIENTS

a. Inadvertent safety injection; or

b. Charging/letdown flow mismatch.

HEAT INPUT TYPE TRANSIENTS

a. Inadvertent actuation of pressurizer heaters;

b. Loss of RHR cooling; or

c. Reactor coolant pump (RCP) startup with temperature asymmetry within the RCS or between the RCS and steam generators.

The following are required during the OPPS MODES to ensure that mass and heat input transients do not occur, which either of the OPPS overpressure protection means cannot handle:

a. Deactivating all but one charging pump OPERABLE;

b. Deactivating the accumulator discharge isolation valves in their closed positions; and

c. Disallowing start of an RCP if secondary temperature is more than 50°F above primary temperature in any one loop. LCO 3.4.1.6, "Reactor Coolant Pump Startup," provides this protection.

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

HEAT INPUT TYPE TRANSIENTS (Continued)

The analyses demonstrate that either one RCS relief valve or the depressurized RCS and RCS vent can maintain the RCS pressure below the limits when only one charging pump is actuated by SI. Thus, the LCO allows only one charging pump OPERABLE during the OPPS MODES. Since neither one RCS relief valve nor the RCS vent can handle a full SI actuation, the LCO also requires the accumulators isolated.

The isolated accumulators must have their discharge valves closed with power removed. Fracture mechanics analyses established the temperature of OPPS Applicability at the enable temperature.

PORV PERFORMANCE

The fracture mechanics analyses show that the vessel is protected when the PORVs are set to open at or below the limit. The setpoint is derived by analyses that model the performance of the OPPS assuming the limiting transient of SI actuation of one charging pump. These analyses consider pressure overshoot and undershoot beyond the PORV opening and closing, resulting from signal processing and valve stroke times. The PORV setpoints at or below the derived limit ensures the P/T limits will be met.

The Maximum Allowed PORV Setpoint for the OPPS is derived by analysis which models the performance of the OPPS assuming various mass input and heat input transients. Operation with a PORV setpoint less than or equal to the maximum setpoint ensures that Appendix G limits will not be violated with consideration for: (1) a maximum pressure overshoot beyond the PORV setpoint which can occur as a result of time delays in signal processing and valve opening; (2) a 50°F heat transport effect made possible by the geometrical relationship of the RHR suction line and the RCS wide range temperature indicator used for OPPS; (3) instrument uncertainties; and (4) single failure.

The PORV setpoint will be updated when the revised P/T limits conflict with the OPPS analysis limits. The P/T limits are periodically modified as the reactor vessel material toughness decreases due to neutron embrittlement caused by neutron irradiation. Revised limits are determined using neutron fluence projections and the results of examinations of the reactor vessel material irradiation surveillance specimens. The Bases for LCO 3.4.9.1, "Pressure/Temperature Limits," discuss these examinations.

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

PORV PERFORMANCE (Continued)

The PORVs are considered active components. Thus, the failure of one PORV is assumed to represent the worst case, single active failure.

RCS VENT PERFORMANCE

With the RCS depressurized, analyses show that a PORV or equivalent opening with a vent size of 3.14 square inches is capable of mitigating the allowed OPPS overpressure transient. The capacity of a vent this size is greater than the flow of the limiting transient for the OPPS configuration, SI actuation with one charging pump OPERABLE, maintaining RCS pressure less than the maximum pressure on the P/T limit curve.

The RCS vent size is based on the PORV size, therefore, the vent is bounded by the PORV analyses.

The RCS vent is passive and is not subject to active failure.

LCO

This LCO requires that the OPPS is OPERABLE. The OPPS is OPERABLE when the minimum coolant input and pressure relief capabilities are OPERABLE. Violation of this LCO could lead to the loss of low temperature overpressure mitigation and violation of the limits as a result of an operational transient.

To limit the coolant input capability, the LCO requires one charging pump capable of injecting into the RCS and all accumulator discharge isolation valves closed and immobilized. The LCO is qualified by a note that permits two pumps capable of RCS injection for less than or equal to 15 minutes to allow for pump swaps. This note also allows all charging pumps capable of injecting into the RCS during a change from MODE 3 to MODE 4 to be OPERABLE for a limited period of time.

The LCO is also qualified by a note stating that accumulator isolation with power removed from the discharge isolation valves is only required when the accumulator pressure is greater than or at the maximum RCS pressure for the existing temperature, as allowed by the P/T limit curves. This note permits the accumulator discharge isolation valve surveillance to be performed only under these pressure and temperature conditions.

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

LCO (Continued)

Operation above 350°F but less than 375°F with only one centrifugal charging pump OPERABLE is allowed for up to 4 hours. As shown by analysis, LOCAs occurring at low temperature, low pressure conditions can be successfully mitigated by the operation of a single centrifugal charging pump and a single LHSI pump with no credit for accumulator injection. Given the short time duration that the condition of having only one centrifugal charging pump OPERABLE is allowed and the probability of a LOCA occurring during this time, the failure of the single centrifugal charging pump is not assumed.

Operation below 350°F but greater than 325°F with all centrifugal charging pumps OPERABLE is allowed for up to 4 hours immediately following a change from MODE 3 to MODE 4. This provides a reasonable period of time for the operators to secure an OPERABLE pump following entry into MODE 4. Since the charging pump is required to be OPERABLE in MODE 3, but is not required in MODE 4 due to OPPS limitations, some time constraints for making the transition must be identified. During low pressure, low temperature operation, all automatic Safety Injection actuation signals are blocked. In normal conditions, a single failure of the ESF actuation circuitry will result in the starting of at most one train of Safety Injection (one centrifugal charging pump, and one LHSI pump). For temperatures above 325°F, an overpressure event occurring as a result of starting these two pumps can be successfully mitigated by operation of both PORVs without exceeding Appendix G limits. Given the short time duration that this condition is allowed and the low probability of a single failure causing an overpressure event during this time, the single failure of a PORV is not assumed. Initiation of both trains of Safety Injection during this 4-hour time frame due to operator error or a single failure occurring during testing of a redundant channel are not considered to be credible accidents.

The elements of the LCO that provide low temperature overpressure mitigation through pressure relief are:

a. Two OPERABLE PORVs; a PORV is OPERABLE for OPPS when its block valve is open, its lift setpoint is set to the limit and testing proves its ability to open at this setpoint, and motive power is available to the two valves and their control circuits; or

b. A depressurized RCS and an RCS vent.

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

LCO (Continued)

An RCS vent is OPERABLE when open with an area of 3.14 square inches.

Each of these methods of overpressure prevention is capable of mitigating the limiting OPPS transient.

APPLICABILITY

This LCO is applicable in MODE 4 when any RCS cold leg temperature is less than or equal to the enable temperature, in MODE 5, and in MODE 6 when the reactor vessel head is on. When the reactor vessel head is off, overpressurization cannot occur.

Low temperature overpressure prevention is most critical during shutdown when the RCS is water solid, and a mass or heat input transient can cause a very rapid increase in RCS pressure when little or no time allows operator action to mitigate the event.

ACTION

a. With two or more charging pumps capable of injecting into the RCS, RCS overpressurization is possible.

   To immediately initiate action to restore restricted coolant input capability to the RCS reflects the urgency of removing the RCS from this condition.

b. An unisolated accumulator requires isolation within 1 hour. This is only required when the accumulator pressure is at or more than the maximum RCS pressure for the existing temperature allowed by the P/T limit curves.

   If isolation is needed and cannot be accomplished in 1 hour, the ACTION provides two options, either of which must be performed in the next 12 hours. By increasing the RCS temperature to more than the enable temperature, the accumulator pressure cannot exceed the OPPS limits if the accumulators are fully injected. Depressurizing the accumulators below the OPPS limit also gives this protection.

   The completion times are based on operating experience that these activities can be accomplished in these time periods indicating that an event requiring OPPS is not likely in the allowed times.

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

ACTION (Continued)

c. In MODE 4 when any RCS cold leg temperature is less than or equal to the enable temperature, with one required RCS relief valve inoperable, the RCS relief valve must be restored to OPERABLE status within a completion time of 7 days. Two RCS relief valves are required to provide low temperature overpressure mitigation while withstanding a single failure of an active component. The exception to Specification 3.0.4 will permit plant heatup with one inoperable PORV. Continued operation is permitted with one PORV inoperable.

The completion time considers the facts that only one of the RCS relief valves is required to mitigate an overpressure transient and that the likelihood of an active failure of the remaining valve path during this time period is very low. If plant operation results in transitioning to MODE 5, the completion time to restore an inoperable PORV may not exceed 7 days as required by this ACTION.

d. The consequences of operational events that will overpressurize the RCS are more severe at lower temperature. Thus, with one of the two RCS relief valves inoperable in MODE 5 or in MODE 6 with the head on, the completion time to restore two valves to OPERABLE status is 24 hours.

The completion time represents a reasonable time to investigate and repair several types of relief valve failures without exposure to a lengthy period with only one OPERABLE RCS relief valve to protect against overpressure events. If a PORV is inoperable when the plant enters MODE 5 from MODE 4, the completion time to restore an inoperable PORV changes to 24 hours but the cumulative inoperable time may not exceed 7 days before taking action to depressurize and vent.

e. The RCS must be depressurized and a vent must be established within 12 hours when both required RCS relief valves are inoperable. The vent must be sized greater than or equal to 3.14 square inches to ensure that the flow capacity is greater than that required for the worst case mass input transient reasonable during the applicable MODES. This action is needed to protect the RCPB from a low temperature overpressure event and a possible brittle failure of the reactor vessel.

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

ACTION (Continued)

The completion time considers the time required to place the plant in this condition and the relatively low probability of an overpressure event during this time period due to increased operator awareness of administrative control requirements.

SURVEILLANCE REQUIREMENTS (SR)

SR 4.4.9.3.1

To minimize the potential for a low temperature overpressure event by limiting the mass input capability, a maximum of one charging pump is OPERABLE with the others verified deactivated with power removed and the accumulator discharge isolation valves are verified closed and locked out.

The frequency of 12 hours is sufficient, considering other indications and alarms available to the operator in the control room, to verify the required status of the equipment.

SR 4.4.9.3.1.b allows opening the accumulator discharge isolation valves to perform accumulator discharge check valve testing.

SR 4.4.9.3.2

The PORV block valve must be verified open every 72 hours to provide the flow path for each required PORV to perform its function when actuated. The valve must be remotely verified open in the main control room. This surveillance is performed if the PORV satisfies the LCO.

The block valve is a remotely controlled, motor operated valve. The power to the valve operator is not required removed, and the manual operator is not required locked in the inactive position. Thus, the block valve can be closed in the event the PORV develops excessive leakage or does not close (sticks open) after relieving an overpressure situation.

The 72 hour frequency is considered adequate in view of other administrative controls available to the operator in the control room, such as valve position indication, that verify that the PORV block valve remains open.

3/4.4.9 PRESSURE/TEMPERATURE LIMITS (Continued)

SURVEILLANCE REQUIREMENTS (SR) (Continued)

The SR is required to be performed prior to entering the condition for the OPPS to be OPERABLE. This assures low temperature overpressure protection is available when the RCS cold leg temperature is less than or equal to the enable temperature. Performing the surveillance every 31 days on each required PORV permits verification and adjustment, if necessary, of its lift setpoint, and considers instrumentation reliability which has been shown through operating experience to be acceptable. The CHANNEL FUNCTIONAL TEST will verify the setpoint is within the allowed maximum limits. PORV actuation could depressurize the RCS and is not required.

Performance of a CHANNEL CALIBRATION on each required PORV actuation channel is required every 18 months to adjust the whole channel so that it responds and the valve opens within the required range and accuracy to known input.

SR 4.4.9.3.3

The RCS vent of greater than or equal to 3.14 square inches is proven OPERABLE by verifying its open condition either:

a. Once every 12 hours for an open vent or valve that cannot be locked, except

b. Once every 31 days for a valve that is locked, or provided with remote position indication, or sealed, or secured in position. A removed pressurizer safety valve fits this category.

The passive vent arrangement must only be open to be OPERABLE. This surveillance is required to be performed if the vent is being used to satisfy the pressure relief requirements of the LCO.

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 REACTOR COOLANT SYSTEM RELIEF VALVES

BACKGROUND

The Pressurizer is equipped with two types of devices for pressure relief: pressurizer safety valves and PORVs. The PORVs are electro-solenoid actuated valves that are controlled to open in response to a signal from a pressure sensing system when the pressurizer pressure increases and close when the pressurizer pressure decreases. The PORVs may also be manually operated from the control room.

Block valves, which are normally open, are located between the pressurizer and the PORVs. The block valves are used to isolate the PORVs in case of excessive leakage or a stuck open PORV. Block valve closure is accomplished manually using controls in the control room. A stuck open PORV is, in effect, a small break loss of coolant accident (LOCA). As such, block valve closure terminates the RCS depressurization and coolant inventory loss.

The PORVs and their associated block valves may be used by plant operators to depressurize the RCS to recover from certain transients if normal pressurizer spray is not available. Additionally, the series arrangement of the PORVs and their block valves permit performance of certain surveillances on the valves during power operation.

The PORVs may also be used for feed and bleed core cooling in the case of multiple equipment failure events that are not within the design basis, such as a total loss of feedwater.

The PORVs, their block valves, and their controls are powered from emergency power sources in the event of a loss of offsite power. Two PORVs and their associated block valves are powered from two separate safety trains.

The plant has three PORVs, each having a relief capacity of 210,000 lb/hr at 2350 psig. The functional design of the PORVs is based on maintaining pressure below the high pressure reactor trip setpoint. In addition, the PORVs minimize challenges to the pressurizer safety valves and also may be used for low temperature overpressure protection (OPPS). See LCO 3.4.9.3, "Overpressure Protection System."

3/4.4.11 REACTOR COOLANT SYSTEM RELIEF VALVES (Continued)

APPLICABLE SAFETY ANALYSES

Plant operators employ the PORVs to depressurize the RCS in response to certain plant transients if normal pressurizer spray is not available. For the Steam Generator Tube Rupture (SGTR) event, the safety analysis assumes that manual operator actions are required to mitigate the event. A loss of offsite power is assumed to accompany the event, and thus, normal pressurizer spray is unavailable to reduce RCS pressure. The PORVs are assumed to be used for RCS depressurization, which is one of the steps performed to equalize the primary and secondary pressures in order to terminate the primary to secondary break flow and the radioactive releases from the affected steam generator.

The PORVs are used in safety analyses for events that result in increasing RCS pressure for which departure from nucleate boiling ratio (DNBR) criteria are critical. Certain analyses have been performed to study the effects on primary pressure assuming PORV actuation. The results of the turbine trip event indicate the primary pressure remains within the design limits and the DNBR is maintained within the acceptance criteria.

LCO

The LCO requires the PORVs and their associated block valves to be OPERABLE for manual operation to mitigate the effects associated with an SGTR.

By maintaining at least two PORVs and their associated block valves OPERABLE, redundancy has been provided. The block valves are available to isolate the flow path through either a failed open PORV or a PORV with excessive leakage. Satisfying the LCO helps minimize challenges to fission product barriers.

APPLICABILITY

In MODES 1, 2, and 3, the PORV and its block valve are required to be OPERABLE to limit the potential for a small break LOCA through the flow path. The most likely cause for a PORV small break LOCA is a result of a pressure increase transient that causes the PORV to open. Imbalances in the energy output of the core and heat removal by the secondary system can cause the RCS pressure to increase to the

3/4.4.11 REACTOR COOLANT SYSTEM RELIEF VALVES (Continued)

APPLICABILITY (Continued)

PORV opening setpoint. The most rapid increases will occur at the higher operating power and pressure conditions of MODES 1 and 2. The PORVs are also required to be OPERABLE in MODES 1, 2, and 3 to minimize challenges to the pressurizer safety valves.

Pressure increases are less prominent in MODE 3 because the core input energy is reduced, but the RCS pressure is high. Therefore, the LCO is applicable in MODES 1, 2, and 3. The LCO is not applicable in MODE 4 when both pressure and core energy are decreased and the pressure surges become much less significant. The PORV setpoint is reduced for OPPS in MODES 4 (below the enable temperature), 5, and 6 with the reactor vessel head in place. LCO 3.4.9.3 addresses the PORV requirements in these MODES.

ACTION

A General Note provides clarification that all pressurizer PORVs and block valves are treated as separate entities, each with separate completion times (i.e., the completion time is on a component basis).

a. With one PORV inoperable, either the PORV must be restored or the flow path isolated within 1 hour. The block valve should be closed with power removed from the associated block valve because of downstream piping concerns. With the block valve closed, the potential exists to condense steam in the piping between the block valve and the downstream PORV. If the block valve were opened and the PORV actuated, the piping downstream of the PORV may be overstressed due to the slug of water being forced down the piping. Based on the downstream piping concern, it is prudent to remove power from the closed block valve. Removing power from the block valve renders the block valve inoperable, however, two PORVs and their associated block valves remain OPERABLE and redundancy exists for PORV operation. Therefore, plant operation may continue with one block valve closed and power removed. PORV inoperability may be due to seat leakage, instrumentation problems (including PORV accident monitoring instruments identified in LCO 3.3.3.8), or other causes. Automatic control problems and related instrumentation problems would not render the PORVs inoperable. Accident analyses assume manual operation of the PORVs and do not take credit for automatic actuation. This condition is only intended to permit operation of the plant for a limited

3/4.4.11 REACTOR COOLANT SYSTEM RELIEF VALVES (Continued)

ACTION (Continued)

period of time not to exceed the next refueling outage so that maintenance can be performed on the PORV to return the valve to an OPERABLE condition. Normally, the PORV should be available for automatic mitigation of overpressure events and should be returned to OPERABLE status prior to entering startup (MODE 2).

The completion time of 1 hour is based on plant operating experience that has shown that minor problems can be corrected or closure accomplished in this time period.

b. With two PORVs inoperable, they must be either restored or isolated by closing the associated block valves and removing the power to the associated block valves. The completion time of 1 hour is reasonable, based on challenges to the PORVs during this time period, and provides the operator adequate time to correct the situation. If the inoperable valves cannot be restored to OPERABLE status, the inoperable valves must be isolated within the specified time. Because there is one PORV that remains OPERABLE, an additional 72 hours is provided to restore at least one inoperable PORV to OPERABLE status. If a PORV cannot be restored within this additional time, the plant must be brought to a MODE in which the LCO does not apply.

c. If three PORVs are inoperable, it is necessary to either restore at least one valve within the completion time of 1 hour or isolate the flow path by closing and removing the power to the associated block valves. The completion time of 1 hour is reasonable, based on the small potential for challenges to the system during this time and provides the operator time to correct the situation. If one PORV is restored, then the plant will be in a less limiting ACTION statement with the time clock started at the original declaration of having three PORVs inoperable. If no PORVs are restored within the completion time, then the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 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. In MODES 4 and 5, maintaining PORV OPERABILITY may be required. See LCO 3.4.9.3.

3/4.4.11 REACTOR COOLANT SYSTEM RELIEF VALVES (Continued)

ACTION (Continued)

d. If one block valve is inoperable and open, then it is necessary to either restore the block valve to OPERABLE status within the completion time of 1 hour or place the associated PORV in manual control. The prime importance for the capability to close the block valve is to isolate a stuck open PORV. Therefore, if the block valve cannot be restored to OPERABLE status within 1 hour, the required action is to place the PORV in manual control to preclude its automatic opening for an overpressure event and to avoid the potential for a stuck open PORV at a time that the block valve is inoperable. If the block valve is inoperable, it is necessary to restore the block valve to OPERABLE status within 1 hour or close it. If block valve instrumentation related to accident monitoring instrumentation identified in LCO 3.3.3.8 is determined to be inoperable, then the block valve shall be declared inoperable. Closing the block valve precludes the need to place the PORV in manual control since it is isolated from the system. The completion time of 1 hour is reasonable, based on the small potential for challenges to the system during this time period, and provides the operator time to correct the situation. Because at least one PORV remains OPERABLE, the operator is permitted a completion time of 72 hours to restore the inoperable open block valve to OPERABLE status. If it cannot be restored within this additional time, the plant must be brought to a MODE in which the LCO does not apply in order to avoid continuous operation without a redundant ability to isolate this PORV flow path. If the block valve is restored within the completion time of 72 hours, the power will be restored and the PORV restored to OPERABLE status. With one block valve inoperable and closed, there still remains two PORV flow paths. This redundancy will allow continued operation until the next refueling outage to perform maintenance on the inoperable valve and return it to OPERABLE status.

e. If more than one block valve is inoperable, it is necessary to either restore the block valves within the completion time of 1 hour, or place the associated PORVs in manual control and restore at least one block valve within 2 hours [and restore a minimum of two block valves within 72 hours]. Two OPERABLE PORVs provide redundancy to allow continued operation until the next refueling outage to perform maintenance on the inoperable valve and return it to

3/4.4.11 REACTOR COOLANT SYSTEM RELIEF VALVES (Continued)

ACTION (Continued)

OPERABLE status. The completion times are reasonable, based on the small potential for challenges to the system during this time and provide the operator time to correct the situation. If the required actions are not met, then the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 within 12 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. In MODES 4 and 5, maintaining PORV OPERABILITY may be required. See LCO 3.4.9.3.

SURVEILLANCE REQUIREMENTS (SR)

SR 4.4.11.1

This surveillance requires a complete cycle of each PORV. Operating a PORV through one complete cycle ensures that the PORV can be manually actuated for mitigation of an SGTR. The frequency of 18 months is based on a typical refueling cycle and industry accepted practice.

SR 4.4.11.2

Block valve cycling verifies that the valve(s) can be closed if needed. The basis for the frequency of 92 days is the ASME Code, Section XI. If the block valves are closed to isolate inoperable PORVs, the maximum completion time to restore one PORV and open the block valve is 72 hours, which is well within the allowable limits (25%) to extend the block valve frequency of 92 days. Furthermore, these test requirements would be completed by the reopening of a recently closed block valve upon restoration of the PORV to OPERABLE status (i.e., completion of the required actions fulfills the SR).

This SR is not required to be met with the block valve closed, in accordance with required ACTIONs a, b, or c of this LCO.

3/4.4.12 REACTOR COOLANT SYSTEM HEAD VENTS

Reactor Coolant System Vents are provided to exhaust noncondensible gases and/or steam from the primary system that could inhibit natural circulation core cooling. The OPERABILITY of at least one reactor coolant system vent path from the reactor vessel head or the pressurizer steam space via the PORV's ensures the capability exists to perform this function.

The valve redundancy of the Reactor Coolant System Head vent paths serves to minimize the probability of inadvertent or irreversible actuation while ensuring that a single failure of a vent valve, power supply or control system does not prevent isolation of the vent path.

The function, capabilities, and testing requirements of the Reactor Coolant System vent systems are consistent with the requirements of Item II.B.1 of NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1980.

SPECIAL REPORTS (Continued)

d. Seismic event analysis, Specification 4.3.3.3.2.

e. Sealed source leakage in excess of limits, Specification 4.7.9.1.3.

f. Miscellaneous reporting requirements specified in the ACTION Statements for Radiological Effluent Technical Specifications.

g. Containment Inspection Report, Specification 4.6.1.6.2.

h. Steam generator tube inservice inspection, Specification 4.4.5.5.

i. Inoperable accident monitoring, Specification 3.3.3.8.

6.10 RECORD RETENTION

6.10.1 The following records shall be retained for at least five (5) years;

a. Records and logs of facility operation covering time interval at each power level.

b. Records and logs of principal maintenance activities, inspections, repair and replacement of principal items of equipment related to nuclear safety.

c. All REPORTABLE EVENTS.

d. Records of surveillance activities, inspections and calibrations required by these Technical Specifications.

e. Records of reactor tests and experiments.

f. Records of changes made to Operating Procedures.

g. Records of radioactive shipments.

h. Records of sealed source leak tests and results.

i. Records of annual physical inventory of all sealed source material of record.

6.10.2 The following records shall be retained for the duration of the Facility Operating License:

a. Records and drawing changes reflecting facility design modifications made to systems and equipment described in the Final Safety Analysis Report.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 187 AND 69 TO FACILITY OPERATING

LICENSE NOS. DPR-66 AND NPF-73

DUQUESNE LIGHT COMPANY

OHIO EDISON COMPANY

PENNSYLVANIA POWER COMPANY

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

THE TOLEDO EDISON COMPANY

BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2

DOCKET NOS. 50-334 AND 50-412

1.0 INTRODUCTION

By letter dated April 19, 1994, as supplemented March 31, 1995, Duquesne Light Company (DLC or the licensee) proposed Technical Specifications (TSs) changes for Beaver Valley Power Station, Units 1 and 2. These changes were in response to NRC Generic Letter (GL) 90-06, "Resolution of Generic Issue 70, "Power-Operated Relief Valve and Block Valve Reliability," and Generic Issue 94, "Additional Low-Temperature Overpressure Protection for Light-Water Reactors," Pursuant to 10 CFR 50.54(f)." The proposed amendment would revise the TSs related to power operated relief valves (PORVs) and low temperature overpressure protection (LTOP) to enhance plant safety and improve the reliability of the PORVs during all modes of plant operation. The March 31, 1995, letter provided typed final TS pages for issuance of these amendments and included minor editorial changes that did not change the initial proposed no significant hazards consideration determination or expand the scope of the original Federal Register notice.

2.0 EVALUATION

The licensee's proposed TS amendment is consistent with the intent of the recommendations of GL 90-06. The NRC staff-recommended allowable outage times (AOT) for various PORV inoperable conditions are adopted in the licensee's proposed TSs and are, therefore, acceptable to the NRC staff.

GL 90-06 recommends improvements to the quality assurance, maintenance, and testing of the PORVs and block valves. For both Units 1 and 2, the licensee has proposed improvements which generally agree with the GL recommendations. The licensee includes both the Unit 1 and 2 PORVs and block valves as QA Category I on the Master Equipment Lists, and the maintenance programs include

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maintenance and refurbishment in accordance with the manufacturers recommendations. Since the PORVs on Unit 1 are air-operated, the air control valves, in addition to the PORVs, are tested and included in the inservice testing (IST) program. For both Units 1 and 2, the block valves are included in the GL 89-10 motor-operated valve test program as recommended.

The licensee has proposed to demonstrate the operability of the PORVs at least once per 18 months by operating the PORVs through one complete cycle of full travel without specifying operation in any specific mode. This proposal differs from the recommendations of GL 90-06 to test the PORVs at least once per 18 months in Mode 3 or 4. The proposed change is necessary for Unit 2 because the licensee has determined that (1) the PORVs cannot be fully stroked with their block valves closed, and (2) with the block valve open, repeated cycling of the PORVs would result in overstressing of the downstream piping since it is designed to withstand only a limited number of valve actuation cycles at full pressure conditions. Demonstration of PORV operability at least once per 18 months without specifying operation in any specific mode (testing would normally be performed in Mode 5) is consistent with the NRC staff's current position for testing these valves as reflected in the NRC's improved Standard Technical Specifications (NUREG-1431) and is acceptable to the NRC staff. Therefore, the NRC staff has determined that the proposed TS changes are acceptable since, within the limits of the plant design, the licensee has satisfied the intent of the GL 90-06 recommendations regarding the quality assurance, maintenance, and testing of the Unit 1 and 2 PORVs and block valves.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendments. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (59 FR 34661). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: C. Liang
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Date: May 15,1995