ATTACHMENT A-1

Beaver Valley Power Station, Unit No. 1
Proposed Technical Specification Change No. 184
MARKED-UP PAGES

The following is a list of the affected pages:

Affected Pages:

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REACTIVITY CONTROL SYSTEMS

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 ~~charging~~ 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 All charging pumps, except the above required charging pump, shall be demonstrated inoperable* at least once per 12 hours by verifying that the control switches are placed in the PULL-TO-LOCK position and tagged. move to Specification 3.4.9.3

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 at least once per 12 hours.~~** in accordance with 4.4.9.3.3.

Delete

* An inoperable pump may be energized for testing provided the discharge of the pump has been isolated from the RCS by a closed isolation valve with power removed from the valve operator, or by a manual isolation valve locked in the closed position.

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

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

delete

PROPOSED

INSTRUMENTATION

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 ~~except for the PORV(s) which may be isolated in accordance with~~ Specification 3.4.11.~~*~~ (follow 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. PORV Control Pressure Channels (PT-RC-444, 445)~~ Deleted	~~M~~	~~R~~
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.

DPR-66

REACTOR COOLANT SYSTEM

OVERPRESSURE PROTECTION SYSTEMS

LIMITING CONDITION FOR OPERATION

INSERT 1

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

a. Two power operated relief valves (PORVs) with a nominal trip setpoint of less than or equal to 432 psig, or

b. A reactor coolant system vent of greater than or equal to 3.14 square inches.

APPLICABILITY: When the temperature of one or more of the non-isolated RCS cold legs is less than or equal to an enable temperature of 329°F.

ACTION:

a. With one PORV inoperable, either restore the inoperable PORV to OPERABLE status within 7 days or depressurize and vent the RCS through a 3.14 square inch vent(s) within the next 12 hours; maintain the RCS in a vented condition until both PORVs have been restored to OPERABLE status. Refer to Technical Specification 3.4.1.6 for further limitations.

b. With both PORV's inoperable, depressurize and vent the RCS through a 3.14 square inch vent(s) within 12 hours; maintain the RCS in a vented condition until both PORVs have been restored to OPERABLE status.

c. The provisions of specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENT

4.4.9.3.1 Each PORV shall be demonstrated OPERABLE BY:

REACTOR COOLANT SYSTEM

INSERT 1 Continued

SURVEILLANCE REQUIREMENTS (Continued)

a. Performance of a CHANNEL FUNCTIONAL TEST on the PORV actuation channel, but excluding valve operation, within 31 days prior to entering a condition in which the PORV is required OPERABLE and at least once per 31 days thereafter when the PORV is required OPERABLE.

b. Performance of a CHANNEL CALIBRATION on the PORV actuation channel at least once per 18 months.

c. Verifying the PORV isolation valve is open at least once per 72 hours when the PORV is being used for overpressure protection.

d. Stroking the operable PORV(s) each time the plant enters Mode 5, unless tested within the preceding three months.

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

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

INSERT 1

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.

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.

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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.

(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.

INSERT 1 (Continued)

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.

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.

DPR-66

REACTOR COOLANT SYSTEM

3/4.4.11 RELIEF VALVES

INSERT 2

LIMITING CONDITION FOR OPERATION

3.4.11 (Two) power operated relief valves (PORVs) and their associated block valves shall be OPERABLE.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

a. With less than 2 PORV(s) operable, within 1 hour either restore two PORV(s) to OPERABLE status or close the associated block valve(s) and remove power from the block valve(s); otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With one or more block valve(s) inoperable, within 1 hour either restore the block valve(s) to OPERABLE status or close the block valve(s) and remove power from the block valve(s); otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.4.11.1 Each PORV shall be demonstrated OPERABLE:

a. At least once per 31 days by performance of a CHANNEL CHECK of the position indication, excluding valve operation and

b. By performance of a CHANNEL CALIBRATION in accordance with Table 4.3-7 on the operable PORV(s) Control Channel(s).

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.

4.4.11.3 The emergency power supply for the PORV(s) and block valves shall be demonstrated OPERABLE at least once per 18 months by operating the valves through a complete cycle of full travel.

PROPOSED

INSERT 2

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 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.

INSERT 2 (Continued)

LIMITING CONDITION FOR OPERATION (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 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.

EMERGENCY CORE COOLING SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

b. At least once per 31 days and within 6 hours after each solution volume increase of greater than or equal to 1% 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.

moved to Specification 3.4.9.3

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

moved to SR 4.4.9.3.1.b

* 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.

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.

The OPERABILITY of two PORV's or an RCS vent opening of greater than 3.14 square inches ensures that the RCS will be protected from pressure transients which could exceed the limits of Appendix G to 10 CFR Part 50 when one or more of the RCS cold legs are $\leq$ the enable temperature. The enable temperature is defined in Standard Review Plan Section 5.2.2 Branch Technical Position RSB 5-2 as the water temperature corresponding to a metal temperature of at least RT_{NDT} + 90°F. The OPPS setpoint is determined from an assessment of steady-state pressure-temperature limits as described in UFSAR Section 4.2. Either PORV has adequate relieving capability to protect the RCS from over-pressurization when the transient is limited to either (1) the start of an idle RCP with the secondary water temperature of the steam generator $\leq$ 25°F above the RCS cold leg temperature or (2) the start of a charging pump and its injection into a water solid RCS.

REPLACE WITH INSERT 3

INSERT 3

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.

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 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 ensure 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.

INSERT 3 (Continued)

APPLICABLE SAFETY ANALYSES (Continued)

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

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.

INSERT 3 (Continued)

HEAT INPUT TYPE TRANSIENTS (Continued)

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 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.

INSERT 3 (Continued)

LCO (Continued)

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.

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.

INSERT 3 (Continued)

ACTION (Continued)

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.

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.

INSERT 3 (Continued)

ACTION (Continued)

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 temp rature overpressure event and a possible brittle failure of the reactor vessel.

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.

INSERT 3 (Continued)

SURVEILLANCE REQUIREMENTS (SR) (Continued)

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.

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

INSERT 4 2

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

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.

INSERT 4

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.

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

INSERT 4 (Continued)

APPLICABLE SAFETY ANALYSES (Continued)

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.

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 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

ACTION (Continued)

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 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 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

ACTION (Continued)

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 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

SURVEILLANCE REQUIREMENTS (SR) (Continued)

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.

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.

ATTACHMENT A-2

Beaver Valley Power Station, Unit No. 2
Proposed Technical Specification Change No. 49
MARKED-UP PAGES

The following is a list of the affected pages:

Affected Pages:

3/4 1-10
3/4 1-11
3/4 3-57
3/4 4-35
3/4 4-36
3/4 4-39
3/4 5-2
B 3/4 4-14
B 3/4 4-15
B 3/4 4-16
6-19

NPF-73

REACTIVITY CONTROL SYSTEMS

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.

move to specification 3.4.9.3

4.1.2.3.2 All charging pumps, except the above required charging pump, shall be demonstrated inoperable* by verifying that the control switches are placed in the PULL-TO-LOCK position and tagged within 4 hours after entering MODE 4 from MODE 3 or prior to the temperature of one or more of the RCS cold legs decreasing below 325°F, whichever comes first, and at least once per 12 hours thereafter.

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 ~~at least once per 12 hours.**~~ in accordance with 4.4.9.3.3.

Delete

*An inoperable pump may be energized for testing provided the discharge of the pump has been isolated from the RCS by a closed isolation valve with power removed from the valve operator, or by a manual isolation valve locked in the closed position.

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

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

REACTIVITY CONTROL SYSTEMS

CHARGING PUMPS-OPERATING

LIMITING CONDITION FOR OPERATION

3.1.2.4 At least two charging pumps shall be OPERABLE

APPLICABILITY: MODES 1, 2 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% 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 ≥ 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 ~~4.1.2.3.2~~ 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.

(Proposed Wording)

INSTRUMENTATION

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 ~~except for the PORV(s) which may be isolated in accordance with Specification 3.4.11~~. (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 a 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.

REACTOR COOLANT SYSTEM

OVERPRESSURE PROTECTION SYSTEMS

INSERT 1

LIMITING CONDITION FOR OPERATION

3.4.9.3 At least one of the following Overpressure Protection Systems (OPPS) shall be OPERABLE:

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

b. A Reactor Coolant System vent of $\geq$ 3.14 square inches.

APPLICABILITY: When the temperature of one or more of the non-isolated RCS cold legs is $\leq$ 350°F.

ACTION:

a. With one PORV inoperable, either restore the inoperable PORV to OPERABLE status within 7 days or depressurize and vent the RCS through a 3.14 square inch vent(s) within the next 12 hours; maintain the RCS in a vented condition until both PORVs have been restored to OPERABLE status. Refer to Technical Specification 3.4.1.6 for further limitations.

b. With both PORVs inoperable, depressurize and vent the RCS through a 3.14 square inch vent(s) within 12 hours; maintain the RCS in a vented condition until both PORVs have been restored to OPERABLE status.

c. In the event either the PORVs or the RCS vent(s) are used to mitigate an RCS pressure transient, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 30 days. The report shall describe the circumstances initiating the transient, the effect of the PORVs or RCS vent(s) on the transient, and any corrective action necessary to prevent recurrence.

d. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.4.9.3.1 Each PORV shall be demonstrated OPERABLE BY:

a. Performance of a CHANNEL FUNCTIONAL TEST on the PORV actuation channel, but excluding valve operation, within 31 days prior to entering a condition in which the PORV is required OPERABLE and at least once per 31 days thereafter when the PORV is required OPERABLE.

b. Performance of a CHANNEL CALIBRATION on the PORV actuation channel at least once per 18 months.

PROPOSED

INSERT 1 continued ↓

SURVEILLANCE REQUIREMENTS(Continued)

c. Verifying the PORV isolation valve is open at least once per 72 hours when the PORV is being used for overpressure protection.

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

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

INSERT 1

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.

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.

---

(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.

INSERT 1 (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.

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.

REACTOR COOLANT SYSTEM

3/4.4.11 RELIEF VALVES

LIMITING CONDITION FOR OPERATION

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

APPLICABILITY: MODES 1, 2, and 3

ACTION: REPLACE WITH INSERT 2

a. With one or more PORV(s) inoperable, because of excessive seat leakage, within 1 hour either restore the PORV(s) to OPERABLE status or close the associated block valve(s); otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With one or two PORV(s) inoperable as a result of causes other than excessive seat leakage, within 1 hour either restore the PORV(s) to OPERABLE status or close the associated block valve(s) and remove power from the block valve(s).

c. With all three PORVs inoperable due to causes other than excessive seat leakage, within 72 hours either restore one PORV to OPERABLE status or be in HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

d. With one or more block valve(s) inoperable, within 1 hour: (1) restore the block valve(s) to OPERABLE status, or close the block valve(s) and remove power from the block valve(s), or close the PORV; and (2) apply the ACTION b. or c. above, as appropriate, for the isolated PORV(s).

e. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.4.11.1 In addition to the requirements of Specification 4.0.5, each PORV shall be demonstrated OPERABLE at least once per 18 months by:

a. Performance of a CHANNEL CALIBRATION, and
b. Operating the valve 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 with power removed in order to meet the requirements of ACTION b., c. or d. in Specification 3.4.11.

INSERT 2

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.

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.

INSERT 2 (Continued)

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.

EMERGENCY CORE COOLING SYSTEMS

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.

moved to Specification 3.4.9.3

4.5.1.3 During normal plant cooldown and depressurization, each accumulator discharge isolation valve 2 SIS-MOV 865 A, B, and C shall be verified to be closed* and de-energized when RCS pressure is reduced to 1,000 ± 100 psig.

moved to Specification 4.4.9.3.1.b

* 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.

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.

The ~~OPERABILITY~~ of two PORVs or an RCS vent opening of greater than 3.14 square inches ensures that the RCS will be protected from pressure transients which could exceed the limits of Appendix G to 10 CFR Part 50 when one or more of the RCS cold legs are $\leq$ 350°F. Either PORV has adequate relieving capability to protect the RCS from overpressurization when the transient is limited to either (1) the start of an idle RCP with the secondary water temperature of the steam generator $\leq$ 50°F above the RCS cold leg temperature or (2) the start of a charging pump and its injection into a water solid RCS.

OVERPRESSURE PROTECTION SYSTEMS

The Maximum Allowed PORV Setpoint for the Overpressure Protection Systems (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 nominal 10 EPPY 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.

REPLACE WITH INSERT 3

INSERT 3

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.

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.

INSERT 3 (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 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 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.

INSERT 3 (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. 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.

INSERT 3 (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.

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.

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 LCCA occurring during this time, the failure of the single centrifugal charging pump is not assumed.

INSERT 3 (Continued)

LCO (Continued)

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.

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.

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.

INSERT 3 (Continued)

ACTION (Continued)

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.

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.

SURVEILLANCE REQUIREMENTS (SR) (Continued)

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.

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.

OVERPRSSURE PROTECTION SYSTEMS (Continued)

To ensure mass and heat input transients more severe than those assumed cannot occur, Technical Specifications require lockout of all but one centrifugal charging pump while in MODES 4, 5, and 6 with the reactor vessel head installed and disallow start of an RCP if secondary coolant temperature is more than 50°F above reactor coolant temperature. Exceptions to these requirements are acceptable as described below.

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. 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 limit. 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 maximum allowed PORV setpoint for the Overpressure Protection System will be updated based on the results of examinations of reactor vessel material irradiation surveillance specimens performed as required by 10 CFR Part 50, Appendix H and in accordance with the schedule in UFSAR Table 5.3-6.

INSERT 3 Continued

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 INSERT 4

The relief valves have remotely operated block valves to provide a positive shutoff capability should a relief valve become inoperable. The electrical power for both the relief valves and the block valves is supplied from an emergency power source to ensure the ability to seal this possible RCS leakage path. The operability of at least one PORV will ensure the additional capability to vent the pressurizer steam space via the PORV's.

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.

INSERT 4

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."

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

APPLICABLE SAFETY ANALYSES (Continued)

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 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.

INSERT 4 (Continued)

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 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.

INSERT 4 (Continued)

ACTION (Continued)

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.

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

INSERT 4 (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.

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.

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 all cases 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.

~~j. Operation of PORVs or RCS vents, Specification 3.4.9.3.~~

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 (lower case) 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.

ATTACHMENT B

Beaver Valley Power Station, Unit Nos. 1 and 2
Proposed Technical Specification Change No. 184 and 49
REVISION OF PORV REQUIREMENTS

A. DESCRIPTION OF AMENDMENT REQUEST

The proposed amendment would modify Specifications 3.4.9.3 and 3.4.11 to incorporate the power operated relief valve (PORV) requirements in accordance with the guidance in Generic Letter 90-06 as implemented in NUREG-1431 Improved Standard Technical Specifications (ISTS), with some exceptions and modifications to reflect plant specific design features. Certain other specifications have also been modified to address related requirements. A detailed description of the changes is provided in Attachment D.

B. BACKGROUND

Generic Letter 90-06 was issued to recommend appropriate PORV technical specifications to licensees to enhance plant safety and improve the reliability of the PORVs. Our response, dated December 26, 1990, to the generic letter included various changes to the technical specifications which were provided as information for discussion since some deviation to the generic letter was necessary. On July 1, 1991, a revised schedule for submitting a request for changing the technical specifications was docketed as a result of negotiating a review approach with our NRC Project Manager. The NRC provided additional guidance in Information Notice 89-32 Supplement 1 "Surveillance Testing of Low-Temperature Overpressure Protection Systems" and the ISTS for Westinghouse plants in NUREG-1431. These regulatory documents have been reviewed and the most current guidance has been generally incorporated into this request for technical specification change.

C. JUSTIFICATION

Specification 3.1.2.3 has been modified by adding "At least" to the beginning of the limiting condition for operation (LCO) and adding note (1) applicable to charging pump. "At least" was added consistent with the need to perform pump testing in accordance with the * note. This note is no longer required since the new SR 4.4.9.3.1.a does not preclude performing the testing addressed in the note. Note (1) was added to refer the operator to Specification 3.4.9.3 which contains limitations on the number of charging pumps operable in Modes 4, 5, and 6. The capital letters of "Low Head Safety Injection Pump" have been replaced throughout this specification with lower case letters since the capital letters are inconsistent with other pump titles. The word "charging" has been deleted from the BV-1 action statement so that the action can be applied to both pumps addressed in the LCO like the BV-2 action statement. The ** note has been deleted since the content of this note is addressed in

Surveillance Requirement (SR) 4.4.9.3.3. Reference to the ** note in SR 4.1.2.3.3.d has been replaced with reference to the vent surveillance requirements in SR 4.4.9.3.3.

SR 4.1.2.3.2 has been deleted from Specification 3.1.2.3 since this requirement has been moved to the LCO of Specification 3.4.9.3 in accordance with the ISTS. The * note has been deleted from Specification 3.1.2.3 since this requirement no longer needs to be addressed due to the change in SR 4.4.9.3.1.a. SR 4.1.2.3.3 has been renumbered to 4.1.2.3.2 to address the deletion of SR 4.1.2.3.2.

Specification 3.3.3.8 actions "a" and "b" have been modified (as appropriate for each unit) to require following the actions of Specification 3.4.11 when PORV position indication and limit switch position indicators are inoperable. This clearly applies the action requirements of Specification 3.4.11 to avoid potential operator confusion. BV-1 Table 4.3-7 has been modified by deleting Item 9 "PORV Control Pressure Channels (PT-RC-444, 445)." This item is not required since the accident analyses assume manual PORV actuation and does not take credit for PORV automatic actuation in Modes 1, 2, and 3.

Specification 3.4.9.3 has been revised to address the ISTS guidance. The LCO includes a requirement to limit to one the number of charging pumps capable of injecting into the RCS (from current SR 4.1.2.3.2) and another requirement to isolate the accumulators (from current SR 4.5.1.3). The ISTS note in Specification 3.4.12 Required Action B.1 has been incorporated as Note (1) and is applied to "one charging pump" in the LCO to qualify the operable charging pump limitations. This note allows two operable charging pumps for a short duration (up to 15 minutes) to swap pumps. This satisfies the requirements of Specifications 3.1.2.1 and 3.1.2.3 when at least one charging pump is required operable in Modes 5 and 6 and the operable pump is being replaced with another operable pump. The BV-2 Note (1) provides an additional qualifier from the guidance from the current SR 4.1.2.3.2 which permits a maximum of 4 hours, or until the RCS temperature decreases to 325°F, to remove one of two charging pumps from operable status. This permits the operators a reasonable amount of time to secure one operable charging pump following a mode change which happens to coincide with the OPPS enable temperature. The ISTS note referring to accumulator isolation has been identified as Note (2) and is applied to "accumulators isolated" in the LCO. Items "a" and "b" have been modified to incorporate the ISTS wording while maintaining the current limits. The applicability statement also includes the new wording along with incorporating the current overpressure protection system (OPPS) enable temperature. The action statements provide alternative steps to follow when the LCO is not met and are consistent with the ISTS except that the current 12 hour time to vent the RCS is maintained. The current 12 hour

time to vent the RCS was negotiated with the NRC during the initial development of Specification 3.4.9.3 since the 8 hours recommended in the Standard Technical Specifications was insufficient to perform all the necessary activities to vent the RCS. SR 4.4.9.3.2.b is consistent with the current requirements and requires demonstrating the PORV actuation channel is operational prior to entering a condition for which the PORV is required to be operable. The remaining SRs are consistent with the ISTS and periodically verify the applicable LCO conditions are met and the required equipment is operable.

Specification 3.4.11 has been revised to address the ISTS guidance. The LCO has been modified to apply to "Each" PORV, therefore, all PORVs are now addressed. The applicability remains unchanged. The Action statements provide alternatives when the LCO is not met and are consistent with the ISTS except for a plant specific change for BV-2 which includes modified actions for inoperable PORVs and the ability to continue to operate (for each unit) with two vent paths operable versus requiring a plant shutdown after 72 hours. The ISTS describes two situations where PORVs are inoperable and requires a determination of whether or not the PORV is or is not capable of being manually cycled. This concept has not been applied to BV-2 since with a PORV inoperable the block valve must be closed and power removed to prevent subsequent opening which will avert a potential downstream piping overstress condition. ISTS Note 1 allows for separate condition entry for each PORV and has been included in this format as a general note. The SRs periodically verify the applicable LCO required equipment is operable and are consistent with the ISTS except for:

SR 4.4.11.1 is consistent with current requirements, and requires operating the PORV through one complete cycle. For Unit 1, this includes using the normal air supply system along with testing the backup nitrogen supply system. This is consistent with Information Notice 89-32 Supplement 1. Testing in this manner assures each component within the PORV control system necessary to support PORV operation has been determined to function satisfactorily.

Unit 1 has deleted SR 4.4.11.3 since the PORVs and block valves are normally supplied by emergency power sources. This power arrangement has been reviewed and approved as part of the NRC evaluation of NUREG-0737, Item II.G.1.1, which required the PORVs and block valves to be supplied from emergency sources of power. This is documented in:

a) Unit 1 submittals "Discussion of Lessons Learned Short Term Requirements," dated November 30, 1979 and June 26, 1980.

b) NRC SER on TMI Lessons Learned Category "A" items, dated October 9, 1980.

Unit 2 does not have a SR 4.4.11.3 since the PORVs and block values are normally supplied by emergency power.

Existing SR 4.5.1.3 and related * note have been deleted since accumulator isolation is now addressed in Specification 3.4.9.3 and SR 4.4.9.3.1.a. This is consistent with the ISTS and is applicable for the OPPS and not for the accumulator specification since the OPPS setpoints are all below the applicability for the accumulator specification.

Bases 3/4.4.9 "Pressure/Temperature Limits" has been revised by replacing that paragraph related to OPPS with the applicable portions of ISTS B 3.4.12. Bases 3/4.4.11 "Relief Valves" has been modified by replacing the current discussion with the applicable portions of ISTS B 3.4.11. These Bases changes significantly improve the quality and content of the subject discussions.

Unit 2 Administrative Control 6.9.2 "Special Reports" item "j" is being deleted since Specification 3.4.9.3 no longer contains this reporting requirement and this section requires reference to a specific specification.

D. SAFETY ANALYSIS

The PORV requirements have been consolidated into Specification 3.4.11 for Modes 1, 2 and 3 and into Specification 3.4.9.3 for Modes 4, 5 and 6. This is consistent with the guidance provided in the NUREG-1431 ISTS with some exceptions to reflect plant specific design features. A detailed comparison of the proposed changes with the ISTS is provided in Attachment E.

Specification 3.1.2.3 has been modified by adding "At least" to the beginning of the limiting condition for operation (LCO) and adding note (1) applicable to charging pump. "At least" was added to allow testing pumps to return them to operable status since this is controlled for OPPS concerns. A new Note (1) was added to refer the operator to Specification 3.4.9.3 which contains limitations on the number of charging pumps operable in Modes 4, 5, and 6. The capital letters of "Low Head Safety Injection Pump" have been replaced throughout this specification with lower case letters since the capital letters are inconsistent with other pump titles. The word "charging" has been replaced with "above" in the BV-1 action statement so that the action statement can be applied to both pumps addressed in the LCO like the BV-2 action statement. The * note has been deleted. This note is no longer required since the new SR 4.4.9.3.1.a does not preclude testing inoperable pumps to return them to operable status. The ** note has been deleted. The content of this note is now addressed in the new SR 4.4.9.3.3, therefore, reference to the ** note in SR 4.1.2.3.3.d is replaced with reference to SR 4.4.9.3.3.

SR 4.1.2.3.2 has been transferred to Specification 3.4.9.3. The Specification 3.4.9.3 LCO now states that an operable OPPS includes a maximum of one charging pump capable of injecting into the RCS. Action "a" is provided to address the condition when this requirement is not met and SR 4.4.9.3.1.a provides for periodic verification that this requirement is met. Therefore, this modification represents no actual change in requirements, they have just been moved to a different specification.

Specification 3.3.3.8 Action "a" for BV-1 has been revised by modifying the reference to the PORV requirements from Specification 3.4.11.a to 3.4.11 due to the new Specification 3.4.11 action statements. This is consistent with the BV-2 action statement. In addition, the same exception to Action "a" (for both units), when PORVs are isolated, has been added to Action "b" (Unit 1 only) to reflect the new Specification 3.4.11 action statements. The exception has been modified slightly to clarify the requirements and ensure the actions of Specification 3.4.11 are applied when the PORV position indication and limit switch position indicators are inoperable. As a result of the revisions to the PORV and block valve operability requirements, restrictions on operation with limit switches inoperable will be the same or more restrictive, depending on the unit and component affected. Operating restrictions for the acoustic monitors, Unit 1 only, will not be changed if one channel is inoperable. If two channels are inoperable, then a less restrictive requirement would be in effect. Current Specification 3.3.3.8 action "b" would require the channel to be restored to operable status within 48 hours or initiate a plant shutdown. The proposed specification would require isolating the vent path by closing the block valve and maintaining power to the block valve. As per proposed Specification 3.4.11 action "a," operation may continue until the next refueling outage, at which time repairs would be completed. This is considered acceptable since the vent path will be isolated and, therefore, not subject to the potential for sticking open if an auto open signal was generated. It would take three instrument failures (i.e., limit switch on the valve and two acoustic monitor channels on the same valve discharge line), to eliminate position indication capability per vent path per PORV. In the event the vent path would be needed for manual operation following a plant transient, the block valve is still operable to allow venting and the PORV should still have an operable limit switch. Deleting the BV-1 PORV Control Pressure Channels from Table 4.3-7 is consistent with the accident analyses. These channels are only required for automatic PORV actuation. Automatic actuation is not assumed in the accident analyses, therefore, this item is not applicable to technical specification control.

SR 4.5.1.3 and its related * note have been moved to Specification 3.4.9.3 and SR 4.4.9.3.1.b. The LCO for Specification 3.4.9.3 now states that an operable OPPS includes

accumulator isolation. Action "b" is provided to address the condition when this requirement is not met and SR 4.4.9.3.1.b provides for periodic verification that the requirement is met. Therefore, although the requirements have been moved to a different specification, this modification does not represent any change in actual requirements.

Our response to Generic Letter 90-06 included an information copy of modifications to Specification 3.4.9.3 and Specification 3.4.11 to incorporate the requirements of the generic letter (GL) with some exceptions to reflect plant specific design features. Although the concerns addressed by the GL are provided for in the ISTS, the wording has been modified to improve the clarity and understanding of the PORV requirements.

The following compares our response to GL 90-06 with the changes proposed here, which for the most part, result from following the guidance of NUREG-1431, ISTS. For Specification 3.4.9.3, the proposed change differs from the GL response in that the proposed change includes the charging pump limitation and accumulator isolation along with recognizing that the RCS vent is part of the OPPS. In addition, for BV-1, the lift setting has been revised to reflect the latest amendment; for BV-2, the current requirements are maintained by reference to Figure 3.4-4. The BV-1 applicability statement includes reference to the latest amended enable temperature; for BV-2, the current requirements are maintained by reference to the current enable temperature. A new Note (1) has been added to qualify the operable charging pump limitations. This note is identical to the ISTS note which allows two operable charging pumps for a short time to replace the operable pump required by Specifications 3.1.2.1 and 3.1.2.3 with another operable pump and for Unit 2 only, provide an additional limitation for securing the second operable pump following a Mode change. This remains consistent with the existing specification. A new Note (2) has been added to qualify the accumulator isolation requirements. The accumulators must be isolated only if 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. This note follows the intent of the ISTS note but does not reference the P/T limit curves provided in the Pressure/Temperature Limits Report (PTLR) like the ISTS note since we do not have a PTLR. Action statements "a," "c," "d," and "e" provide 12 hours to vent the RCS. This differs from the 8 hours provided in the ISTS, however, the 12 hours is consistent with the current time and is needed to perform all the necessary actions required to adequately vent the RCS. Proposed action statements "a" and "b" are new and have been added to address two or more charging pumps capable of injecting into the RCS and accumulator isolation, respectively. Proposed action statements "c" and "d" are similar to actions "a" and "b," respectively, in the GL response which address one inoperable PORV. Action statement "c" includes a

qualifier to clearly apply this action in Mode 4 when any RCS cold leg temperature is less than or equal to the enable temperature. This is consistent with the applicability statement and will reduce the potential for confusion when applying this action. The exception to Specification 3.0.4 has been entirely deleted from the Unit 1 action statements and applied to the Unit 2 action "c" only. By including this provision in action "c," the plant would be able to continue with a plant startup provided that it could be accomplished before the action time would expire for restoring the one inoperable PORV to operable status. Operating with one inoperable PORV is permitted above Mode 4, therefore, by continuing to heatup the RCS, the plant is placed in a mode for which action "c" does not apply. Proposed action "e" is similar to action "c" provided in the GL response and addresses two inoperable PORVs. Action "d" in the GL response is similar to proposed SR 4.4.9.3.3. Action "e" in the GL response is not addressed in the proposed action statements since the ISTS does not include a requirement to submit a special report when the PORVs or an RCS vent is used to mitigate an RCS pressure transient. Proposed SR 4.4.9.3.1 provides new requirements that were not addressed in the GL response. These new requirements require verification at least once per 12 hours that the charging pump limitations and the accumulator isolation requirements are met. Proposed SR 4.4.9.3.2 is similar to those requirements addressed in the GL response with a modification to perform the channel functional test within 31 days prior to going below the enable temperature. Proposed SR 4.4.9.3.3 requires verification of the RCS vent when used; this is similar to action statement "d" provided in the GL response.

The response to the GL included adding BV-1 item "i" to Specification 6.9.2 for special reports when the PORVs or an RCS vent is used to mitigate an RCS pressure transient, however, the ISTS does not include a requirement to submit a special report for this event. In addition, for BV-2 this item (Specification 6.9.2 item "j") is being deleted for the same reason stated above.

For Specification 3.4.11, the proposed change differs from the GL response in that the proposed LCO change specifies "Each," consistent with the ISTS, while the GL response specifies "All" PORVs. The proposed applicability statement is consistent with our response to GL 90-06 and remains applicable in Modes 1, 2 and 3. The ISTS includes Note 1 which allows separate condition entry for each PORV. This note has been included in our proposed change as a general note. As discussed in the bases, the note has been added to clarify the intent that all pressurizer PORVs and block valves are treated as separate entities, each with separate completion times since the completion times are on a component basis.

The ISTS action statements address PORVs from the standpoint of "capable of being manually cycled" whereas the GL response

addresses the PORVs with respect to "excessive seat leakage." BV-1 proposed action "a" is similar to that in the GL response and the ISTS concerning one or more inoperable PORVs capable of being manually cycled. However, the actions have been modified slightly to recognize that although there are three PORVs installed in the plant, two are required to provide the redundancy required for continued plant operation. Proposed actions "b" and "c" apply when inoperable PORVs are not capable of being manually cycled and are similar to our GL response. However, BV-1 action "b" and BV-2 action "a" include a clarification statement that allows continued plant operation with one PORV isolated until the next refueling outage. This is reasonable since two PORVs remain operable to provide redundancy until the plant can shutdown and perform maintenance to restore the valve to operable status. BV-2 actions "a," "b," and "c" differ from the ISTS actions because they do not address inoperable PORVs from the standpoint of "capable of being manually cycled" since with the block valves closed the PORV is inoperable. With the block valve closed, the potential would exist to condense steam in the downstream piping. If the block valves were opened and the PORV actuated, the piping could be overstressed due to the slug of water being forced down the piping. Therefore, the actions have been developed to apply with one, two, and three inoperable PORVs and require closing and removing power from the associated block valve. With one PORV inoperable, it is prudent to remove power from the closed block valve to provide additional assurance that the block valve will not be opened to avert the possibility of overstressing the downstream piping. This renders the PORV and block valve inoperable and allows continued operation for the remainder of the cycle with one closed block valve, however, two operable PORVs and their associated block valves are available to provide redundancy. The actions have been modified slightly to recognize that although there are three PORVs installed in the plant, two are necessary to provide redundancy for continued plant operation. This is more conservative than the current requirements and is consistent with the design of the plant. Action "d" is new and addresses one open inoperable block valve; this is different from the GL response but is similar to the ISTS. A clarification statement is included with this action to address an inoperable block valve that may be closed. It requires restoring the inoperable block valve to operable status or closing it within 1 hour. Continued plant operation is allowed until the next refueling outage since two PORV pressure relief valves remain operable to provide redundancy until the plant can shutdown and perform maintenance to restore the valve to operable status. Action "e" addresses more than one inoperable block valve and is similar to the GL response and the ISTS. Reference to Specification 4.0.5 has been deleted to maintain consistency with the ISTS. SR 4.4.11.1 also requires cycling the PORVs. This is consistent with the ISTS and our GL 90-06 response. In addition, for BV-1 only, this SR requires

cycling the PORVs using the normal air supply system and the backup nitrogen supply system. This is specified to address the concerns identified in NRC Information Notice 89-32, Supplement 1 with respect to lack of adequate testing when in the OPPS modes. Testing in this manner assures each component within the PORV control system necessary to support PORV operation has been determined to function satisfactorily. The current SR and the ISTS for OPPS exclude PORV valve operation, therefore, this surveillance is stated here similar to our GL 90-06 response. The BV-2 PORVs are electro-solenoid actuated valves not subject to the concerns identified in the information notice. This valve design is different from the BV-1 PORV design, therefore, the BV-2 SR only addresses cycling the PORVs. SR 4.4.11.2 requires stroking the block valves quarterly unless the valve is closed in accordance with the required actions. This is consistent with the ISTS and our response to GL 90-06. The existing SR 4.4.11.3 requires stroking the PORVs using the emergency power supply and was only applicable to BV-1 since the existing SR would have this surveillance performed. BV-2 was licensed without requiring this surveillance as a result of different criteria existing at the time of licensing. This SR has been deleted from the BV-1 specification since the PORVs and block valves are normally supplied by emergency power sources and is now consistent with BV-2. This is also consistent with the ISTS.

The bases for Specifications 3.4.9.3 and 3.4.11 have been extensively revised to incorporate the ISTS descriptions with some modifications to address plant specific design requirements. The differences between the ISTS bases and these proposed bases are included in Attachment F.

These changes remain consistent with the analysis assumptions and the operation of the PORVs in accordance with the UFSAR. The requirements of GL 90-06 are substantially addressed in the ISTS which have been incorporated here except for specific design differences. Therefore, these changes have been determined to be safe and will not reduce the safety of the plant.

E. NO SIGNIFICANT HAZARDS EVALUATION

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

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

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

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

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

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

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

   The proposed changes consolidate the power operated relief valve requirements into Specifications 3.4.9.3 and 3.4.11 which generally adopt the new Improved Standard Technical Specifications of NUREG-1431 to address the concerns identified in Generic Letter 90-06 except for those changes required to reflect plant specific design features. These changes are proposed to enhance safety and improve the reliability of the PORVs and block valves. Since the proposed changes augment or preserve the requirements contained in the current technical specifications, we have concluded that these changes do not involve a significant increase in the probability or consequences of an accident previously evaluated in the UFSAR.

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

   The proposed changes do not involve any physical changes to the PORVs or their setpoints. These changes do not delete any function previously provided by the PORVs nor has the probability of inadvertent opening been increased. Accordingly, no new failure modes have been defined for any plant system or component important to safety nor has any new limiting single failure been identified as a result of these changes. Therefore, these changes will not create the possibility of a new or different kind of accident from any accident previously evaluated in the UFSAR.

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

   The proposed changes have been incorporated to enhance safety and improve the reliability of the PORVs and block valves to ensure their availability when called upon to perform their function. These changes do not affect the manner by which the facility is operated or involve a change to equipment or features which affect the operational characteristics of the facility. Therefore, operation of

the facility in accordance with the proposed amendment would not involve a significant reduction in a margin of safety.

F. NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

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

G. UFSAR CHANGES

None.

ATTACHMENT C-1

Beaver Valley Power Station, Unit No. 1
Proposed Technical Specification Change No. 184
TYPED PAGES

Applicable Typed Pages

ATTACHMENT TO LICENSE AMENDMENT NO. _____

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 4-10a
----	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 4-11	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

(Proposed Wording)

REACTIVITY CONTROL SYSTEMS

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	N/A	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.

DPR-66

REACTOR COOLANT SYSTEM

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.

REACTOR COOLANT SYSTEM

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 with the next 6 hours and in HOT SHUTDOWN

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

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.

BASES

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.

BASES (Continued)

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.

BASES (Continued)

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.

BASES (Continued)

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

BASES (Continued)

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

BASES (Continued)

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.

BASES (Continued)

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.

BASES (Continued)

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.

BASES (Continued)

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

BASES (Continued)

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.

BASES (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 the 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 b or c of this LCO.

3/4.4.12 REACTOR COOLANT SYSTEM VENTS

Reactor Coolant System Vents are provided to exhaust noncondensable 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.

ATTACHMENT C-2

Beaver Valley Power Station, Unit No. 2
Proposed Technical Specification Change No. 49
TYPED PAGES

Applicable Typed Pages

ATTACHMENT TO LICENSE AMENDMENT NO. _____

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

(Proposed Wording)

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.

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(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 $\Delta k/k$ at 200°F within the next 6 hours; restore at least two charging pumps to OPERABLE status within the next 7 days or be in 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 Specification 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 a 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 with 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 leas' e block valve to OPERABLE status within the next hour if block valves are inoperable; restore a minimum of two b. . 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.

BASES (Continued)

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

BASES (Continued)

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 about 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.

BASES (Continued)

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.

BASES (Continued)

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 and 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.

BASES (Continued)

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.

BASES (Continued)

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.

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.

BASES (Continued)

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.

BASES (Continued)

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 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."

BASES (Continued)

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

BASES (Continued)

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

BASES (Continued)

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.

BASES (Continued)

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

BASES (Continued)

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.

BASES (Continued)

3/4 4.12 REACTOR COOLANT SYSTEM HEAD VENTS

Reactor Coolant System Vents are provided to exhaust noncondensable 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.

ATTACHMENT D

Beaver Valley Power Station, Unit Nos. 1 and 2
Proposed Technical Specification Change No. 184 and 49
DESCRIPTION OF CHANGES

Specification	Change Description
3.1.2.3	"At least" is added to the LCO. Note (1) is added to "one charging pump". Lower case letters on "Low Head Safety Injection Pump".
ACTION	BV-1 replace "charging" with "above". Lower case letters on "Low Head Safety Injection Pump".
SR 4.1.2.3.2	Moved to Specification 3.4.9.3.
SR 4.1.2.3.3	Renumbered to 4.1.2.3.2. Lower case letters on "Low Head Safety Injection Pump" (in 4 places).
SR 4.1.2.3.3.d	Replaced vent surveillance requirements with reference to SR 4.4.9.3.3.
* Note	Deleted, since the new SR 4.4.9.3.1.a does not preclude performing the pump testing addressed in the note.
(1) Note	Added to refer to specification 3.4.9.3 for charging pump limitations.
** Note	Deleted, the contents of this note are addressed in SR 4.4.9.3.3.
3.1.2.4 (BV-2 only)	Replaced * note with (1), replaced "%" with "percent," replaced "≥" with "greater than or equal to ," in the note replaced reference to Specification "4.1.2.3.2" with "3.4.9.3."
3.3.3.8 ACTION a	Replaced BV-1 reference to Specification 3.4.11.a with 3.4.11 and for both units modified the exception for the PORVs to clarify the items this action applies to.
BV-1 ACTION b	Added an exception for isolated PORV's same as ACTION a exception, only applies to Table 3.3-11 Item 4 since Items 5 and 6 require zero minimum channels operable.

ATTACHMENT D

Beaver Valley Power Station, Unit Nos. 1 and 2
Proposed Technical Specification Change No. 184 and 49
DESCRIPTION OF CHANGES

Specification	Change Description
BV-1 Table 4.3-7	Deleted Item 9 "PORV Control Pressure Channels (PT-RC-444, 445)" since these channels are not required to satisfy the accident analysis assumptions.
3.4.9.3	Modified this LCO to specify an operable OPPS along with limiting to 1 the number of charging pumps operable [includes note (1) to allow 2 operable pumps for 15 minutes for pump swap and for BV-2 allows all pumps operable for 4 hours during cooldown from Mode 3 to Mode 4] and the accumulators isolated [includes note (2) to qualify the accumulator isolation requirements].
APPLICABILITY	Modified to specify modes with qualifications.
ACTION a	Separated into new ACTIONS "c" and "d" qualified by mode requirements and addresses 1 inoperable PORV with "12" hours to be in a depressurized and vented condition. The new ACTION statement "c" includes a qualifier to clearly apply this ACTION in Mode 4 when any RCS cold leg temperature is less than or equal to the enable temperature. Included exception to Specification 3.0.4, Unit 2 only.
ACTION b	Modified as new ACTION "e," maintains "12" hours to be in a depressurized and vented condition and addresses 2 inoperable PORV's.
ACTION c	Deleted.
New ACTION a	Addresses 2 or more operable charging pumps with "12" hours to be in a depressurized and vented condition.
New ACTION b	Addresses non-isolated accumulators.
SR 4.4.9.3.1.a	Renumbered to 4.4.9.3.2.b.
SR 4.4.9.3.1.b	Renumbered to 4.4.9.3.2.c.
SR 4.4.9.3.1.c	Renumbered to 4.4.9.3.2.a.
SR 4.4.9.3.1.d	Deleted.

ATTACHMENT D

Beaver Valley Power Station, Unit Nos. 1 and 2
Proposed Technical Specification Change No. 184 and 49
DESCRIPTION OF CHANGES

Specification	Change Description
SR 4.4.9.3.2	Renumbered to 4.4.9.3.3 and 4.4.9.3.3.a, applicable * note re-annotated to 4.4.9.3.3.b and replaces "7 day" frequency with "31 day" frequency.
3.4.11	BV-1 replaced "(Two)" with "Each". BV-2 replaced "All" with "Each".
ACTIONs	Added a General Note that applies to all ACTION statements. This note is consistent with ISTS Note 1 and states that: Separate Action statement entry is allowed for each PORV and block valve.
ACTION a	Replaced by ACTIONS "a", "b" and "c" with additional POR" qualification requirements. The proposed actions have been modified from the ISTS wording to recognize that two operable PORVs satisfy the redundancy requirements. This allows isolating one inoperable PORV and removing power from the block valve until the next time the plant enters a refueling outage and can repair the valve.
New ACTION a	Applies with 1 or more PORV's inoperable but capable of being manually cycled. The BV-2 action differs from the ISTS to address concerns related to overstressing downstream piping.
New ACTION b	Applies with 1 or more PORV's inoperable but not capable of being manually cycled, allows up to 72 hours in this condition. The ISTS "not capable of being manually cycled" is not applicable to BV-2 since any time a block valve is closed the PORV is inoperable.
New ACTION c	Applies with 3 PORV's inoperable but not capable of being manually cycled, allows 1 hour to restore or close the associated block valves and remove power from the block valves then shutdown. The ISTS "not capable of being manually cycled" is not applicable to BV-2 since any time a block valve is closed the PORV is inoperable.
ACTION b	Replaced by ACTIONS "d" and "e" with additional block valve qualification requirements.

ATTACHMENT D

Beaver Valley Power Station, Unit Nos. 1 and 2
Proposed Technical Specification Change No. 184 and 49
DESCRIPTION OF CHANGES

Specification	Change Description
New ACTION d	Applies with 1 block valve inoperable and open, allows 1 hour to restore or place the associated PORV's in manual control, then allows additional 72 hours to restore or shutdown. With 1 block valve inoperable but capable of being closed, then close it, operation can then continue until the next time the plant enters a refueling outage and can repair the valve.
New ACTION e	Applies with more than 1 block valve inoperable, allows 1 hour to restore or place the associated PORVs in manual control. Then allows 1 additional hour to restore at least 1 block valve if 3 block valves are inoperable and allows up to 72 hours to restore at least 2 block valves or shutdown.
SR 4.4.11.1	Replaced this surveillance with the ISTS requirement to stroke the PORVs once per 18 months.
SR 4.4.11.2	Modified to provide an exception to the block valve cycle requirements when the block valve is closed to meet the required ACTIONS.
SR 4.4.11.3	Deleted the BV-1 SR since the PORVs and block valves are normally supplied by emergency power sources.
SR 4.5.1.3	Moved to Specification 3.4.9.3 Note (2).
* Note	Moved to SR 4.4.9.3.1.b.

ATTACHMENT E

Beaver Valley Power Station, Unit Nos. 1 and 2
Proposed Technical Specification Change No. 184 and 49
BV COMPARISON WITH ISTS

PROPOSED BV TECH SPEC	ISTS
3.1.2.3 CHARGING PUMP-SHUTDOWN	This Tech Spec was relocated to another controlled document.
BV-2 3.1.2.4 CHARGING PUMPS-OPERATING	This Tech Spec was relocated to another controlled document.
3.3.3.8 ACCIDENT MONITORING INSTRUMENTATION	3.3.3 POST ACCIDENT MONITORING (PAM) INSTRUMENTATION
Proposed exception to Actions "a" and "b" for the PORVs.	The proposed exception to Actions "a" and "b" for the PORVs is not in the ISTS since the PORVs are not listed in the PAM Table. [The PORVs will remain in this Spec. since they meet the criteria for inclusion, i.e., "SER for REG. GUIDE 1.97 identifies the PORV position indication as a Non-Type A instrument"].
3.4.9.3 is consistent with the ISTS except for the following.	3.4.12
Note (1) allows 2 operable charging pumps for pump swap operation for ≤ 15 minutes and for BV-2 allows all pumps operable for 4 hours during cooldown from Mode 3 to Mode 4.	Required Action B.1 note.
Note (2) qualifies the accumulator isolation requirements to maximum RCS pressure for the existing RCS cold leg temperature allowed by the heatup and cooldown curves.	Note following the Applicability statement qualifies the accumulator isolation requirements to the maximum RCS cold leg temperature allowed by the P/T limit curves provided in the PTLR.
Action "a" includes 12 hours to vent.	Conditions "A" and "G"

ATTACHMENT E

Beaver Valley Power Station, Unit Nos. 1 and 2
Proposed Technical Specification Change No. 184 and 49
BV COMPARISON WITH ISTS

PROPOSED BV TECH SPEC	ISTS
Action "b"	Conditions "C", "D" and "G"
Action "c" includes 12 hours to vent.	Conditions "E" and "G"
Action "d" includes 12 hours to vent.	Conditions "F" and "G"
Action "e" includes 12 hours to vent.	Condition "G"
No similar Action	Condition G - "LTOP system inoperable for any reason other than condition A, B, C, D, E, OR F".
This SR only applies to plants with HPI pumps.	SR 3.4.12.1
SR 4.4.9.3.1.a	SR 3.4.12.2
SR 4.4.9.3.1.b also includes the contents of the * note moved from SR 4.5.1.3 to allow testing the accumulator discharge check valves.	SR 3.4.12.3
This SR only applies to plants that use RHR suction relief valves for OPPS.	SR 3.4.12.4
SR 4.4.9.3.2.a	SR 3.4.12.6
This SR only applies to plants that use RHR suction relief valves for OPPS.	SR 3.4.12.7
SR 4.4.9.3.2.b "COT" in the ISTS has been replaced with "CHANNEL FUNCTIONAL TEST" for consistency with current nomenclature and retains the current SR instead of the ISTS wording regarding performance of the "CHANNEL FUNCTIONAL TEST."	SR 3.4.12.8
SR 4.4.9.3.2.c	SR 3.4.12.9
SR 4.4.9.3.3.a	SR 3.4.12.5

ATTACHMENT E

Beaver Valley Power Station, Unit Nos. 1 and 2
Proposed Technical Specification Change No. 184 and 49
BV COMPARISON WITH ISTS

PROPOSED BV TECH SPEC	ISTS
SR 4.4.9.3.3.b includes current description of locked valves.	SR 3.4.12.5
3.4.11 is consistent with the ISTS except for the following.	3.4.11
ISTS Note (1) is included in a General Note that allows separate condition entry for each PORV.	Note (1) allows separate condition entry for each PORV and block valve.
This exception has been deleted.	Note (2) provides an exception to Spec. 3.0.4.
The proposed actions have been modified from the ISTS wording to recognize that two operable PORVs satisfy the need for redundancy. This allows isolating one inoperable PORV and removing power from the block valve until the next time the plant enters a refueling outage to repair the valve.	
Action "a"	Conditions "A" and "D"
Action "b"	Conditions "B" and "D"
Action "c"	Condition "E"
Action "d"	Conditions "C" and "D"
Action "e"	Conditions "F" and "G"
SR 4.4.11.1 requires cycling the PORVs and for BV-1 (only) requires using both the normal air and backup nitrogen supply system.	SR 3.4.11.2 and SR 3.4.11.3
SR 4.4.11.2	SR 3.4.11.1
SR 4.4.11.3 for BV-1 (only) has been deleted since the PORVs and block valves are normally supplied by emergency power sources. The BV-2 PORVs and block valves are normally powered from the emergency bus.	SR 3.4.11.4

ATTACHMENT F

Beaver Valley Power Station, Unit Nos. 1 and 2
Proposed Technical Specification Change No. 184 and 49
BASES COMPARISON

ISTS 3.4.12	PROPOSED SPECIFICATION 3.4.9.3
Low Temperature Overpressure Protection (LTOP) System	The current title Overpressure Protection System (OPPS) is maintained.
Refers to PTLR.	Reference to the PTLR is replaced by reference to the heatup and cooldown curves.
[275]°F	Specifies enable temperature.
PORV Requirements LTOP actuation logic monitors both RCS temperature and RCS pressure.	PORV Requirements BV-1 OPPS only monitors pressure.
The PORV setpoints are normally staggered.	The BV PORV setpoints are not staggered.
RCS Vent Requirements For an RCS vent to meet the flow capacity requirement, it requires removing a pressurizer safety valve, (removing a PORV's internals, and disabling its block valve in the open position, or similarly establishing a vent by opening an RCS vent valve).	RCS Vent Requirements For an RCS vent to meet the flow capacity requirement, it requires 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.)
Applicable Safety Analyses Any change to the RCS must be evaluated against the analyses to determine the impact of the change on the OPPS acceptance limits.	Applicable Safety Analyses 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.
Heat Input Type Transients The analyses show the effect of accumulator discharge is over a narrower range ([175]°F and below) than that of the LCO ([275]°F and below).	Heat Input Type Transients We don't have this analysis so discussion was deleted.

ATTACHMENT F

Beaver Valley Power Station, Unit Nos. 1 and 2
Proposed Technical Specification Change No. 184 and 49
BASES COMPARISON

ISTS 3.4.12	PROPOSED SPECIFICATION 3.4.9.3
RCS Vent Performance The RCS vent size will be re-evaluated each time the P/T limit curves are revised based on the results of the vessel material surveillance.	RCS Vent Performance Replaced with, "The RCS vent size is based on the PORV size,therefore, the vent is bounded by the PORV analyses." In the ISTS the vent size is different from the PORV size, but at BV the vent size was selected based on the size of the PORV, therefore, the vent is bounded by the PORV analyses.
LCO ACTION B.1 note that permits two pumps capable of RCS injection for ≤ 15 minutes to allow for pump swap.	LCO The LCO is qualified by a note that permits two pumps capable of RCS injection for ≤ 15 minutes to allow for pump swap. For BV-2, this note also allows all charging pumps capable of injecting into the RCS during a change from Mode 3 to Mode 4. This is consistent with the contents of current SR 4.1.2.3.2.
Accumulator isolation note is discussed under APPLICABILITY.	The LCO is also qualified by a note stating that accumulator isolation 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.
RCS vent ≥ [2.07] square inches based on analysis.	RCS vent ≥ 3.14 square inches based on PORV size.

ATTACHMENT F

Beaver Valley Power Station, Unit Nos. 1 and 2
Proposed Technical Specification Change No. 184 and 49
BASES COMPARISON

ISTS 3.4.12	PROPOSED SPECIFICATION 3.4.9.3
ACTION G.1 The RCS must be depressurized and a vent must be established within 8 hours when: a. Both required RCS relief valves are inoperable; or b. A Required Action and associated Completion Time of Condition A, B, C, D, E or F is not met; or c. The LTOP System is inoperable for any reason other than Condition A, B, C, D, E or F.	ACTION e }The intent of this }discussion is provided in }paragraph form, however, the }8 hours to vent is replaced }with 12 hours. The 12 hours }is consistent with the }current action vent require- }ments and is incorporated in }ACTIONs a, c, d, and e. } }NA [not consistent with } current format] }
SR 3.4.12.1 Verify a maximum of one charging pump is capable of injecting into the RCS.	SR 4.4.9.3.1.a Verify a maximum of one charging pump is capable of injecting into the RCS.
SR 3.4.12.3 Verify each accumulator is isolated.	SR 4.4.9.3.1.b SR 4.4.9.3.1.b also allows opening the accumulator discharge isolation valves to perform accumulator discharge check valve testing. This is consistent with current Spec. 4.5.1.3 * note.

ATTACHMENT F

Beaver Valley Power Station, Unit Nos. 1 and 2
Proposed Technical Specification Change No. 184 and 49
BASES COMPARISON

ISTS 3.4.12	PROPOSED SPECIFICATION 3.4.9.3
SR 3.4.12.8 Discusses a note applied to this SR indicating this SR is required to be met 12 hours after decreasing RCS cold leg temperature ≤ [275]°F.	SR 4.4.9.3.2 The ISTS SR has been modified to retain existing requirements to perform a channel functional test prior to decreasing RCS cold leg temperature to less than or equal to the enable temperature.
SR 3.4.12.2 & SR 3.4.12.3	SR 4.4.9.3.1
SR 3.4.12.5	SR 4.4.9.3.3
SR 3.4.12.6 & SR 3.4.12.8 & SR 3.4.12.9	SR 4.4.9.3.2

ISTS 3.4.11	PROPOSED SPECIFICATION 3.4.11
BACKGROUND The plant has 2 PORVs.	BACKGROUND The plant has 3 PORVs.
APPLICABLE SAFETY ANALYSES By assuming PORV manual actuation, the primary pressure remains below the high pressurizer pressure trip setpoint, thus the DNBR calculation is more conservative. Events that assume this condition include a turbine trip and the loss of normal feedwater.	APPLICABLE SAFETY ANALYSES 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. [The UFSARs specify PORV actuation for this event but not automatic actuation.]
ACTIONS Note 1 [Separate condition entry is allowed for each PORV]	ACTIONS A general note is included. [Separate ACTION statement entry is allowed for each PORV and block valve.]

Beaver Valley Power Station, Unit Nos. 1 and 2
Proposed Technical Specification Change No. 184 and 49
BASES COMPARISON

ISTS 3.4.11	PROPOSED SPECIFICATION 3.4.11
Note 2 [LCO 3.0.4 is not applicable]	The ISTS actions have been modified slightly to recognize that two operable PORVs provide redundancy for continued plant operation, therefore, an exception to LCO 3.0.4 is not required.
ACTION A.1, D.1 & D.2	ACTION a
ACTION B.1, B.2, B.3, D.1 & D.2	ACTION b
ACTION E.1, E.2, E.3 & E.4	ACTION c
ACTION C.1, C.2, D.1 &D.2	ACTION d
ACTION F.1, F.2, F.3, G.1 & G.2	ACTION e
SR 3.4.11.2 and for BV-1 only SR 3.4.11.3	SR 4.4.11.1
SR 3.4.11.1	SR 4.4.11.2
SR 3.4.11.4	For BV-1 only SR 4.4.11.3 has been deleted, this SR is not applicable since both units' PORVs and block valves are powered from emergency sources.