# Industry/TSTF Standard Technical Specification Change Traveler

**PORV Operability Clarification**

Priority/Classification 4) Change Bases

NUREGs Affected: ☐ 1430 ☑ 1431 ☐ 1432 ☐ 1433 ☐ 1434

Description:

PORV Operability is clarified in the Bases. Miscellaneous usage clarifications are made to the Bases. An inaccurate statement in the Action 3.4.11.E Bases is deleted.

Justification:

PORV Operability in Modes 1, 2, and 3 is based on manual actuation (no reliance on automatic opening is credited for event mitigation) and its ability to isolate a potential small-break LOCA path. The Bases are not clear in many areas about the credited Operability function. The Applicable Safety Analysis discussion of events that model the PORV opening is clarified to point out that this modeling is part of conservative assumptions, and does not reflect an assumed automatic mitigative function.

The deleted statement in the Action E Bases is incorrect in that it assumes that both PORVs became inoperable at the same time. The correct start time for Condition B would be the time the remaining inoperable PORV was declared inoperable. The statement is deleted as start times are adequately described in Section 1.3, Completion Times.

## Revision History

### OG Revision 0 Revision Status: Closed

Revision Proposed by: WOG Mini-Group

Revision Description:
Original Issue

### Owners Group Review Information

Date Originated by OG: 16-Aug-96

Owners Group Comments
(No Comments)

Owners Group Resolution: Approved Date: 16-Aug-96

### TSTF Review Information

TSTF Received Date: 27-Sep-96 Date Distributed for Review 27-Sep-96

OG Review Completed: ☑ BWOG ☑ WOG ☑ CEOG ☑ BWROG

TSTF Comments:

CEOG - Not applicable, accepts
BWROG - Not applicable, accepts
BWOG - Not applicable, accepts

TSTF Resolution: Approved Date: 21-Oct-96

## NRC Review Information

NRC Received Date: 23-Jan-97 NRC Reviewer: Weston. M.

NRC Comments:

3/5/97 - SRXB recommends a modification to the package that maintains Mode 5; changes made in Actions D.1, D.2, E.1, E.2, E.3, E.4, G.1 and G.2 are not acceptable since they are in conflict with the Applicability of LCO 3.4.12. LTOP is needed in Modes 3, 4, 5, and 6 with the reactor vessel head on. Do not delete Mode 5; these section now include Modes 4 and 5 and the change would delete Mode 5.
3/17/97 - To C. Grimes for disposition.
4/11/97 - C. Grimes returned to reviewer for a clarification of the modification and SRXBs basis for rejection.
6/10/97 - Reviewer clarified markup by un-deleting "MODES 4 and 5" in the proposed change.
6/18/97 - To M. Reinhart for disposition.
8/12/97 - Changes made in ACTIONS D.1, D.2, E.1, E.2, E.3, E.4, G.1 and G.2 are not acceptable since they conflict with the Applicability in LCO 3.4.12. The LTOP is needed during MODES 3, 4, 5 and 6 with reactor vessel head on. Retain MODE 5 in WOG Bases, ACTIONS Section D.1 and D.2, E.1, E.2, E.3, and E.4; G.1 and G.2. All other proposed changes are acceptable.

Final Resolution: Superceded by Revision Final Resolution Date: 31-Jul-97

## TSTF Revision 1 Revision Status: Active Next Action: NRC

Revision Proposed by: TSTF

Revision Description:
Revised Traveler in response to NRC comments. Revised the Bases changes to Actions D.1 and D.2; E.1, E.2, E.3, and E.4; and G.1 and G.2 to restore the reference to MODE 5 eliminated in Revision 0.

## TSTF Review Information

TSTF Received Date: 14-Jan-98 Date Distributed for Review 15-Jan-98

OG Review Completed: ☑ BWOG ☑ WOG ☑ CEOG ☑ BWROG

TSTF Comments:
(No Comments)

TSTF Resolution: Approved Date: 05-Feb-98

This Traveler is modified by WOG-ED-20. The affected pages are annotated.

## Incorporation Into the NUREGs

File to BBS/LAN Date: TSTF Informed Date: TSTF Approved Date:

NUREG Rev Incorporated:

## Affected Technical Specifications

| | |
|---|---|
| S/A 3.4.11 Bases | Pressurizer PORVs |
| LCO 3.4.11 Bases | Pressurizer PORVs |
| Appl. 3.4.11 Bases | Pressurizer PORVs |
| Action 3.4.11.A Bases | Pressurizer PORVs |

| | |
|---|---|
| Action 3.4.11.B Bases | Pressurizer PORVs |
| Action 3.4.11.C Bases | Pressurizer PORVs |
| Action 3.4.11.D Bases | Pressurizer PORVs |
| Action 3.4.11.E Bases | Pressurizer PORVs |
| Action 3.4.11.F Bases | Pressurizer PORVs |
| Action 3.4.11.G Bases | Pressurizer PORVs |
| SR 3.4.11.1 Bases | Pressurizer PORVs |

BASES

BACKGROUND (continued)

the PORVs minimize challenges to the pressurizer safety valves and also ~~may~~ be used for low temperature overpressure protection (LTOP). See LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP) 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~~ also modeled in safety analyses for events (Ref. 2) that result in increasing RCS pressure for which departure from nucleate boiling ratio (DNBR) criteria are critical. 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 (Ref. 2).~~ INSERT B51a

Pressurizer PORVs satisfy Criterion 3 of the NRC Policy Statement.

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 two PORVs and their associated block valves OPERABLE, the single failure criterion is satisfied. ~~The block valves are available to isolate the flow path through either a failed open PORV or a PORV with excessive leakage.~~ INSERT B51b
Satisfying the LCO helps minimize challenges to fission product barriers.

(continued)

TSTF-151, Rev. 1

This page is replaced in WOG-ED-20. See the following page.

INSERT B51a

As such, this actuation is not required to mitigate these events, and PORV automatic operation is, therefore, not an assumed safety function.

INSERT B51b

An OPERABLE block valve may be either open, or closed and energized with the capability to be opened, since the required safety function is accomplished by manual operation. Although typically open to allow PORV operation, the block valves may be OPERABLE when closed to isolate the flow path of an inoperable PORV that is capable of being manually cycled (e.g., as in the case of excessive PORV leakage). Similarly, isolation of an OPERABLE PORV does not render that PORV or block valve inoperable provided the relief function remains available with manual action.

An OPERABLE PORV is required to be capable of manually opening and closing, and not experiencing excessive seat leakage. Excessive seat leakage, although not associated with a specific acceptance criteria, exists when conditions dictate closure of the block valve to limit leakage.
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TSTF-163, Rev. 1

WOG-EO-20

INSERT B51a

As such, this actuation is not required to mitigate these events, and PORV automatic operation is, therefore, not an assumed safety function.

INSERT B51b

and energized with the capability to be closed

An OPERABLE block valve may be either open, or closed and energized with the capability to be opened, since the required safety function is accomplished by manual operation. Although typically open to allow PORV operation, the block valves may be OPERABLE when closed to isolate the flow path of an inoperable PORV that is capable of being manually cycled (e.g., as in the case of excessive PORV leakage). Similarly, isolation of an OPERABLE PORV does not render that PORV or block valve inoperable provided the relief function remains available with manual action.

An OPERABLE PORV is required to be capable of manually opening and closing, and not experiencing excessive seat leakage. Excessive seat leakage, although not associated with a specific acceptance criteria, exists when conditions dictate closure of the block valve to limit leakage.
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TSTF-151, Rev. 1

BASES (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.~~ INSERT B52a

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 LTOP in~~ MODES 4, 5, and 6 with the reactor vessel head in place, LCO 3.4.12 addresses the PORV requirements in these MODES.

ACTIONS

Note 1 has been added to clarify that all pressurizer PORVs are treated as separate entities, each with separate Completion Times (i.e., the Completion Time is on a component basis). The exception for LCO 3.0.4, Note 2, permits entry into MODES 1, 2, and 3 to perform cycling of the PORVs or block valves to verify their OPERABLE status. Testing is not performed in lower MODES.

INSERT B52b

A.1

~~With the~~ PORVs maybe inoperable and associated capable of is required to being manually cycled, either the PORVs must be restored or the flow path isolated within 1 hour. The block valve~~s~~ ~~should~~ be closed, but power must be maintained to the associated block valve~~s~~, 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, automatic control problems, or other causes that do not prevent manual use and do not create a possibility for a

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TSTF-151, Rev. 1

INSERT B52a

...for manual actuation to mitigate a steam generator tube rupture event.

INSERT B52b

...(e.g., excessive seat leakage). In this condition, ...

ACTIONS

A.1 (continued)

~~small break LOCA. For these reasons, the block valve may be closed but the Action requires power be maintained to the valve.~~ This ~~Condition is only intended to~~ permit operation of the plant ~~for a limited period of time not to exceed the~~ until next refueling outage (MODE 6) so that maintenance can be performed on the PORVs to eliminate the problem 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.1, B.2, and B.3

If one [or two] PORV[s] is inoperable and not capable of being manually cycled, it must be either restored, or isolated by closing the associated block valve and removing the power to the associated block valve. The Completion Times of 1 hour are reasonable, based on challenges to the PORVs during this time period, and provide the operator adequate time to correct the situation. If the inoperable valve cannot be restored to OPERABLE status, it 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 the inoperable PORV to OPERABLE status. If the PORV cannot be restored within this additional time, the plant must be brought to a MODE in which the LCO does not apply, as required by Condition D.

C.1 and C.2

If one block valve is inoperable, 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

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This page is replaced by WOG-ED-20. The revised page follows.

TSTF-151, Rev.1

BASES

ACTIONS

C.1 and C.2 (continued)

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. 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 block valve to OPERABLE status. The time allowed to restore the block valve is based upon the Completion Time for restoring an inoperable PORV in Condition B, since the PORVs are not capable of mitigating an overpressure event when placed in manual control. 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. If it cannot be restored within this additional time, the plant must be brought to a MODE in which the LCO does not apply, as required by Condition D.

May not be

if the inoperable block valve is not full open

to

D.1 and D.2

If the Required Action of Condition A, B, or C is 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 3.4.12.

automatic

E.1, E.2, E.3, and E.4

If more than one PORV is 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

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TSTF-151, Rev. 1

BASES

WOG-ED-20

ACTIONS

C.1 and C.2 (continued)

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. 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 block valve to OPERABLE status. The time allowed to restore the block valve is based upon the Completion Time for restoring an inoperable PORV in Condition B, since the PORVs ~~are not~~ capable of mitigating an ~~overpressure~~ event ~~when placed in manual control~~. 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~~. If it cannot be restored within this additional time, the plant must be brought to a MODE in which the LCO does not apply, as required by Condition D.

May not be

if the inoperable block valve is not full open

to

the PORV may be restored to automatic operation.

D.1 and D.2

If the Required Action of Condition A, B, or C is 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~~ automatic PORV OPERABILITY may be required. See LCO 3.4.12.

E.1, E.2, E.3, and E.4

If more than one PORV is 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

(continued)

ACTIONS

E.1, E.2, E.3, and E.4 (continued)

to correct the situation. If one PORV is restored and one PORV remains inoperable, then the plant will be in Condition B with the time clock started at the original declaration of having two [or 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 3.4.12.

Automatic

F.1, F.2, and F.3

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 the remaining block valve within 72 hours]. 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.

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G.1 and G.2

If the Required Actions of Condition F 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 3.4.12.

Automatic

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.11.1

Block valve cycling verifies that the valve(s) can be opened and closed if needed. The basis for the Frequency of 92 days is the ASME Code, Section XI (Ref. 3). 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 valve is closed to isolate an ~~otherwise~~ inoperable PORV that is incapable of being manually cycled, 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)~~.

The Note modifies this SR by stating that it is not required to be met with the block valve closed, in accordance with the Required Action of this LCO.

SR 3.4.11.2

SR 3.4.11.2 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 3.4.11.3

Operating the solenoid air control valves and check valves on the air accumulators ensures the PORV control system actuates properly when called upon. The Frequency of [18] months is based on a typical refueling cycle and the Frequency of the other Surveillances used to demonstrate PORV OPERABILITY. ]

[ SR 3.4.11.4

This Surveillance is not required for plants with permanent 1E power supplies to the valves. ]

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