

## Industry/TSTF Standard Technical Specification Change Traveler

### Charging Pump Swap LTOP Allowance

Classification: 1) Correct Specifications

NUREGs Affected:  1430  1431  1432  1433  1434

**Description:**

1. Delete NUREG-1431 and NUREG-1432 LCO 3.4.12 Required Action B.1 Note.
2. Delete NUREG-1430 LCO 3.4.12 Required Action A.1 Note
3. Add new Note to LCO 3.4.12.
4. Move Applicability Note to LCO 3.4.12.
5. Modify Bases accordingly.
6. Clarify Bases discussion of LCO requirement.

**Justification:**

NUREG-1431 and NUREG-1432 LCO 3.4.12, Required Action B.1, has a Note allowing two charging pumps to be capable of injecting into the RCS for up to 15 minutes during pump swap operations. Likewise, NUREG-1430 LCO 3.4.12, Required Action A.1, has a Note allowing two makeup pumps to be capable of injecting into for the RCS for up to 15 minutes during pump swap operations. This presentation is undesirable since it requires entry into Actions; specifically an action with an "Immediately fix the condition" requirement. The relation between the "15 minutes" allowance in the Note and the "Immediately" could be confusing. Furthermore, 15 minutes is insufficient time to prudently complete the operation of making the charging/makeup pump incapable of injection. Closing and racking out valves, or racking out the pump breaker requires appropriate administrative controls to be followed by Operations personnel. With proper diligence, these actions may not be safely accomplished in 15 minutes in all cases. One hour is reasonable considering the small likelihood of an event during this brief period and the other administrative controls available (e.g., operator action to stop any pump that inadvertently starts.) Therefore, the exception is reformatted as an LCO Note with a 1 hour allowance.

Additionally, the Applicability for LCO 3.4.12 is modified by a Note. This Note allows an exception to the LCO. Thus, it would be more appropriately located under the LCO. This Note was moved to the LCO, and renumbered as Note 2.

Pump swaps during LTOP conditions must take into account the restrictions of the LTOP analysis as well as the other required functions. In Mode 4, a charging pump is required to be operable to meet the ECCS requirements. The charging pump also is a part of charging and letdown to maintain RCS inventory and chemistry control. Further, securing charging for the purpose of not having more than the allowable pumps operable would also put thermal fatigue cycles on the piping and impact seal injection to the Reactor Coolant Pumps (RCP) which has seal degradation potential. For these reasons it is desirable to have a provision to safely and deliberately swap pumps. In Modes 5 or 6, a charging pump is required for the necessary boration flowpath. This requirement has been relocated from the TS, but remains part of the Licensing Basis. While not as time critical as the ECCS function, it is still required, and depending on plant status, the need for RCP seal injection may still be present. A time estimate for the charging pump swap performed by one Equipment Operator and one Reactor Operator was performed to confirm the requested time. This was an estimate starting with an open, racked out pump breaker on one pump and ending with an open, racked out, and properly surveilled pump breaker on the other pump. The estimates clearly demonstrated 15 minutes to be inadequate to safely and deliberately complete the evolution. One hour is more appropriate, with the intent to minimize the actual time that more than [one] charging pump is physically capable of injection, which has been inserted into the Bases.

The Bases were revised to reflect these changes. Also, an editorial change was made to clarify the Bases discussion for the LCO requirements.

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4/28/99

**Revision History****OG Revision 0****Revision Status: Closed**

Revision Proposed by:

Revision Description:

Original Issue

**Owners Group Review Information**

Date Originated by OG: 12-Mar-96

Owners Group Comments

Originally accepted on 3/12/96. Withdrawn for further consideration. Approved with changes on 4/25/96.

Owners Group Resolution: Approved Date: 25-Apr-96

**TSTF Review Information**

TSTF Received Date: 31-May-96

Date Distributed for Review 05-Aug-96

OG Review Completed:  BWOG  WOG  CEOG  BWROG

TSTF Comments:

TSTF Comments on Revision 0:

CEOG - Applicable to CEOG, but CEOG suggests modification. The relationship between the time allowed in the Note and the Action are clear. Moving the allowance to an LCO Note makes tracking of the time awkward. Suggest leaving as Action Note but extending time to 1 hour as suggested. Bases require removing power to the pumps and 1 hour is more appropriate for that action.

BWOG - NA to BWOG. This change would appear to be more "risk" based than deterministic. Should the risk consequences be more clearly discussed?

TSTF - add more information to the justification, move LCO note to an Action. WOG to revise.

TSTF Resolution: Superceded Date: 05-Feb-98

**OG Revision 1****Revision Status: Closed**

Revision Proposed by: WOG

Revision Description:

Added the following changes:

Moved the existing Applicability Note to an LCO Note.

This is an editorial change providing a more consistent presentation for this kind of exception.

**Owners Group Review Information**

Date Originated by OG: 01-Jul-96

Owners Group Comments

(No Comments)

Owners Group Resolution: Rejected Date: 01-Jul-96

**OG Revision 2****Revision Status: Closed**

Revision Proposed by: WOG

Revision Description:

Made minor editorial change.

4/28/99

**OG Revision 2****Revision Status: Closed**

WOG wants the Traveler to be reconsidered by the TSTF.

**Owners Group Review Information**

Date Originated by OG: 19-Aug-97

Owners Group Comments

Made minor editorial change.

WOG wants the Traveler to be reconsidered by the TSTF.

Owners Group Resolution: Approved Date: 19-Aug-97

**TSTF Review Information**

TSTF Received Date: 19-Aug-97 Date Distributed for Review 06-Jan-98

OG Review Completed:  BWOG  WOG  CEOG  BWROG

TSTF Comments:

Revise the justification to address moving the applicability Note to the LCO. Applicable to all PWRs.  
Describe the editorial change.

TSTF Resolution: Approved Date: 05-Feb-98

**NRC Review Information**

NRC Received Date: 29-May-98

NRC Comments:

12/17/98 - TSTF to provide an enhanced technical justification by 1/8/99 and the NRC will respond within 1 week with comments.

1/13/98 - Referred to SRXB and EMCB

Final Resolution: Superseded by Revision

Final Resolution Date:

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

Revision Proposed by: NRC

Revision Description:

Changed the second sentence of the insert to: "1 hour provides sufficient time to safely complete the actual transfer and to complete the administrative controls and surveillance requirements associated with the swap. The intent is to minimize the actual time that more than [one] charging pump is physically capable of injection."

Revised justification per NRC request.

**TSTF Review Information**

TSTF Received Date: 21-Apr-99 Date Distributed for Review 21-Apr-99

OG Review Completed:  BWOG  WOG  CEOG  BWROG

TSTF Comments:

(No Comments)

TSTF Resolution: Approved Date: 21-Apr-99

4/28/99

TSTF Revision 1

Revision Status: Active

Next Action: NRC

**NRC Review Information**

NRC Received Date: 30-Apr-99

NRC Comments:

(No Comments)

Final Resolution: NRC Action Pending

Final Resolution Date:

**Incorporation Into the NUREGs**

File to BBS/LAN Date:

TSTF Informed Date:

TSTF Approved Date:

NUREG Rev Incorporated:

**Affected Technical Specifications**

LCO 3.4.12	LTOP System	
	Change Description:	Add an LCO NOTE
LCO 3.4.12 Bases	LTOP System	
Appl. 3.4.12	LTOP System	
	Change Description:	Move Applicability Note to LCO Note 2.
Appl. 3.4.12 Bases	LTOP System	
Action 3.4.12.A Bases	LTOP System	
Action 3.4.12.A	LTOP System	NUREG(s)- 1430 Only
Action 3.4.12.B	LTOP System	NUREG(s)- 1431 1432 Only

4/28/99

Insert 1 (WOG and CEOG)

The LCO is modified by two Notes. Note 1 allows [two charging pumps] to be made capable of injecting for  $\leq 1$  hour during pump swap operations. One hour provides sufficient time to safely complete the actual transfer and to complete the administrative controls and surveillance requirements associated with the swap. The intent is to minimize the actual time that more than [one] charging pump is physically capable of injection.

Insert 2 (BWOOG)

The LCO is modified by two Notes. Note 1 allows [two makeup pumps] to be made capable of injecting for  $\leq 1$  hour during pump swap operations. One hour provides sufficient time to safely complete the actual transfer and to complete the administrative controls and surveillance requirements associated with the swap. The intent is to minimize the actual time that more than [one] makeup pump is physically capable of injection.

### 3.4 REACTOR COOLANT SYSTEM (RCS)

#### 3.4.12 Low Temperature Overpressure Protection (LTOP) System

##### LCO 3.4.12

An LTOP System shall be OPERABLE with a maximum of [one] makeup pump capable of injecting into the RCS, high pressure injection (HPI) deactivated, and the core flood tanks (CFTs) isolated and:

----- NOTES -----  
1. [Two makeup pumps] may be made capable of injecting for  $\leq 1$  hour for Pump swap operations.

- a. Pressurizer level  $\leq [220]$  inches and an OPERABLE power operated relief valve (PORV) with a lift setpoint of  $\leq [555]$  psig; or
- b. The RCS depressurized and an RCS vent of  $\geq [0.75]$  square inch.

APPLICABILITY: MODE 4 when any RCS cold leg temperature is  $\leq [283]^{\circ}\text{F}$ ,  
MODE 5,  
MODE 6 when the reactor vessel head is on.

----- NOTE -----  
② → CFT ~~isolation is only required~~ when CFT pressure is ~~greater than or equal to~~ the maximum RCS pressure for the existing RCS temperature allowed by the pressure and temperature limit curves provided in the PTLR.

*may be unisolated* (circled)  
*less than* (circled)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. More than [one] makeup pump capable of injecting into the RCS.</p>	<p>A.1</p> <div style="border: 1px dashed black; padding: 5px; width: fit-content; margin: 10px auto;"> <p style="text-align: center;">-----NOTE-----</p> <p>Two makeup pumps may be capable of injecting into the RCS during pump swap operation for <math>\leq 15</math> minutes.</p> </div> <p>Initiate action to verify only [one] makeup pump is capable of injecting into the RCS.</p>	<p>Immediately</p>
<p>B. HPI activated.</p>	<p>B.1 Initiate action to verify HPI deactivated.</p>	<p>Immediately</p>
<p>C. A CFT not isolated when CFT pressure is greater than or equal to the maximum RCS pressure for existing temperature allowed in the PTLR.</p>	<p>C.1 Isolate affected CFT.</p>	<p>1 hour</p>
<p>D. Required Action C.1 not met within the required Completion Time.</p>	<p>D.1 Increase RCS temperature to <math>&gt; 175^{\circ}\text{F}</math>.</p> <p><u>OR</u></p> <p>D.2 Depressurize affected CFT to <math>&lt; [555]</math> psig.</p>	<p>12 hours</p> <p>12 hours</p>

(continued)

BASES

APPLICABLE  
SAFETY ANALYSES

Pressurizer Level Performance (continued)

The pressurizer level limit will also be re-evaluated for compliance each time P/T limit curves are revised based on the results of the vessel material surveillance.

RCS Vent Performance

With the RCS depressurized, analyses show a vent of [0.75] square inches is capable of mitigating the transient resulting from full opening of the makeup control valve while the makeup pump is providing RCS makeup. The capacity of a vent this size is greater than the flow resulting from this credible transient at 100 psig back pressure, which is less than the maximum RCS pressure on the P/T limit curve in LCO 3.4.3.

The RCS vent size will also be re-evaluated for compliance each time P/T limit curves are revised based on the results of the vessel material surveillance.

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

The LTOP System satisfies Criterion 2 of the NRC Policy Statement.

LCO

<EDIT>

a maximum of

The LCO requires an LTOP System OPERABLE with a limited coolant input capability and a pressure relief capability. To limit coolant input, the LCO requires ~~only~~ [one] makeup pump OPERABLE, the HPI deactivated, and the CFT discharge isolation valves closed and immobilized. For pressure relief, it requires either the pressurizer coolant at or below a maximum level and the PORV OPERABLE with a lift setting at the LTOP limit or the RCS depressurized and a vent established.

INSERT 2

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The pressurizer is OPERABLE with a coolant level  $\leq$  [220] inches.

The PORV is OPERABLE when its block valve is open, its lift setpoint is set at  $\leq$  [555] psig and testing has proven its ability to open at that setpoint, and motive power is available to the two valves and their control circuits.

(continued)

BASES

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LCO (continued) For the depressurized RCS, an RCS vent is OPERABLE when open with an area of at least [0.75] square inches.

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APPLICABILITY This LCO is applicable in MODE 4 when any RCS cold leg temperature is  $\leq$  [283] $^{\circ}$ F, in MODE 5, and in MODE 6 when the reactor vessel head is on. The Applicability temperature of [283] $^{\circ}$ F is established by fracture mechanics analyses. The pressurizer safety valves provide overpressure protection to meet LCO 3.4.3 P/T limits above [283] $^{\circ}$ F. With the vessel head off, overpressurization is not possible.

LCO 3.4.3 provides the operational P/T limits for all MODES. LCO 3.4.10, "Pressurizer Safety Valves," requires the pressurizer safety valves OPERABLE to provide overpressure protection during MODES 1, 2, and 3, and MODE 4 above [283] $^{\circ}$ F.

Note 2 states

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Page B3.4-61

~~The Applicability is modified by a Note stating that CFT isolation is only required when the CFT pressure is more than or equal to the maximum RCS pressure for the existing RCS temperature, as allowed in LCO 3.4.3. This Note permits the CFT discharge valve surveillance performed only under these pressure and temperature conditions.~~

ACTIONS

A.1 and B.1

With two or more makeup pumps capable of injecting into the RCS or if the HPI is activated, immediate actions are required to render the other pump(s) inoperable or to deactivate HPI. Emphasis is on immediate deactivation because inadvertent injection with [one] or more HPI pump OPERABLE is the event of greatest significance, since it causes the greatest pressure increase in the shortest time. Also, the vent cannot mitigate overpressurization from the injection of even one HPI pump.

The immediate Completion Times reflect the urgency of quickly proceeding with the Required Actions.

~~Required Action A.1 is modified by a Note that permits two pumps capable of RCS injection for  $\leq$  15 minutes to allow for pump swaps.~~

(continued)

### 3.4 REACTOR COOLANT SYSTEM (RCS)

#### 3.4.12 Low Temperature Overpressure Protection (LTOP) System

LCO 3.4.12

An LTOP System shall be OPERABLE with a maximum of [one] [high pressure injection (HPI)] pump [and one charging pump] capable of injecting into the RCS and the accumulators isolated and either a or b below.

NOTES  
1. [Two charging pumps] may be made capable of injecting for  $\leq 1$  hour for pump swap operations.

- a. Two RCS relief valves, as follows:
  - 1. Two power operated relief valves (PORVs) with lift settings within the limits specified in the PTLR, or
  - 2. Two residual heat removal (RHR) suction relief valves with setpoints  $\geq [436.5]$  psig and  $\leq [463.5]$  psig, or
  - 3. One PORV with a lift setting within the limits specified in the PTLR and one RHR suction relief valve with a setpoint  $\geq [436.5]$  psig and  $\leq [463.5]$  psig.
- b. The RCS depressurized and an RCS vent of  $\geq [2.07]$  square inches.

APPLICABILITY: MODE 4 when all RCS cold leg temperature is  $\leq [275]^{\circ}\text{F}$ ,  
MODE 5,  
MODE 6 when the reactor vessel head is on.

NOTE  
② Accumulator ~~isolation is only required when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed by the P/T limit curves provided in the PTLR.~~  
*may be unisolated*  
*less than*

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. Two or more [HPI] pumps capable of injecting into the RCS.</p>	<p>A.1 .Initiate action to verify a maximum of [one] [HPI] pump is capable of injecting into the RCS.</p>	<p>Immediately</p>
<p>B. Two or more charging pumps capable of injecting into the RCS.</p>	<p>B.1</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center;"><del>NOTE</del></p> <p style="text-align: center;"><del>Two charging pumps may be capable of injecting into the RCS during pump swap operation for <math>\leq 15</math> minutes.</del></p> </div> <p>Initiate action to verify a maximum of [one] charging pump is capable of injecting into the RCS.</p>	<p>Immediately</p>
<p>C. An accumulator not isolated when the accumulator pressure is greater than or equal to the maximum RCS pressure for existing cold leg temperature allowed in the PTLR.</p>	<p>C.1 Isolate affected accumulator.</p>	<p>1 hour</p>

(continued)

BASES

APPLICABLE  
SAFETY ANALYSES

RCS Vent Performance (continued)

The LTOP System satisfies Criterion 2 of the NRC Policy Statement.

LCO

This LCO requires that the LTOP System is OPERABLE. The LTOP System 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 Reference 1 limits as a result of an operational transient.

that a maximum of

be

be

[Edit]

To limit the coolant input capability, the LCO requires [one] [HPI] pump [and one charging pump] capable of injecting into the RCS, and all accumulator discharge isolation valves, closed and immobilized. When accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed in the PTLR.

INSERT 1

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from pg B 3.4-66

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

a. Two RCS relief valves, as follows:

1. Two OPERABLE PORVs; or

A PORV is OPERABLE for LTOP when its block valve is open, its lift setpoint is set to the limit required by the PTLR and testing proves its ability to open at this setpoint, and motive power is available to the two valves and their control circuits.

[2. Two OPERABLE RHR suction relief valves; or]

An RHR suction relief valve is OPERABLE for LTOP when its RHR suction isolation valve and its RHR suction valve are open, its setpoint is at or between [436.5] psig and [463.5] psig; and testing has proven its ability to open at this setpoint.

(continued)

BASES

LCO  
(continued)

3. One OPERABLE PORV and one OPERABLE RHR suction relief valve; or

b. A depressurized RCS and an RCS vent.

An RCS vent is OPERABLE when open with an area of  $\geq [2.07]$  square inches.

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

APPLICABILITY

This LCO is applicable in MODE 4 when any RCS cold leg temperature is  $\leq [275]^{\circ}\text{F}$ , in MODE 5, and in MODE 6 when the reactor vessel head is on. The pressurizer safety valves provide overpressure protection that meets the Reference 1 P/T limits above  $[275]^{\circ}\text{F}$ . When the reactor vessel head is off, overpressurization cannot occur.

LCO 3.4.3 provides the operational P/T limits for all MODES. LCO 3.4.10, "Pressurizer Safety Valves," requires the OPERABILITY of the pressurizer safety valves that provide overpressure protection during MODES 1, 2, and 3, and MODE 4 above  $[275]^{\circ}\text{F}$ .

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.

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Page  
B 3.4-65

Note 2 states  
The Applicability is modified by a Note stating that accumulator isolation is only required when the accumulator pressure is more 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.

(continued)

BASES (continued)

ACTIONS

A.1 [and B.1]

With two or more HPI 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.

Required Action B.1 is modified by a Note that permits two charging pumps capable of RCS injection for  $\leq 15$  minutes to allow for pump swaps.

C.1, D.1, and D.2

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, Required Action D.1 and Required Action D.2 provide two options, either of which must be performed in the next 12 hours. By increasing the RCS temperature to  $> [275]^{\circ}\text{F}$ , an accumulator pressure of  $[600]$  psig cannot exceed the LTOP limits if the accumulators are fully injected. Depressurizing the accumulators below the LTOP limit from the PTLR also gives this protection.

The Completion Times are based on operating experience that these activities can be accomplished in these time periods and on engineering evaluations indicating that an event requiring LTOP is not likely in the allowed times.

E.1

In MODE 4 when any RCS cold leg temperature is  $\leq [275]^{\circ}\text{F}$ ; 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 [in any combination of the PORVS and the RHR suction relief valves] are required to provide low temperature overpressure mitigation while withstanding a single failure of an active component.

(continued)

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.12 Low Temperature Overpressure Protection (LTOP) System

LCO 3.4.12

An LTOP System shall be OPERABLE with a maximum of one high pressure safety injection (HPSI) pump and one charging pump capable of injecting into the RCS and the safety injection tanks (SITs) isolated, and:

NOTES  
 1. [Two charging pumps] may be made capable of injecting for  $\leq 1$  hour for pump swap operations.

- a. Two OPERABLE power operated relief valves (PORVs) with lift settings  $\leq [450]$  psig; or
- b. The RCS depressurized and an RCS vent of  $\geq [1.3]$  square inches.

APPLICABILITY: MODE 4 when any RCS cold leg temperature is  $\leq [285]^{\circ}\text{F}$ ,  
 MODE 5,  
 MODE 6 when the reactor vessel head is on.

NOTE  
 2. SIT isolation is only required when SIT pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed by the P/T limit curves provided in the PTLR.  
 (Handwritten annotations: "may be unisolated" above "isolation", "less than" above "greater")

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Two or more HPSI pumps capable of injecting into the RCS.	A.1 Initiate action to verify a maximum of one HPSI pump capable of injecting into the RCS.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>B. Two or more charging pumps capable of injecting into the RCS.</p>	<div style="border: 1px dashed black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;">NOTE</p> <p>Two charging pumps may be capable of injecting into the RCS during pump swap operation for <math>\leq 15</math> minutes.</p> </div> <p>B.1 Initiate action to verify a maximum of one charging pump capable of injecting into the RCS.</p>	<p>Immediately</p>
<p>C. A SIT not isolated when SIT pressure is greater than or equal to the maximum RCS pressure for existing cold leg temperature allowed in the PTLR.</p>	<p>C.1 Isolate affected SIT.</p>	<p>1 hour</p>
<p>D. Required Action and associated Completion Time of Condition C not met.</p>	<p>D.1 Increase RCS cold leg temperature to <math>&gt; [175]^{\circ}\text{F}</math>.</p> <p><u>OR</u></p> <p>D.2 Depressurize affected SIT to less than the maximum RCS pressure for existing cold leg temperature allowed in the PTLR.</p>	<p>12 hours</p> <p>12 hours</p>
<p>E. One required PORV inoperable in MODE 4.</p>	<p>E.1 Restore required PORV to OPERABLE status.</p>	<p>7 days</p>

(continued)

BASES

APPLICABLE  
SAFETY ANALYSES  
(continued)

RCS Vent Performance

With the RCS depressurized, analyses show a vent size of [1.3] square inches is capable of mitigating the limiting allowed LTOP overpressure transient. In that event, this size vent maintains RCS pressure less than the minimum RCS pressure on the P/T limit curve.

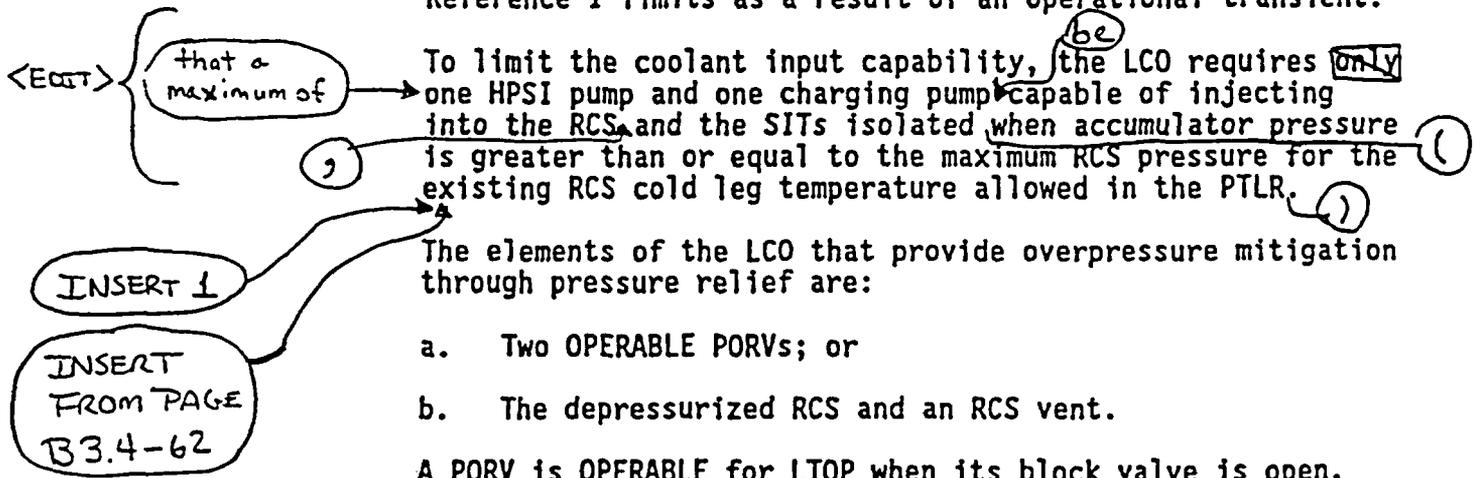
The RCS vent size will also be re-evaluated for compliance each time the P/T limit curves are revised based on the results of the vessel material surveillance.

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

LTOP System satisfies Criterion 2 of the NRC Policy Statement.

LCO

This LCO is required to ensure that the LTOP System is OPERABLE. The LTOP System 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 Reference 1 limits as a result of an operational transient.



To limit the coolant input capability, <sup>be</sup> the LCO requires only one HPSI pump and one charging pump <sup>9</sup> capable of injecting into the RCS, and the SITs isolated when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed in the PTLR. <sup>1</sup>

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

- a. Two OPERABLE PORVs; or
- b. The depressurized RCS and an RCS vent.

A PORV is OPERABLE for LTOP when its block valve is open, its lift setpoint is set at [450] psig or less and testing has proven its ability to open at that setpoint, and motive power is available to the two valves and their control circuits.

(continued)

BASES

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LCO  
(continued)

An RCS vent is OPERABLE when open with an area  $\geq$  [1.3] square inches.

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

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✓ APPLICABILITY

This LCO is applicable in MODE 4 when the temperature of any RCS cold leg is  $\leq$  [285] $^{\circ}$ F, in MODE 5, and in MODE 6 when the reactor vessel head is on. The pressurizer safety valves provide overpressure protection that meets the Reference 1 P/T limits above [285] $^{\circ}$ F and below. When the reactor vessel head is off, overpressurization cannot occur.

LCO 3.4.3 provides the operational P/T limits for all MODES. LCO 3.4.10, "Pressurizer Safety Valves," requires the OPERABILITY of the pressurizer safety valves that provide overpressure protection during MODES 1, 2, and 3, and MODE 4 above [285] $^{\circ}$ F.

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.

Note 2 states

Move to  
Page  
B 3.4-61

The Applicability is modified by a Note stating that SIT isolation is only required when the SIT pressure is greater than or equal to the RCS pressure for the existing temperature, as allowed by the P/T limit curves provided in the PTLR. This Note permits the SIT discharge valve surveillance performed only under these pressure and temperature conditions.

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ACTIONS

A.1 and B.1

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

The immediate Completion Time to initiate actions to restore restricted coolant input capability to the RCS reflects the importance of maintaining overpressure protection of the RCS.

(continued)

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BASES

ACTIONS

A.1 and B.1 (continued)  
Required Action B.1 is modified by a Note that permits two charging pumps capable of RCS injection for  $\leq 15$  minutes to allow for pump swaps.

C.1, D.1, and D.2

An unisolated SIT requires isolation within 1 hour. This is only required when the SIT pressure is greater than or equal to the maximum RCS pressure for the existing cold leg temperature allowed in the PTLR.

If isolation is needed and cannot be accomplished within 1 hour, Required Action D.1 and Required Action D.2 provide two options, either of which must be performed within 12 hours. By increasing the RCS temperature to  $> [175]^{\circ}\text{F}$ , a SIT pressure of  $[600]$  psig cannot exceed the LTOP limits if the tanks are fully injected. Depressurizing the SIT below the LTOP limit stated in the PTLR also protects against such an event.

The Completion Times are based on operating experience that these activities can be accomplished in these time periods and on engineering evaluations indicating that an event requiring LTOP is not likely in the allowed times.

E.1

In MODE 4 when any RCS cold leg temperature is  $\leq [285]^{\circ}\text{F}$ , with one PORV inoperable, two PORVs must be restored to OPERABLE status within a Completion Time of 7 days. Two valves are required to meet the LCO requirement and to provide low temperature overpressure mitigation while withstanding a single failure of an active component.

The Completion Time is based on the facts that only one PORV 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.

(continued)