Industry/TSTF Standard Technical Specification Change Traveler

RCS Maximum Flowrate

Priority/Classification 3) Improve Specifications

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

Description:

Removal of RCS maximum flowrate requirement from LCO 3.4.1.

Justification:

The purpose of LCO 3.4.1 is to specify parameters to protect DNB limits. Minimum flowrate is one of those parameters. However, maximum RCS flowrate is used to determine design hydraulic loads, not for thermal margin. For that matter, higher RCS flowrates will improve thermal margin. Also, RCS flowrate is not a controllable parameter. Therefore, maximum RCS flowrate should not be limited in the DNB limits specification.

Revision History

OG Revision 0 **Revision Status: Active** **Next Action:**

Revision Proposed by: Palo Verde

Revision Description:
Original Issue

Owners Group Review Information

Date Originated by OG: 29-May-96

Owners Group Comments
(No Comments)

Owners Group Resolution: Approved Date: 04-Jun-96

TSTF Review Information

TSTF Received Date: 01-Jul-96 Date Distributed for Review 31-Jul-96

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

TSTF Comments:

BWOG - Not applicable, BWOG accepts
WOG - Not applicable, WOG accepts
BWROG - Not applicable, BWROG accepts

TSTF Resolution: Approved Date: 10-Oct-96

NRC Review Information

NRC Received Date: 22-Jan-97 NRC Reviewer: Weston, M.

NRC Comments:

3/6/97 - Reviewer and Tech Branch recommend approval.
3/17/97 - To C. Grimes for disposition.

Final Resolution: NRC Approves Final Resolution Date: 11-Apr-97

Incorporation Into the NUREGs

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

NUREG Rev Incorporated.

Affected Technical Specifications

Bkgnd 3.4.1 Bases	RCS Pressure, Temperature, and FLOW [DNB] Limits
S/A 3.4.1 Bases	RCS Pressure, Temperature, and FLOW [DNB] Limits
LCO 3.4.1	RCS Pressure, Temperature, and FLOW [DNB] Limits
SR 3.4.1.3	RCS Pressure, Temperature, and FLOW [DNB] Limits

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3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.1 RCS Pressure, Temperature, and Flow [Departure from Nucleate Boiling (DNB)] Limits

LCO 3.4.1 RCS DNB parameters for pressurizer pressure, cold leg temperature, and RCS total flow rate shall be within the limits specified below:

a. Pressurizer pressure $\geq$ [2025] psia and $\leq$ [2275] psia;

b. RCS cold leg temperature (T_c) $\geq$ [535]°F and $\leq$ [558]°F for < [70]% RTP, or $\geq$ [544]°F and $\leq$ [588]°F for $\geq$ [70]% RTP; and

c. RCS total flow rate $\geq$ [148 E6] lb/hour ~~and $\leq$ [177.6 E6] lb/hour.~~

APPLICABILITY: MODE 1.

---NOTE---
Pressurizer pressure limit does not apply during:

a. THERMAL POWER ramp > 5% RTP per minute; or

b. THERMAL POWER step > 10% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Pressurizer pressure or RCS flow rate not within limits.	A.1 Restore parameter(s) to within limit.	2 hours
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 2.	6 hours

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ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. RCS cold leg temperature not within limits.	C.1 Restore cold leg temperature to within limits.	2 hours
D. Required Action and associated Completion Time of Condition C not met.	D.1 Reduce THERMAL POWER to ≤ [30]% RTP.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.1.1	Verify pressurizer pressure ≥ [2025] psia and ≤ [2275] psia.	12 hours
SR 3.4.1.2	Verify RCS cold leg temperature ≥ [535]°F and ≤ [558]°F for < [70]% RTP or ≥ [544]°F and ≤ [558]°F for ≥ [70]% RTP.	12 hours
SR 3.4.1.3	----------NOTE---------- Required to be met in MODE 1 with all RCPs running. ----------	
	Verify RCS total flow rate ≥ [148 E6] lb/hour and ≤ [177.6 E6] lb/hour.	12 hours

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B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.1 RCS Pressure, Temperature, and Flow [Departure from Nucleate Boiling (DNB)] Limits

BASES

BACKGROUND

These Bases address requirements for maintaining RCS pressure, temperature, and flow rate within limits assumed in the safety analyses. The safety analyses (Ref. 1) of normal operating conditions and anticipated operational occurrences assume initial conditions within the normal steady state envelope. The limits placed on DNB related parameters ensure that these parameters will not be less conservative than were assumed in the analyses and thereby provide assurance that the minimum departure from nucleate boiling ratio (DNBR) will meet the required criteria for each of the transients analyzed.

The LCO limits for minimum and maximum RCS pressures as measured at the pressurizer are consistent with operation within the nominal operating envelope and are bounded by those used as the initial pressures in the analyses.

The LCO limits for minimum and maximum RCS cold leg temperatures are consistent with operation at the indicated power level and are bounded by those used as the initial temperatures in the analyses.

The LCO limits for minimum ~~and maximum~~ RCS flow rates ~~are~~ is bounded by ~~those used as~~ the initial flow rates in the analyses. The RCS flow rate is not expected to vary during plant operation with all pumps running.

APPLICABLE SAFETY ANALYSES

The requirements of LCO 3.4.1 represent the initial conditions for DNB limited transients analyzed in the safety analyses (Ref. 1). The safety analyses have shown that transients initiated from the limits of this LCO will meet the DNBR criterion of ≥ [1.3]. This is the acceptance limit for the RCS DNB parameters. Changes to the facility that could impact these parameters must be assessed for their impact on the DNBR criterion. The transients analyzed for include loss of coolant flow events and dropped or struck control element assembly (CEA) events. A key assumption for the analysis of these events is that the core power

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BASES

APPLICABLE SAFETY ANALYSES (continued)

distribution is within the limits of [LCO 3.1.7, "Regulating CEA Insertion Limits"; LCO 3.1.8, "Part Length CEA Insertion Limits"; LCO 3.2.3, "AZIMUTHAL POWER TILT (T_q)"; and LCO 3.2.5, "AXIAL SHAPE INDEX (ASI) (Digital)]"; [LCO 3.1.7, "Regulating Rod Insertion Limits"; LCO 3.2.4, "AZIMUTHAL POWER TILT (T_q)"; and LCO 3.2.5, "AXIAL SHAPE INDEX (Analog)"]. The safety analyses are performed over the following range of initial values: RCS pressure [1785-2400] psig, core inlet temperature [500-580]°F, and reactor vessel inlet coolant flow rate ~~[95-116]~~ ≥ [95]%.

The RCS DNB limits satisfy Criterion 2 of the NRC Policy Statement.

LCO

This LCO specifies limits on the monitored process variables—RCS pressurizer pressure, RCS cold leg temperature, and RCS total flow rate—to ensure that the core operates within the limits assumed for the plant safety analyses. Operating within these limits will result in meeting the DNBR criterion in the event of a DNB limited transient.

The LCO numerical values for pressure, temperature, and flow rate are given for the measurement location but have not been adjusted for instrument error. Plant specific limits of instrument error are established by the plant staff to meet the operational requirements of this LCO.

APPLICABILITY

In MODE 1, the limits on RCS pressurizer pressure, RCS cold leg temperature, and RCS flow rate must be maintained during steady state operation in order to ensure that DNBR criteria will be met in the event of an unplanned loss of forced coolant flow or other DNB limited transient. In all other MODES, the power level is low enough so that DNBR is not a concern.

A Note has been added to indicate the limit on pressurizer pressure may be exceeded during short term operational transients such as a THERMAL POWER ramp increase of > 5% RTP per minute or a THERMAL POWER step increase of > 10% RTP. These conditions represent short term perturbations where actions to control pressure variations might be

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