Entergy

Entergy Nuclear Northeast
Indian Point Energy Center
450 Broadway, GSB
P.O. Box 249
Buchanan, NY 10511-0249
Tel 914 254 6700

John A Ventosa
Site Vice President
Administration

NL-13-001

February 6, 2013

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

SUBJECT: Proposed Changes to Indian Point 2 Technical Specifications Regarding Reactor Vessel Heatup and Cooldown Curves and Low Temperature Over Pressure Requirements
Indian Point Unit Number 2
Docket No. 50-247
License No. DPR-26

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Entergy Nuclear Operations, Inc, (Entergy) hereby requests a License Amendment to Operating License DPR-26, Docket No. 50-247 for Indian Point Nuclear Generating Unit No. 2 (IP2). The proposed amendment will revise the Reactor Heatup and Cooldown curves and Low Temperature Overpressure Protection Requirements in Technical Specifications (TS) 3.4.3, 3.4.6, 3.4.7, 3.4.10 and 3.4.12. The existing limits are for lifetime burnup of 29.2 Effective Full Power Years (EFPY) and the revised limits are for a lifetime burnup of 48 EFPY.

Entergy has evaluated the proposed change in accordance with 10 CFR 50.91 (a)(1) using the criteria of 10 CFR 50.92 (c) and Entergy has determined that this proposed change involves no significant hazards considerations, as described in Attachment 1. The proposed changes to the Technical Specifications are shown in Attachment 2. The associated Bases changes are provided in Attachment 3 for information. A copy of this application and the associated attachments are being submitted to the designated New York State official in accordance with 10 CFR 50.91.

A001
NRR

Entergy requests approval of the proposed amendment within 12 months and an allowance of 30 days for implementation. There are no new commitments being made in this submittal. If you have any questions or require additional information, please contact Mr. Robert Walpole, IPEC Licensing Manager at (914) 734-6710.

I declare under penalty of perjury that the foregoing is true and correct. Executed on February 6, 2013.

Sincerely,

Patrick W. Conway, acting for John A. Ventosa

JAV/ai

Attachments:

1. Analysis of Proposed Technical Specification Changes regarding Reactor Heatup and Cooldown Curves and LTOP Requirements
2. Markup of Technical Specification Pages for Proposed Changes regarding Reactor Heatup and Cooldown Curves and LTOP Requirements
3. Markup of Technical Specification Bases Pages for Proposed Changes regarding Reactor Heatup and Cooldown Curves and LTOP Requirements

cc: Mr. Douglas Pickett, Senior Project Manager, NRC NRR DORL
Mr. William M. Dean, Regional Administrator, NRC Region 1
NRC Resident Inspectors
Mr. Francis J. Murray, Jr., President and CEO, NYSERDA
Ms. Bridget Frymire, New York State Dept. of Public Service

ATTACHMENT 1 TO NL-13-001

ANALYSIS OF PROPOSED TECHNICAL SPECIFICATION CHANGES REGARDING REACTOR HEATUP AND COOLDOWN CURVES AND LTOP REQUIREMENTS

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NO. 2
DOCKET NO. 50-247

1.0 DESCRIPTION

Entergy Nuclear Operations, Inc (Entergy) is requesting an amendment to Operating License DPR-26, Docket 50-247 for Indian Point Nuclear Generating Unit No. 2 (IP2). The proposed change will revise the Reactor Vessel Heatup and Cooldown curves in Unit 2 Technical Specification (TS) 3.4.3, and revise the Low Temperature Overpressure Protection System (LTOP) requirements in IP2 TS 3.4.6 (Note 2), 3.4.7 (Note 3), LCO 3.4.10 and TS 3.4.12. The change is necessary to account for a service life increase from 29.2 Effective Full Power Years (EFPY) to an extended service life of 48 EFPY.

The specific proposed changes are listed in the following section.

2.0 PROPOSED CHANGES

2.1 The Heatup and Cooldown limitations in IP2 TS 3.4.3 will be revised as follows:

Replace the existing TS Figure 3.4.3-1 and Figure 3.4.3-2 with the proposed TS Figure 3.4.3-1 and Figure 3.4.3-2 as shown in attachment 2.

2.2 Reactor Coolant System (RCS) in IP2 TS 3.4 will be revised as follows:

Change LCO 3.4.6 Notes from:

"

- NOTES -

1. All reactor coolant pumps (RCPs) and RHR pumps may be removed from operation for ≤ 1 hour per 8 hour period provided:

   a. No operations are permitted that would cause introduction into the RCS of any coolant with a boron concentration less than that required to meet the SDM of LCO 3.1.1, and

   b. Core outlet temperature is maintained at least 10°F below saturation temperature.

2. No RCP shall be started with any RCS cold leg temperature ≤ 280°F unless the requirements for RCP starting in LCO 3.4.12 are met."

To:

"

- NOTES -

1. All reactor coolant pumps (RCPs) and RHR pumps may be removed from operation for ≤ 1 hour per 8 hour period provided:

   a. No operations are permitted that would cause introduction into the RCS of any coolant with a boron concentration less than that required to meet the SDM of LCO 3.1.1, and

b. Core outlet temperature is maintained at least 10°F below saturation temperature.

2. No RCP shall be started with any RCS cold leg temperature ≤ 288°F unless the requirements for RCP starting in LCO 3.4.12 are met."

Change LCO 3.4.7 Notes from:

"

- NOTES -

1. The RHR pump of the loop in operation may be removed from operation for ≤ 1 hour per 8 hour period provided:

   a. No operations are permitted that would cause introduction into the RCS of any coolant with a boron concentration less than that required to meet the SDM of LCO 3.1.1; and

   b. Core outlet temperature is maintained at least 10°F below saturation temperature.

2. One required RHR loop may be inoperable for up to 2 hours for surveillance testing provided that the other RHR loop is OPERABLE and in operation.

3. No reactor coolant pump shall be started with any RCS cold leg temperatures ≤ 280°F unless the requirements for RCP starting in LCO 3.4.12 are met.

4. All RHR loops may be removed from operation during planned heatup to MODE 4 when at least one RCS loop is in operation.

"

To:

"

- NOTES -

1. The RHR pump of the loop in operation may be removed from operation for ≤ 1 hour per 8 hour period provided:

   a. No operations are permitted that would cause introduction into the RCS of any coolant with a boron concentration less than that required to meet the SDM of LCO 3.1.1; and

   b. Core outlet temperature is maintained at least 10°F below saturation temperature.

2. One required RHR loop may be inoperable for up to 2 hours for surveillance testing provided that the other RHR loop is OPERABLE and in operation.

3. No reactor coolant pump shall be started unless the requirements for RCP starting in LCO 3.4.12 are met.

4. All RHR loops may be removed from operation during planned heatup to MODE 4 when at least one RCS loop is in operation.

"

Change LCO 3.4.10 from:

"APPLICABILITY: MODES 1, 2, and 3,
MODE 4 with all RCS cold leg temperatures > 280°F."

To:

"APPLICABILITY: MODES 1, 2, and 3,
MODE 4 with all RCS cold leg temperatures > 288°F."

2.3 The Low Temperature Overpressure Protection in IP2 TS 3.4.12 will be revised as follows:

Change LCO 3.4.12 from:

"APPLICABILITY: MODE 4 when any RCS cold leg temperature is ≤ 280°F,
MODE 5,
MODE 6 when the reactor vessel head is on."

To:

"APPLICABILITY: MODE 4 when any RCS cold leg temperature is ≤ 288°F,
MODE 5,
MODE 6 when the reactor vessel head is on."

and

"ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time of Condition B not met.	C.1	Increase RCS cold leg temperature to > 280°F.	12 hours
	OR		
	C.2	Depressurize affected accumulator to less than the maximum RCS pressure for existing cold leg temperature allowed in Figure 3.4.12-1.	12 hours

"

To:

"ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time of Condition B not met.	C.1	Increase RCS cold leg temperature to > 288°F.	12 hours
	OR		
	C.2	Depressurize affected accumulator to less than the maximum RCS pressure for existing cold leg temperature allowed in Figure 3.4.12-1.	12 hours

"

Change SR 3.4.12.6 from:
"

SR 3.4.12.6	- NOTE - Not required to be performed until 12 hours after decreasing RCS cold leg temperature to ≤ 280°F. Perform a COT on each required PORV, excluding actuation.	31 days

"

To:
"

SR 3.4.12.6	- NOTE - Not required to be performed until 12 hours after decreasing RCS cold leg temperature to ≤ 288°F. Perform a COT on each required PORV, excluding actuation.	31 days

"

Change SR 3.4.12.8 from:

"SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.12.8	Verify the conditions in one of the following options is satisfied prior to starting any RCP: A.1 Temperature of all steam generators (SGs) ≤ RCS temperature. <u>OR</u> B.1 Two PORVs with lift settings within Figure 3.4.12-1 limits are OPERABLE; and B.2 Temperature of all SGs ≤ 40°F higher than the RCS temperature; and B.3 RCS temperature is ≤ 249°F; and B.4 Pressurizer level ≥ 30% and ≤ 85% of span. <u>OR</u> C.1 Temperature of all SGs ≤ 40°F higher than the RCS temperature; and C.2 RCS pressure, temperature and pressurizer level within limits specified in Figure 3.4.12-5 for RCP pump start with SGs ≤ 40°F higher than the RCS temperature. <u>OR</u> D.1 Temperature of all SGs ≤ 100°F higher than the RCS temperature; and D.2 RCS Pressure, temperature and pressurizer level within limits specified in Figure 3.4.12-6 for RCP pump start with SGs ≤ 100°F higher than the RCS temperature.	Within 30 minutes prior to starting any RCP if no other RCP is operating

"

To:

"SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.12.8	Verify the conditions in one of the following options is satisfied prior to starting any RCP: A.1 Temperature of all steam generators (SGs) ≤ RCS temperature. <u>OR</u> B.1 Two PORVs with lift settings within Figure 3.4.12-1 limits are OPERABLE; and B.2 Temperature of all SGs ≤ 40°F higher than the RCS temperature; and B.3 RCS temperature as shown in Table on Figure 3.4.12-1; and B.4 Pressurizer level ≥ 30% and ≤ 85% of span. <u>OR</u> C.1 Temperature of all SGs ≤ 40°F higher than the RCS temperature; and C.2 RCS pressure, temperature and pressurizer level within limits specified in Figure 3.4.12-5 for RCP pump start with SGs ≤ 40°F higher than the RCS temperature. <u>OR</u> D.1 Temperature of all SGs ≤ 100°F higher than the RCS temperature; and D.2 RCS Pressure, temperature and pressurizer level within limits specified in Figure 3.4.12-6 for RCP pump start with SGs ≤ 100°F higher than the RCS temperature.	Within 30 minutes prior to starting any RCP if no other RCP is operating

"

Change Table 3.4.12-1 from:

Table 3.4.12 - 1
Options for LTOP OPERABILITY

LTOP Option	Relief Capability or Vent Size	Maximum Injection Capability		Restrictions on RCS Temperature, Pressure and Pressurizer Level
		HHSI Pumps	Charging Pumps	
A.	2 OPERABLE PORVs with normal setpoint specified in Figure 3.4.12-1	0	≤ 3	None
B.	2 OPERABLE PORVs with reduced setpoint specified in Figure 3.4.12-1	≤1	≤ 2	None
C.	None	0	≤ 1	As Specified in Figure 3.4.12-2
D.	None	0	≤ 2	As Specified in Figure 3.4.12-3
E.	None	0	≤ 3	As Specified in Figure 3.4.12-4.
F.	≥ 2 square inch vent (1 PORV blocked open)	≤ 1	≤ 3	None
G.	≥ 5 square inch vent (2 PORVs blocked open)	≤ 2	≤ 3	None
H.	≥ 5 square inch vent (2 PORVs blocked open)	≤ 3	≤ 2	None
I.	≥ 5 square inch vent	≤ 3	≤ 3	None

To:

Table 3.4.12 - 1
Options for LTOP OPERABILITY

LTOP Option	Relief Capability or Vent Size	Maximum Injection Capability		Restrictions on RCS Temperature, Pressure and Pressurizer Level
		HHSI Pumps	Charging Pumps	
A.	2 OPERABLE PORVs with setpoint specified in Figure 3.4.12-1	0	≤ 3	None
B.	2 OPERABLE PORVs with setpoint specified in Figure 3.4.12-1	≤1	≤ 2	None
C.	None	0	≤ 1	As Specified in Figure 3.4.12-2
D.	None	0	≤ 2	As Specified in Figure 3.4.12-3
E.	None	0	≤ 3	As Specified in Figure 3.4.12-4.
F.	≥ 2 square inch vent (1 PORV blocked open)	≤ 1	≤ 3	None
G.	≥ 5 square inch vent (2 PORVs blocked open)	≤ 2	≤ 3	None
H.	≥ 5 square inch vent (2 PORVs blocked open)	≤ 3	≤ 2	None
I.	≥ 5 square inch vent	≤ 3	≤ 3	None

Replace the existing Figure 3.4.12-1 to Figure 3.4.12-6 with the proposed Figure 3.4.12-1 to Figure 3.4.12-6 as shown in Attachment 2.

3.0 BACKGROUND

This Technical Specification (TS) amendment proposes to revise the Heatup (HU), Cooldown (CD) curves and Low Temperature Overpressure Protection System (LTOP) requirements, in order to compensate for an increased service life. The current Technical Specifications (TS) for these curves expire at a service life of 29.2 Effective Full-Power Years (EFPY), which is the end of cycle 21, scheduled for March 4, 2014. Based on estimates of lifetime neutron fluence, and allowing for the effects of the Stretch Power Uprate (Amendment #241), calculations have been performed to establish pressure versus temperature limits for all curves in TS Sections 3.4.3 and 3.4.12 for a service life extending up to 48 EFPY, which is the estimated accumulated burnup at the expiration of the extended Life Operating License on September 28, 2033.

As expected, the revised curves are more restrictive than the existing ones, due to the effects of greater lifetime neutron fluence on the reactor vessel inner wall, and the associated increase in RT_{NDT} at the ¼ and ¾ locations. The methodologies used for the generation of the new curves are identical to those used for the existing curves. In accordance with ASME BPV Code Section XI, Appendix G, the LTOP Arming Temperature for the revised curves is increased from 280 degF to 288 degF, and this change is also reflected in TS Sections 3.4.6 (Note 2), 3.4.7 (Note 3), LCO 3.4.10 and TS 3.4.12.

4.0 TECHNICAL ANALYSIS

The IP2 TS establishes limits on Reactor Coolant System (RCS) pressure at low temperatures, in order to protect the reactor vessel from damage due to crack propagation. These limits include normal Heatup and Cooldown restrictions, as well as the automatic setpoints and manual restrictions associated with operation of the LTOPS. These requirements are promulgated in accordance with 10CFR50 Appendix G, which provide guidelines for development of these limits.

The existing limits are valid for plant operation through a lifetime burnup of 29.2 EFPY, which is the anticipated burnup at the end of cycle 21, scheduled for March 4, 2014. The revised limits are valid for a lifetime burnup of 48 EFPY, which is the anticipated burnup at the time of extended life Operating License expiration on September 28, 2033.

The revised curves fall into two categories: heatup and cooldown curves for normal operation (TS Section 3.4.3) and LTOP curves (TS Section 3.4.12). The former have been prepared by Westinghouse (Reference 1), and the latter have been established via internal Entergy calculation (Reference 2).

The WCAP (Reference 1) for normal HU and CD curves identifies the methodology under which the figures were generated, and was previously transmitted to the NRC (Reference 4). These curves are based on latest available reactor vessel information and updated calculated fluences, which include the impact of Stretch Power Uprate. The new Indian Point Unit 2 HU and CD curves were generated using the "Axial-Flaw" methodology of the 1998 ASME Code, Section XI through the 2000 Addenda (which allows the use of the K_{Ic} methodology) and the "Circ-Flaw" methodology. The material with the highest adjusted reference temperature (ART) was intermediate shell plate B-2002-3 (Heat Number B4782-1) for the Axial-Flaw methodology and circumferential weld wire Heat Number B34009 for the Circ-Flaw methodology. The pressure-temperature limit curves were generated for 48 EFPY using heatup rates of 60 and 100 degF/hr and cooldown rates of steady state, 20, 40, 60 and 100 degF/hr. These curves were developed without allowance for

instrumentation errors or pressure bias, as is the case for the existing TS curves. Prior to implementation, allowances for pressure and temperature instrument errors and bias will be applied to the 48 EFPY curves as has been the practice in previous implementations. In similar fashion to RPS and ESFAS setpoint determinations, the methodology used for estimating instrument uncertainties conforms to the recommended practices of industry standard ISA 67.04.

The calculation for the LTOP curves uses a methodology identical to that of the existing curves, based on the source calculations for TS Amendment 262 (Reference 3). The LTOP curves in Reference 2 are based on the HU/CD curves established in Reference 1, and therefore the revised LTOP setpoints, and its family of associated curves, similarly reflect the increase in lifetime fluence for a service life of 48 EFPY. The Maximum PORV Opening setpoint shown in Figure 3.4.12-1 is implemented as a variable setpoint for the LTOP instrumentation. The other curves in the LTOP family (as well as the HU and CD curves in Section 3.4.3) are procedurally implemented as Operations Procedure graphs and do not relate to any automatic protection systems.

The LTOP Arming temperature is the point below which the LTOP is required to be in service. In TS Amendments 224 and 262, the Commission granted Entergy the use of ASME BPV Code Section XI, Appendix G; it allows use of code case N-588 and N-640 for determination of this setpoint. The ASME BPV Code Section XI, Appendix G with the 2000 Addenda incorporates these code cases. This defines the LTOP system to become effective at coolant temperatures corresponding to reactor vessel temperatures less than RT_{NDT} + 50 degF, to a minimum Arming Temperature of 200 degF. For 48 EFPY, the calculated Arming Temperature is 288 degF, which is the limiting RT_{NDT} of 238 degF from Table 4-8 of WCAP-16752 plus 50 degF. This change to the Arming Temperature is reflected in TS Sections 3.4.6 (Note 2), 3.4.7 (Note 3), LCO 3.4.10, LCO 3.4.12 and SR 3.4.12.6.

5.0 REGULATORY ANALYSIS

5.1 No Significant Hazards Consideration

Entergy has determined that this proposed Technical Specification change does not involve a significant hazards consideration as defined by 10CFR.50.92(c).

1. Operation of the facility in accordance with the proposed amendment would not involve a significant increase in the probability of occurrence or consequences of an accident previously evaluated.

   The proposed TS changes do not involve a significant increase in the probability or consequences of an accident previously evaluated. Except for a setpoint change for automatic PORV actuation, there are no physical changes to the plant being introduced by the proposed changes to the heatup and cooldown limitation curves. The proposed changes do not modify the RCS pressure boundary. That is, there are no changes in operating pressure, materials, or seismic loading. The proposed changes do not adversely affect the integrity of the RCS pressure boundary such that its function in the control of radiological consequences is affected. The proposed heatup and cooldown limitation curves were generated in accordance with the fracture toughness requirements of 10CFR50 Appendix G, and ASME B&PV code, Section XI, Appendix G edition with 2000 Addenda. The proposed heatup and cooldown limitation curves were established in compliance with the methodology used to calculate and predict effects of radiation on embrittlement of RPV beltline materials. Use of this methodology provides compliance with the intent of 10CFR50 Appendix G and provides margins of safety that ensure non-ductile failure of the RPV will

not occur. The proposed heatup and cooldown limitation curves prohibit operation in regions where it is possible for non-ductile failure of carbon and low alloy RCS materials to occur. Hence, the primary coolant pressure boundary integrity will be maintained throughout the limit of applicability of the curves, 48 EFPY.

Operation within the proposed LTOP limits ensures that overpressurization of the RCS at low temperatures will not result in component stresses in excess of those allowed by the ASME B&PV Code Section XI Appendix G.

Consequently, the proposed changes do not involve a significant increase in the probability or the consequences of an accident previously evaluated.

2. Operation of the facility in accordance with the proposed amendment would not create the possibility of a new or different kind of accident from any accident previously evaluated.

   The proposed TS changes do not create the possibility of a new or different kind of accident from any accident previously evaluated. No new modes of operation are introduced by the proposed changes. The proposed changes will not create any failure mode not bounded by previously evaluated accidents. Further, the proposed changes to the heatup and cooldown limitation curves and the LTOP limits do not affect any activities or equipment other than the RCS pressure boundary and do not create the possibility of a new or different kind of accident from any accident previously evaluated.

   Consequently, the proposed changes do not create the possibility of a new or different kind of accident, from any accident previously evaluated.

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

   The Proposed TS changes do not involve a significant reduction in the margin of safety. The revised heatup and cooldown limitation curves and LTOP limits are established in accordance with current regulations and the ASME B&PV Code 1998 edition with 2000 Addenda. These proposed changes are acceptable because the ASME B&PV Code maintains the margin of safety required by 10CFR50.55(a). Because operation will be within these limits, the RCS materials will continue to behave in a non-brittle manner consistent with the original design bases.

   The proposed changes to the allowable operation of charging and safety injection pumps when LTOP is required to be operable is consistent with the IP2 licensing bases as established in TS Amendment 262.

   Therefore, Entergy has concluded that the proposed changes do not involve a significant reduction in a margin of safety.

Based on the above evaluation, Entergy has concluded that the proposed changes will not result in a significant increase in the probability or consequences of any accident previously analyzed; will not create the possibility of a new or different kind of accident from any accident previously evaluated; and, does not result in a significant reduction in the margin of safety. Therefore, operation of IP2 in accordance with the proposed amendment does not involve a significant hazards consideration.

5.2 Applicable Regulatory Requirements / Criteria

The proposed changes were developed in accordance with the following NRC regulations and guidance:

- 10CFR50 Appendix G
- Regulatory Guide (RG) 1.99, Rev. 2
- ASME B&PV Code Section XI Appendix G, 1998 Edition with 2000 Addenda

10CFR50 Appendix G, by reference to ASME B&PV Code Section XI Appendix G, 1998 Edition with 2000 Addenda, specifies fracture toughness and testing requirements for reactor vessel materials. 10CFR50 Appendix G also requires prediction of the effects of neutron irradiation on vessel embrittlement by calculating the Adjusted Reference Temperature (ART) and the Charpy Upper Shelf Energy (USE). The methods provided in RG 1.99 Rev. 2, defines the ART as the sum of unirradiated reference temperature, the increase of reference temperature resulting from neutron irradiation, and a margin to account for uncertainties in the prediction method.

5.3 Environmental Considerations

The proposed changes to the IP2 Technical Specifications do not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 PRECEDENCE

The methodology under which the Heatup and Cooldown curves were created is a standard used by Westinghouse throughout the industry. A previous request for a change to these Curves was approved with NRC SER for TS Amendment 262 (Reference 3).

7.0 REFERENCES

1) WCAP-16752-NP, Revision 0, "Indian Point Unit 2 Heatup and Cooldown Limit Curves for Normal Operation," Westinghouse Electric Co, January 2008

2) Entergy Calculation FMX-00270 Rev 2, "IP2 Overpressure Protection System (OPS) Thermal Hydraulic Analysis, Setpoint Development And Tech Spec Revision," November 28, 2012.

3) Indian Point Nuclear Generating Unit No. 2 – Issuance of Amendment RE: Reactor Vessel updated Heatup and Cooldown curves (TAC No. ME 0788), August 17, 2009.

4) Entergy Letter NL-09-013 to NRC, "Proposed Changes to Indian Point 2 Technical Specifications Regarding Reactor Vessel Heatup and Cooldown Curves and Low Temperature Over Pressure Requirements", dated March 5, 2009.

ATTACHMENT 2 TO NL-13-001

MARKUP OF TECHNICAL SPECIFICATION PAGES FOR PROPOSED CHANGES REGARDING REACTOR HEATUP AND COOLDOWN CURVES AND LTOP REQUIREMENTS

Text changes indicated by lineout for deletion and Bold/Italics for additions
Figure changes are marked "Void" and all new Figures are unmarked

Unit 2 Affected Pages:
3.4.6-1
3.4.7-1
3.4.10-1
3.4.12-1, 3.4.12-3, 3.4.12-5, 3.4.12-6 and 3.4.12-7
3.4.3-3 and 4
3.4.12-8 to13

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NO. 2
DOCKET NO. 50-247

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.6 RCS Loops - MODE 4

LCO 3.4.6 Two loops consisting of any combination of RCS loops and residual heat removal (RHR) loops shall be OPERABLE, and one loop shall be in operation.

- NOTES -

1. All reactor coolant pumps (RCPs) and RHR pumps may be removed from operation for ≤ 1 hour per 8 hour period provided:

   a. No operations are permitted that would cause introduction into the RCS of any coolant with a boron concentration less than that required to meet the SDM of LCO 3.1.1, and

   b. Core outlet temperature is maintained at least 10°F below saturation temperature.

2. No RCP shall be started with any RCS cold leg temperature ≤ 28~~0~~***8***°F unless the requirements for RCP starting in LCO 3.4.12 are met.

APPLICABILITY: MODE 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One required loop inoperable.	A.1	Initiate action to restore a second loop to OPERABLE status.	Immediately
	<u>AND</u>		
	A.2	--- **- NOTE -** Only required if RHR loop is OPERABLE. ---	
		Be in MODE 5.	24 hours

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.7 RCS Loops - MODE 5, Loops Filled

LCO 3.4.7

One residual heat removal (RHR) loop shall be OPERABLE and in operation, and either:

a. The non-operating RHR loop shall be OPERABLE or

b. The secondary side water level of at least two steam generators (SGs) shall be ≥ 0% narrow range.

- NOTES -

1. The RHR pump of the loop in operation may be removed from operation for ≤ 1 hour per 8 hour period provided:

   a. No operations are permitted that would cause introduction into the RCS of any coolant with a boron concentration less than that required to meet the SDM of LCO 3.1.1; and

   b. Core outlet temperature is maintained at least 10°F below saturation temperature.

2. One required RHR loop may be inoperable for up to 2 hours for surveillance testing provided that the other RHR loop is OPERABLE and in operation.

3. No reactor coolant pump shall be started ~~with any RCS cold leg temperatures ≤ 280°F~~ unless the requirements for RCP starting in LCO 3.4.12 are met.

4. All RHR loops may be removed from operation during planned heatup to MODE 4 when at least one RCS loop is in operation.

APPLICABILITY: MODE 5 with RCS Loops Filled

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.10 Pressurizer Safety Valves

LCO 3.4.10 Three pressurizer safety valves shall be OPERABLE with lift settings set ≥ 2460 psig and ≤ 2510 psig.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 with all RCS cold leg temperatures > 28~~0~~***8***°F.

- NOTE -
The lift settings are not required to be within the LCO limits during MODES 3 and 4 for the purpose of setting the pressurizer safety valves under ambient (hot) conditions. This exception is allowed for 54 hours following entry into MODE 3 provided a preliminary cold setting was made prior to heatup.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One pressurizer safety valve inoperable.	A.1	Restore valve to OPERABLE status.	15 minutes
B. Required Action and associated Completion Time not met. <u>OR</u> Two or more pressurizer safety valves inoperable.	B.1 <u>AND</u> B.2	Be in MODE 3. Be in MODE 4 with any RCS cold leg temperature ≤ LTOP Applicability temperature specified in LCO 3.4.12.	6 hours 24 hours

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.12 Low Temperature Overpressure Protection (LTOP)

LCO 3.4.12 LTOP shall be OPERABLE in accordance with one of the options in Table 3.4.12-1 and the accumulators shall be isolated.

- NOTES -

1. Accumulator isolation is only required when accumulator pressure is greater than or equal to the maximum RCS pressure for the coldest existing RCS cold leg temperature allowed by the P/T limit curves provided in Figure 3.4.12-1.

2. If conditions require the use of High Head Safety Injection (HHSI) pumps in the event of loss of RCS inventory, the pumps can be made capable of injecting into the RCS.

3. One HHSI pump may be made capable of injecting into the RCS as needed to support abnormal operations such as emergency boration or response to loss of RHR cooling.

4. SR 3.4.12.8 shall be met prior to starting a reactor coolant pump (RCP) if no other RCPs are in operation.

APPLICABILITY: MODE 4 when any RCS cold leg temperature is ≤ ~~280~~***288***°F,
MODE 5,
MODE 6 when the reactor vessel head is on.

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time of Condition B not met.	C.1	Increase RCS cold leg temperature to > ~~280~~***288***°F.	12 hours
	<u>OR</u>		
	C.2	Depressurize affected accumulator to less than the maximum RCS pressure for existing cold leg temperature allowed in Figure 3.4.12-1.	12 hours
D. One required PORV inoperable.	D.1	Restore required PORV to OPERABLE status.	7 days
E. Two required PORVs inoperable. <u>OR</u> Required Action and associated Completion Time of Condition A or D not met. <u>OR</u> LTOP inoperable for any reason other than Condition A, B, C or D.	E.1	Initiate action to reduce the number of HHSI pumps and charging pumps capable of injecting into the RCS consistent with Table 3.4.12-1.	Immediately
	<u>AND</u>		
	E.2	Depressurize RCS and establish RCS vent required by Table 3.4.12-1 for existing plant conditions.	8 hours

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.4.12.4	-- **- NOTE -** Not required to be met when Table 3.4.12-1, Option A, B, C, D or E is met. -- Verify required RCS vent meets the following: a. ≥ 2.00 square inches (or 1 PORV blocked fully open) when required by Table 3.4.12-1, Option F; b. ≥ 5.00 square inches (or 2 PORVs blocked fully open) when required by Table 3.4.12-1, Option G or H; or c. ≥ 5.00 square inches when required by Table 3.4.12-1, Option I.	24 hours for unlocked open vent valve(s) <u>AND</u> 31 days for locked open vent valve(s)
SR 3.4.12.5	Verify PORV block valve is open for each required PORV.	72 hours
SR 3.4.12.6	-- **- NOTE -** Not required to be performed until 12 hours after decreasing RCS cold leg temperature to ≤ ~~280~~***288***°F. -- Perform a COT on each required PORV, excluding actuation.	31 days
SR 3.4.12.7	Perform CHANNEL CALIBRATION for each required PORV actuation channel.	24 months

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.12.8	Verify the conditions in one of the following options is satisfied prior to starting any RCP: A.1 Temperature of all steam generators (SGs) ≤ RCS temperature. OR B.1 Two PORVs with lift settings within Figure 3.4.12-1 limits are OPERABLE; and B.2 Temperature of all SGs ≤ 40°F higher than the RCS temperature; and B.3 RCS temperature ~~is ≤ 249°F~~ ***as shown in Table on Figure 3.4.12-1***; and B.4 Pressurizer level ≥ 30% and ≤ 85% of span. OR C.1 Temperature of all SGs ≤ 40°F higher than the RCS temperature; and C.2 RCS pressure, temperature and pressurizer level within limits specified in Figure 3.4.12-5 for RCP pump start with SGs ≤ 40°F higher than the RCS temperature. OR D.1 Temperature of all SGs ≤ 100°F higher than the RCS temperature; and D.2 RCS Pressure, temperature and pressurizer level within limits specified in Figure 3.4.12-6 for RCP pump start with SGs ≤ 100°F higher than the RCS temperature.	Within 30 minutes prior to starting any RCP if no other RCP is operating

Table 3.4.12 - 1
Options for LTOP OPERABILITY

LTOP Option	Relief Capability or Vent Size	Maximum Injection Capability		Restrictions on RCS Temperature, Pressure and Pressurizer Level
		HHSI Pumps	Charging Pumps	
A.	2 OPERABLE PORVs with ~~normal~~ setpoint specified in Figure 3.4.12-1	0	≤ 3	None
B.	2 OPERABLE PORVs with ~~reduced~~ setpoint specified in Figure 3.4.12-1	≤1	≤ 2	None
C.	None	0	≤ 1	As Specified in Figure 3.4.12-2
D.	None	0	≤ 2	As Specified in Figure 3.4.12-3
E.	None	0	≤ 3	As Specified in Figure 3.4.12-4.
F.	≥ 2 square inch vent (1 PORV blocked open)	≤ 1	≤ 3	None
G.	≥ 5 square inch vent (2 PORVs blocked open)	≤ 2	≤ 3	None
H.	≥ 5 square inch vent (2 PORVs blocked open)	≤ 3	≤ 2	None
I.	≥ 5 square inch vent	≤ 3	≤ 3	None

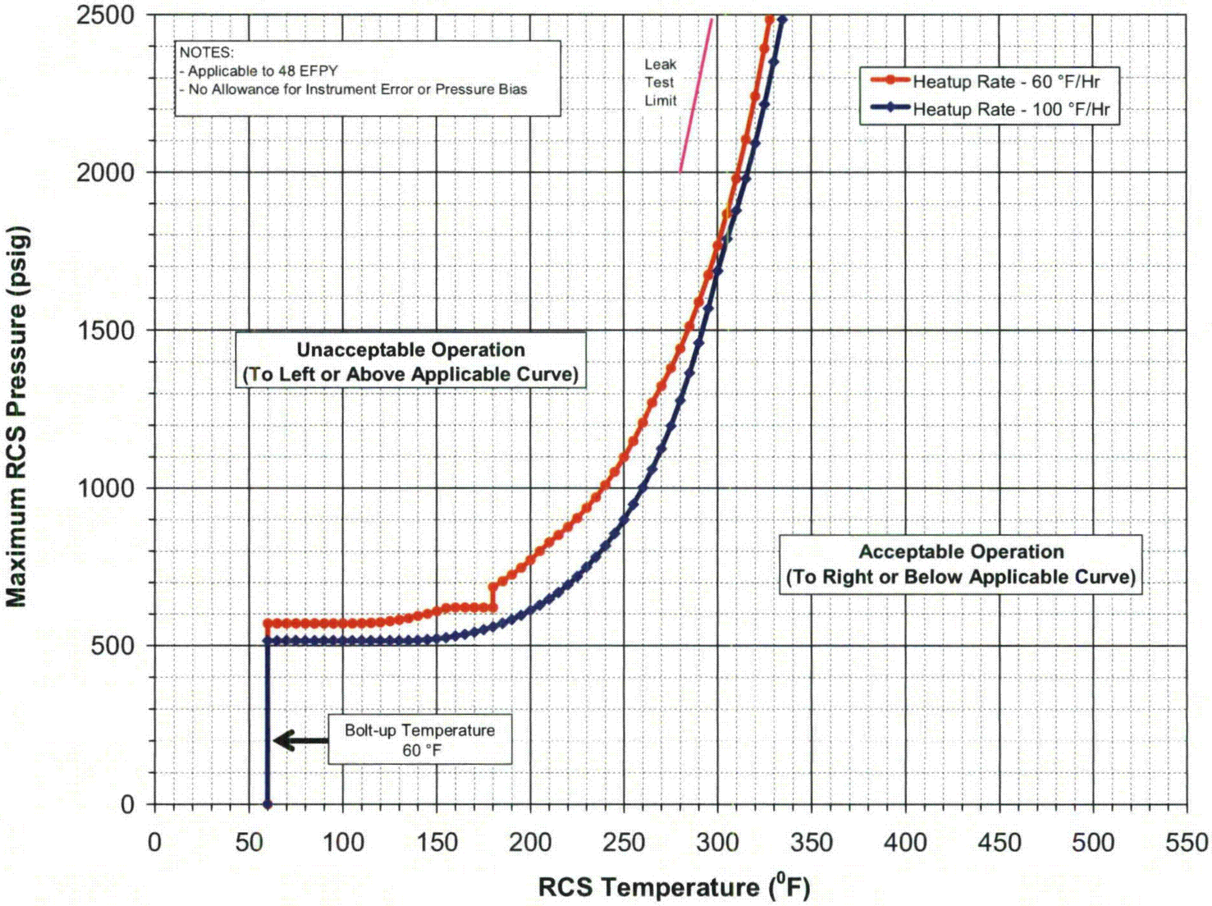
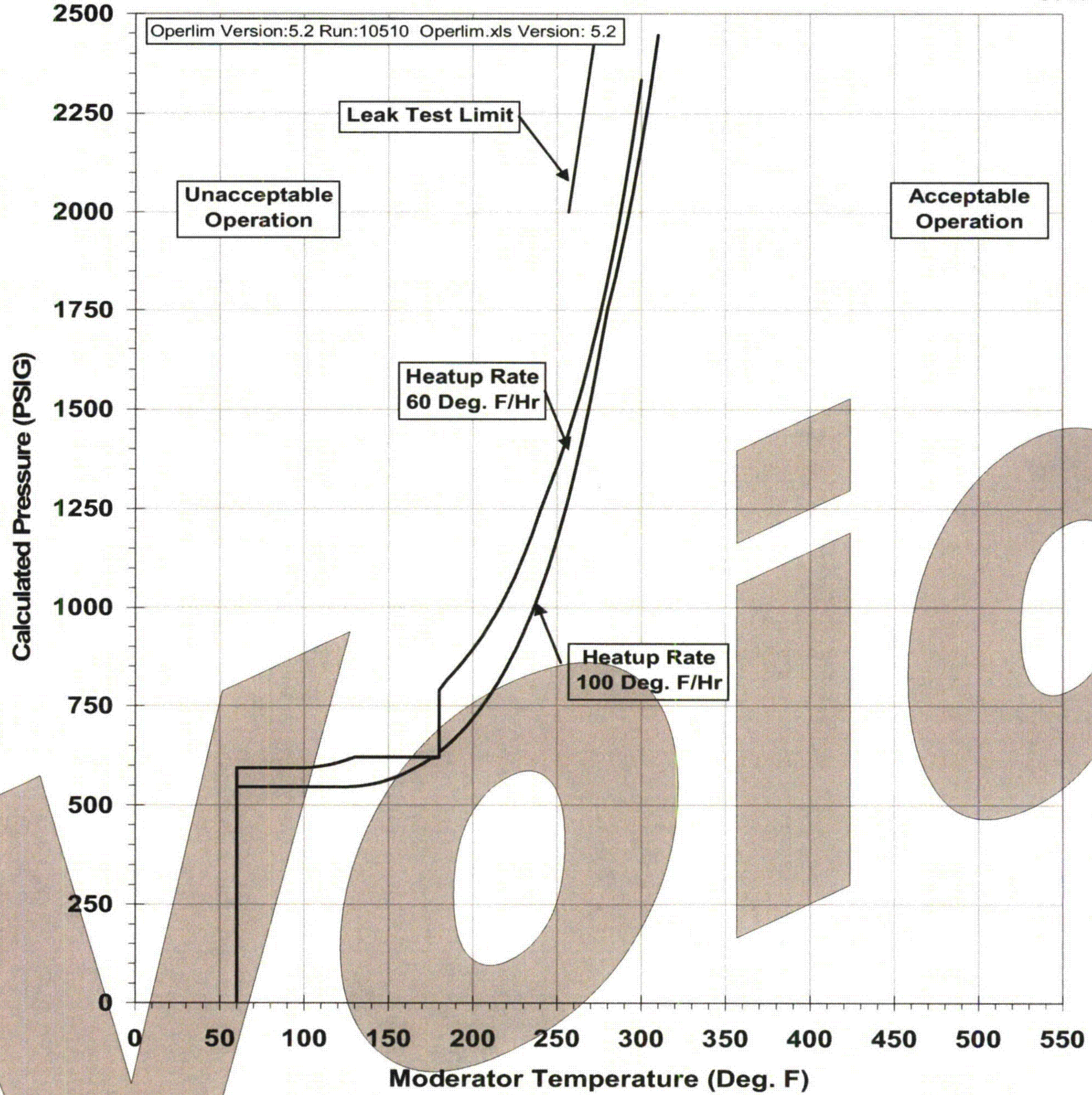


Figure 3.4.3-1:
Heatup Limitations for the Reactor Coolant System (RCS) and Hydrostatic and Inservice Leak Testing Limitations for the RCS.



-Notes-

1. Acceptable operation is to the right of or below the applicable curve. Unacceptable operation is to the left of or above the applicable curve.
2. Figure 3.4.3-1 is effective until 29.2 effective full power years (EFPYs)
3. Figure 3.4.3-1 does not include any allowance for instrument uncertainty.

Figure 3.4.3-1:
Heatup Limitations for the Reactor Coolant System (RCS) and Hydrostatic and Inservice Leak Testing Limitations for the RCS.

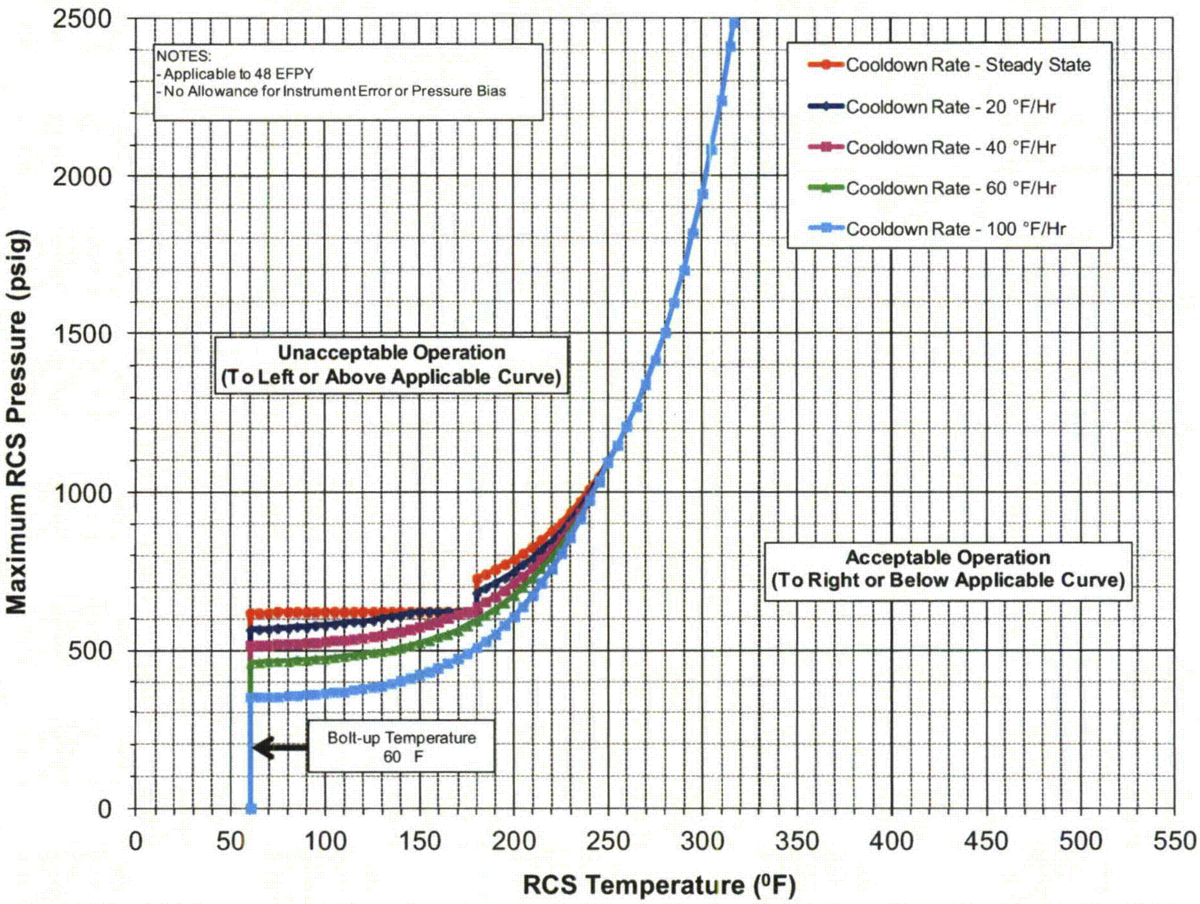
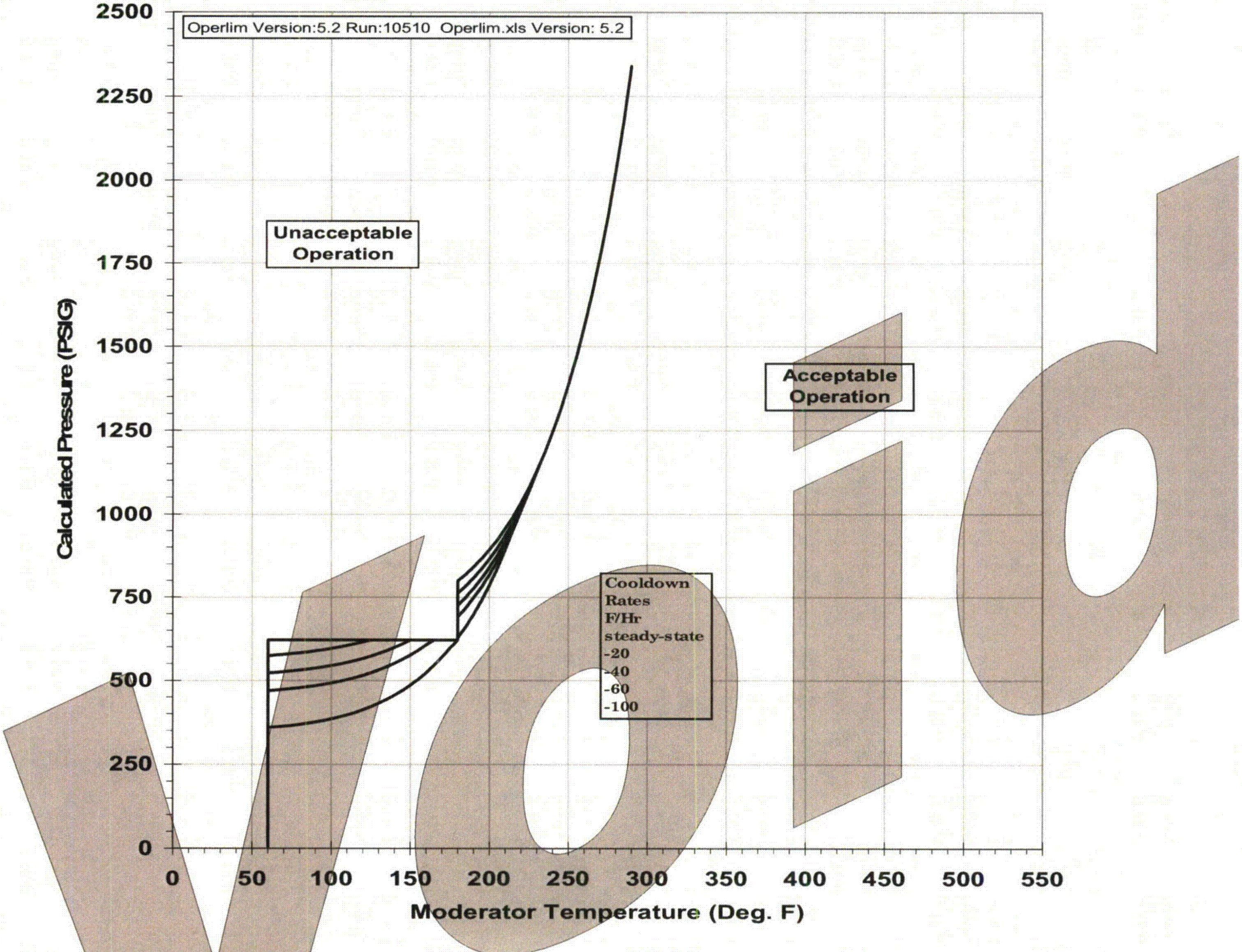


Figure 3.4.3-2:
Cooldown Limitations for the RCS (including RCS cooldown following RCS inservice leak and hydrostatic testing)



-Notes-

1. Acceptable operation is to the right of or below the applicable curve. Unacceptable operation is to the left of or above the applicable curve.
2. Figure 3.4.3-2 is effective until 29.2 effective full power years (EFPYs).
3. Figure 3.4.3-2 does not include any allowance for instrument uncertainty.

Figure 3.4.3-2:

Cooldown Limitations for the RCS (including RCS cooldown following RCS inservice leak and hydrostatic testing)

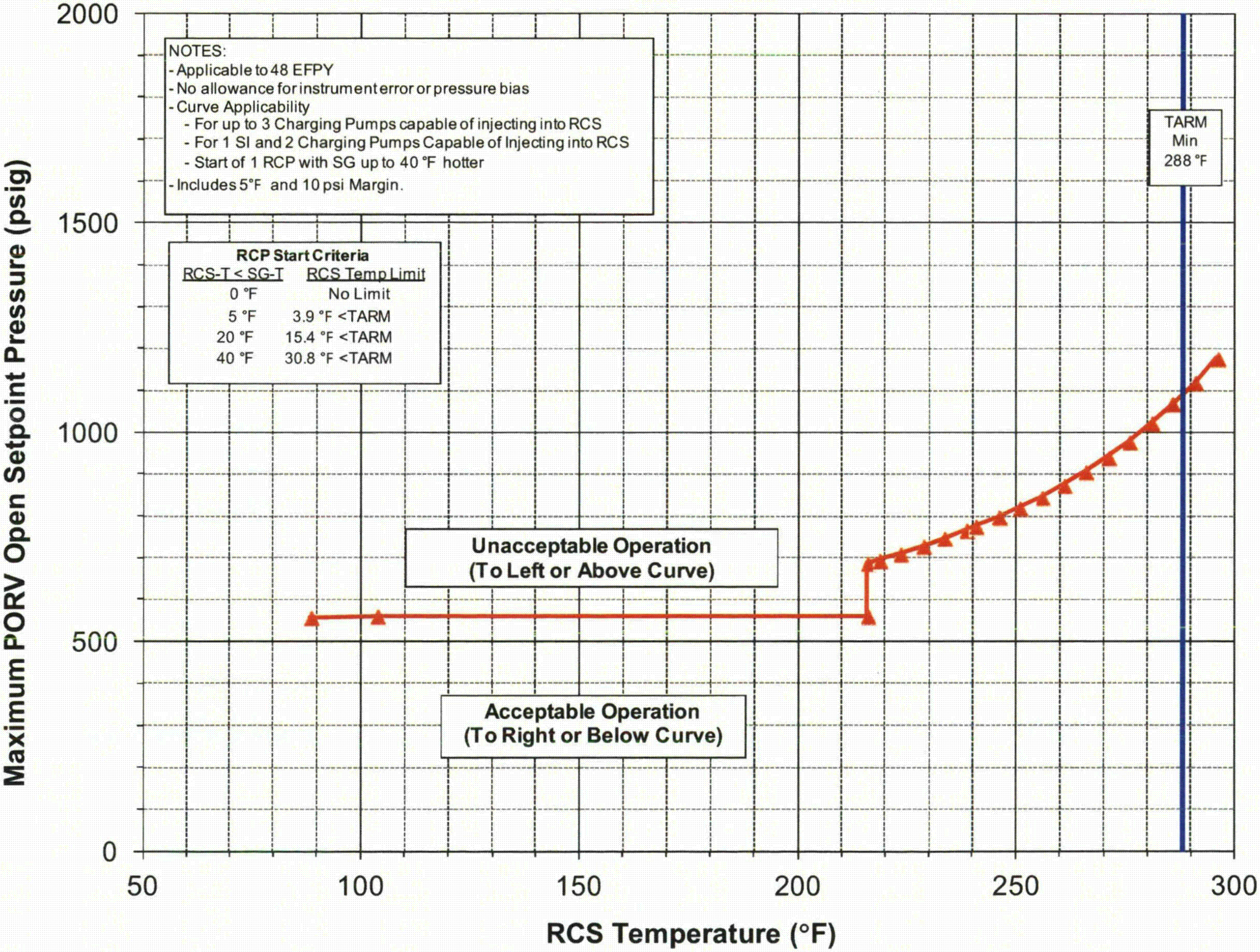


Figure 3.4.12-1: Maximum PORV Opening Setpoint as a Function of Temperature

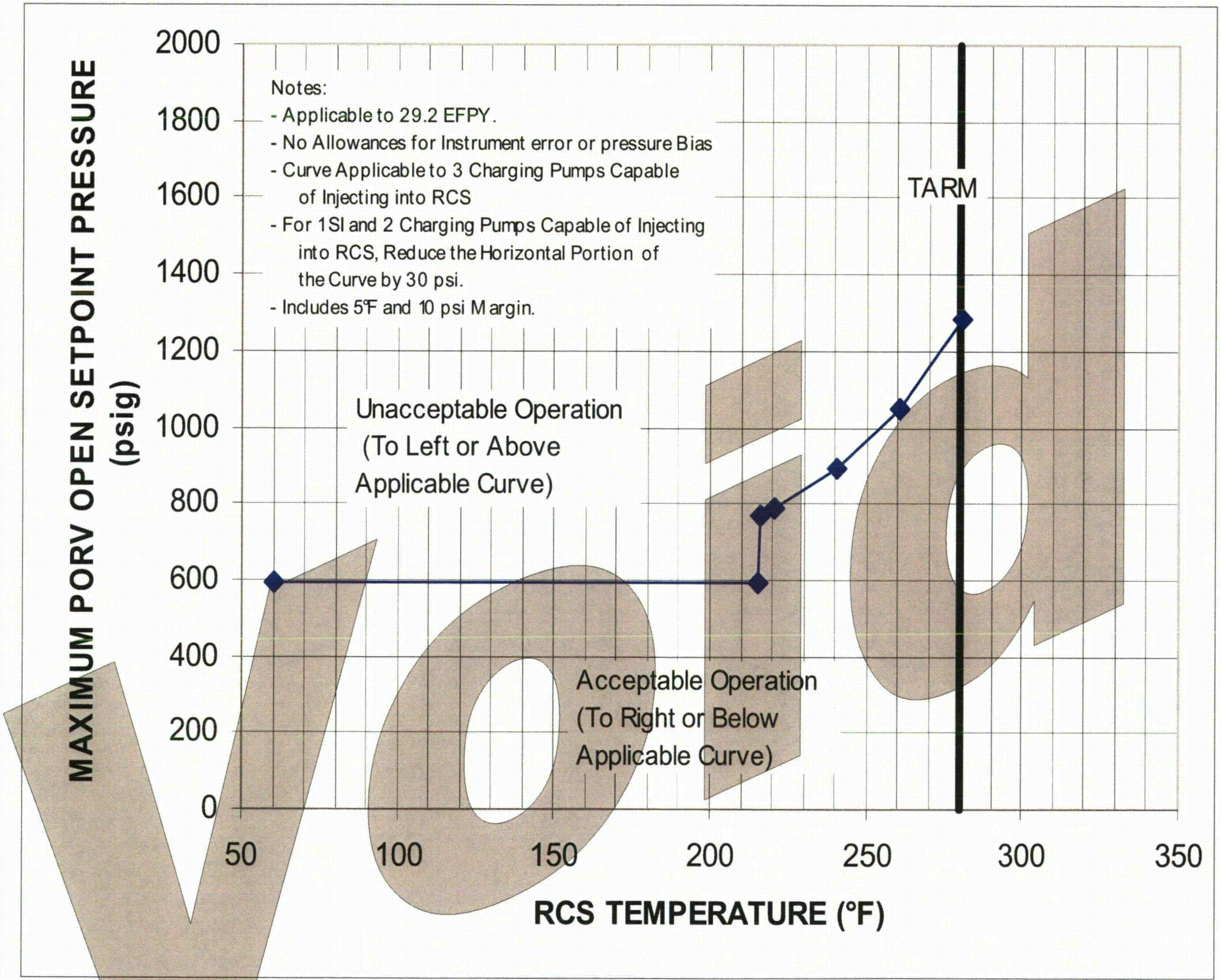


Figure 3.4.12-1: Maximum PORV Opening Setpoint as a Function of Temperature

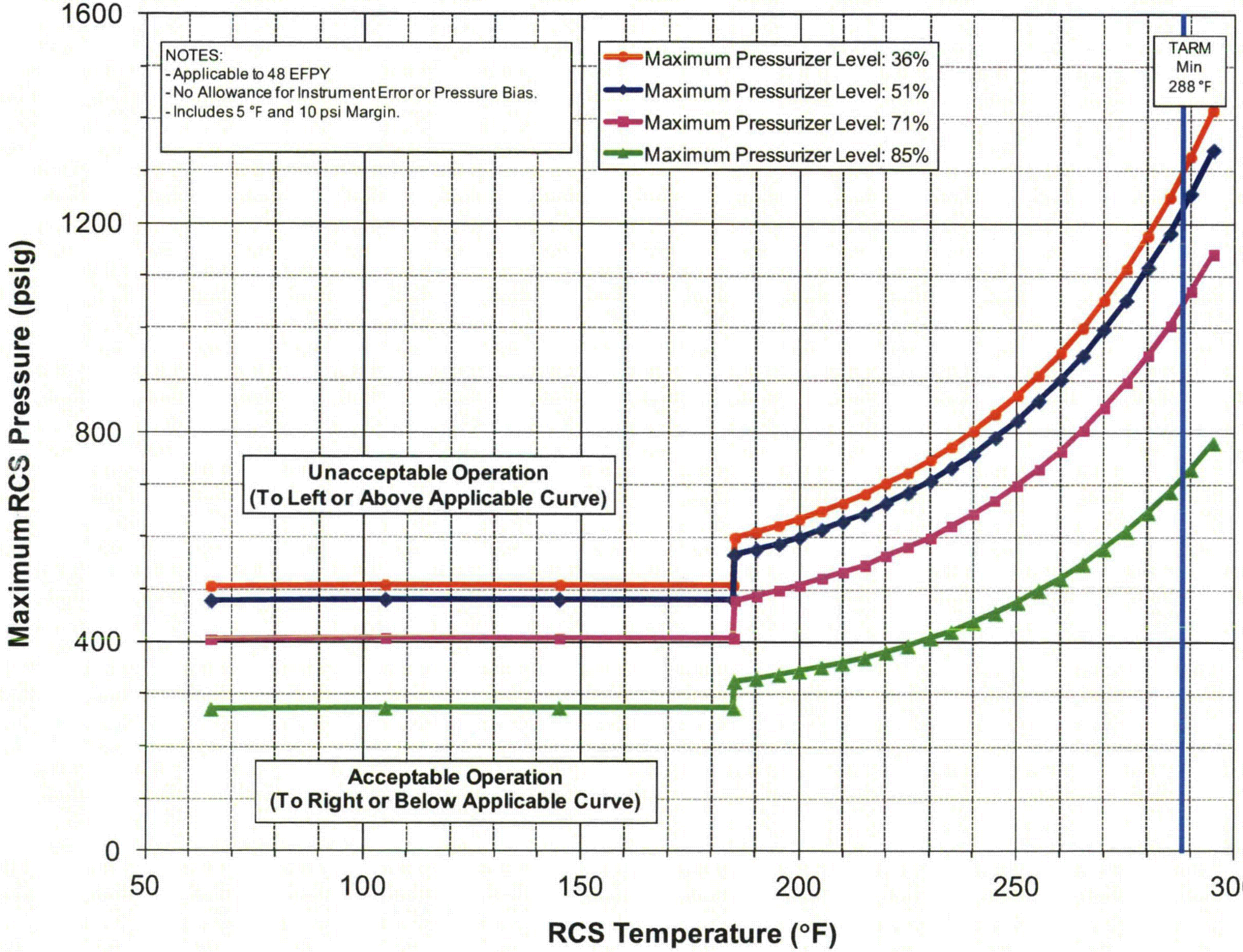


Figure 3.4.12-2: Maximum RCS Pressure - PORVs Inoperable and 1 Charging Pump Capable of Injecting into the RCS.

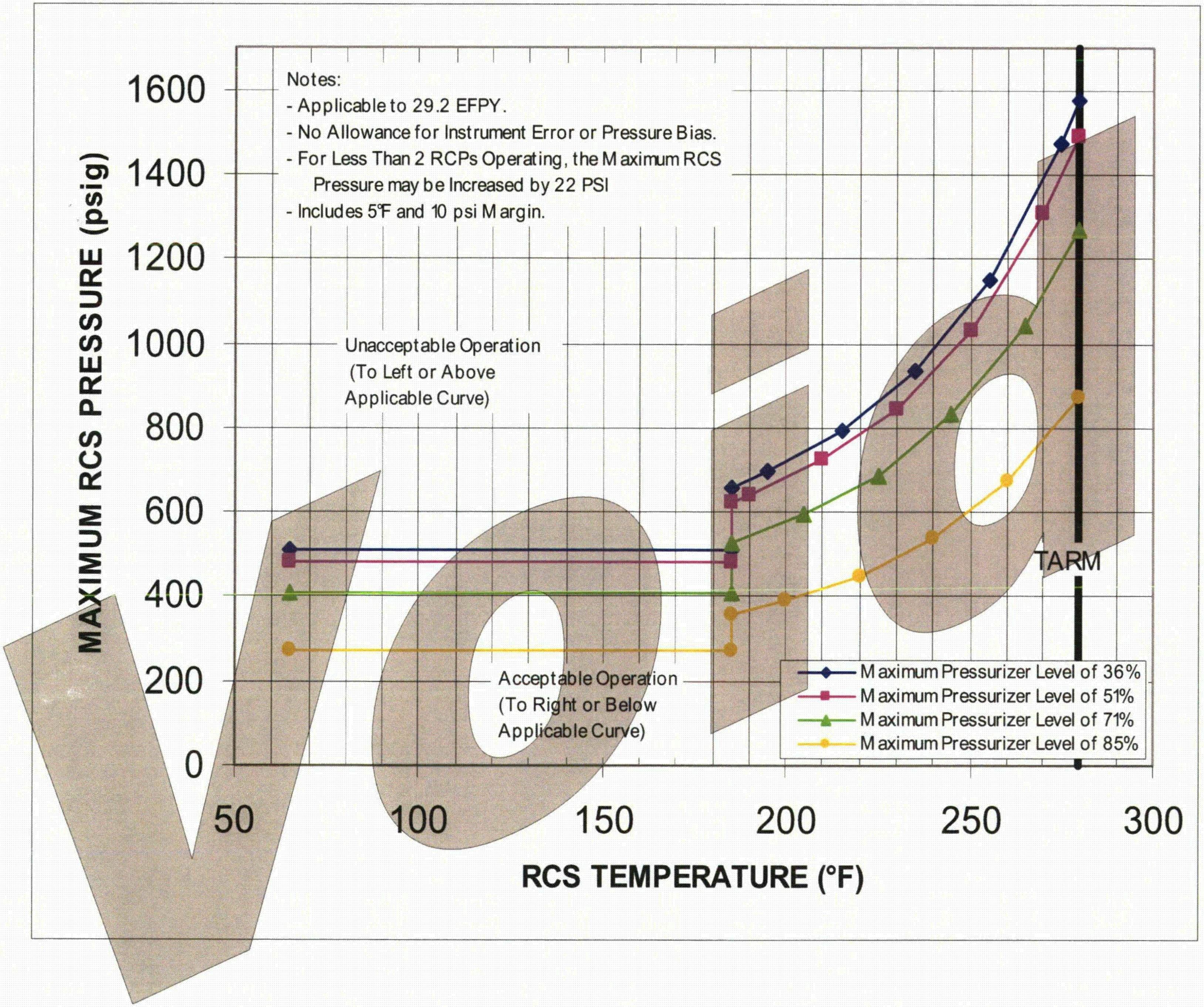


Figure 3.4.12-2: Maximum RCS Pressure - PORVs Inoperable and 1 Charging Pump Capable of Injecting into the RCS.

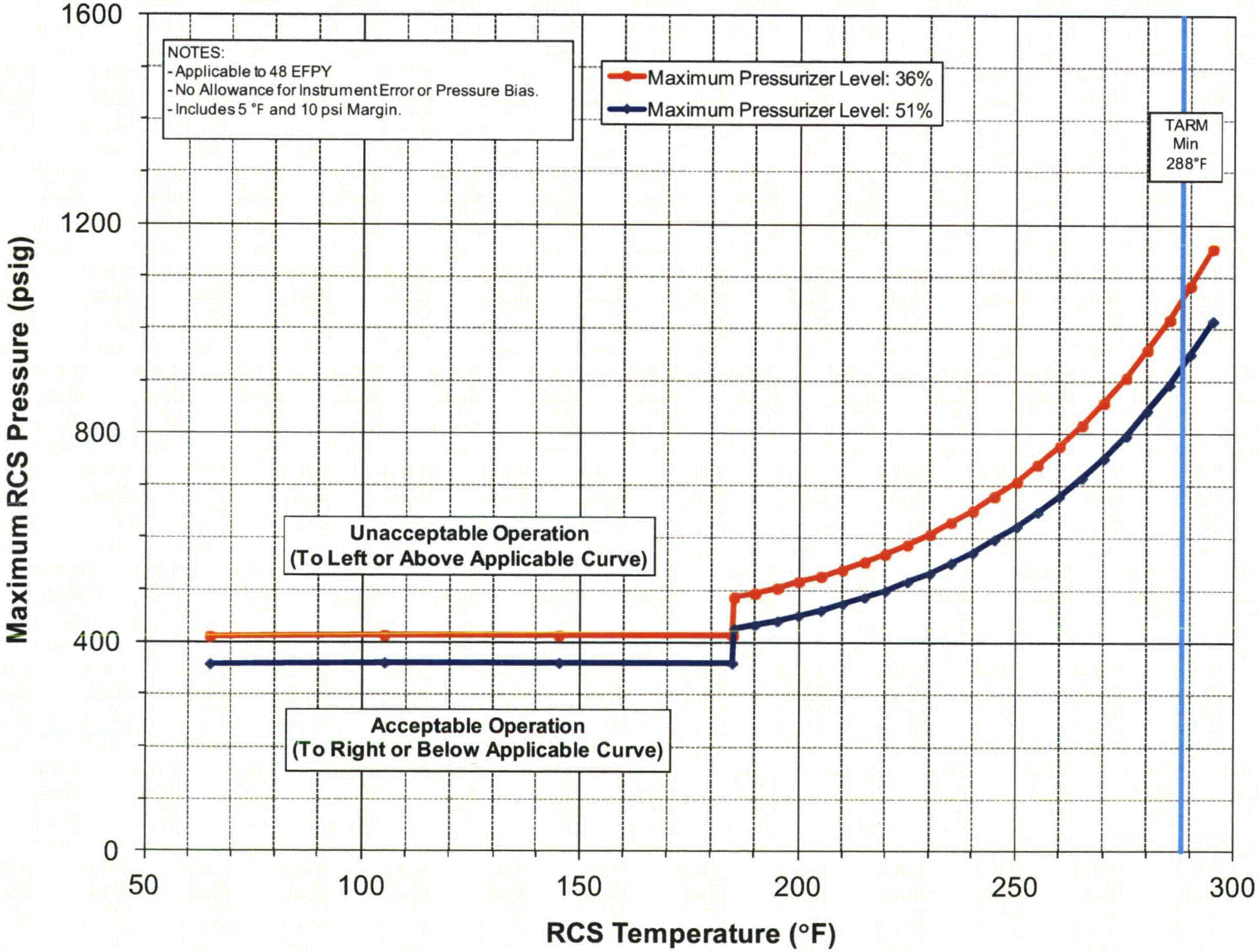


Figure 3.4.12-3: Maximum RCS Pressure - PORVs Inoperable and 2 Charging Pumps Capable of Injecting into the RCS.

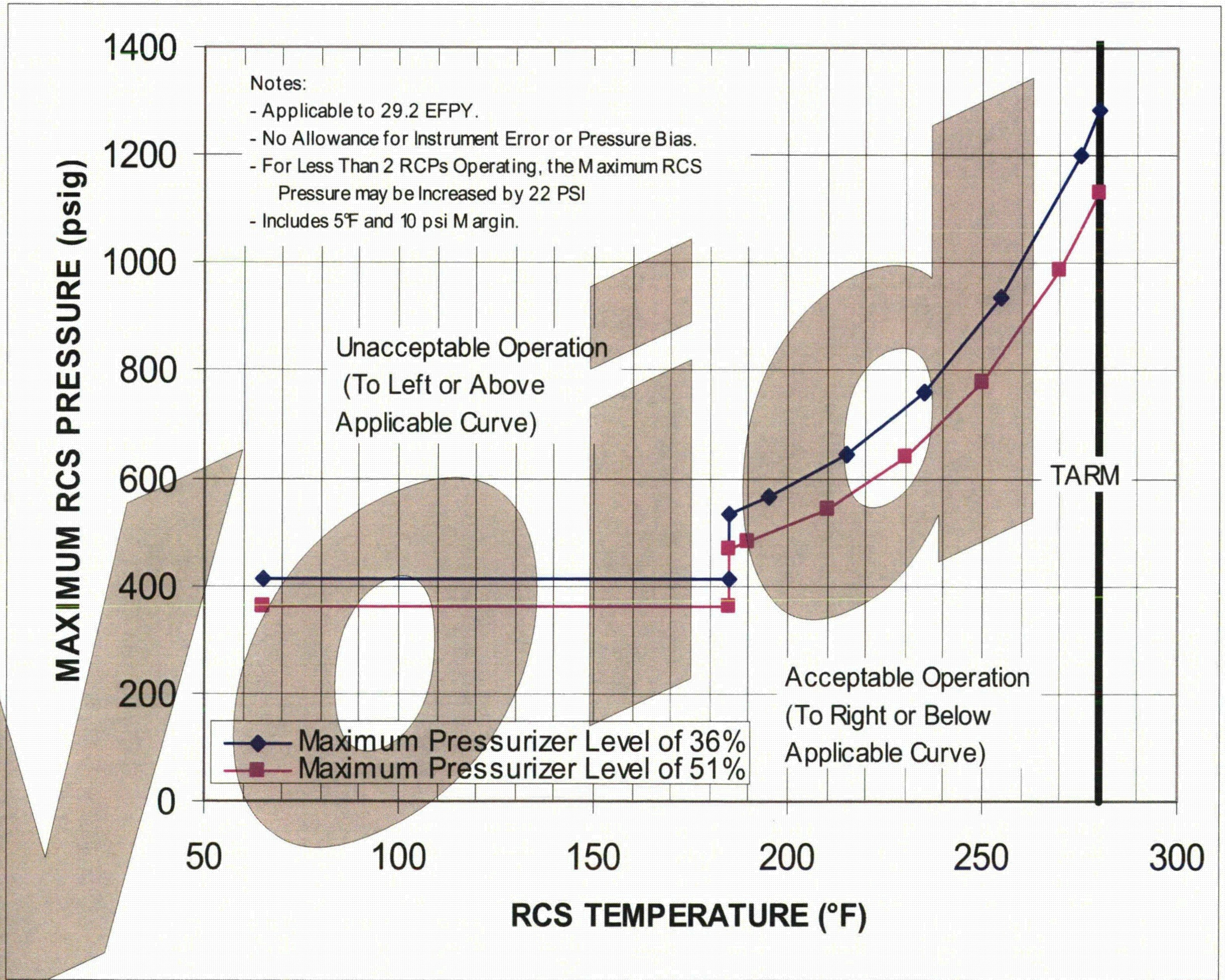


Figure 3.4.12-3: Maximum RCS Pressure - PORVs Inoperable and 2 Charging Pumps Capable of Injecting into the RCS.

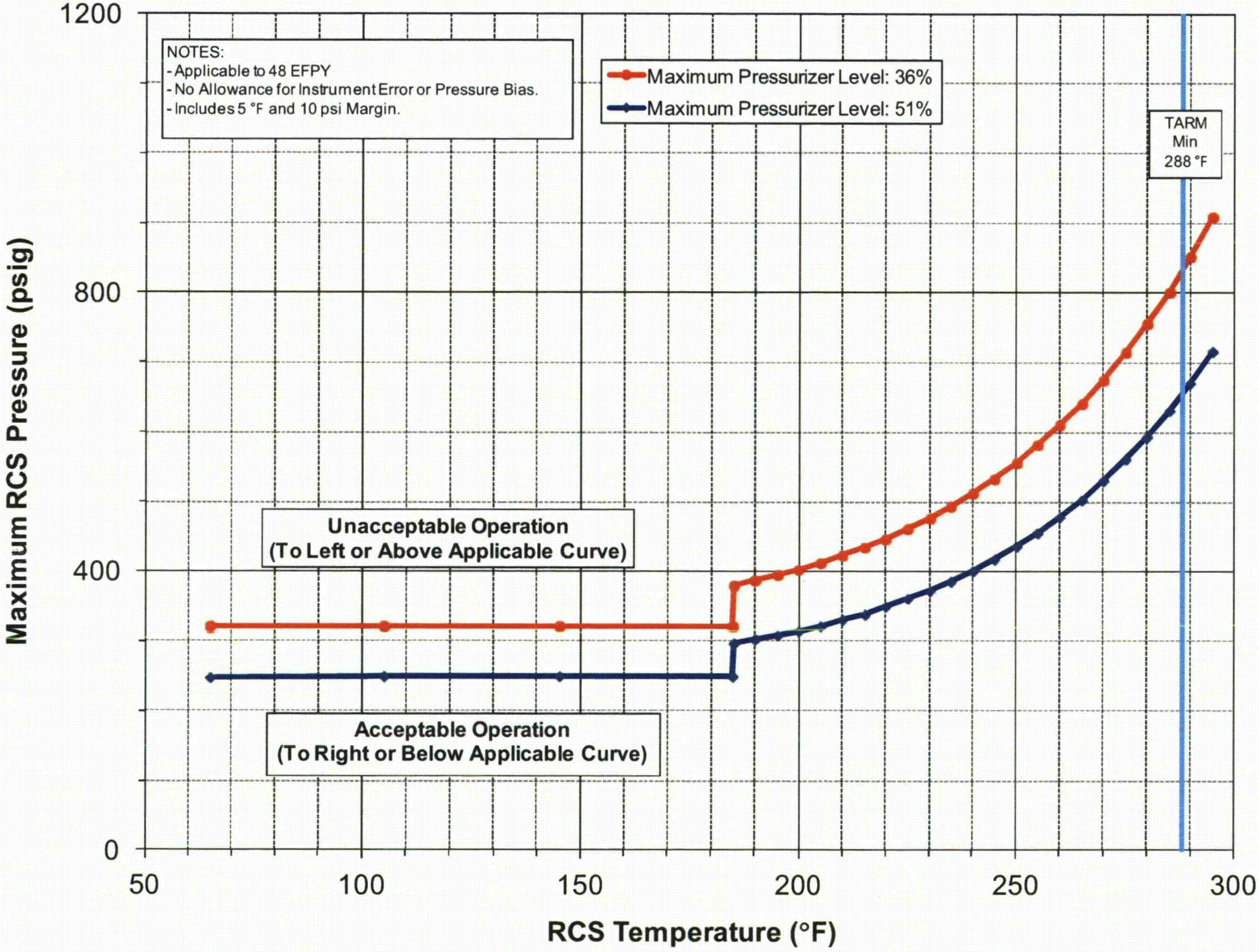


Figure 3.4.12-4: Maximum RCS Pressure - PORVs Inoperable and 3 Charging Pumps Capable of Injecting into the RCS.

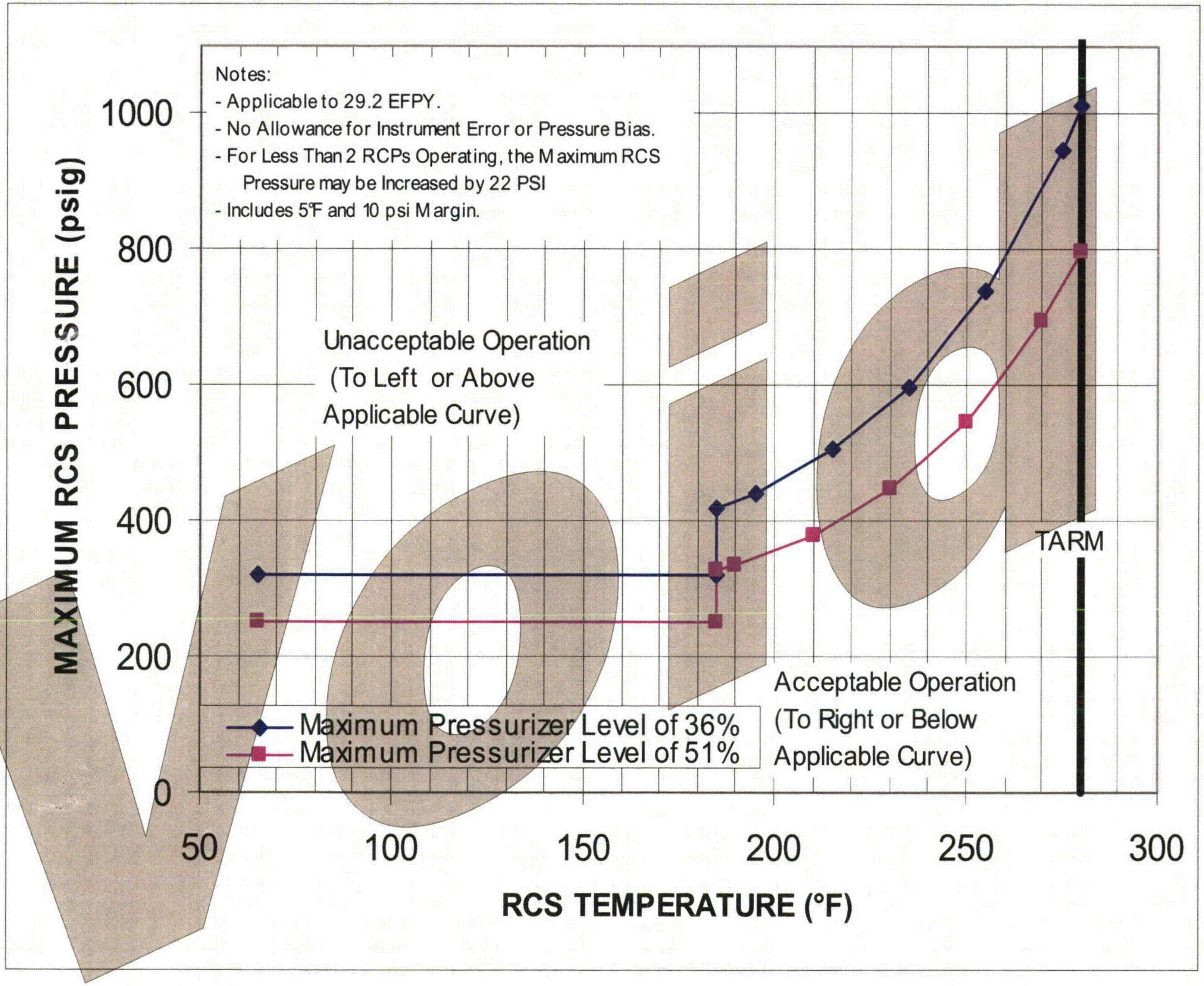


Figure 3.4.12-4: Maximum RCS Pressure - PORVs Inoperable and 3 Charging Pumps Capable of Injecting into the RCS.

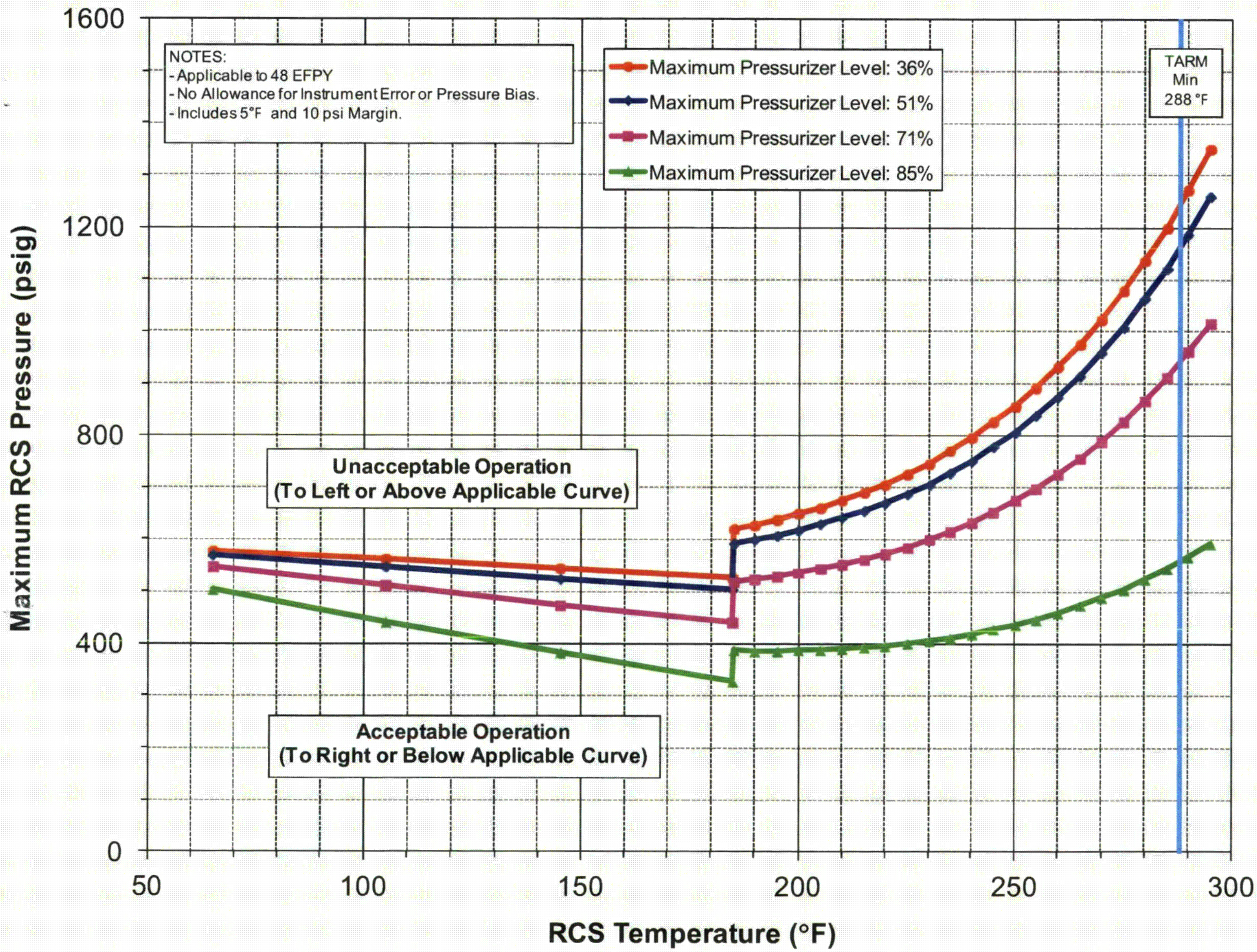


Figure 3.4.12-5: Maximum RCS Pressure and Pressurizer Level during Reactor Coolant Pump Start with PORVs Inoperable and SGs ≤ 40°F Hotter than RCS.

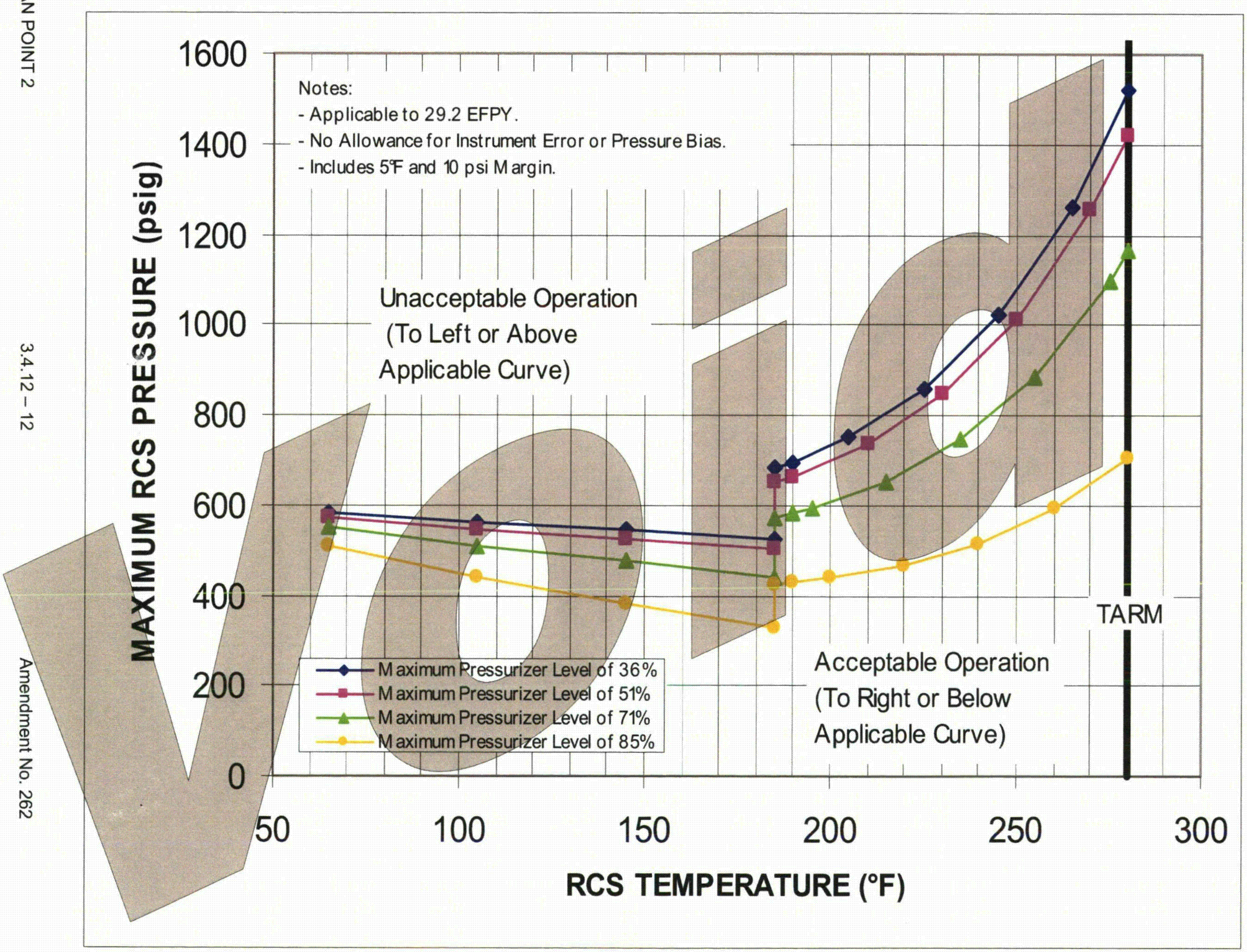


Figure 3.4.12-5: Maximum RCS Pressure and Pressurizer Level during Reactor Coolant Pump Start with PORVs Inoperable and SGs ≤ 40°F Hotter than RCS.

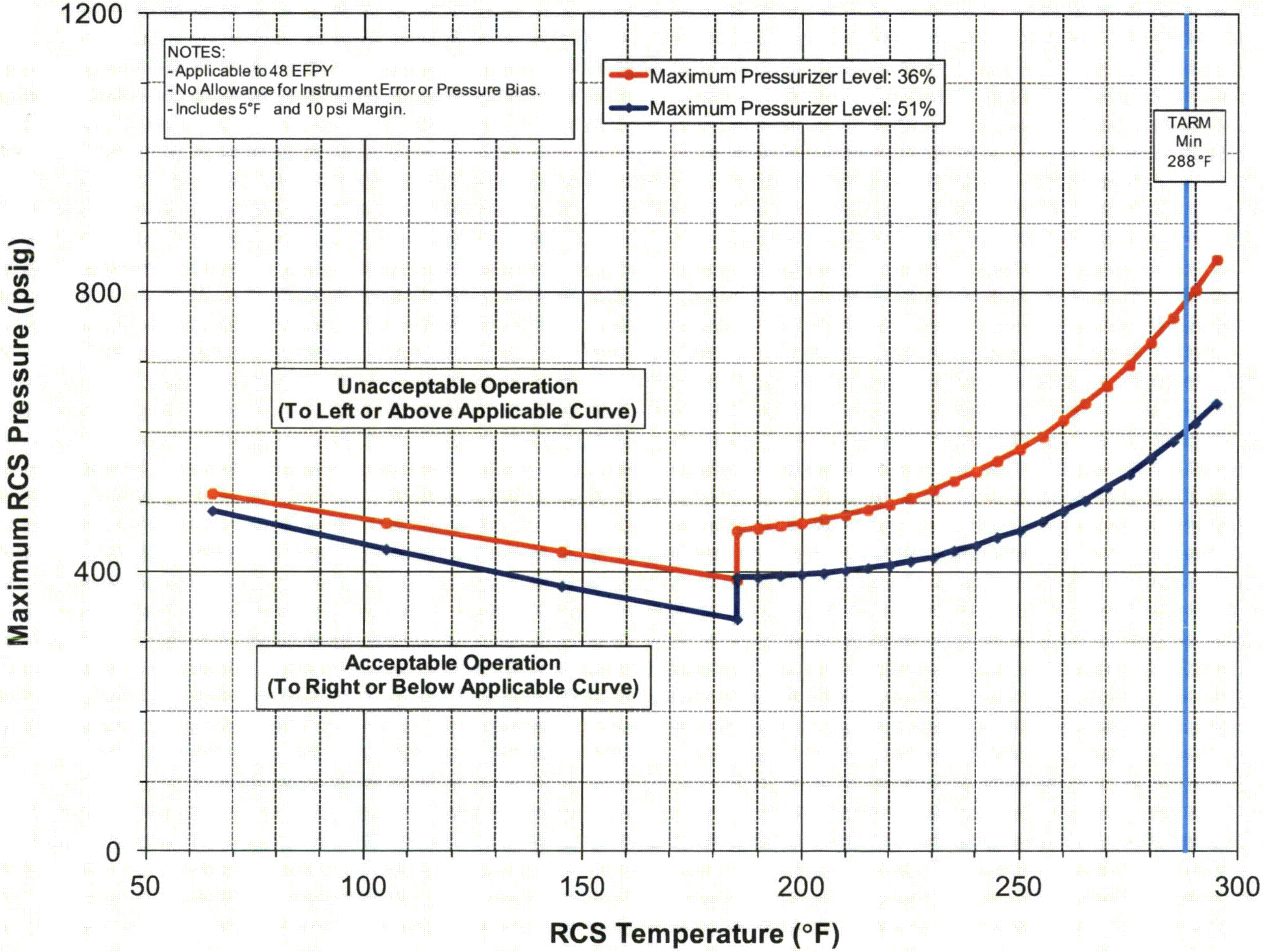


Figure 3.4.12-6: Maximum RCS Pressure and Pressurizer Level during Reactor Coolant Pump Start with PORVs Inoperable and SGs ≤ 100°F Hotter than RCS.

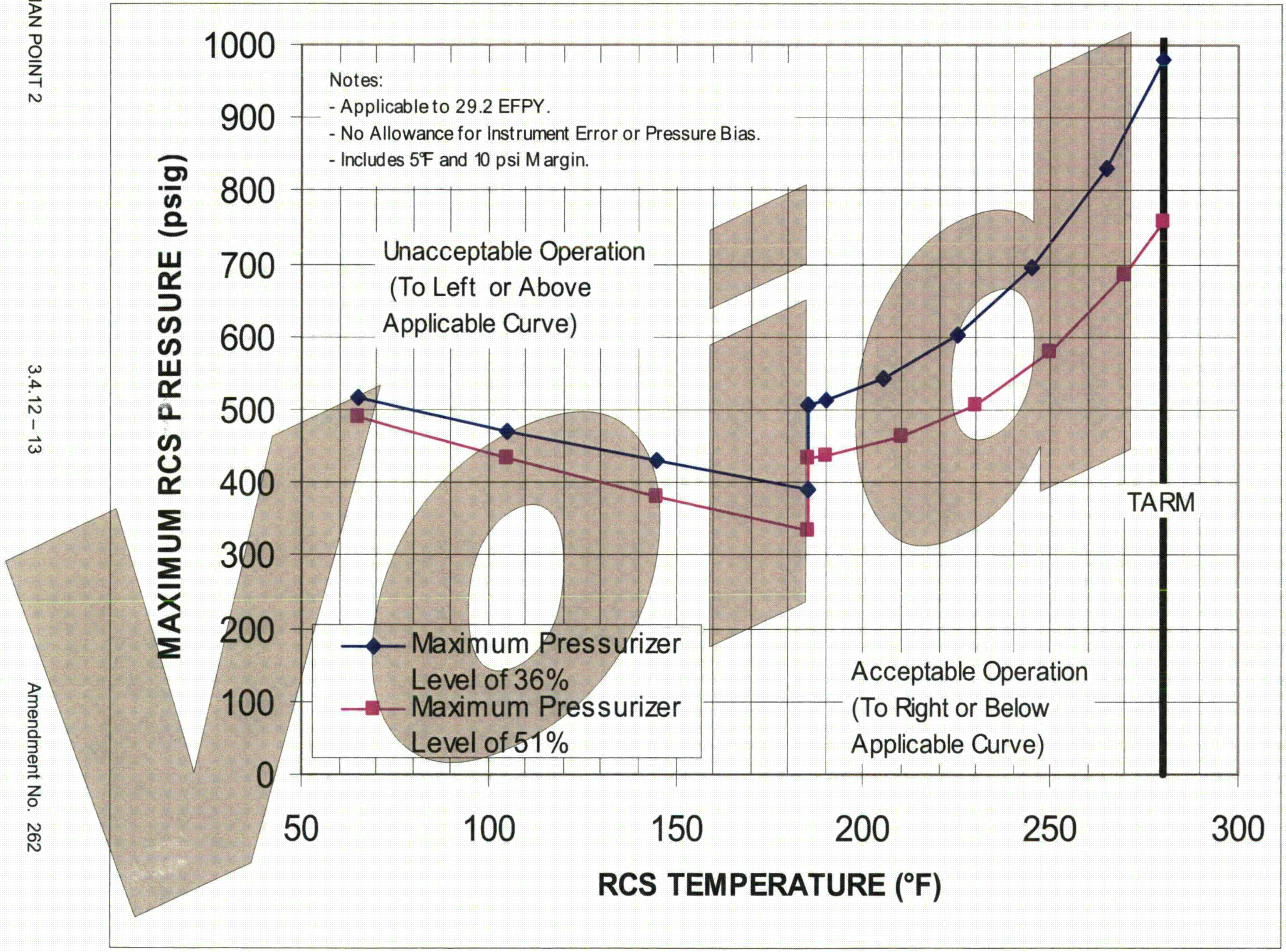


Figure 3.4.12-6: Maximum RCS Pressure and Pressurizer Level during Reactor Coolant Pump Start with PORVs Inoperable and SGs ≤ 100°F Hotter than RCS.

ATTACHMENT 3 TO NL-13-001

MARKUP OF TECHNICAL SPECIFICATION BASES PAGES FOR PROPOSED CHANGES REGARDING REACTOR HEATUP AND COOLDOWN CURVES AND LTOP REQUIREMENTS

Text changes indicated by lineout for deletion and Bold/Italics for additions

Unit 2 Affected Pages:
3.4.3-4
3.4.12-4 and 5
3.4.12-7 to 9
3.4.12-12
3.4.12-14

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NO. 2
DOCKET NO. 50-247

BASES

LCO (continued)

c. The existences, sizes, and orientations of flaws in the vessel material.

Figures 3.4.3-1 and 3.4.3-2 must be revised using approved methodology prior to exceeding ~~29.2~~ ***48*** EFPYs.

APPLICABILITY

The RCS P/T limits LCO provides a definition of acceptable operation for prevention of nonductile failure in accordance with 10 CFR 50, Appendix G (Ref. 2). Although the P/T limits were developed to provide guidance for operation during heatup or cooldown (MODES 3, 4, and 5) or ISLH testing, their Applicability is at all times in keeping with the concern for nonductile failure. The limits do not apply to the pressurizer.

During MODES 1 and 2, other Technical Specifications provide limits for operation that can be more restrictive than or can supplement these P/T limits. LCO 3.4.1, "RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits," LCO 3.4.2, "RCS Minimum Temperature for Criticality," and Safety Limit 2.1, "Safety Limits," also provide operational restrictions for pressure and temperature and maximum pressure. Furthermore, MODES 1 and 2 are above the temperature range of concern for nonductile failure, and stress analyses have been performed for normal maneuvering profiles, such as power ascension or descent.

ACTIONS

A.1 and A.2

Operation outside the P/T limits during MODE 1, 2, 3, or 4 must be corrected so that the RCPB is returned to a condition that has been verified by stress analyses.

The 30 minute Completion Time of Required Action A.1 reflects the urgency of restoring the parameters to within the analyzed range. Most violations will not be severe, and the activity can be accomplished in this time in a controlled manner.

Required Action A.2 recognizes that besides restoring operation within limits, an evaluation is required to determine if RCS operation can continue. The evaluation must verify the RCPB integrity remains acceptable and must be completed before continuing operation. Several methods may be used, including comparison with pre-analyzed transients in the stress analyses, new analyses, or inspection of the components.

BASES

APPLICABLE SAFETY ANALYSIS

Safety analyses (Ref. 4) demonstrate that the reactor vessel is adequately protected against exceeding the Reference 1 P/T limits. In MODES 1, 2, and 3, and in MODE 4 with all RCS cold leg temperatures exceeding ~~280~~***288***°F, the pressurizer safety valves will prevent RCS pressure from exceeding the Reference1 limits. At about ~~280~~***288***°F and below, overpressure protection is established by restricting RCS injection capability using the HHSI pumps and the charging pumps based on the pressure relief capability provided by one of the two power operated relief valves with setpoints based on the RCS temperature (i.e., the Overpressure Protection System) or the size of the vent provided in the RCS for pressure relief. Alternately, if redundant PORVs are not OPERABLE or an RCS vent cannot be established, LTOP protection may be established by limiting the pressurizer level to within limits specified in Figure 3.4.12-2, Figure 3.4.12-3, or Figure 3.4.12-4 depending on the number of charging pumps and number of HHSI pumps capable of injecting into the RCS. This approach is acceptable because pressurizer level can be maintained such that it will either accommodate any anticipated pressure surge or allow operators time to react to any unanticipated pressure surge. When pressurizer level is used to satisfy LTOP requirements, operator action is assumed to terminate an unplanned HHSI pump injection within 10 minutes. The LTOP analysis also assumes that the RCS accumulators are either isolated or depressurized whenever LTOP requirements are applicable.

The actual temperature at which the pressure in the P/T limit curve falls below the pressurizer safety valve setpoint increases as the reactor vessel material toughness decreases due to neutron embrittlement. Each time the P/T curves are revised, LTOP must be re-evaluated to ensure its functional requirements can still be met using the RCS relief valve method or the depressurized and vented RCS condition.

Table 3.4.12-1 and Figures 3.4.12-1 through 3.4.12-6 contain the acceptance limits that define the LTOP requirements. Any change to the RCS must be evaluated against the Reference 4 analyses to determine the impact of the change on the LTOP acceptance limits.

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

<u>Mass Input Type Transients</u>

a. Inadvertent safety injection or

b. Charging/letdown flow mismatch.

BASES

APPLICABLE SAFETY ANALYSES (continued)

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.

PORV Performance

The fracture mechanics analyses show that the vessel is protected when the PORVs are set to open at or below the limit shown in Figure 3.4.12-1. The setpoints are derived by analyses that model the performance of the PORVs in the LTOP mode of operation. 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 Reference 1 P/T limits will be met. The LTOP analysis currently addresses two scenarios that depend on the PORVs in the LTOP mode. With the PORVs set at the ~~normal~~ LTOP setpoint, the analysis requires limiting injection capability to three charging pumps and no HHSI pumps~~. With the PORVs set at the reduced LTOP setpoint, the analysis requires limiting injection capability~~ ***or*** to two charging pumps and one HHSI pump.

The PORV setpoints in Figure 3.4.12-1 will be updated when the revised P/T limits conflict with the LTOP 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 3.4.3, "RCS Pressure and Temperature (P/T) 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 an RCS vent of ≥ 2.00 square inches with a maximum of one HHSI pump and three charging pumps capable of injecting into the RCS or an RCS vent of ≥ 5.00 square inches

BASES

LCO (continued)

Options C, D or E are used only when the required PORVs in LTOP mode are not OPERABLE and there is no vent path established. These options depend on maintaining the combination of pressurizer pressure, pressurizer level and RCS temperature within the limits specified in Figure 3.4.12-2, Figure 3.4.12-3, or Figure 3.4.12-4 depending on the number of HHSI pumps and charging pumps capable of injecting into the RCS.

Options F, G, H and I satisfy LTOP requirements when the RCS is depressurized and an RCS vent of the required size is maintained. A fully blocked open PORV or a PORV with the internals removed with the associated block valve blocked open establishes a vent path ≥ 2.00 square inches. Other methods for establishing a vent of the required size are also acceptable.

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

The LCO is modified by four Notes. Note 1 states that accumulator isolation (i.e., valve closed and power removed as specified in SR 3.4.12.3) is only required when the accumulator pressure is more than or at the maximum RCS pressure for the coldest 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.

Note 2 allows the HHSI pumps to be made capable of injecting into the RCS if required to respond to a loss of RCS inventory. Note 3 allows one HHSI pump to be made capable of injecting into the RCS as needed for emergency boration or in response to loss of RHR cooling. Note 4 specifies that SR 3.4.12.8 must be met when starting any RCP to ensure that temperature asymmetry within the RCS or between the RCS and steam generators does not result in a pressure increase that could exceed LTOP relief capacity.

APPLICABILITY

This LCO is applicable in MODE 4 when any RCS cold leg temperature is ≤ ~~280~~***288***°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 ~~280~~***288***°F. When the reactor vessel head is off, overpressurization cannot occur.

BASES

APPLICABILITY (continued)

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 ~~280~~ ***288***°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.

ACTIONS

A Note prohibits the application of LCO 3.0.4.b to an inoperable LTOP system. There is an increased risk associated with entering MODE 4 from MODE 5 with LTOP inoperable and the provisions of LCO 3.0.4.b, which allow entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, should not be applied in this circumstance.

A.1

RCS overpressurization is possible whenever the number of HHSI pumps and/or charging pumps capable of injecting into the RCS exceeds Table 3.4.12-1 limits for plant conditions or the combination of pressurizer pressure, pressurizer level and RCS temperature is not within the limits specified in Figure 3.4.12-2, Figure 3.4.12-3 or Figure 3.4.12-4 depending on the number of HHSI pumps and charging pumps capable of injecting into the RCS.

The urgency for removing the RCS from this condition is reflected in the Completion Time of immediately for the Required Action to verify that the number of HHSI pumps and charging pumps capable of injecting into the RCS is within Table 3.4.12-1 limits for plant conditions or restore the combination of pressurizer pressure, pressurizer level and RCS temperature to within the limits specified in Figure 3.4.12-2, Figure 3.4.12-3 or Figure 3.4.12-4 depending on the number of HHSI pumps and charging pumps capable of injecting into the RCS.

BASES

ACTIONS (continued)

Required Action A.1 is modified by a Note that permits exceeding the Table 3.4.12-1 limit on the number of charging pumps capable of injecting into the RCS for a period of 15 minutes during pump swap operations. This allowance recognizes operational requirements for continuous availability of a minimum number of charging pumps and the low probability of an overpressure event during the 15 minutes allowed for swapping pumps.

B.1, C.1, and C.2

An improperly isolated accumulator (isolation valve closed with power not removed per SR 3.4.12.3) 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 C.1 and Required Action C.2 provide two options, either of which must be performed in the next 12 hours. By increasing the RCS temperature to > ~~280~~***288***°F, accumulator pressure cannot exceed the LTOP limits if the accumulators are injected. Depressurizing the accumulators below the LTOP limit from Figure 3.4.12-1 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.

D.1

In MODE 4 when any RCS cold leg temperature is ≤ ~~280~~***288***°F, with one required PORV inoperable, the PORV must be restored to OPERABLE status within a Completion Time of 7 days. Two PORVs 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 PORVs 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.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.12.5

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 only if the PORV is being used to satisfy the LCO.

The block valve is a remotely controlled, motor operated valve that opens automatically below the LTOP Applicability temperature. The power to the valve operator is not required to be removed, and the manual operator is not required to be locked in the open 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.

SR 3.4.12.6

Performance of a COT on each required PORV is required within 12 hours after decreasing RCS temperature to less than or equal to LTOP Applicability temperature and every 31 days thereafter to verify and, as necessary, adjust its lift setpoint. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable COT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The COT will verify the setpoint is within Figure 3.4.12-1 allowed maximum limits. PORV actuation could depressurize the RCS and is not required.

A Note has been added indicating that this SR is required to be performed (i.e., completed) within 12 hours after decreasing RCS cold leg temperature to ≤ ~~280~~***288***°F. The 12 hour allowance considers the unlikelihood of a low temperature overpressure event during this time.

BASES

SURVEILLANCE REQUIREMENTS (continued)

(c) contact reading from the steam generator shell; or

(d) actual or inferred measurement of the secondary side steam generator water temperature at those times it can be measured (such as return from a refueling outage).

The Frequency for verification of the RCP starting prerequisites is 30 minutes prior to starting any RCP. This means that each of the required verifications must be performed within 30 minutes prior to the pump start and must be met at the time of the pump start.

REFERENCES

1. Safety Evaluation by the Office of Nuclear Reactor Regulation Related to Amendment No. ~~262~~ ***XXX*** to Facility Operating License No. DPR-26, ~~August 17, 2009~~ ***(date of SER)***.
2. Generic Letter 88-11.
3. ASME, Boiler and Pressure Vessel Code, Section III.
4. UFSAR, Section 4.3.4.
5. 10 CFR 50, Section 50.46.
6. 10 CFR 50, Appendix K.
7. Generic Letter 90-06.
8. ASME, Boiler and Pressure Vessel Code, Section XI.