Entergy

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Fred Dacimo
Site Vice President
Administration

January 18, 2007

Re: Indian Point Unit 3
Docket 50-286

NL-07-008

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

SUBJECT: **Proposed Changes to Indian Point 3 Technical Specifications Regarding Updated Pressure-Temperature and Low Temperature Overpressure Protection System Limits**

REFERENCES:

1. NRC letter to Entergy dated December 3, 2003; regarding issuance of Indian Point 3 License Amendment 220 for changes to pressure-temperature curves. (ML033370869)

2. NRC letter to Entergy dated March 24, 2005; regarding issuance of Indian Point 3 License Amendment 225 for stretch power uprate. (ML050600380)

Dear Sir:

Pursuant to 10 CFR 50.90, Entergy Nuclear Operations, Inc, (Entergy) hereby requests an amendment to the Technical Specifications for Indian Point Nuclear Generating Unit 3 (IP3). The proposed change will:

- Revise the expiration limit from 20 Effective Full Power Years (EFPY) to 27.2 EFPY for the three Pressure / Temperature (P/T) Limit graphs in Technical Specification Section 3.4.3 and the four Low Temperature Overpressure Protection (LTOP) graphs in Technical Specification Section 3.4.12.

- Revise the adjusted reference temperature (ART) for the reactor pressure vessel to reflect the above revised expiration limit. The ART at the ¼ T location is changed from 230.1°F to 241.1°F and the ART for the ¾ T location is changed from 188.8°F to 198.1°F.

- Revise the Low Temperature Overpressure Protection (LTOP) system arming temperature value specified in Technical Specifications 3.4.7, 3.4.10, and 3.4.12 from 319°F to 330°F. In addition, editorial changes are proposed to make the use of inequality signs consistent among Sections 3.4.7, 3.4.10, and 3.4.12.

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The current P/T limit and LTOP graphs, with an expiration of 20 EFPY were established by Amendment 220 (Reference 1) and were subsequently reevaluated in Amendment 225 (Reference 2). The analysis methodology used for this license amendment request is the same as that used in the prior amendments 220 and 225. The actual pressure-temperature operating limits depicted in the existing graphs are not being changed. The analysis previously approved by NRC for the existing graphs is valid for 34 EFPY. The existing limit of 20 EFPY was established by Entergy to allow use of the LTOP arming temperature (319^{O}F) that was in effect when license amendment 220 was requested. This amendment will now specify the expiration limit as 27.2 EFPY, and a more restrictive LTOP arming temperature (330^{O}F) will be established to maintain the validity of the graphs for the new expiration limit.

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 One. The proposed changes to the Technical Specifications are shown in Attachment Two. A copy of this application and the associated attachments are being submitted to the designated New York State official.

Entergy estimates that the current limit of 20 EFPY will be reached in December 2007. Therefore, Entergy requests approval of the proposed amendment by November 15, 2007. The proposed change to 27.2 EFPY will provide for valid graphs and limits for operation through 2015. There are no new commitments being made in this submittal. If you have any questions or require additional information, please contact Mr. Patric W. Conroy, IPEC Licensing Manager at (914) 734-6668.

I declare under penalty of perjury that the foregoing is true and correct. Executed on 1-18-2007

Sincerely,

Fred R. Dacimo
Site Vice President
Indian Point Energy Center

Attachments:

One: Analysis of Proposed Technical Specification Changes Regarding Updated Pressure-Temperature and Low Temperature Overpressure Protection System Limits

Two: Markup of Technical Specification Pages for Proposed Changes Regarding Updated Pressure-Temperature and Low Temperature Overpressure Protection System Limits

cc: Mr. John P. Boska, Senior Project Manager, NRC NRR DORL
Mr. Samuel J. Collins, Regional Administrator, NRC Region 1
NRC Resident Inspector, IP2
NRC Resident Inspector, IP3
Mr. Peter R. Smith, President, NYSERDA
Mr. Paul Eddy, New York State Dept. of Public Service

ATTACHMENT ONE TO NL-07-008

ANALYSIS OF PROPOSED

TECHNICAL SPECIFICATION CHANGES REGARDING

UPDATED PRESSURE-TEMPERATURE AND

LOW TEMPERATURE OVERPRESSURE PROTECTION SYSTEM LIMITS

ENTERGY NUCLEAR OPERATIONS, INC.
INDIAN POINT NUCLEAR GENERATING UNIT NO. 3
DOCKET NO. 50-286

1.0 DESCRIPTION

This is a request to amend Operating License DPR-64, Docket No. 50-286 for Indian Point Nuclear Generating Unit No. 3 (IP3). The proposed change will revise Technical Specifications Sections 3.4.3, 3.4.7, 3.4.10, and 3.4.12 as follows:

- Revise the expiration limit from 20 Effective Full Power Years (EFPY) to 27.2 EFPY for the three Pressure / Temperature (P/T) Limit graphs in Technical Specification Section 3.4.3 and the four Low Temperature Overpressure Protection (LTOP) graphs in Technical Specification Section 3.4.12.

- Revise the adjusted reference temperature (ART) for the reactor pressure vessel to reflect the above revised expiration limit. The ART at the ¼ T location is changed from 230.1°F to 241.1°F and the ART for the ¾ T location is changed from 188.8°F to 198.1°F.

- Revise the Low Temperature Overpressure Protection (LTOP) system arming temperature specified in Technical Specifications 3.4.7, 3.4.10, and 3.4.12 from 319°F to 330°F. In addition, editorial changes are proposed to make the use of inequality signs consistent among Sections 3.4.7, 3.4.10, and 3.4.12.

2.0 PROPOSED CHANGES

The proposed changes and affected pages are summarized in the following table. The markup of existing Technical Specification pages is provided in Attachment Two.

Summary Table of Affected Technical Specification Pages

Page	Revise EFPY	Revise ART	Revise LTOP temperature
Section 3.4.3: Reactor Coolant System Pressure and Temperature (P/T) Limits			
3.4.3-3	X	X	n/a
3.4.3-4	X	X	n/a
3.4.3-5	X	X	n/a
Section 3.4.7: RCS Loops – Mode 5 Loops Filled			
3.4.7-1	n/a	n/a	X
Section 3.4.10 Pressurizer Spray Valves			
3.4.10-1	n/a	n/a	X
Section 3.4.12: Reactor Coolant System Low Temperature Overpressure Protection (LTOP)			
3.4.12-1	n/a	n/a	X +
3.4.12-3	n/a	n/a	X +
3.4.12-4	n/a	n/a	X +
3.4.12-6	n/a	n/a	X +
3.4.12-7	n/a	n/a	X +
3.4.12-8	n/a	n/a	X +
3.4.12-9	X	n/a	X
3.4.12-10	X	n/a	n/a
3.4.12-11	X	n/a	n/a
3.4.12-12	X	n/a	n/a

Notes: 'X' indicates value change required on this page
'+' indicates correction of inequality sign
'n/a' indicates parameter does not appear on this page

Related Bases changes consist simply of revisions on approximately 15 pages to reflect the new values and inequality signs described above. Therefore, informational markups of these changes are not provided with this amendment request.

3.0 BACKGROUND

This license amendment request proposes to revise the Effective Full Power Years (EFPY) limit associated with the Pressure-Temperature (P/T) and Low Temperature Overpressure Protection (LTOP) System graphs. The P/T curves define an acceptable region for normal plant operation. They limit the pressure and temperature changes during Reactor Coolant System (RCS) heatup and cooldown to within the design assumptions and the established stress limits for cyclic operation.

The LTOP system controls the RCS pressure at low temperatures to ensure the integrity of the reactor coolant boundary is not compromised by violating the pressure and temperature limits of 10CFR 50, Appendix G. The current IP3 Technical Specifications associated with RCS heatup and cooldown are based on a designated expiration limit of 20 EFPY, with a calculated Adjusted Reference Temperature (ART) of 230.1 ^{O}F at the ¼ vessel thickness and 188.8 ^{O}F at the ¾ vessel thickness. The proposed amendment seeks to revise the EFPY limit to 27.2 EFPY, which corresponds to the expected service life at the expiration of the current operating license. The ARTs at 27.2 EFPY are 241.1 ^{O}F at the ¼ vessel thickness and 198.1 ^{O}F at the ¾ vessel thickness. The P/T and LTOP graphs which denote the operating limits to be implemented by plant operators are not being changed in this amendment request, since the limits remain valid through a service life of 34.0 EFPY (References 1 and 2). The validity of the existing graphs is maintained by establishing a more restrictive limit on the LTOP system arming temperature, which is the temperature at which the power operated relief valves (PORVs) will open if RCS pressure exceeds the temperature dependent value depicted in the LTOP curves. The current arming temperature value of 319^{O}F is being increased to 330^{O}F.

In addition, Entergy has determined that inequality signs used in relation to the LTOP arming temperature are not consistently used among three affected Technical Specification sections. For example, Specification 3.4.7 establishes requirements for RCS heat removal capability, and a LCO Note imposes a restriction on RCP starts if RCS temperature is in the LTOP applicability window from Specification 3.4.12. Currently, the IP3 3.4.7 LCO Note is specified as " $\leq$ " , however IP3 3.4.12 applicability is specified as " < ". The inequality symbol in 3.4.12 needs to be changed to " $\leq$ " to be consistent with 3.4.7. This change is also consistent with the inequality signs used in the Standard Technical Specifications (NUREG-1431).

In another example, Specification 3.4.10 establishes requirements for RCS overpressure protection (pressurizer safety valves) when at temperatures above the LTOP arming temperature stated in Specification 3.4.12. Currently, the IP3 3.4.10 applicability is specified as " > " , and the IP3 3.4.12 applicability is specified as " < ". This results in a situation where a temperature equal to the LTOP arming temperature is not covered by either applicability statement. Therefore, the inequality symbol in IP3 3.4.12 needs to be changed to " $\leq$ ". This change is also consistent with the inequality signs used in NUREG-1431.

This observation regarding the use of inequality signs applies to 7 locations in IP3 Specification 3.4.12. The required corrections are shown on the technical specification markup pages provided in Attachment Two.

4.0 TECHNICAL ANALYSIS

The P/T limits currently in the Technical Specifications were developed in accordance with the requirements of 10CFR50 Appendix G and Regulatory Guide 1.99 Rev 2 as described in WCAP-16037 Revision 1, May 2003 ("Final Report on Pressure-Temperature Limits for Indian Point Unit 3 NPP") which was provided in Reference 3. As noted in that WCAP, these curves were prepared for a plant service lifetime of up to 34.7 Effective Full Power Years (EFPY), based on the licensed power level of 3067.4 MWth in effect at that time. The License Amendment Request (LAR) for implementation of these limits (Reference 3) established a more limiting expiration date of 20 EFPY instead of 34.7 EFPY, so that the Technical Specification limit on LTOP system arming temperature (319 ^{o}F) did not have to be changed at that time.

In order to extend the P/T operating limits beyond the current 20 EFPY service life limit, a more restrictive limit on the LTOP system arming temperature must be implemented in order to compensate for the effects of the increase in neutron fluence on the reactor vessel. Reference 3 included a calculation showing the correlation of LTOP system arming temperature with lifetime service burnup. A formula was provided showing how an applicable arming temperature may be determined for any chosen lifetime burnup, and vice versa. Applying this formula for the proposed new service life limit of 27.2 EFPY yields a new LTOP system arming temperature of 330^{o}F.

The choice of 27.2 EFPY is based upon Entergy's current estimate of the lifetime service burnup upon expiration of the current facility operating license. Furthermore, 27.2 EFPY is a burnup explicitly evaluated in WCAP-16037, including the determination of the RT-NDT temperatures at the ¼ and the ¾ vessel thicknesses, as identified on TS Figures 3.4.3-1, 3.4.3-2 and 3.4.3-3.

Reference 1 documented NRC approval of Entergy's amendment request which was based on P/T curves valid for up to 34.7 EFPY, for the licensed power level of 3067.4 MWth in effect at that time. Subsequently, Entergy proposed a 4.85% stretch power uprate (SPU) for IP3 and calculated that the neutron fluence used for developing those P/T curves would be reached in 34.0 EFPY, under the SPU conditions. Since a more limiting expiration period of 20 EFPY was used for the technical specification curves, no change to technical specification curves was needed for the SPU license amendment. Entergy also evaluated the effect of SPU on pressurized thermal shock (PTS) screening criteria (10 CFR 50.61) and Upper Shelf Energy limits (10 CFR 50 Appendix G). Entergy determined that the most limiting PTS screening criterion would be reached at 35.7 EFPY, based on the material properties of the Lower Shell Baseplate, B2803-3, which is the limiting material for the IP3 reactor vessel. Entergy also determined that the limit on reactor vessel Upper Shelf Energy (USE) of >50 ft-lb will be met through a lifetime burnup of greater than 45 EFPY. Reference 2 documented NRC approval of SPU, including the effect on the service life applicable to the P/T graphs. Therefore, for these reasons, the P/T limit curves as they exist in the current technical specifications remain valid and need not be changed for the proposed new expiration limit of 27.2 EFPY.

The reactor vessel surveillance program for IP3 was evaluated as part of the SPU project. To date, four capsules have been withdrawn, with a fifth to be scheduled at a future refueling outage in accordance with the recommendations of ASTM-E185-82. The data analysis for the vessel specimens removed to date confirm that the vessel materials are responding as predicted, and the surveillance program has been shown to provide credible results in accordance with NRC standards.

The methodology under which the existing curves were originally prepared remains valid. The curves are based on the irradiation damage prediction methods of Regulatory Guide 1.99, Rev 2. This methodology has been used repeatedly to calculate the limiting material ARTs for IP3. The crack initiation reference stress intensity factor (K_{IC}) was used for determining the fracture toughness of the beltline. The use of K_{IC} as the basis for establishing the reference fracture toughness limit, K_{IR}, value for the vessel is currently outlined in ASME Code Case N-640. Approval of the LAR for the existing technical specification curves was based on an exemption requested by Entergy and approved by NRC (Reference 4). Use of this Code Case is now approved in Regulatory Guide 1.147 (Revision 14, August 2005) and the exemption is no longer required.

In summary, this LAR proposes changes to the family of Heatup, Cooldown and LTOP figures and specifications in the IP3 TS. The curves themselves are still valid through a proposed lifetime of 27.2 EFPY and do not change. The LTOP system arming temperature has been increased from 319 ^{o}F to 330 ^{o}F, to ensure that 10 CFR 50 Appendix G limits will continue to be met for plant operation through 27.2 EFPY. The adjusted RT-NDT (ART) values appearing on TS Figures 3.4.3-1 through 3.4.3-3 also have been revised to account for the higher burnup limit.

5.0 REGULATORY ANALYSIS

5.1 No Significant Hazards Consideration

Entergy Nuclear Operations, Inc. (Entergy) has evaluated the safety significance of the proposed changes to the Indian Point 3 (IP3) Technical Specification Sections 3.4.3, 3.4.7, 3.4.10, and 3.4.12. The proposed change is an increase of the service life limit specified for the graphs that define the pressure-temperature operating limits for the reactor coolant system. The current service life limit of 20 Effective Full Power Years (EFPY) will be increased to 27.2 EFPY. In order to maintain the validity of the graphs for 27.2 EFPY, two other changes are being made. The values specified on certain graphs for the adjusted reference temperatures (ART) with respect to reactor vessel material fracture toughness are updated and the arming temperature for the Low Temperature Overpressure Protection (LTOP) system is being revised. In addition, editorial changes are proposed in Section 3.4.12 to make the inequality signs used in that section consistent with those used in IP3 Sections 3.4.7 and 3.4.10 and as shown in the Standard Technical Specifications.

This proposed change has been evaluated according to the criteria of 10 CFR 50.92, "Issuance of Amendment" and Entergy has determined that the subject change does not involve a Significant Hazards Consideration as discussed below:

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

   Response: No

   The proposed change does not affect the accident initiators or mitigation assumptions associated with any of the accidents previously evaluated. Operating restrictions on pressure-temperature conditions for the reactor pressure vessel provide assurance that reactor vessel integrity will be maintained under accident or

transient conditions. The proposed change uses approved criteria and analysis methods to update the time period for which the current operating limits remain valid.

The LTOP system performs an automatic function by opening relief valves if reactor coolant system pressure reaches a temperature-dependent limit. The proposed change includes establishing a more restrictive temperature limit for when this system must be in service, to reflect the material condition of the reactor vessel at the new EFPY limit proposed for the pressure-temperature graphs. The mitigation function and capability of the LTOP system is not being changed by this request.

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

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

   Response: No

   There are no new accident initiators being introduced by this proposed change. The proposed change does not involve installation of new plant equipment, modification of existing equipment, or changes in the way that plant equipment is operated. Pressure-temperature operating limits depicted by graphs in the technical specifications will not be changed and will continue to be used by plant operators. A change in the LTOP system arming temperature will assure that the graphs remain valid for the proposed new operating period of 27.2 EFPY.

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

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

   Response: No

   Operating limits on pressure and temperature conditions for the reactor coolant system (RCS) are important to assure that the RCS pressure boundary stresses are within analyzed limits. Margins of safety are inherent in the analysis methods, assumptions, and limits specified in regulations and guidance documents. The proposed change is based on NRC-accepted methods, assumptions and limits and maintains the required margin of safety.

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

Based on the above, Entergy Nuclear Operations, Inc. concludes that the proposed amendment to the Indian Point 3 Technical Specifications presents no significant hazards consideration under the standards set forth in 10 CFR 50.92 (c), and, accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements / Criteria

General Design Criteria 14 (Reactor Coolant Pressure Boundary) requires that the reactor coolant pressure boundary be designed, fabricated, erected, and tested in order to have an extremely low probability of abnormal leakage, of rapid failure, and of gross rupture. General Design Criteria 31 (Fracture Prevention of Reactor Coolant Pressure Boundary) requires, in part, that the reactor coolant pressure boundary be designed with sufficient margin to assure that when stressed under operating, maintenance, and testing, the boundary behaves in a non-brittle manner and the probability of rapidly propagating fracture is minimized.

Standard Review Plan (SRP) 5.3.2 (Pressure-Temperature Limits) describes acceptance criteria, methods, and assumptions for meeting regulatory requirements pertaining to pressure-temperature limits applied to the reactor coolant pressure boundary. This license amendment request applies methods and criteria which are based on SRP 5.3.2 and which NRC has previously approved for IP3.

The existing P/T operating limits approved by NRC and specified in the Technical Specifications are not being changed. The service limit for these curves is valid for 34 EFPY; however their use is currently restricted to 20 EFYP in order to allow use of the current LTOP system arming temperature. The current arming temperature and method for calculating the arming temperature for a given EFPY limit were previously approved by NRC. The same method is being used to determine the new arming temperature associated with the new 27.2 EFPY limit being proposed for the P/T graphs.

Entergy previously obtained NRC approval for a 10 CFR 50 Appendix G exemption which allowed use of ASME Code Case N-640 regarding alternative fracture toughness requirements for development of P/T graphs. Since that time, NRC has incorporated this code case into Regulatory Guide 1.147. The code case requirements are still applicable for this amendment request, but use of that code case no longer relies on a regulatory exemption.

5.3 Environmental Considerations

The proposed changes to the IP3 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

References 1 through 3 provide an applicable precedence for this amendment request.

7.0 REFERENCES

1. NRC letter to Entergy dated December 3, 2003; regarding issuance of Indian Point 3 *License Amendment 220 for changes to pressure-temperature curves.* (ML033370869)

2. NRC letter to Entergy dated March 24, 2005; regarding issuance of Indian Point 3 License Amendment 225 for stretch power uprate. (ML050600380)

3. Entergy letter NL-03-093 to NRC dated May 28, 2003; regarding proposed technical specification changes for pressure-temperature and overpressure protection system limits for up to 20 effective full power years. (ML031550595)

4. NRC letter to Entergy dated December 2, 2003; regarding issuance of Indian Point 3 exemption from the requirements of 10CFR50.60(a).

ATTACHMENT TWO TO NL-07-008

MARKUP OF TECHNICAL SPECIFICATION PAGES

FOR PROPOSED CHANGES REGARDING

PRESSURE-TEMPERATURE AND LOW TEMPERATURE

OVERPRESSURE PROTECTION SYSTEM LIMITS

Affected Technical Specification Pages

Section 3.4.3 RCS P/T Limits:

- Page 3.4.3-3, Amend 220 (Figure 3.4.3-1; Heatup Limitations for Reactor Coolant System)
- Page 3.4.3-4, Amend 220 (Figure 3.4.3-2; Cooldown Limitations for Reactor Coolant System)
- Page 3.4.3-5, Amend 220 (Figure 3.4.3-3; Hydrostatic and Inservice Leak Testing Limitations for Reactor Coolant System)

Section 3.4.7 RCS Loops – MODE 5, Loops Filled:

- Page 3.4.7-1, Amend 205

Section 3.4.10 Pressurizer Safety Valves:

- Page 3.4.10-1, Amend 205

Section 3.4.12 Low Temperature Overpressure Protection (LTOP):

- Page 3.4.12-1, Amend 205
- Page 3.4.12-3, Amend 205
- Page 3.4.12-4, Amend 205
- Page 3.4.12-6, Amend 205
- Page 3.4.12-7, Amend 205
- Page 3.4.12-8, Amend 205
- Page 3.4.12-9, Amend 220 (Figure 3.4.12-1: Maximum Allowable Nominal PORV Setpoint for LTOP (OPS))
- Page 3.4.12-10, Amend 220 (Figure 3.4.12-2: Pressurizer Limitations for OPS Inoperable, Up to one charging pump capable of feeding the RCS)
- Page 3.4.12-11, Amend 220 (Figure 3.4.12-3: Pressurizer Limitations for OPS Inoperable, Up to three charging pumps and/or one safety injection pump capable of feeding the RCS)
- Page 3.4.12-12, Amend 220 (Figure 3.4.12-4: Secondary Side Limitations for RCP Start with Secondary Side Hotter Than Primary Side)

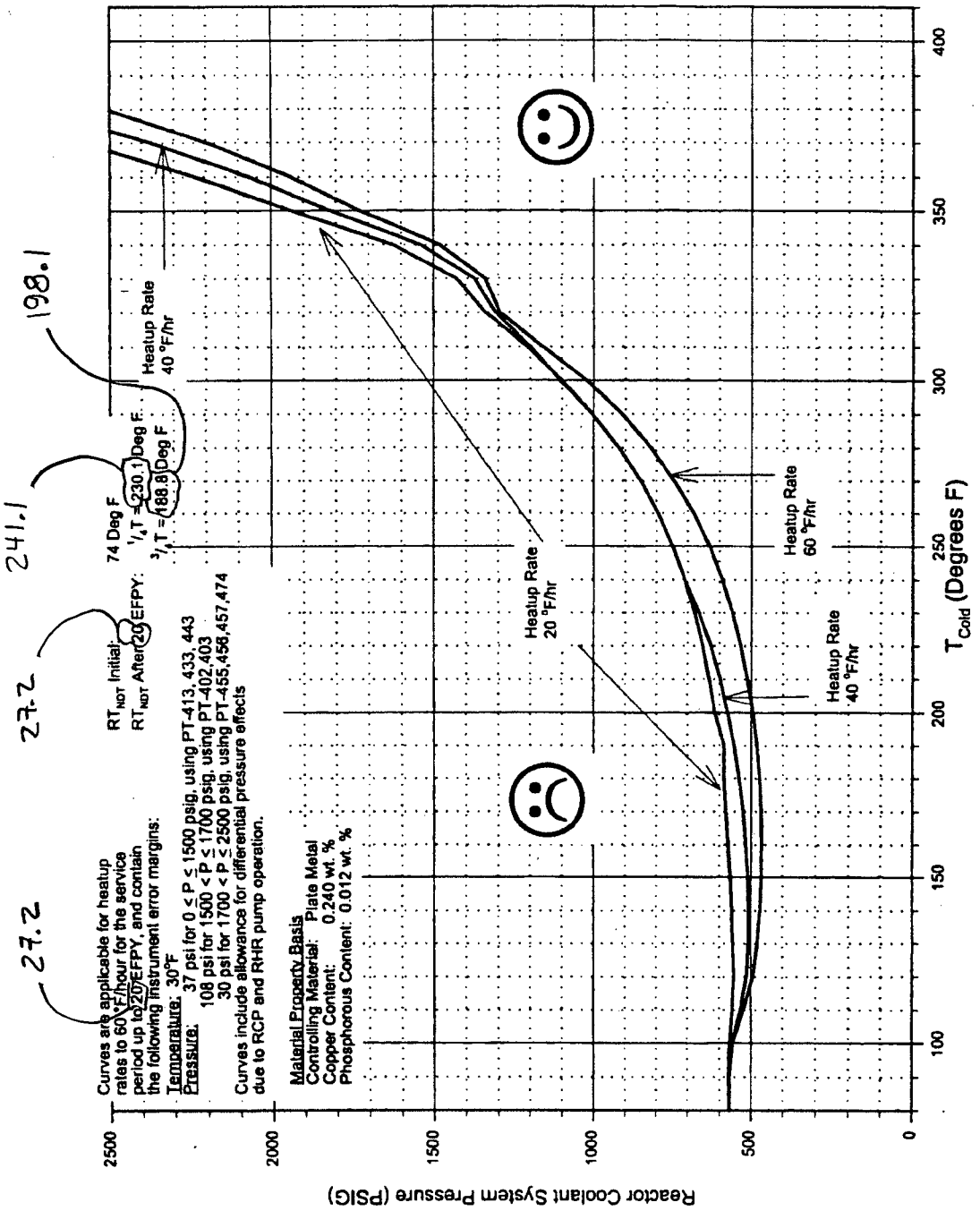

Figure 3.4.3-1:
Heatup Limitations for Reactor Coolant System

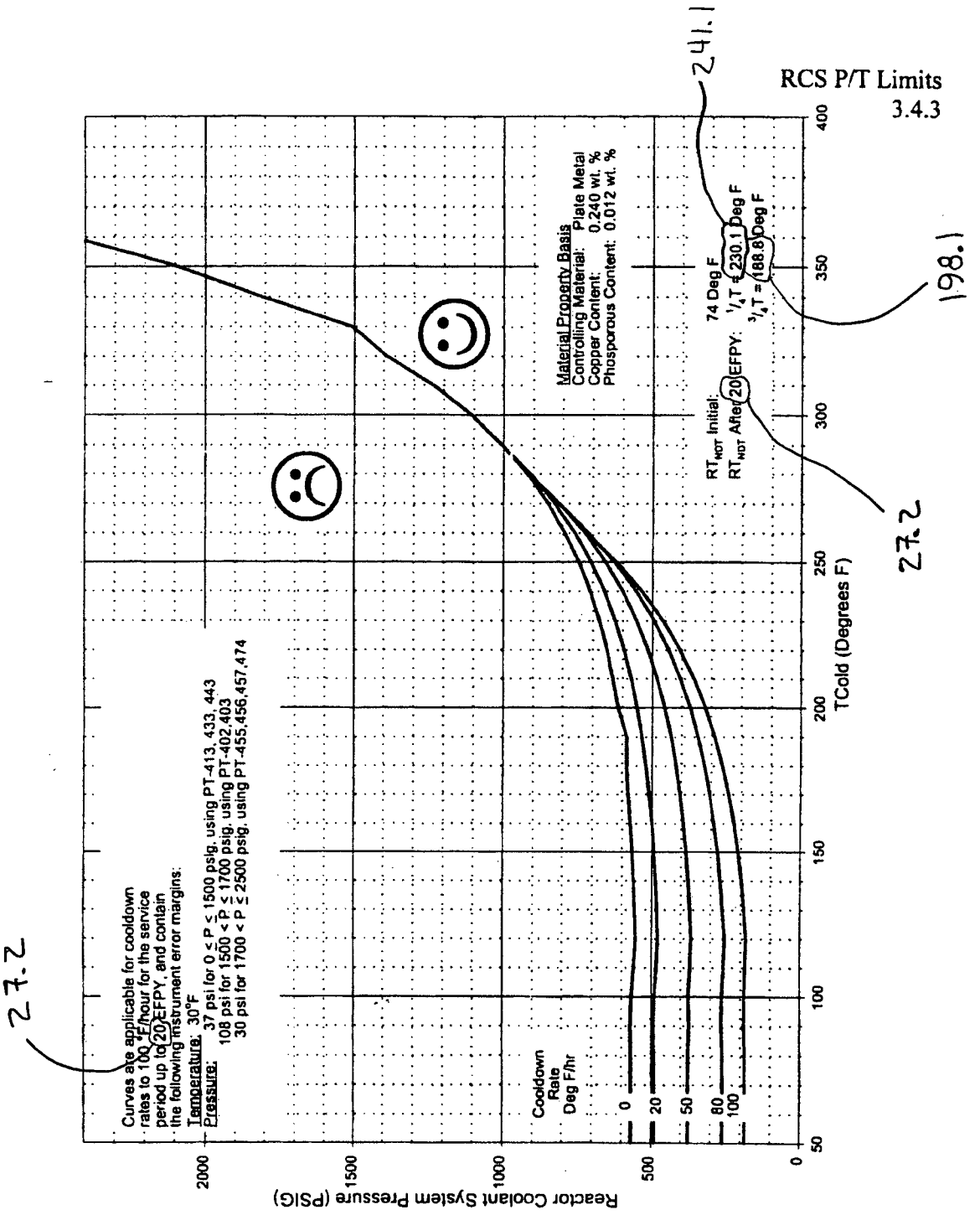

Figure 3.4.3-2:
Cooldown Limitations for Reactor Coolant System

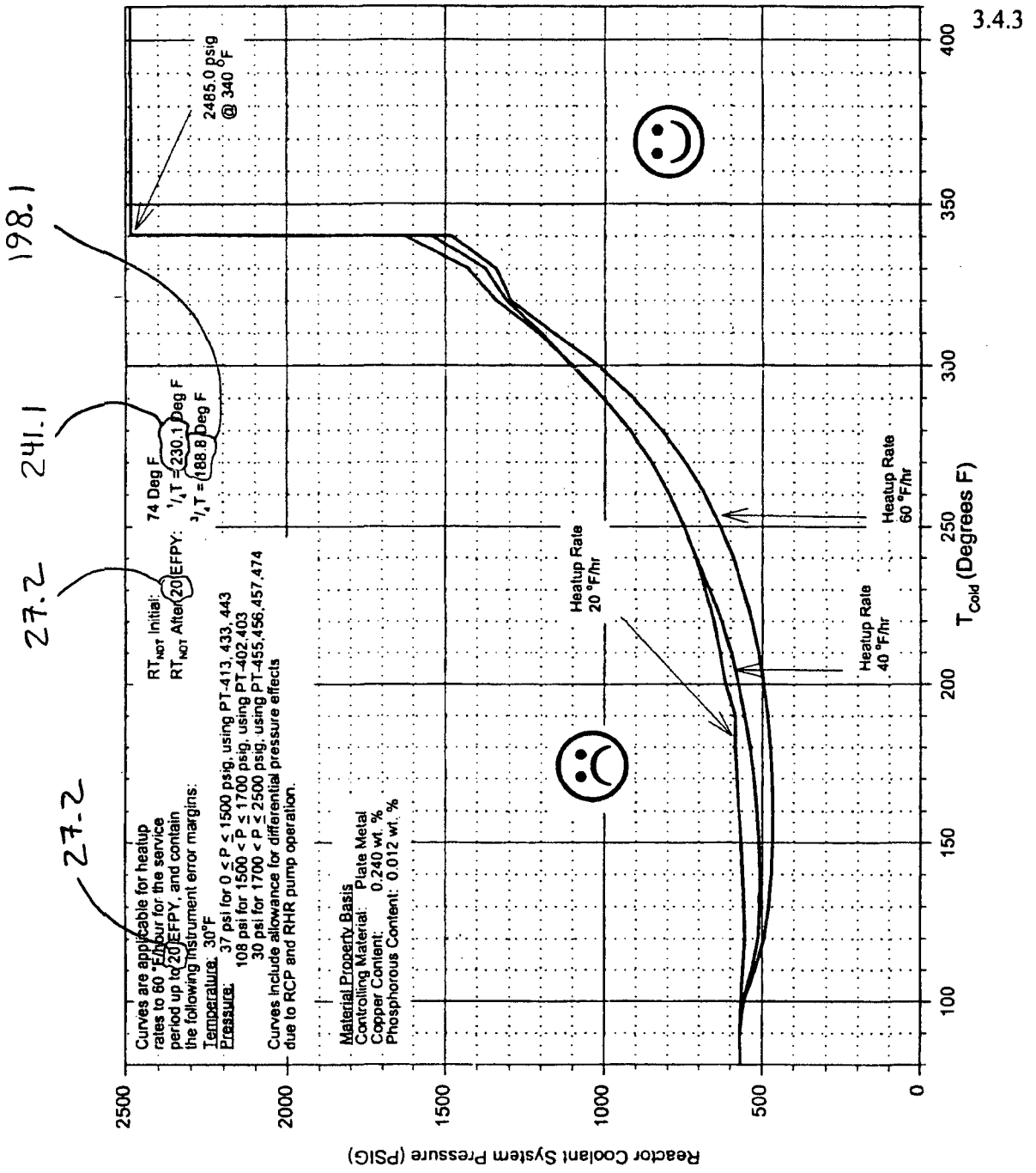

Figure 3.4.3-3:
Hydrostatic and Inservice Leak Testing Limitations for Reactor Coolant System

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. One additional RHR loop shall be OPERABLE; or

b. The secondary side water level of at least two steam generators (SGs) shall be ≥ 71% wide range.

---------- NOTES----------

1. The RHR pump of the loop in operation may not be in operation for ≤ 1 hour per 8 hour period provided:

   a. No operations are permitted that would cause reduction of the RCS boron concentration; 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 the average of the RCS cold leg temperatures ≤ 319°F unless the requirements of LCO 3.4.12, "Low Temperature Overpressure Protection (LTOP)," are met.

   330

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 > 330°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. OR Two or more pressurizer safety valves inoperable.	B.1 Be in MODE 3. AND B.2 Be in MODE 4 with any RCS cold leg temperature ≤ 330°F.	6 hours 12 hours

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.12 Low Temperature Overpressure Protection (LTOP)

LCO 3.4.12 LTOP shall be OPERABLE with no high head safety injection (HHSI) pumps capable of injecting into the RCS and the accumulator discharge isolation valves closed and de-energized, and either of the following:

---Note---
LCO 3.4.12.a and LCO 3.4.12.b are not Applicable when all RCS cold leg temperatures are ≥ 319°F.

330

a. The Overpressure Protection System (OPS) OPERABLE with two power operated relief valves (PORVs) with lift settings within the limit specified in Figure 3.4.12-1;

OR

b. The RCS depressurized with an RCS vent of ≥ 2.00 square inches.

---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 curve in Figure 3.4.12-1.

2. One HHSI pump may be made capable of injecting into the RCS as needed to support emergency boration or to respond to a loss of RHR cooling.

3. One HHSI pump may be made capable of injecting into the RCS for pump testing for a period not to exceed 8 hours.

APPLICABILITY: Whenever the RHR System is not isolated from the RCS,
MODE 4 when any RCS cold leg temperature is ≤ 319°F,
MODE 5,
MODE 6 when the reactor vessel head is on.

330

≤

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. An accumulator discharge isolation valve not closed and de-energized when the accumulator pressure is greater than or equal to the maximum RCS pressure for the coldest existing cold leg temperature specified in Figure 3.4.12-1.	B.1 Close and de-energize isolation valve for affected accumulator.	1 hour
C. Required Action and associated Completion Time of Condition B not met.	C.1.1 Increase all RCS cold leg temperatures to ≥ 319°F.	12 hours
	AND	
	C.1.2 Isolate the RHR System from the RCS.	12 hours
	OR	
	C.2 Depressurize affected accumulator to less than the maximum RCS pressure for coldest existing cold leg temperature specified in Figure 3.4.12-1.	12 hours
D. One required PORV inoperable.	D.1 Restore required PORV to OPERABLE status.	7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two required PORVs inoperable. OR Required Action and associated Completion Time of Condition C or D not met.	E.1 Depressurize RCS and establish RCS vent of ≥ 2.00 square inches. OR E.2.1 Increase all RCS cold leg temperatures to ≥ 319°F. AND E.2.2 Isolate the RHR System from the RCS. OR E.3 Verify pressurizer level, RCS pressure, and RCS injection capability are within limits specified in Figure 3.4.12-2 and Figure 3.4.12-3 for OPS not OPERABLE.	8 hours 8 hours 8 hours 8 hours AND Once per 12 hours thereafter
F. LTOP inoperable for any reason other than Condition A, B, C, D, or E.	F.1 Depressurize RCS and establish RCS vent of ≥ 2.00 square inches.	8 hours

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.4.12.4	----------NOTE---------- Only required to be met when complying with LCO 3.4.12.a. ---------- Perform CHANNEL CHECK of Overpressure Protection (OPS) instrument channels.	 24 hours
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 any RCS cold leg temperature to $\leq$ 330°F. ---------- Perform a COT on each required PORV, excluding actuation.	 24 months
SR 3.4.12.7	Perform CHANNEL CALIBRATION for each required OPS channel as follows: a. OPS actuation channels; and b. RCS pressure and temperature instruments.	 18 months 24 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.12.8	----------NOTES---------- 1. Not required to be met when all RCS cold leg temperatures are ≥ 319°F. (> 330) 2. Not required to be met if SR 3.4.12.9 is met. ---------- Verify each of the following conditions are satisfied prior to starting any RCP: a. Secondary side water temperature of the hottest steam generator (SG) is less than or equal to the coldest RCS cold leg temperature; and b. RCS makeup is less than or equal to RCS losses; and c. Steam generator pressure is not decreasing; and d.1 Overpressure Protection System (OPS) is OPERABLE; OR d.2.1 RCS pressure less than nominal OPS setpoint specified in Figure 3.4.12-1; and d.2.2 Pressurizer level, RCS pressure, and RCS injection capability are within limits specified in Figure 3.4.12-2 and Figure 3.4.12-3 for OPS not OPERABLE.	Within 15 minutes prior to starting any RCP

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.12.9	----------NOTES---------- 1. Not required to be met when all RCS cold leg temperatures are ≥ 319°F. (> 330) 2. Not required to be met if SR 3.4.12.8 is met. ---------- Verify each of the following conditions are satisfied prior to starting any RCP: a. Secondary side water temperature of the hottest steam generator is ≤ 64°F above the coldest RCS cold leg temperature; and b. RCS makeup is less than or equal to RCS losses; and c. Overpressure Protection System (OPS) is OPERABLE; and d. Pressurizer level is ≤ 73%; and e. Coldest RCS cold leg temperature is within limits specified in Figure 3.4.12-4.	Within 15 minutes prior to starting any RCP

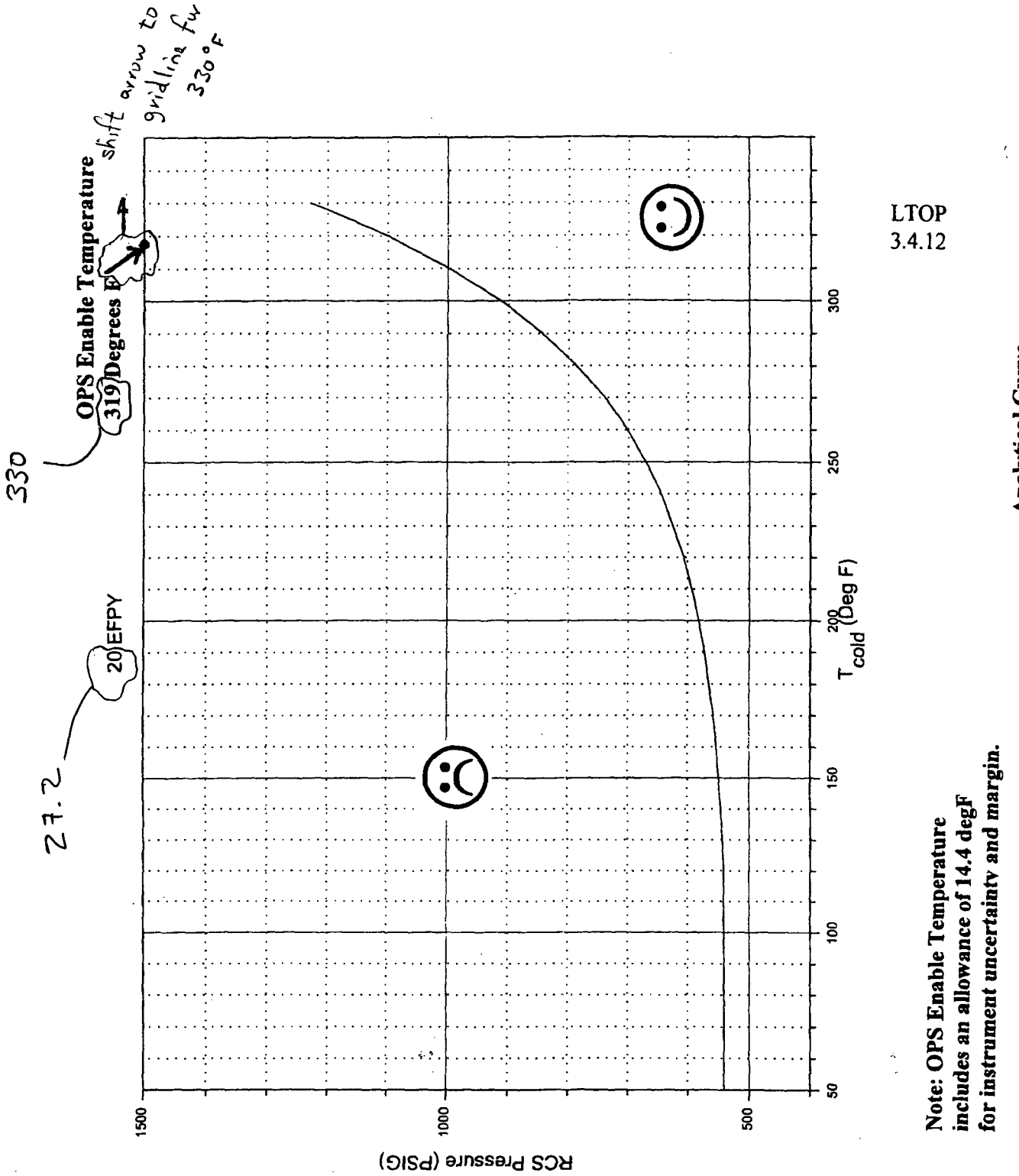

Figure 3.4.12-1: Maximum Allowable Nominal PORV Setpoint for LTOP (OPS), 20 EFPY

27.2

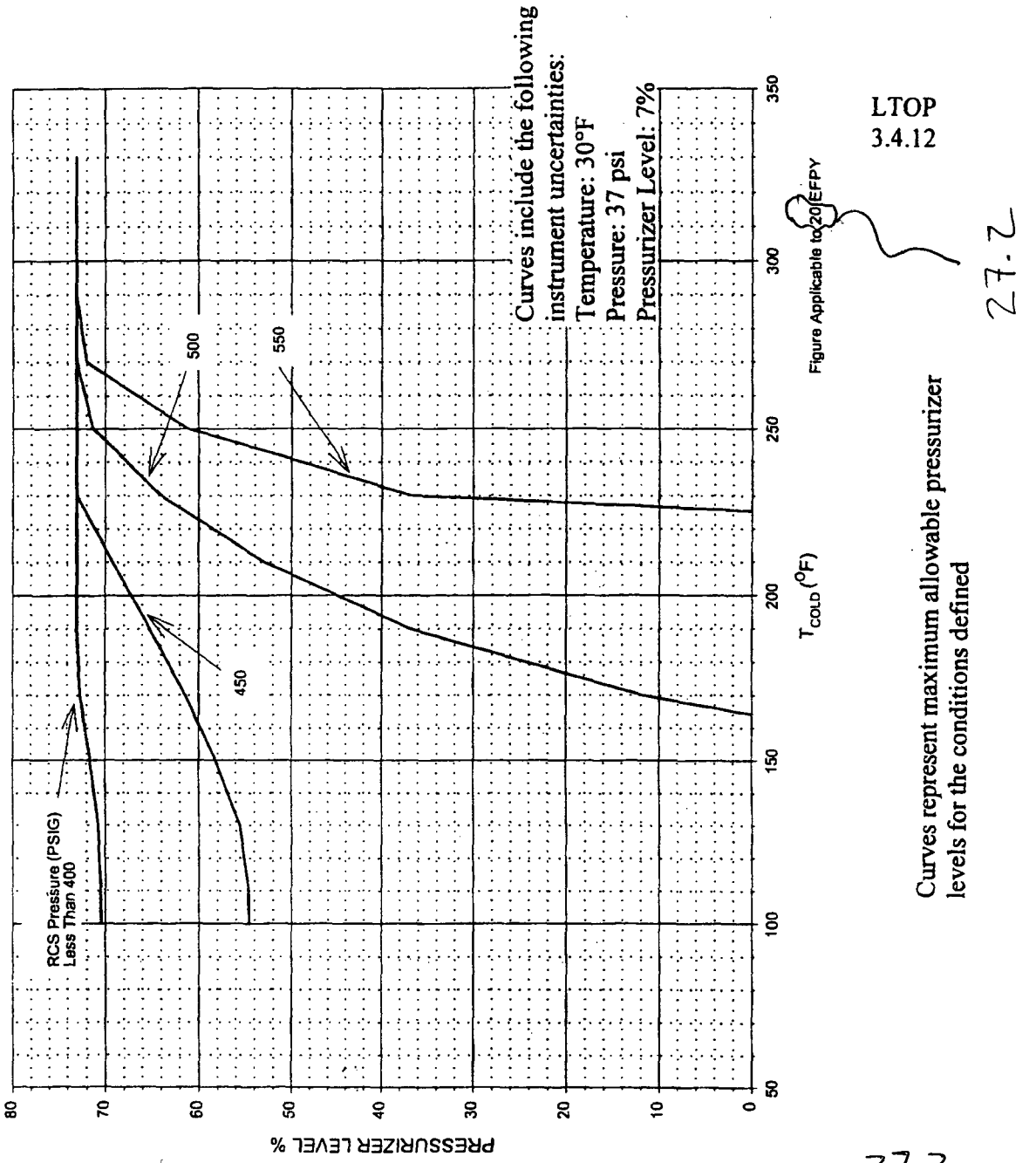

Figure 3.4.12-2: Pressurizer Limitations for OPS Inoperable, 20 EFPY (Up to one charging pump capable of feeding the RCS)

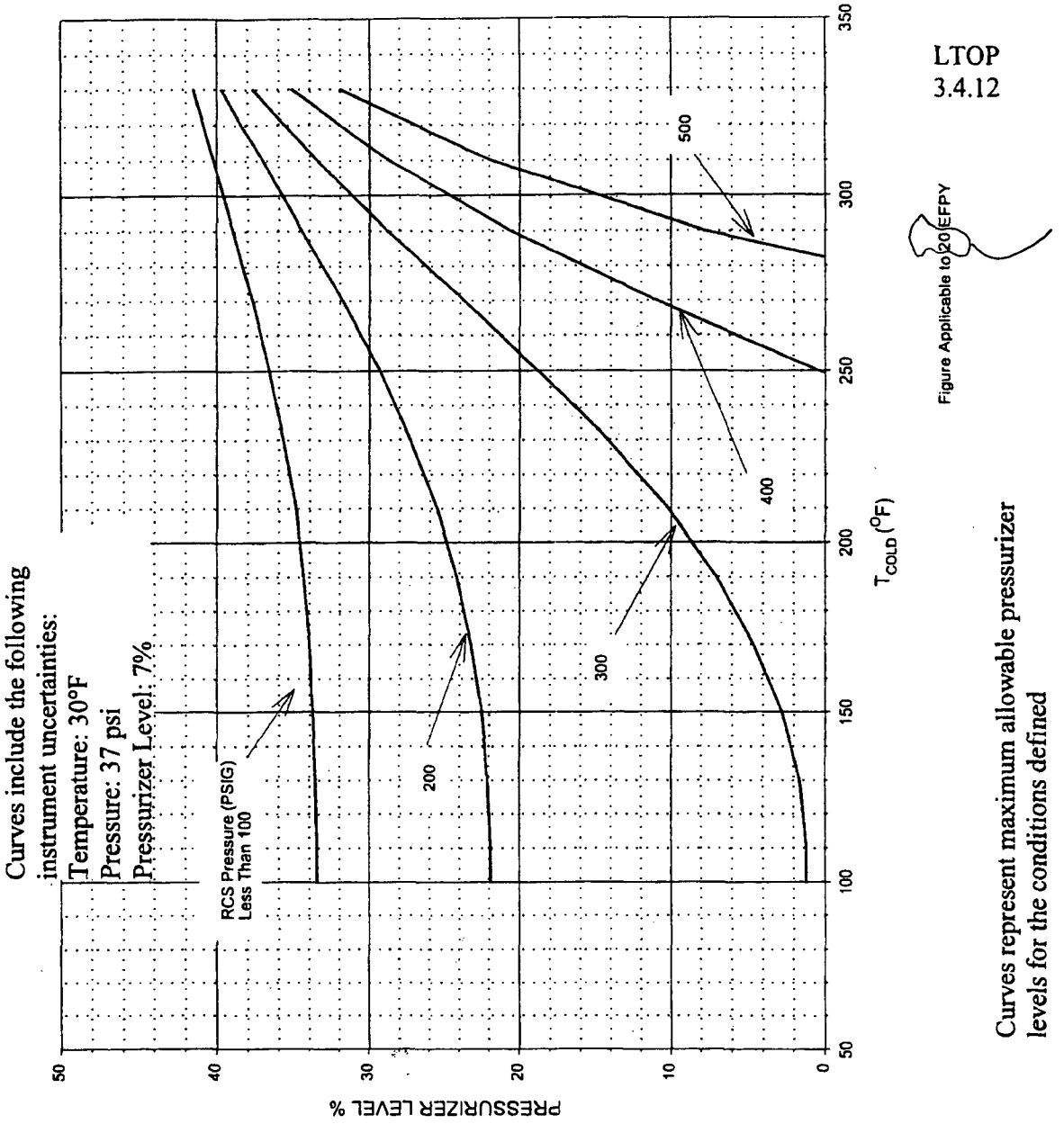

Figure 3.4.12-3: Pressurizer Limitations for OPS Inoperable, 20 EFPY (Up to three charging pumps and/or one safety injection pump capable of feeding the RCS)

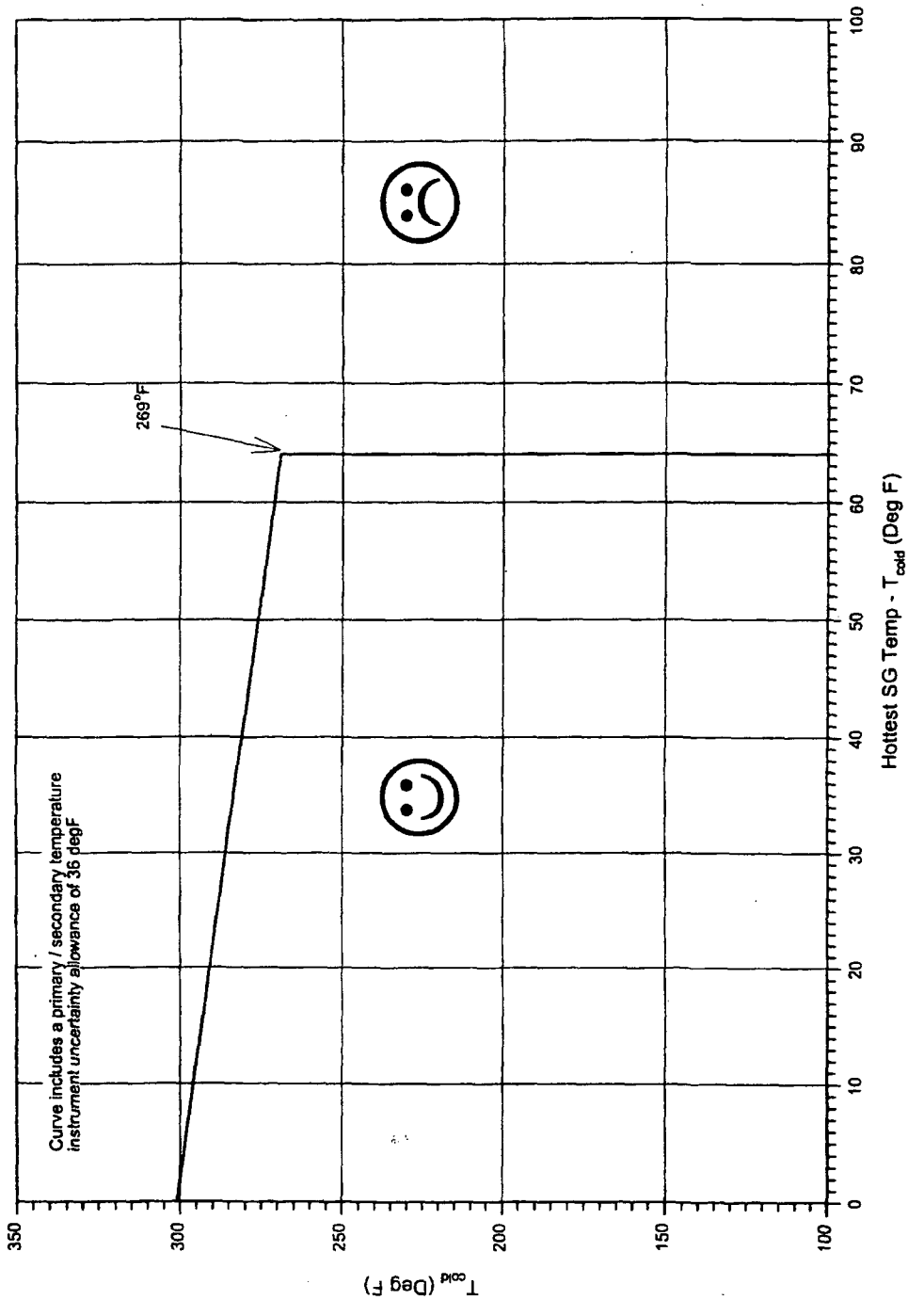

Figure 3.4.12-4: Secondary Side Limitations for RCP Start with Secondary Side Hotter than Primary Side, 20 EFPY

27.2