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John A Ventosa
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Administration

NL-14-035

April 1, 2014

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
11555 Rockville Pike
Rockville, MD 20852

SUBJECT: Proposed Changes to Indian Point 3 Technical Specifications Regarding Reactor Vessel Pressure/Temperature Limit Curves
Indian Point Unit Number 3
Docket No. 50-286
License No. DPR-64

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Entergy Nuclear Operations, Inc., (Entergy) hereby requests a License Amendment to Operating License DPR-64, Docket No. 50-286 for Indian Point Nuclear Generating Unit No. 3 (IP3). The proposed amendment will revise Technical Specifications Figure 3.4.3-1, Heatup Limitations for Reactor Coolant System, Figure 3.4.3-2, Cooldown Limitations for Reactor Coolant System, and Figure 3.4.3-3, Hydrostatic and Inservice Leak Testing Limitations for Reactor Coolant System, to indicate that the curves are applicable for vacuum fill.

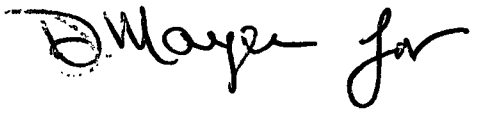
Entergy has evaluated the proposed change in accordance with 10 CFR 50.91 (a)(1) using the criteria of 10 CFR 50.92 (c) and Entergy has determined that this proposed change involves no significant hazards considerations, as described in Attachment 1. The proposed changes to the Technical Specifications 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.

Entergy requests approval of the proposed amendment by March 2, 2015 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 Regulatory Assurance Manager at (914) 254-6710.

A001
NRR

I declare under penalty of perjury that the foregoing is true and correct. Executed on April 1, 2014.

Sincerely,



JAV/ai

Attachments:

1. Analysis of Proposed Technical Specifications Changes regarding Reactor Vessel Pressure/Temperature Limit Curves

2. Markup of Technical Specifications Pages for Proposed Changes regarding Reactor Vessel Pressure/Temperature Limit Curves

3. Markup of Technical Specifications Bases Pages for Proposed Changes regarding Reactor Vessel Pressure/Temperature Limit Curves

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

ATTACHMENT 1 TO NL-14-035

ANALYSIS OF PROPOSED TECHNICAL SPECIFICATIONS CHANGES REGARDING REACTOR VESSEL PRESSURE/TEMPERATURE LIMIT CURVES

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

1.0 DESCRIPTION

Entergy Nuclear Operations, Inc (Entergy) is requesting an amendment to Operating License DPR-64, Docket 50-286 for Indian Point Nuclear Generating Unit No. 3 (IP3). Technical Specifications Figure 3.4.3-1, Heatup Limitations for Reactor Coolant System, Figure 3.4.3-2, Cooldown Limitations for Reactor Coolant System, and Figure 3.4.3-3, Hydrostatic and Inservice Leak Testing Limitations for Reactor Coolant System are being revised to indicate that the curves are applicable for vacuum fill. The change is necessary to account for a short period of time during startup when a vacuum is drawn in the Reactor Coolant System (RCS) while filling with water. The specific proposed changes are to add a note to the Figures that the "curves are applicable for vacuum fill" as shown in Attachment 2.

2.0 BACKGROUND

10 CFR 50, Appendix G (Reference 1), requires the establishment of Pressure/Temperature (P/T) limits for specific material fracture toughness requirements of the Reactor Coolant Pressure Boundary (RCPB) materials. These limits represent an adequate margin to non-ductile failure during normal operation, anticipated operational occurrences, and system hydrostatic tests. The P/T limit curves are composite curves established by superimposing limits derived from stress analyses of those portions of the reactor vessel and head that are the most restrictive. These limit curves are represented by Technical Specifications Figure 3.4.3-1, Heatup Limitations for Reactor Coolant System, Figure 3.4.3-2, Cooldown Limitations for Reactor Coolant System, and Figure 3.4.3-3, Hydrostatic and Inservice Leak Testing Limitations for Reactor Coolant System. The limits in these Figures only contain values for reactor coolant system pressure greater than 0 pounds per square inch gauge. During startup from an outage when the RCS is vented, the RCS is made water solid, and during filling of the RCS, a vacuum is drawn so as to expel any air/non-condensibles from the RCS. During this evolution, the RCS will be below 0 psig, which may be construed as being outside the range of the Figures.

The NRC has previously approved RV P/T limits based on Westinghouse methodology (Reference 2). Although vacuum fill of the RCS is not explicitly mentioned in the previously approved Westinghouse methodology, it is consistent with the regulation for the P/T limits contained in 10 CFR 50, Appendix G.

3.0 TECHNICAL ANALYSIS

The requirements associated with Reactor Vessel (RV) P/T limit curves are contained in 10 CFR 50, Appendix G (Reference 1). Vacuum filling of the RCS that results in an RCS pressure less than 0 psig is not explicitly addressed in 10 CFR 50, Appendix G. Table 1 of 10 CFR 50, Appendix G summarizes the pressure and temperature requirements for the reactor pressure vessel as shown below.

Table 1.—Pressure and Temperature Requirements for the Reactor Pressure Vessel

Operating condition	Vessel pressure[1]	Requirements for pressure-temperature limits	Minimum temperature requirements
1. Hydrostatic pressure and leak tests (core is not critical):			
1.a Fuel in the vessel	≤20%	ASME Appendix G Limits	([2])
1.b Fuel in the vessel	>20%	ASME Appendix G Limits	([2]) +90 °F([6])
1.c No fuel in the vessel (Preservice Hydrotest Only)	ALL	(Not Applicable)	([3]) +60 °F
2. Normal operation (incl. heat-up and cool-down), including anticipated operational occurrences:			
2.a Core not critical	≤20%	ASME Appendix G Limits	([2])
2.b Core not critical	>20%	ASME Appendix G Limits	([2]) + 120 °F([6])
2.c Core critical	≤20%	ASME Appendix G Limits + 40 °F.	Larger of [([4])] or [([2]) + 40 °F.]
2.d Core critical	>20%	ASME Appendix G Limits + 40 °F.	Larger of [([4])] or [([2])+160 °F]
2.e Core critical for BWR ([5])	≤20%	ASME Appendix G Limits + 40 °F.	([2])+60 °F

[1] Percent of the preservice system hydrostatic test pressure.
[2] The highest reference temperature of the material in the closure flange region that is highly stressed by the bolt preload.
[3] The highest reference temperature of the vessel.
[4] The minimum permissible temperature for the inservice system hydrostatic pressure test.
[5] For boiling water reactors (BWR) with water level within the normal range for power operation.
[6] Lower temperatures are permissible if they can be justified by showing that the margins of safety of the controlling region are equivalent to those required for the beltline when it is controlling.

The primary concern for the RV, in terms of pressure, is a low-temperature overpressure condition. A pressure greater than an allowable value increases the likelihood of non-ductile failure. Compliance with the Table 1 requirements ensure that an overpressure condition is prevented. The vessel pressure column of Table 1 does not identify a lower limit on RV pressure. Vacuum filling of the RCS occurs during a plant heatup. Thus, Operating Condition 2 applies per Table 1. Under Operating Condition 2, the vessel pressure is defined as either ≤ 20% or > 20% of the preservice system hydrostatic test pressure. During vacuum filling of the RCS, the vessel pressure is ≤ 20% of the preservice system hydrostatic test pressure. Adding a note to the P/T figures stating the "curves are applicable for vacuum fill" clarifies that the vacuum fill is an acceptable condition since it is within the 10 CFR 50, Appendix G operating region.

4.0 REGULATORY ANALYSIS

4.1 No Significant Hazards Consideration

Entergy has determined that this proposed Technical Specifications change does not involve a significant hazards consideration as defined by 10CFR.50.92(c). As such, the inclusion of a note in Figures 3.4.3-1, 3.4.3-2 and 3.4.3-3 to state that the curves are applicable for vacuum fill may be considered an administrative change.

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. There are no physical changes to the plant being introduced by the proposed changes to the heatup, cooldown and hydrostatic inservice leak testing 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 heatup, cooldown and hydrostatic inservice leak testing limitation curves were established in compliance with the methodology used to calculate and predict effects of radiation on embrittlement of RPV beltline materials and remain valid during vacuum fill.

   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.

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 changes clarify that the heatup, cooldown and hydrostatic inservice leak testing limitation curves remain valid during vacuum fill (to 0 psia) in accordance with current regulations. 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.

   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 may be considered as administrative and 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 IP3 in accordance with the proposed amendment does not involve a significant hazards consideration.

4.2 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 does not change the existing P/T operating limits approved by the NRC and specified in the Technical Specifications.

4.3 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.

5.0 PRECEDENCE

A similar request for inclusion of a note to these Curves was approved by the NRC in SER for IP2 TS Amendment 274 (Reference 3).

6.0 REFERENCES

1) Code of Federal Regulations, 10 CFR Part 50, Appendix G, "Fracture Toughness Requirements", U.S. Nuclear Regulatory Commission, 78 FR 75450, December 12, 2013
2) NRC Letter to Entergy, "Indian Point Nuclear Generating Unit No. 3 – Issuance of Amendment Re: Technical Specification Change Request for Pressure – Temperature and Low Temperature protection System Limits (TAC No. MD4079)," October 4, 2007
3) NRC Letter to Entergy, "Indian Point Nuclear Generating Unit No. 2 – Issuance of Amendment Re: Pressure –Temperature Over Pressure Requirements (TAC No. MF0634)," March 5, 2014

ATTACHMENT 2 TO NL-14-035

MARKUP OF TECHNICAL SPECIFICATIONS PAGES FOR PROPOSED CHANGES REGARDING REACTOR VESSEL PRESSURE/TEMPERATURE LIMIT CURVES

Text changes on Figures indicated by Bold/Italics for additions

Unit 3 Affected Pages:
3.4.3-3
3.4.3-4
3.4.3-5

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

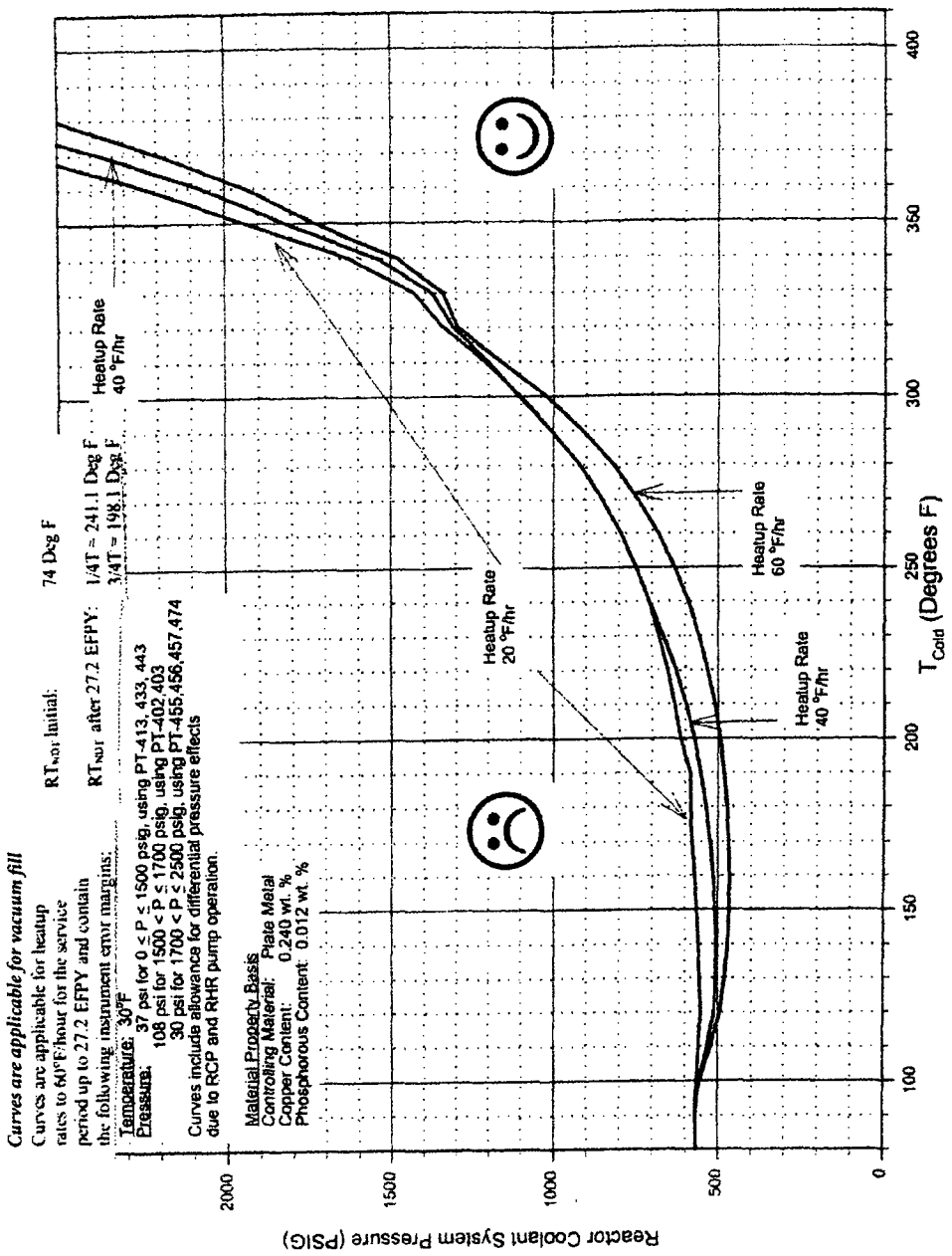


Figure 3.4.3-1:
Heatup Limitations for Reactor Coolant System

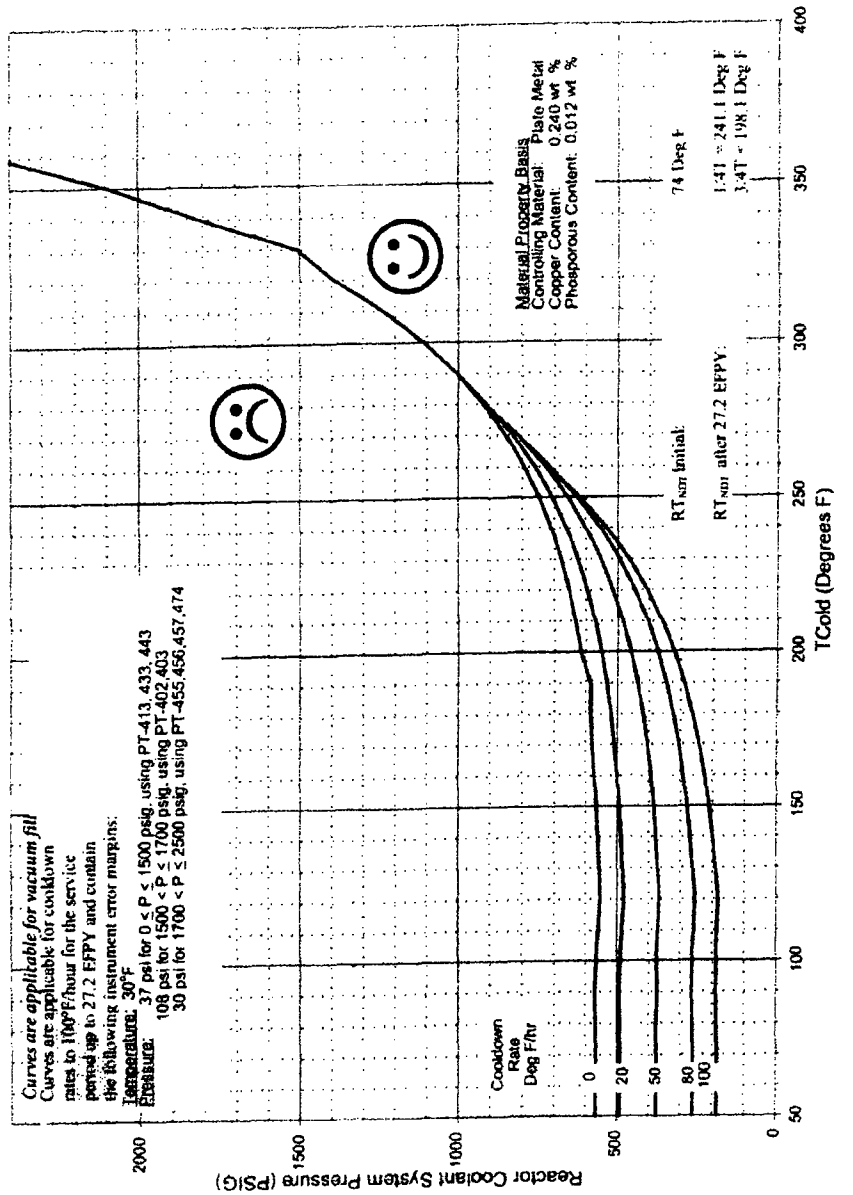


Figure 3.4.3-2:
Cooldown Limitations for Reactor Coolant System

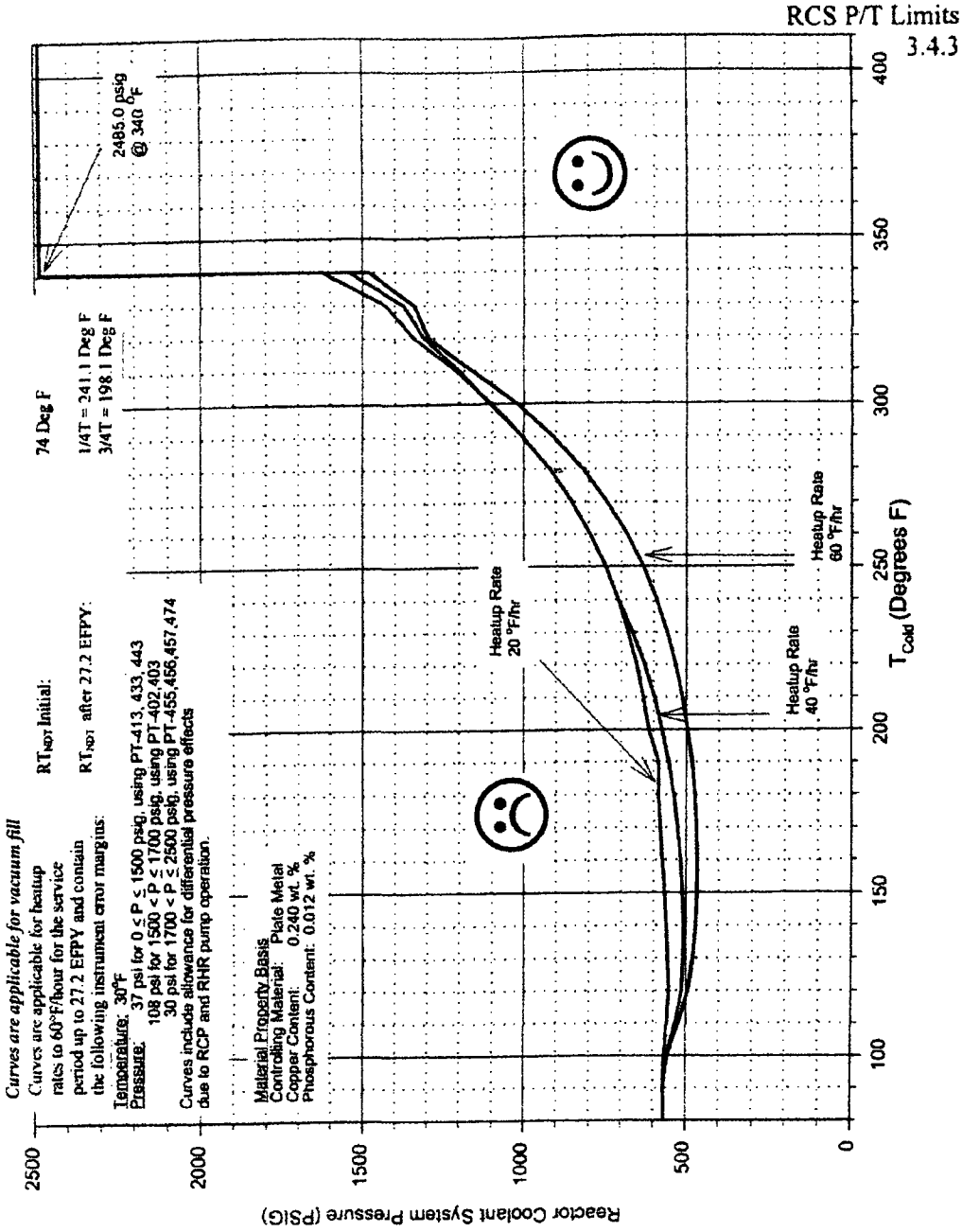


Figure 3.4.3-3:
Hydrostatic and Inservice Leak Testing Limitations for Reactor Coolant System

ATTACHMENT 3 TO NL-14-035

MARKUP OF TECHNICAL SPECIFICATIONS BASES PAGES FOR PROPOSED CHANGES REGARDING REACTOR VESSEL PRESSURE/TEMPERATURE LIMIT CURVES

Text changes indicated by Bold/Italics for additions

Unit 3 Affected Page:
B 3.4.3-1

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

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.3 RCS Pressure and Temperature (P/T) Limits

BASES

BACKGROUND

All components of the RCS are designed to withstand effects of cyclic loads due to system pressure and temperature changes. These loads are introduced by startup (heatup) and shutdown (cooldown) operations, power transients, and reactor trips. This LCO limits the pressure and temperature changes during RCS heatup and cooldown, within the design assumptions and the stress limits for cyclic operation.

LCO 3.4.3, Figure 3.4.3-1, Heatup Limitations for the Reactor Coolant System, Figure, 3.4.3-2, Cooldown Limitations for the Reactor Coolant System, and Figure 3.4.3-3, Hydrostatic and Inservice Leak Testing Limitations for the Reactor Coolant System, contain P/T limit curves for heatup, cooldown, and inservice leak and hydrostatic (ISLH) testing, respectively (Ref. 1).

Each P/T limit curve defines an acceptable region for normal operation. The usual use of the curves is operational guidance during heatup or cooldown maneuvering, when pressure and temperature indications are monitored and compared to the applicable curve to determine that operation is within the allowable region. The happy face icon shown on Figure 3.4.3-1, Figure, 3.4.3-2, and Figure 3.4.3-3, indicates the side of the curve in which operation is permissible. Conversely, the sad face icon indicates the side of the curve in which operation is prohibited. ***Vacuum fill of the RCS is performed in Mode 5 under sub-atmospheric pressure and isothermal conditions. Vacuum fill is an acceptable condition since the resulting pressure/temperature combination is located in the happy face region to the right and below the operating limits provided in Figures 3.4.3-1, 3.4.3-2 and 3.4.3-3.***

The LCO establishes operating limits that provide a margin to brittle failure of the reactor vessel and piping of the reactor coolant pressure boundary (RCPB). The vessel is the component most subject to brittle failure, and the LCO limits apply mainly to the vessel. The limits do not apply to the pressurizer, which has different design characteristics and operating functions.

ATTACHMENT 9.4 **NRC SUBMITTAL REVIEW**

Sheet 1 of 2 *{Typical}*

Letter #: NL-14-035 **Response Due:** 03/21/2014

Subject: Proposed Changes to IP3 P/T Limit Curves to address vacuum fill **Date Issued for Review:** 03/12/14

Correspondence Preparer / Phone #: A. Irani/x6618

Section I **Letter Concurrence and Agreement to Perform Actions**

POSITION / NAME	Action (concurrence, certification, etc.)	Signature (sign, interoffice memo, e-mail, or telecom)
N Azevedo – Code Programs	Concurrence	e-mail 3/19/14 comments incorporated
M Lewis – Ops	Concurrence	e-mail 3/19/14 attached
R Walpole - Man Reg Assurance	Concurrence	3/31/14
J Ventosa – Site VP	Signature	signed Don Mayer 4/1/14
V Andreozzi – Man DE	Information	
R Burroni – Dir Eng	Information	
J Kirkpatrick – Dir Reg & Performance Improvement	Information	
OSRC	Recommendation	Approved mtg 14-06

COMMENTS

Section II	Correspondence Screening	
Does this letter contain commitments? **If "yes," identify the commitments with due dates in the submittal and in Section III. When fleet letters contain commitments, a PCRS LO (e.g., LO-LAR, LO-WT) should be initiated with a CA assigned to each applicable site to enter the commitments into the site's commitment management system.**	Yes No	☐☒
Does this letter contain any information or analyses of new safety issues performed at NRC request or to satisfy a regulatory requirement? **If "yes," reflect requirement to update the UFSAR in Section III.**	Yes No	☐☒
Does this letter require any document changes (e.g., procedures, DBDs, FSAR, TS Bases, etc.), if approved? **If "yes," indicate in Section III an action for the responsible department to determine the affected documents. (The Correspondence Preparer may indicate the specific documents requiring revision, if known or may initiate an action for review.)**	Yes No	☒☐
Does this letter contain information certified accurate? **If "yes," identify the information and document certification in an attachment. (Attachment 9.5 must be used.)**	Yes No	☐☒