Attachment 3

Mark-ups of Affected Technical Specifications Pages and Proposed Replacement Curves for the Request for Revision to the Pressure-Temperature Curves (PCOL 96/10) for Grand Gulf Nuclear Station

9610310297 961022
PDR ADOCK 05000416
P PDR

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. ---------NOTE--------- Required Action C.2 shall be completed if this Condition is entered. --------------------- Requirements of the LCO not met in other than MODES 1, 2, and 3.	C.1 Initiate action to restore parameter(s) to within limits. AND C.2 Determine RCS is acceptable for operation.	Immediately Prior to entering MODE 2 or 3

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.11.1	-------------------NOTE------------------- Only required to be performed during RCS heatup and cooldown operations and RCS inservice leak and hydrostatic testing. --- Verify: a. RCS pressure and RCS temperature are within the limits of the applicable Figure 3.4.11-1 based on the current Effective Full Power Year (EFPY), and b. RCS heatup and cooldown rates are ≤ 100°F in any 1 hour period.	30 minutes

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.11.2	-------------------NOTE-------------------- Only required to be met during control rod withdrawal for the purpose of achieving criticality. --- Verify RCS pressure and RCS temperature are within the criticality limits specified in the applicable Figure 3.4.11-1 based on the current Effective Full Power Year (EFPY).	Once within 15 minutes prior to control rod withdrawal for the purpose of achieving criticality
SR 3.4.11.3	-------------------NOTE-------------------- Only required to be met in MODES 1, 2, 3, and 4 with reactor steam dome pressure ≥ 25 psig during recirculation pump start. --- Verify the difference between the bottom head coolant temperature and the reactor pressure vessel (RPV) coolant temperature is ≤ 100°F.	Once within 15 minutes prior to each startup of a recirculation pump
SR 3.4.11.4	-------------------NOTE-------------------- Only required to be met in MODES 1, 2, 3, and 4 during recirculation pump start. --- Verify the difference between the reactor coolant temperature in the recirculation loop to be started and the RPV coolant temperature is ≤ 50°F.	Once within 15 minutes prior to each startup of a recirculation pump

(continued)

3

& Hydrostatic Testing Limit

4

Core not critical

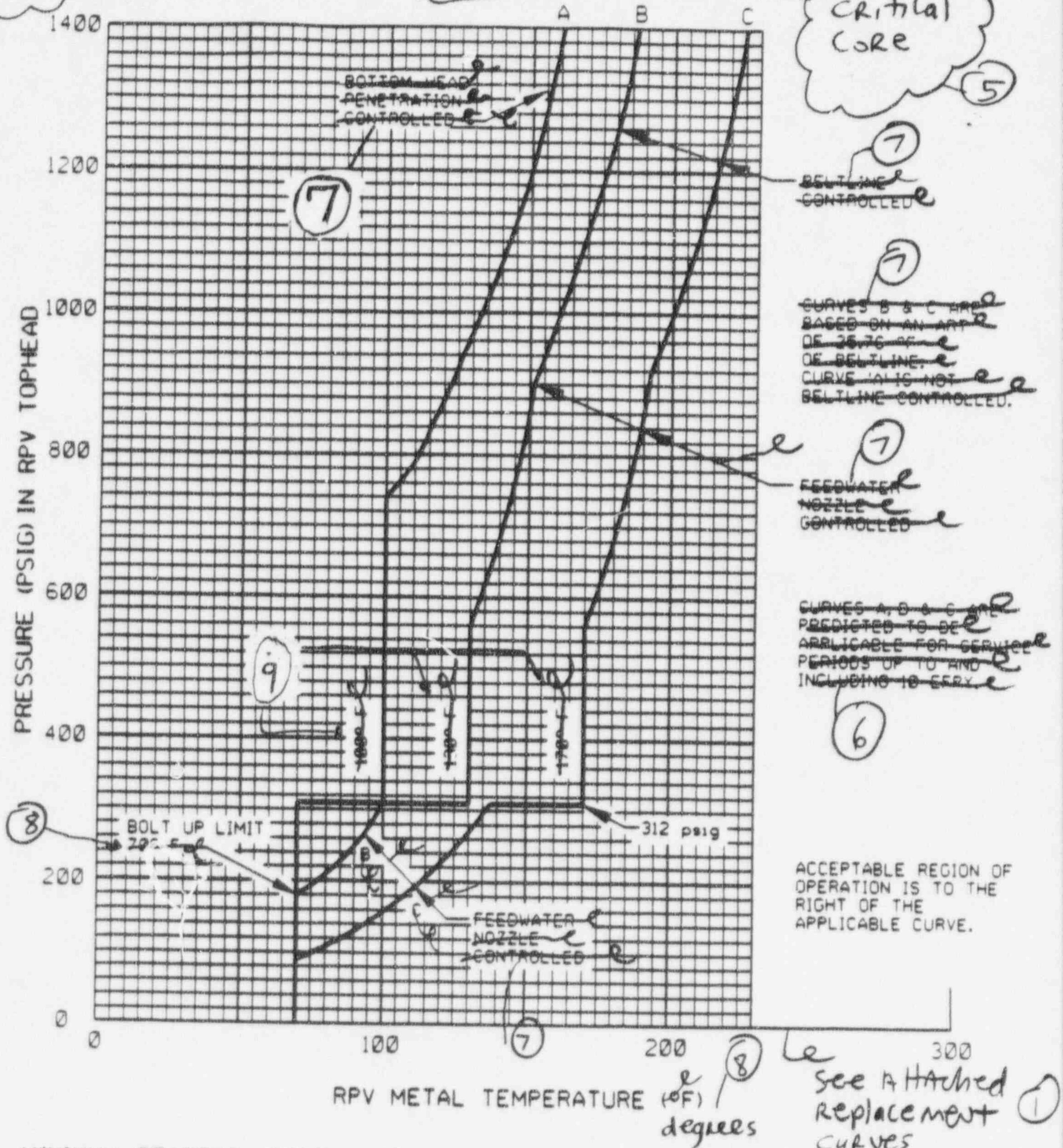
A - INSERVICE LEAK ~~AND HYDROTEST~~

B - ~~NON-NUCLEAR HEAT UP & COOLDOWN~~ LIMIT

C - ~~NUCLEAR (CORE CRITICAL) HEAT UP & COOLDOWN~~ LIMIT

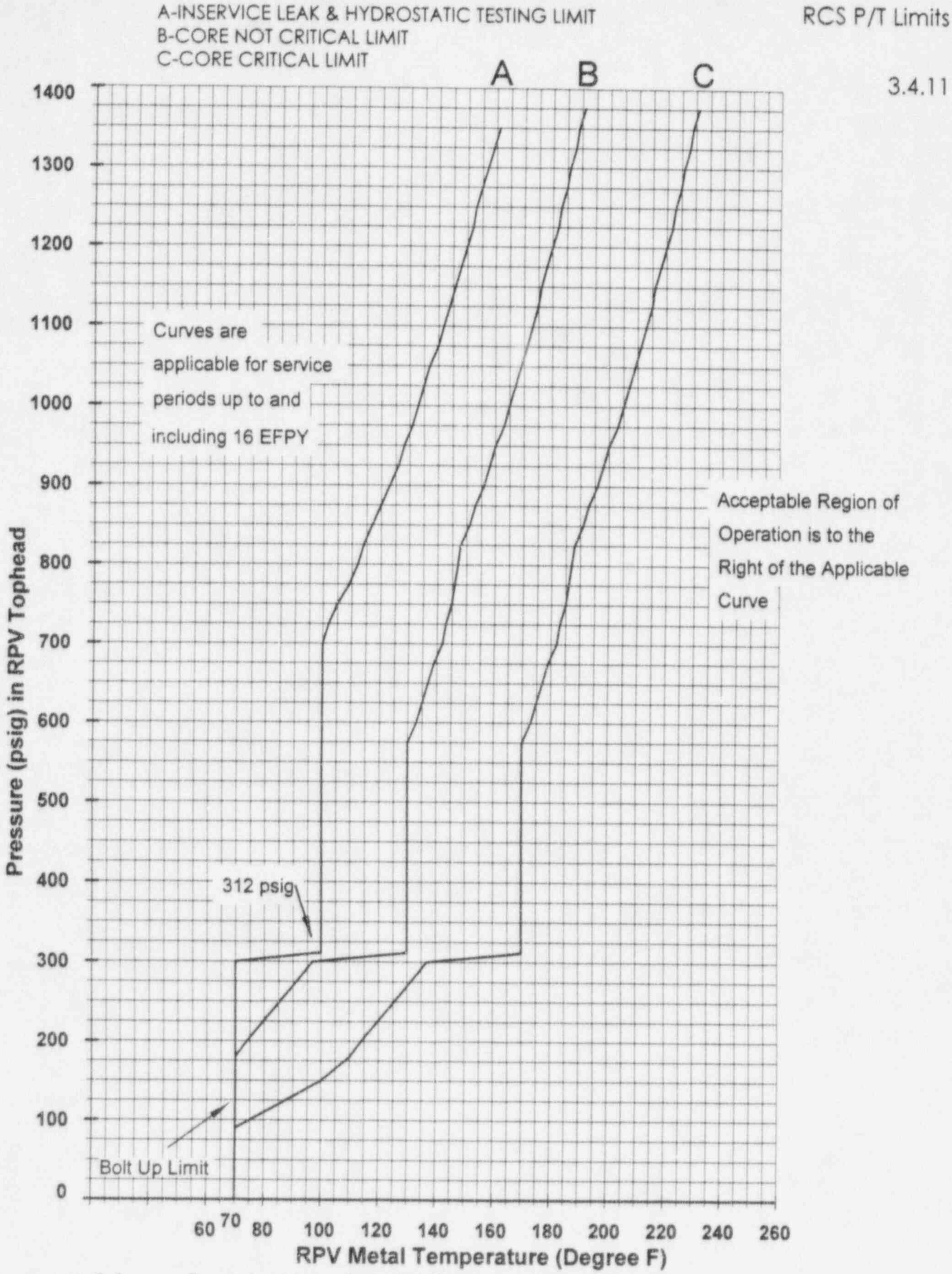
Critical Core

5



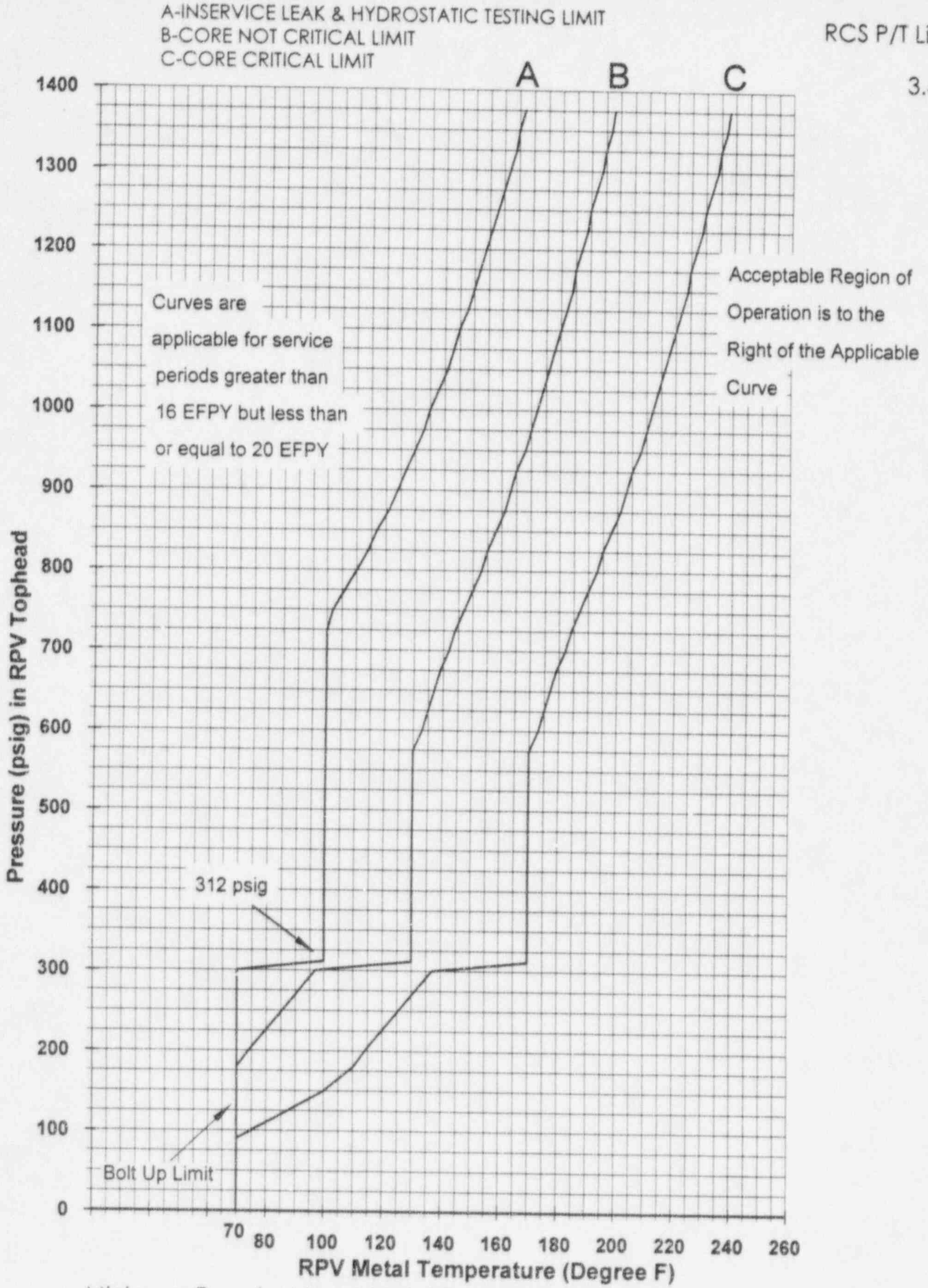
MINIMUM REACTOR VESSEL METAL TEMPERATURE VS. REACTOR VESSEL PRESSURE

FIGURE 3.4.11-1

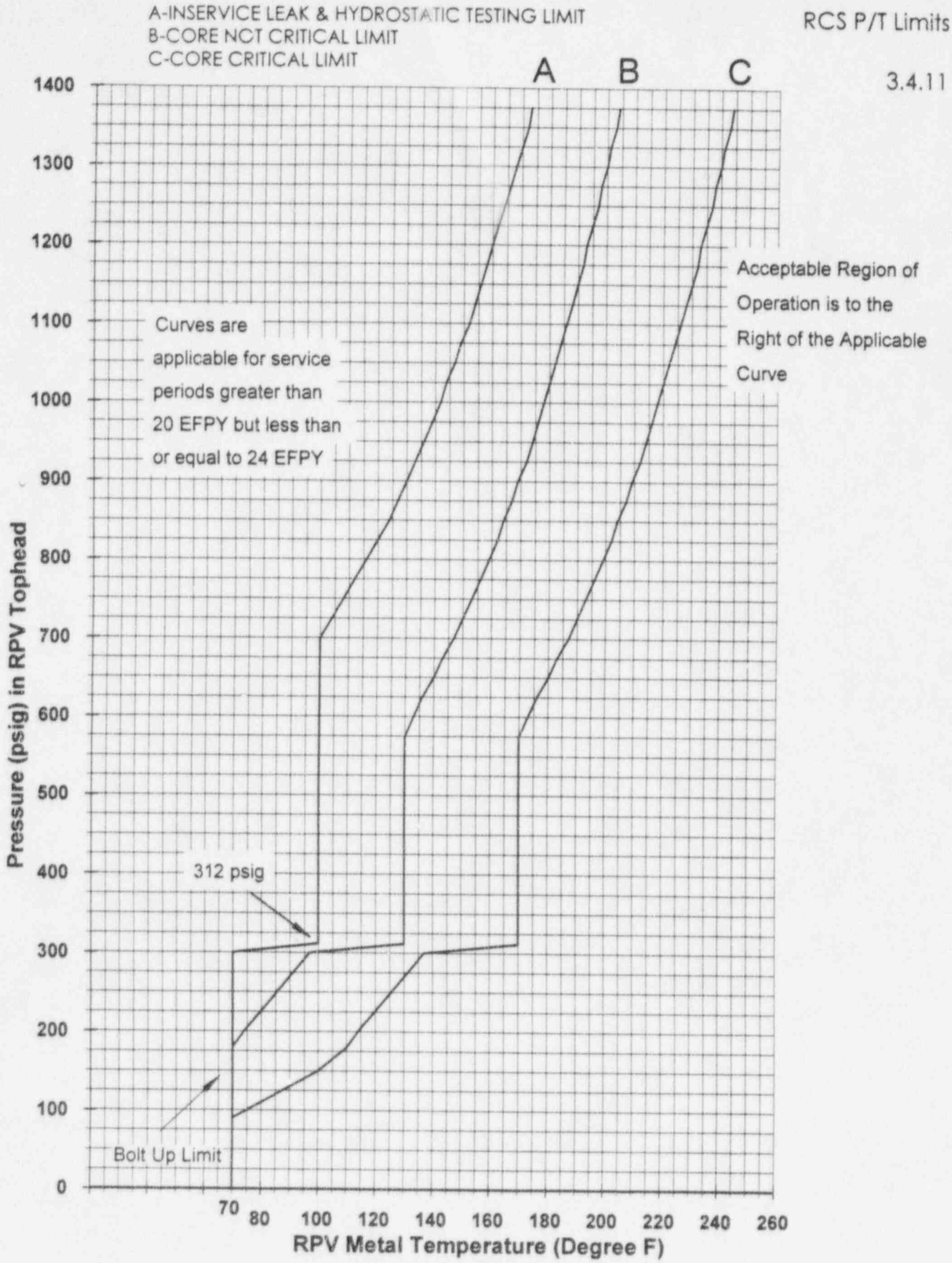


Minimum Reactor Vessel Metal Temperature vs Reactor Vessel Pressure

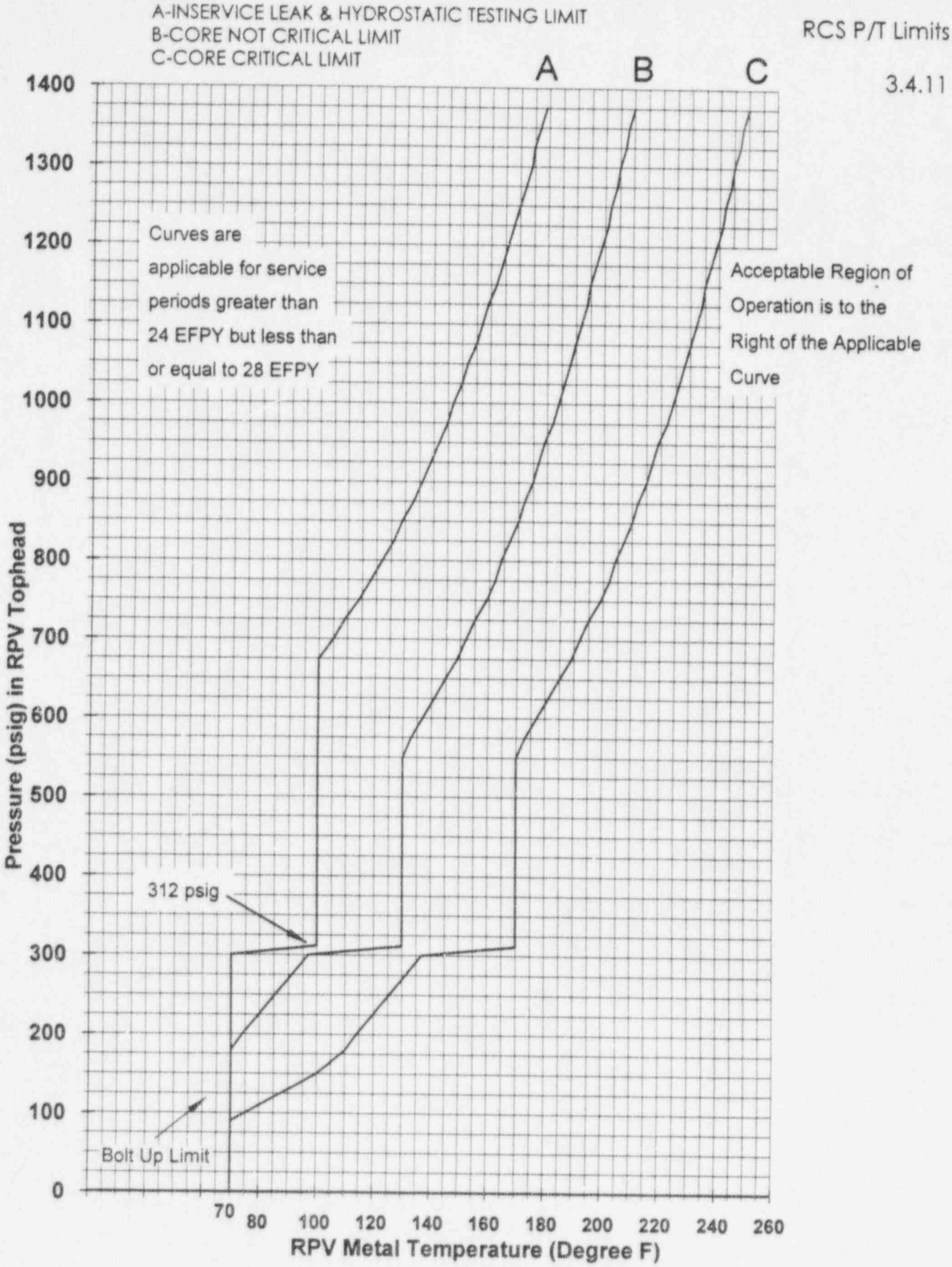
Figure 3.4.11-1 (page 1 of 5)



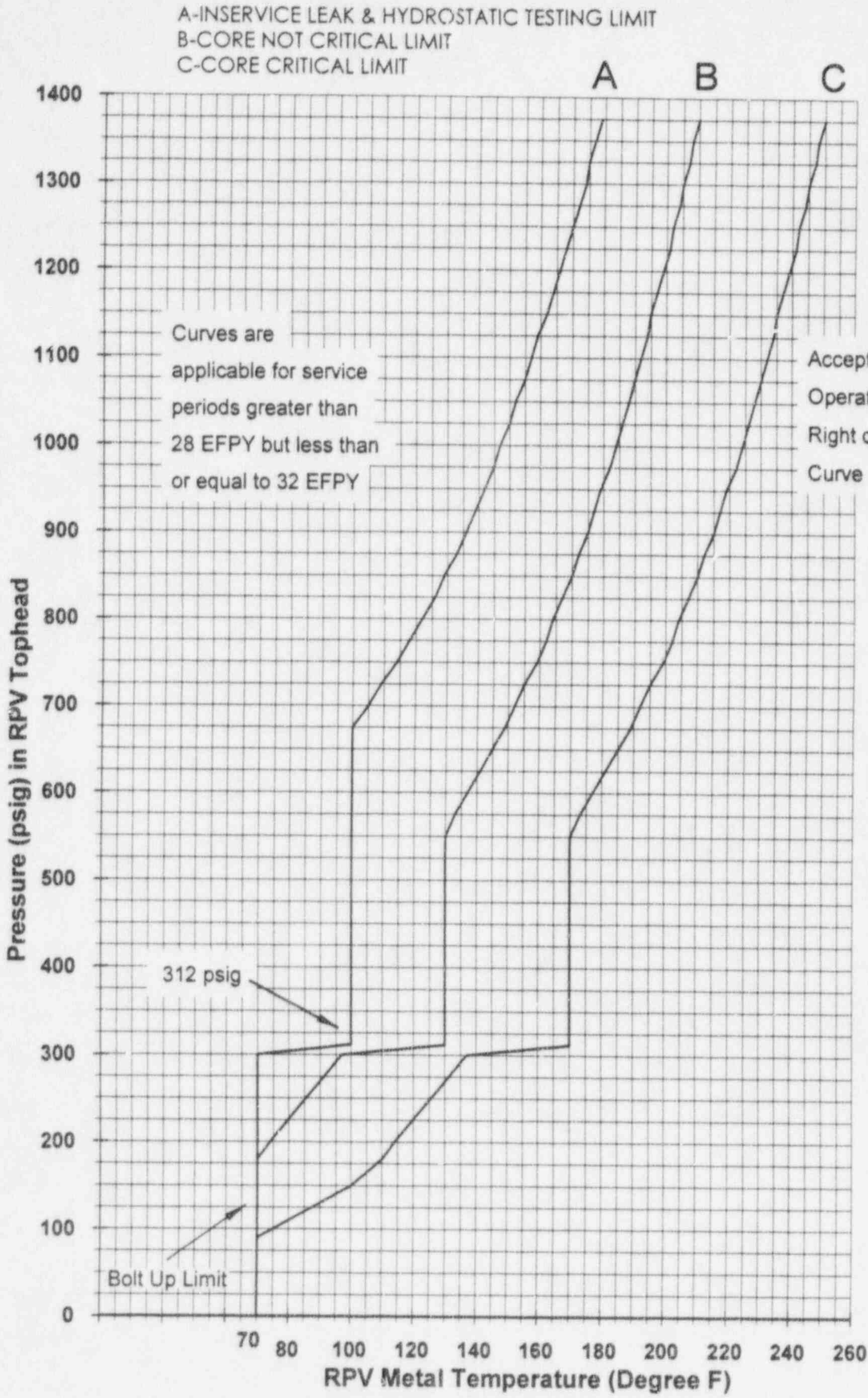
Minimum Reactor Vessel Metal Temperature vs Reactor Vessel Pressure
Figure 3.4.11-1 (page 2 of 5)



Minimum Reactor Vessel Metal Temperature vs Reactor Vessel Pressure
Figure 3.4.11-1 (page 3 of 5)



Minimum Reactor Vessel Metal Temperature vs Reactor Vessel Pressure
Figure 3.4.11-1 (page 4 of 5)



Minimum Reactor Vessel Metal Temperature vs Reactor Vessel Pressure
Figure 3.4.11-1 (page 5 of 5)

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.12 Reactor Steam Dome Pressure

LCO 3.4.12 The reactor steam dome pressure shall be ≤ 1045 psig.

APPLICABILITY: MODES 1 and 2.

ACTIONS

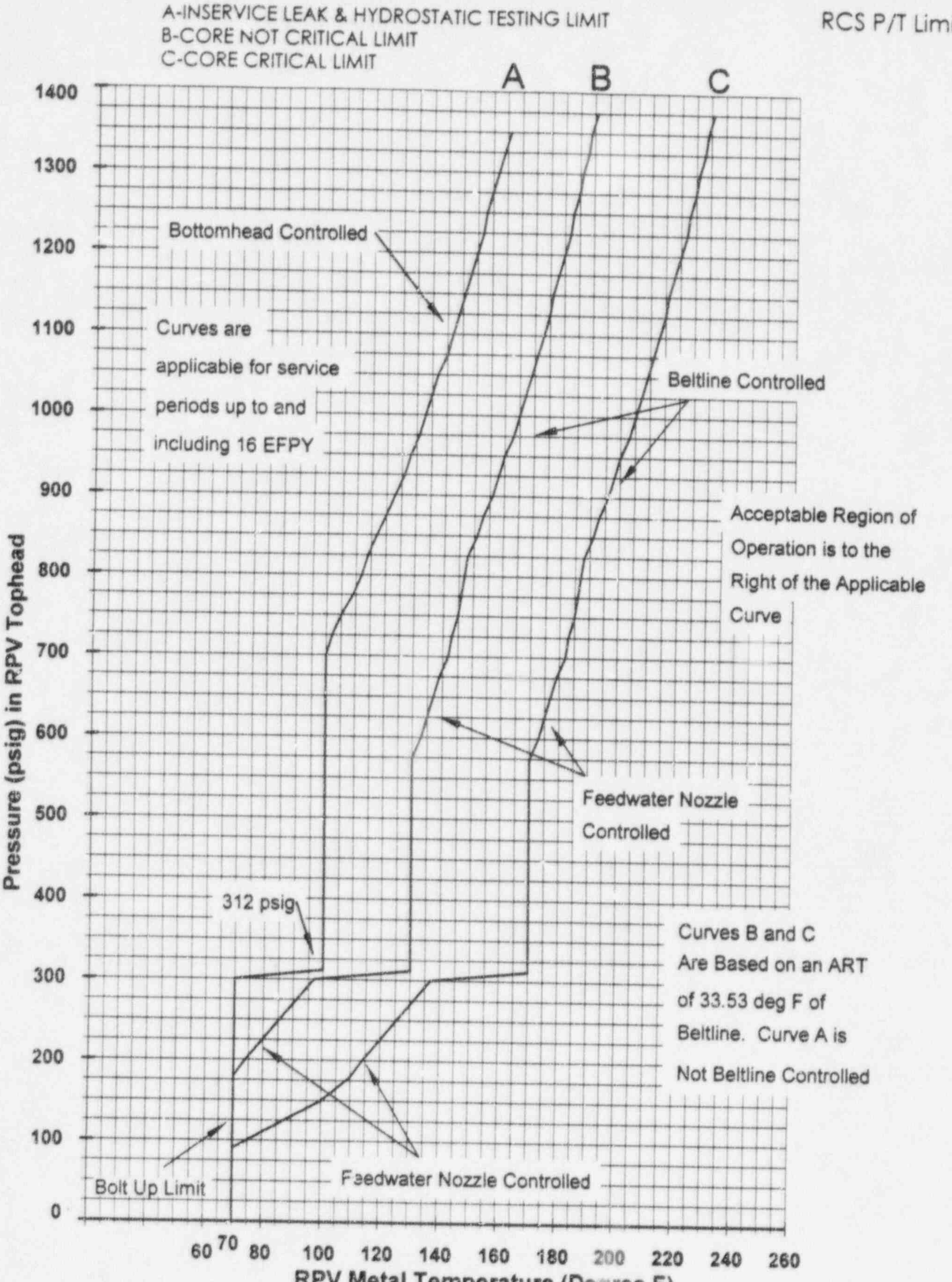
CONDITION	REQUIRED ACTION		COMPLETION TIME
A. Reactor steam dome pressure not within limit.	A.1	Restore reactor steam dome pressure to within limit.	15 minutes
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	12 hours

SURVEILLANCE REQUIREMENTS

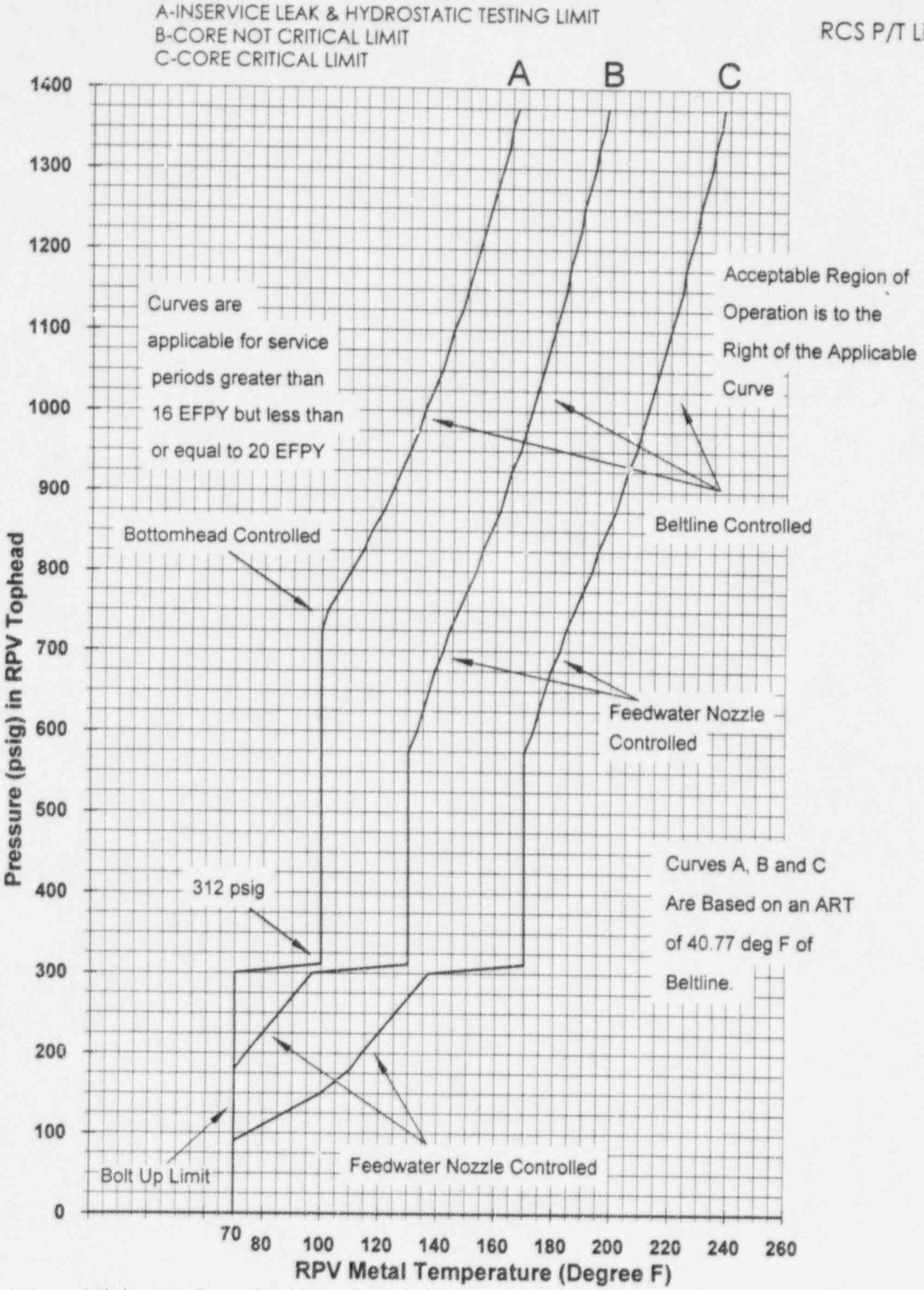
SURVEILLANCE		FREQUENCY
SR 3.4.12.1	Verify reactor steam dome pressure is ≤ 1045 psig.	12 hours

Attachment 4

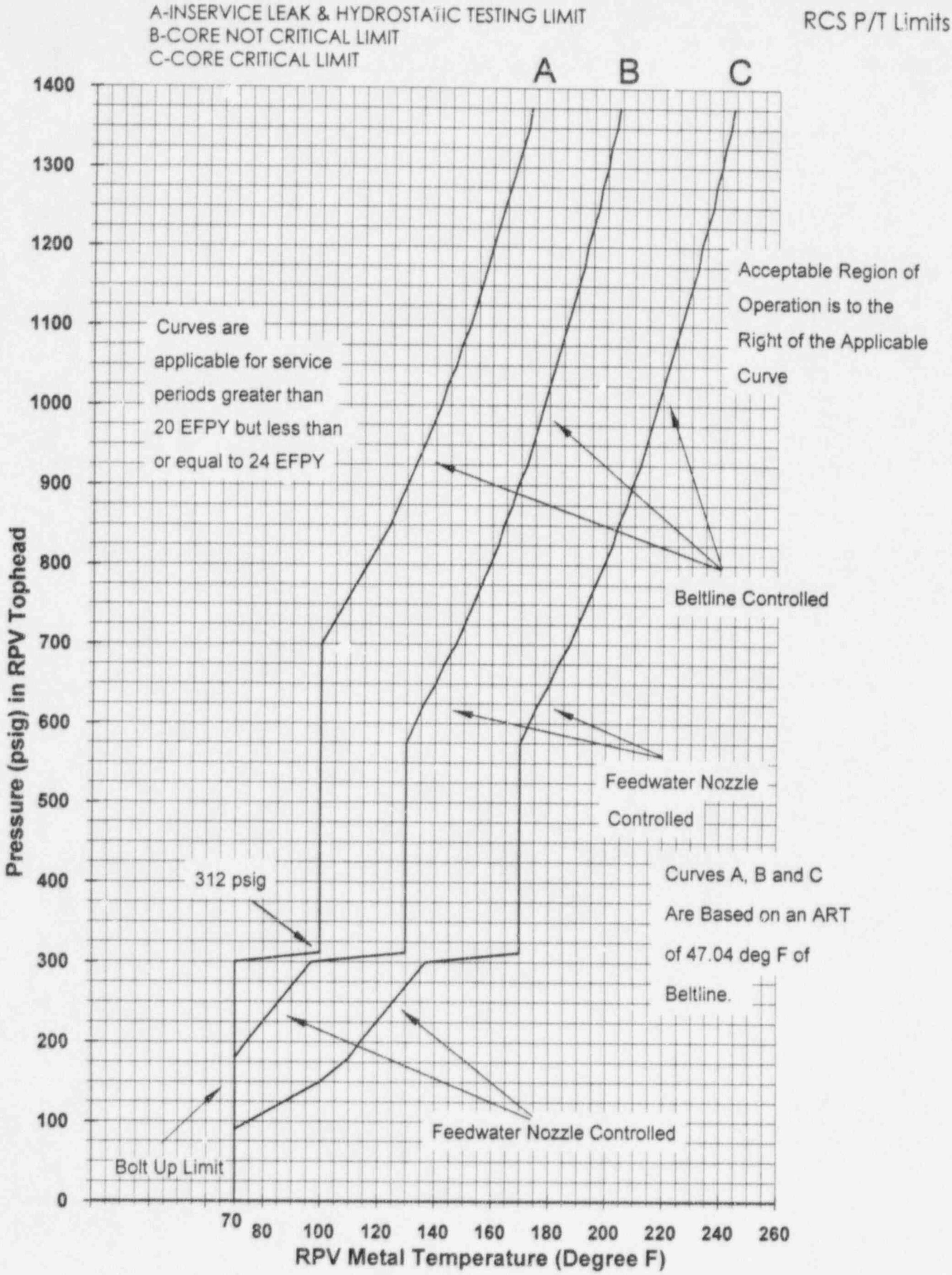
Pressure-Temperature Curves with Additional Information Supporting (PCOL 96/10) for Grand Gulf Nuclear Station



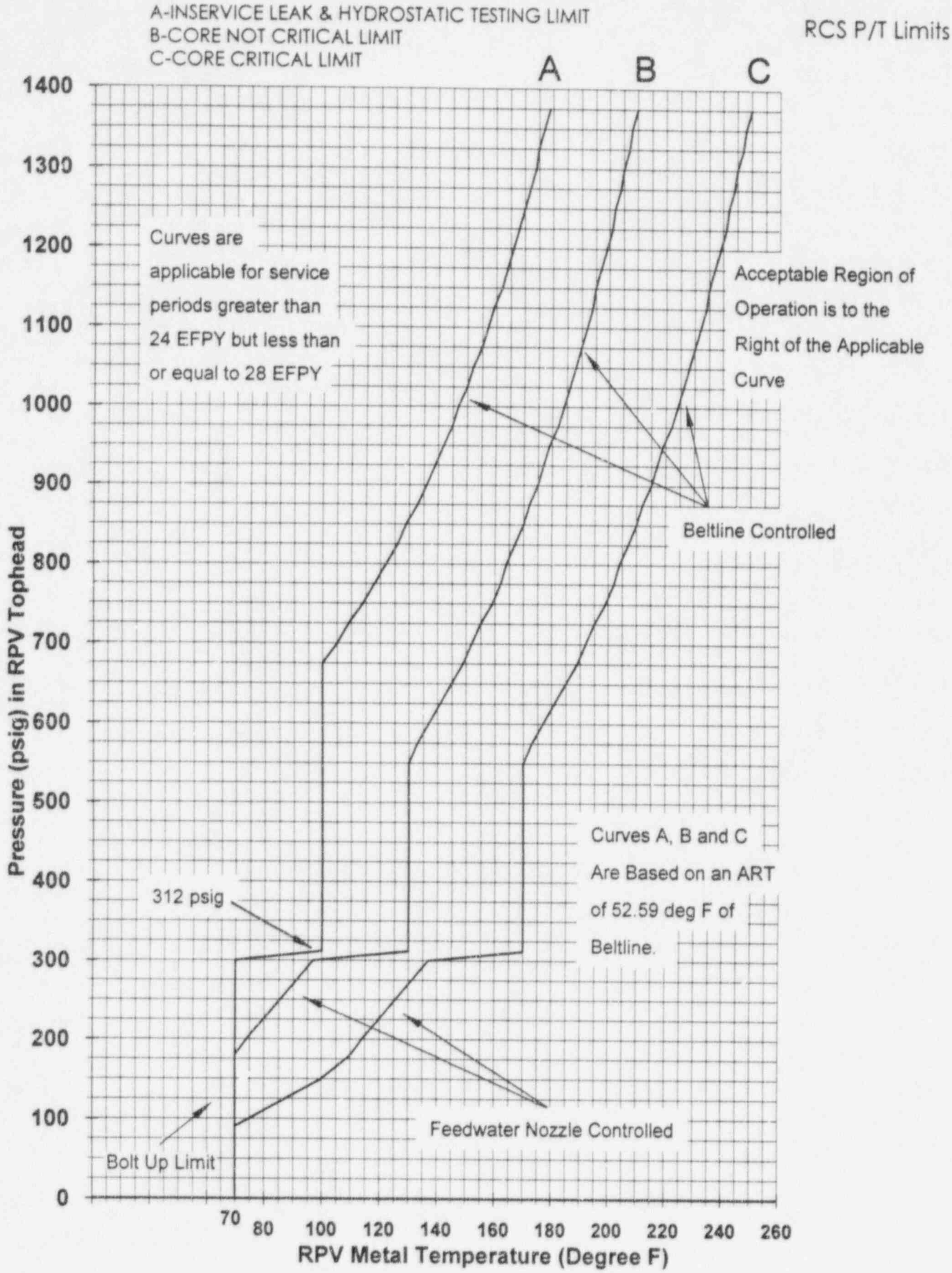
Minimum Reactor Vessel Metal Temperature vs Reactor Vessel Pressure



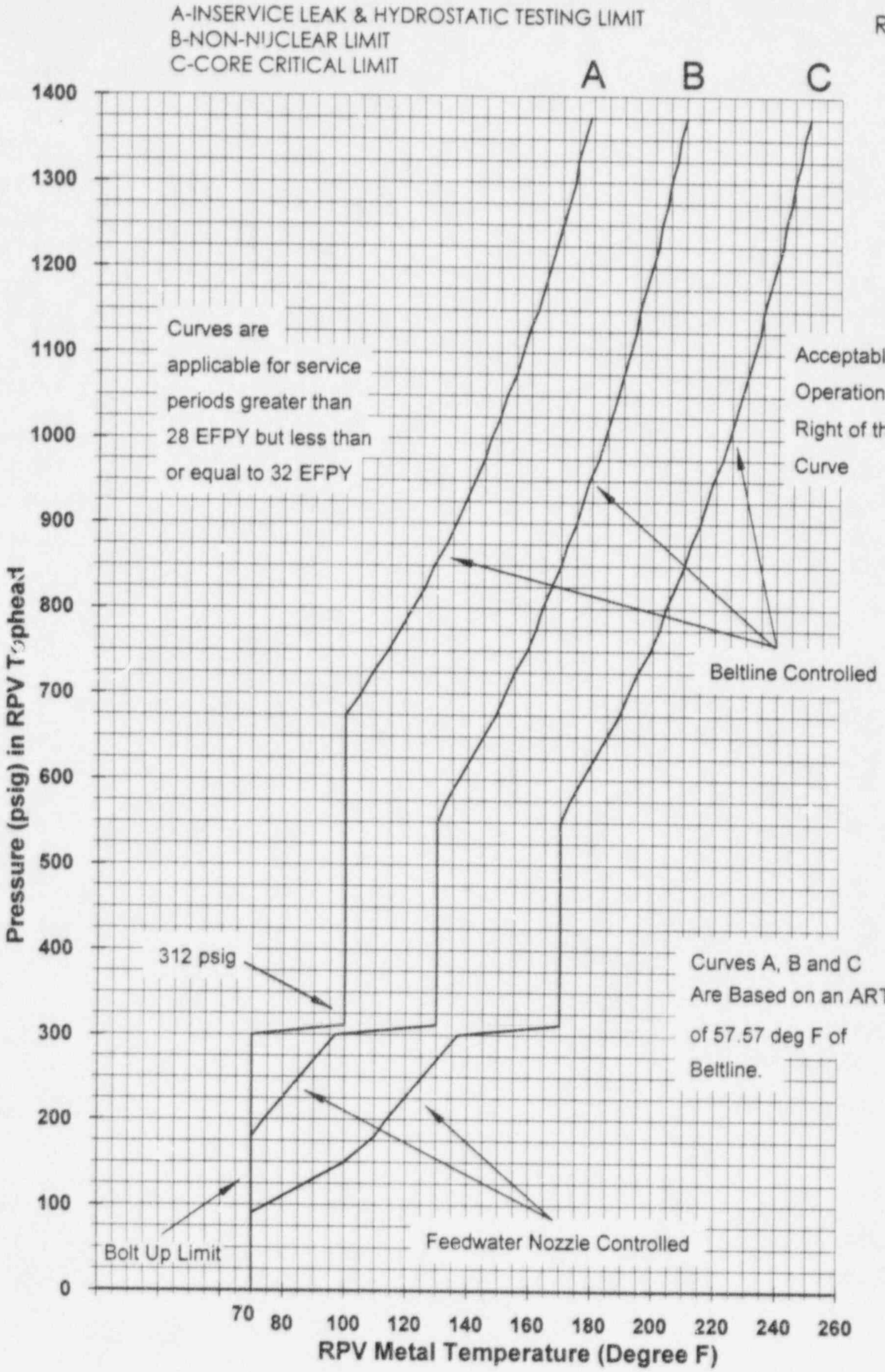
Minimum Reactor Vessel Metal Temperature vs Reactor Vessel Pressure



Minimum Reactor Vessel Metal Temperature vs Reactor Vessel Pressure



Minimum Reactor Vessel Metal Temperature vs Reactor Vessel Pressure



Minimum Reactor Vessel Metal Temperature vs Reactor Vessel Pressure

Attachment 5

Technical Specifications Bases Mark-Ups for Revision to the Pressure-Temperature Curves (PCOL 96/10) for Grand Gulf Nuclear Station

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.11 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.

Normal operation (including heatup and cooldown)

Figure 3.4.11-1 contains P/T limit curves for ~~heatup, cooldown,~~ and inservice leak and hydrostatic testing. ~~The heatup curve provides limits for both heatup and criticality.~~

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 (i.e., to the right of the applicable curve).

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. Therefore, the LCO limits apply mainly to the vessel.

10 CFR 50, Appendix G (Ref. 1), requires the establishment of P/T limits for material fracture toughness requirements of the RCPB materials. Reference 1 requires an adequate margin to brittle failure during normal operation, anticipated operational occurrences, and system hydrostatic tests. It mandates the use of the American Society of Mechanical Engineers (ASME) Code, Section III, Appendix G (Ref. 2).

The actual shift in the RT_{NDT} of the vessel material will be established periodically by removing and evaluating the irradiated reactor vessel material specimens, in accordance with ASTM E 185 (Ref. 3) and 10 CFR 50, Appendix H (Ref. 4). The operating P/T limit curves will be adjusted, as

(continued)

BASES

BACKGROUND (continued)

necessary, based on the evaluation findings and the recommendations of Reference 5.

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. At any specific pressure, temperature, and temperature rate of change, one location within the reactor vessel will dictate the most restrictive limit. Across the span of the P/T limit curves, different locations are more restrictive, and, thus, the curves are composites of the most restrictive regions.

~~The heatup curve represents a different set of restrictions than the cooldown curve because the directions of the thermal gradients through the vessel wall are reversed. The thermal gradient reversal alters the location of the tensile stress between the outer and inner walls.~~ e

Core Not Critical Limit

The criticality limits include the Reference 1 requirement that they be at least 40°F above the ~~heatup curve or the cooldown~~ e curve and not lower than the minimum permissible temperature for the inservice leak and hydrostatic testing.

The consequence of violating the LCO limits is that the RCS has been operated under conditions that can result in brittle failure of the RCPB, possibly leading to a nonisolable leak or loss of coolant accident. In the event these limits are exceeded, an evaluation must be performed to determine the effect on the structural integrity of the RCPB components. The ASME Code, Section XI, Appendix E (Ref. 6), provides a recommended methodology for evaluating an operating event that causes an excursion outside the limits.

APPLICABLE SAFETY ANALYSES

The P/T limits are not derived from Design Basis Accident (DBA) analyses. They are prescribed during normal operation to avoid encountering pressure, temperature, and temperature rate of change conditions that might cause undetected flaws to propagate and cause nonductile failure of the RCPB, a condition that is unanalyzed. Reference 7 establishes the methodology for determining the P/T limits. Since the P/T limits are not derived from any DBA, there are no acceptance limits related to the P/T limits. Rather, the P/T limits

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

are acceptance limits themselves since they preclude operation in an unanalyzed condition.

RCS P/T limits satisfy Criterion 2 of the NRC Policy Statement.

LCO

The elements of this LCO are:

a. RCS pressure and temperature are within the limits specified in Figure 3.4.11-1 and heatup or cooldown rate is ≤ 100°F in any one hour period during RCS heatup, cooldown, and inservice leak and hydrostatic testing.

b. The temperature difference between the reactor vessel bottom head coolant and the reactor pressure vessel (RPV) coolant is ≤ 100°F during recirculation pump startup and during increases in THERMAL POWER or loop flow while operating at low THERMAL POWER or loop flow.

c. The temperature difference between the reactor coolant in the respective recirculation loop and in the reactor vessel is ≤ 50°F during pump startup and during increases in THERMAL POWER or loop flow while operating at low THERMAL POWER or loop flow.

d. RCS pressure and temperature are within the criticality limits specified in Figure 3.4.11-1 prior to achieving criticality.

the applicable

e. The reactor vessel flange and the head flange temperatures is ≥ 70°F when tensioning the reactor vessel head bolting studs.

These limits define allowable operating regions and permit a large number of operating cycles while also providing a wide margin to nonductile failure.

The rate of change of temperature limits control the thermal gradient through the vessel wall and are used as inputs for calculating the heatup, cooldown, and inservice leak and

based on the current Effective Full Power Year (EFPY)

(continued)

facilitate NRC review. Upon approval of the proposed TS curves in Attachment 3, the curves included in Attachment 4 (containing detailed information used in development of the TS curves) will be retained in the Updated Final Safety Analysis Report for information. The Attachment 3 curves (containing operator information) will be included in the TS. In addition, a marked-up copy of the affected pages from the Technical Specification Bases is provided in Attachment 5. Upon approval of this request by the NRC, Entergy will revise the GGNS TS Bases in accordance with GGNS TS 5.5.11, ''Technical Specifications Bases Control Program,'' to reflect the changes provided in Attachment 5. Attachment 1 is the affirmation as per 10CFR50.30 which supports the facts set forth in this letter and its attachments.

Entergy has reviewed the proposed change against the criteria of 10CFR51.22 for categorical exclusion from environmental impact considerations. The proposed change does not involve a: significant hazards consideration; significant change or increase in the types or amounts of any effluents that may be released offsite; significant increase in individual or cumulative occupational radiation exposure. Entergy concludes that the proposed change meets the criteria given in 10CFR51.22(c)(9) for a categorical exclusion from the requirement for an Environmental Impact Statement.

Based on the guidelines presented in 10CFR50.92, Entergy Operations has concluded that this proposed amendment involves no significant hazards considerations. Entergy Operations is requesting action on this submittal by November 1997 as we anticipate reaching 10 EFPY during this month.

If you have any questions, please contact Mike Larson at 601-437-6685.

Yours truly,

JJH/MJL

attachments:
1. Affirmation per 10CFR50.30
2. Evaluation of No Significant Hazards Consideration for Request for Revision to the Pressure-Temperature Curves (PCOL 96/10) for Grand Gulf Nuclear Station
3. Mark-ups of Affected Technical Specifications Pages and Proposed Replacement Curves
4. Pressure-Temperature Curves with Additional Information
5. Technical Specifications Bases Mark-Ups

cc: (See Next Page)

cc:

Mr. J. E. Tedrow (w/a)
Mr. R. B. McGehee (w/a)
Mr. N. S. Reynolds (w/a)
Mr. H. L. Thomas (w/o)
Mr. J. W. Yelverton (w/a)

Mr. L. J. Callan (w/a)
Regional Administrator
U.S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 400
Arlington, TX 76011

Mr. J. N. Donohew, Project Manager (w/2)
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Stop 13H3
Washington, D.C. 20555

Dr. E. F. Thompson (w/a)
State Health Officer
State Board of Health
P. O. Box 1700
Jackson, Mississippi 39205

BEFORE THE

UNITED STATES NUCLEAR REGULATORY COMMISSION

LICENSE NO. NPF-29

DOCKET NO. 50-416

IN THE MATTER OF

ENTERGY MISSISSIPPI, INC
and
SYSTEM ENERGY RESOURCES, INC.
and
SOUTH MISSISSIPPI ELECTRIC POWER ASSOCIATION
and
ENTERGY OPERATIONS, INC.

AFFIRMATION

I, J. J. Hagan, being duly sworn, state that I am Vice President, Operations GGNS of Entergy Operations, Inc.; that on behalf of Entergy Operations, Inc., System Energy Resources, Inc., and South Mississippi Electric Power Association I am authorized by Entergy Operations, Inc. to sign and file with the Nuclear Regulatory Commission, this application for amendment of the Operating License of the Grand Gulf Nuclear Station; that I signed this application as Vice President, Operations GGNS of Entergy Operations, Inc.; and that the statements made and the matters set forth therein are true and correct to the best of my knowledge, information and belief.

JJHagan
J. J. Hagan

STATE OF MISSISSIPPI
COUNTY OF CLAIBORNE

SUBSCRIBED AND SWORN TO before me, a Notary Public, in and for the County and State above named, this 22nd day of October, 1996.

(SEAL)

Richard R. Moore III
Notary Public

My commission expires:
MISSISSIPPI STATEWIDE NOTARY PUBLIC
MY COMMISSION EXPIRES JUNE 5, 1998
BONDED THRU STEGALL NOTARY SERVICE