Enclosure 3

Edwin I. Hatch Nuclear Plant
Request to Revise Technical Specifications:
Pressure and Temperature Limits

Page Change Instructions

Unit 1

Page	Instruction
3.4-22	Replace
3.4-23	Replace
3.4-24	Replace
3.4-25	Replace
3.4-26	Replace
3.4-27	Replace

Unit 2

Page	Instruction
3.4-22	Replace
3.4-23	Replace
3.4-24	Replace
3.4-25	Replace
3.4-26	Replace
3.4-27	Replace

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. <u>AND</u> C.2 Determine RCS is acceptable for operation.	Immediately Prior to entering MODE 2 or 3

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	Verify: a. RCS pressure and RCS temperature are within the limits specified in Figures 3.4.9-1 and 3.4.9-2 during RCS non-nuclear heatup and cooldown operations, and RCS inservice leak and hydrostatic testing; and b. RCS heatup and cooldown rates are $\leq$ 100°F in any 1 hour period during RCS heatup and cooldown operations, and RCS inservice leak and hydrostatic testing.	30 minutes

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.9.2	----------NOTE---------- Only required to be met when the reactor is critical and immediately prior to control rod withdrawal for the purpose of achieving criticality. ------------------------------ Verify RCS pressure and RCS temperature are within the criticality limits specified in Figure 3.4.9-3.	Once within 15 minutes prior to initial control rod withdrawal for the purpose of achieving criticality
SR 3.4.9.3	----------NOTE---------- Only required to be met in MODES 1, 2, 3, and 4 during startup of a recirculation pump. ------------------------------ Verify the difference between the bottom head coolant temperature and the reactor pressure vessel (RPV) coolant temperature is $\leq$ 145°F.	Once within 15 minutes prior to starting an idle recirculation pump
SR 3.4.9.4	----------NOTE---------- Only required to be met in MODES 1, 2, 3, and 4 during startup of a recirculation pump. ------------------------------ Verify the difference between the reactor coolant temperature in the recirculation loop to be started and the RPV coolant temperature is $\leq$ 50°F.	Once within 15 minutes prior to starting an idle recirculation pump

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.9.5	---NOTE--- Only required to be met when tensioning/ detensioning the reactor vessel head bolting studs. --- Verify reactor vessel flange and head flange temperatures are $\geq$ 76°F.	Once within 30 minutes prior to tensioning/ detensioning the reactor vessel head bolting studs and every 30 minutes thereafter
SR 3.4.9.6	---NOTE--- Only required to be met when the reactor vessel head is tensioned. --- Verify reactor vessel flange and head flange temperatures are $\geq$ 76°F.	Once within 12 hours after RCS temperature is $\leq$ 106°F in MODE 4, and 12 hours thereafter <u>AND</u> Once within 30 minutes after RCS temperature is $\leq$ 86°F in MODE 4, and 30 minutes thereafter

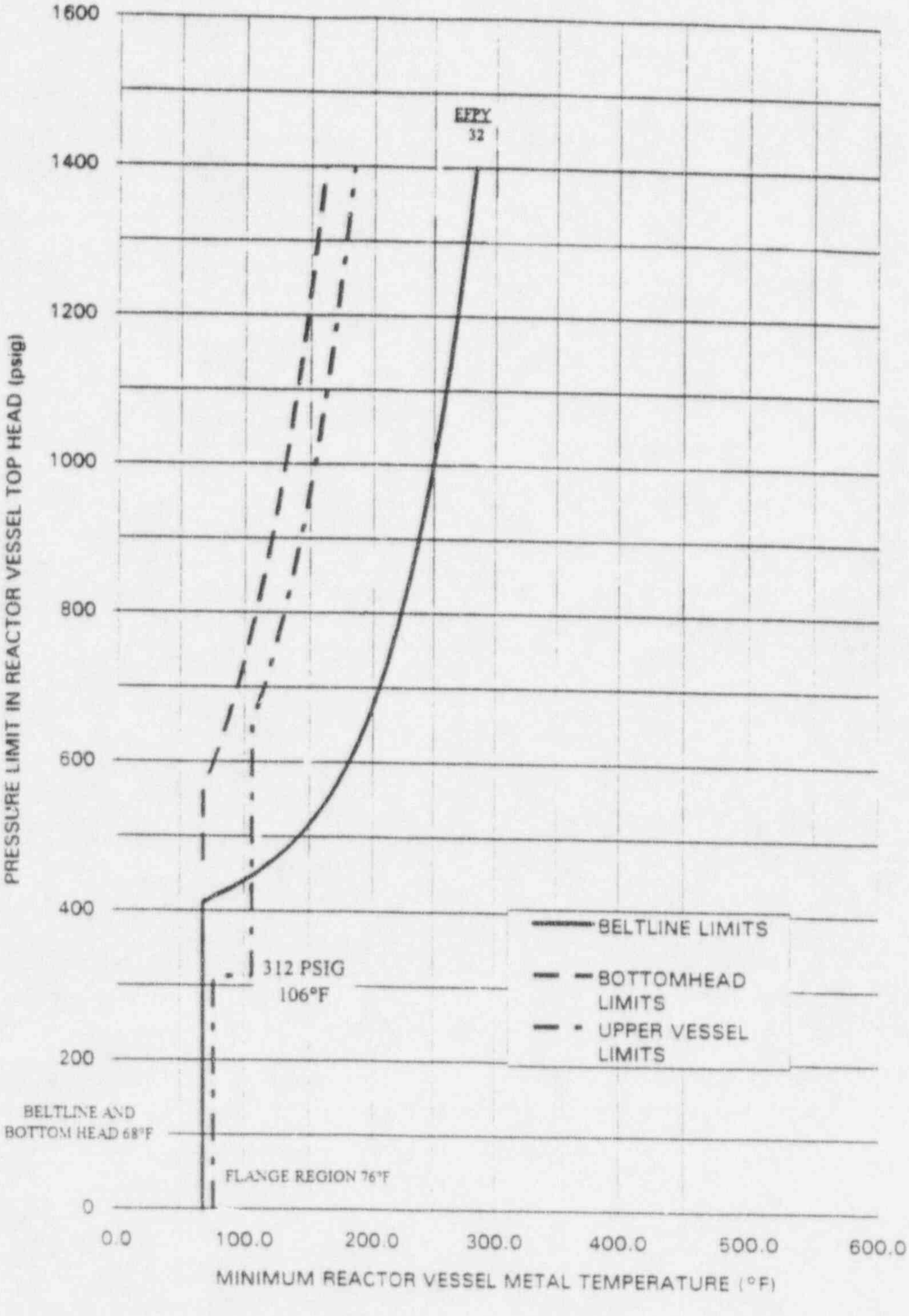


Figure 3.4.9-1 (page 1 of 1)
Pressure/Temperature Limits for
Inservice Hydrostatic and Inservice Leakage Tests

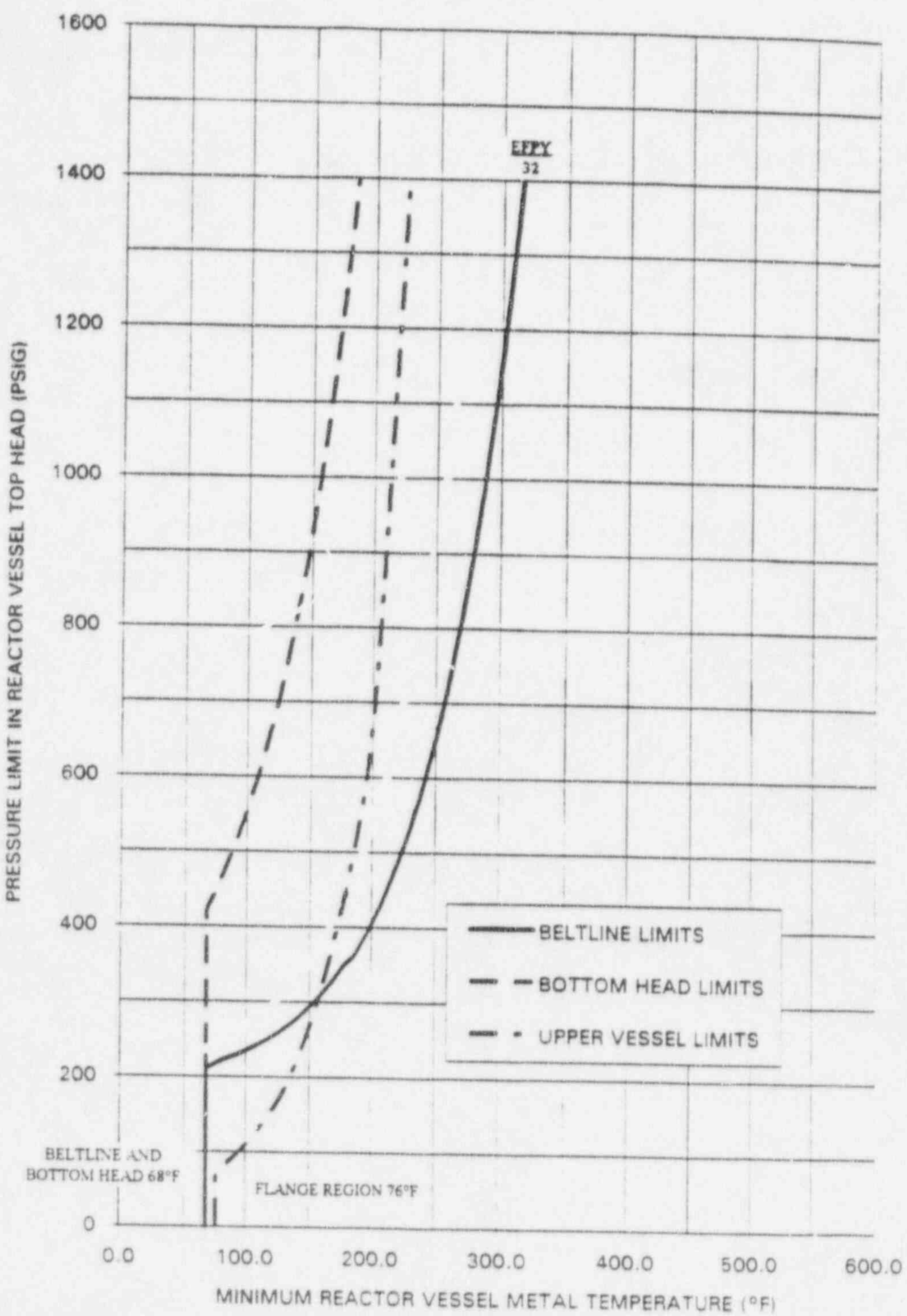


Figure 3.4.9-2 (page 1 of 1)
Pressure/Temperature Limits for Non-Nuclear Heatup,
Low Power Physics Tests, and Cooldown Following a Shutdown

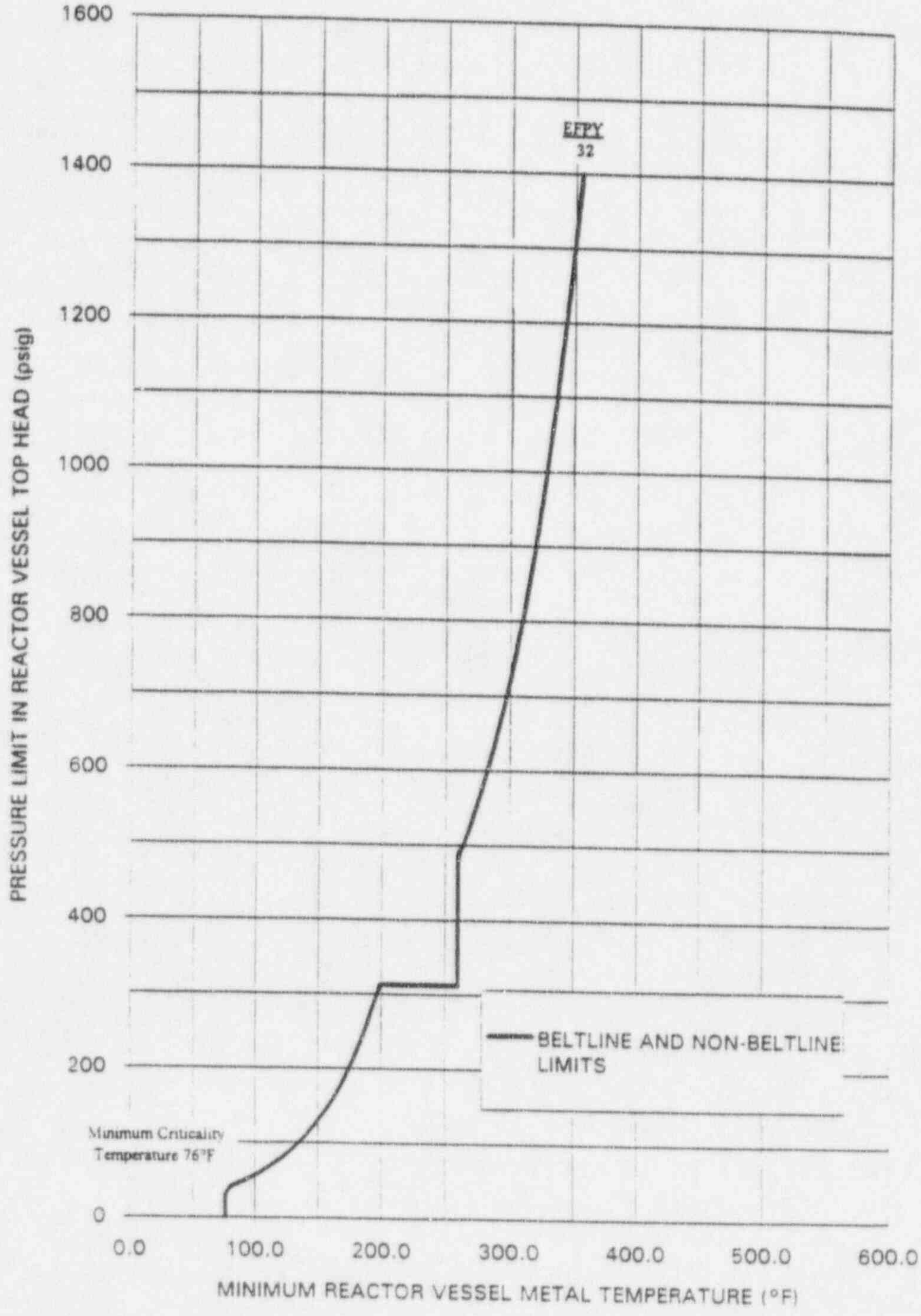


Figure 3.4.9-3 (page 1 of 1)
Pressure/Temperature Limits for Criticality

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.	Immediately
	AND		
	C.2	Determine RCS is acceptable for operation.	Prior to entering MODE 2 or 3

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	Verify: a. RCS pressure and RCS temperature are within the limits specified in Figures 3.4.9-1 and 3.4.9-2 during RCS non-nuclear heatup and cooldown operations, and RCS inservice leak and hydrostatic testing; and b. RCS heatup and cooldown rates are $\leq$ 100°F in any 1 hour period during RCS heatup and cooldown operations, and RCS inservice leak and hydrostatic testing.	30 minutes

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.9.2	-------------------NOTE------------------- Only required to be met when the reactor is critical and immediately prior to control rod withdrawal for the purpose of achieving criticality. -- Verify RCS pressure and RCS temperature are within the criticality limits specified in Figure 3.4.9-3.	Once within 15 minutes prior to initial control rod withdrawal for the purpose of achieving criticality
SR 3.4.9.3	-------------------NOTE------------------- Only required to be met in MODES 1, 2, 3, and 4 during startup of a recirculation pump. -- Verify the difference between the bottom head coolant temperature and the reactor pressure vessel (RPV) coolant temperature is ≤ 145°F.	Once within 15 minutes prior to starting an idle recirculation pump
SR 3.4.9.4	-------------------NOTE------------------- Only required to be met in MODES 1, 2, 3, and 4 during startup of a recirculation pump. -- 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 starting an idle recirculation pump

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.9.5	--------------------NOTE-------------------- Only required to be met when tensioning/ detensioning the reactor vessel head bolting studs. -- Verify reactor vessel flange and head flange temperatures are $\geq$ 90°F.	Once within 30 minutes prior to tensioning/ detensioning the reactor vessel head bolting studs and every 30 minutes thereafter
SR 3.4.9.6	--------------------NOTE-------------------- Only required to be met when the reactor vessel head is tensioned. -- Verify reactor vessel flange and head flange temperatures are $\geq$ 90°F.	Once within 12 hours after RCS temperature is $\leq$ 120°F in MODE 4, and 12 hours thereafter <u>AND</u> Once within 30 minutes after RCS temperature is $\leq$ 100°F in MODE 4, and 30 minutes thereafter

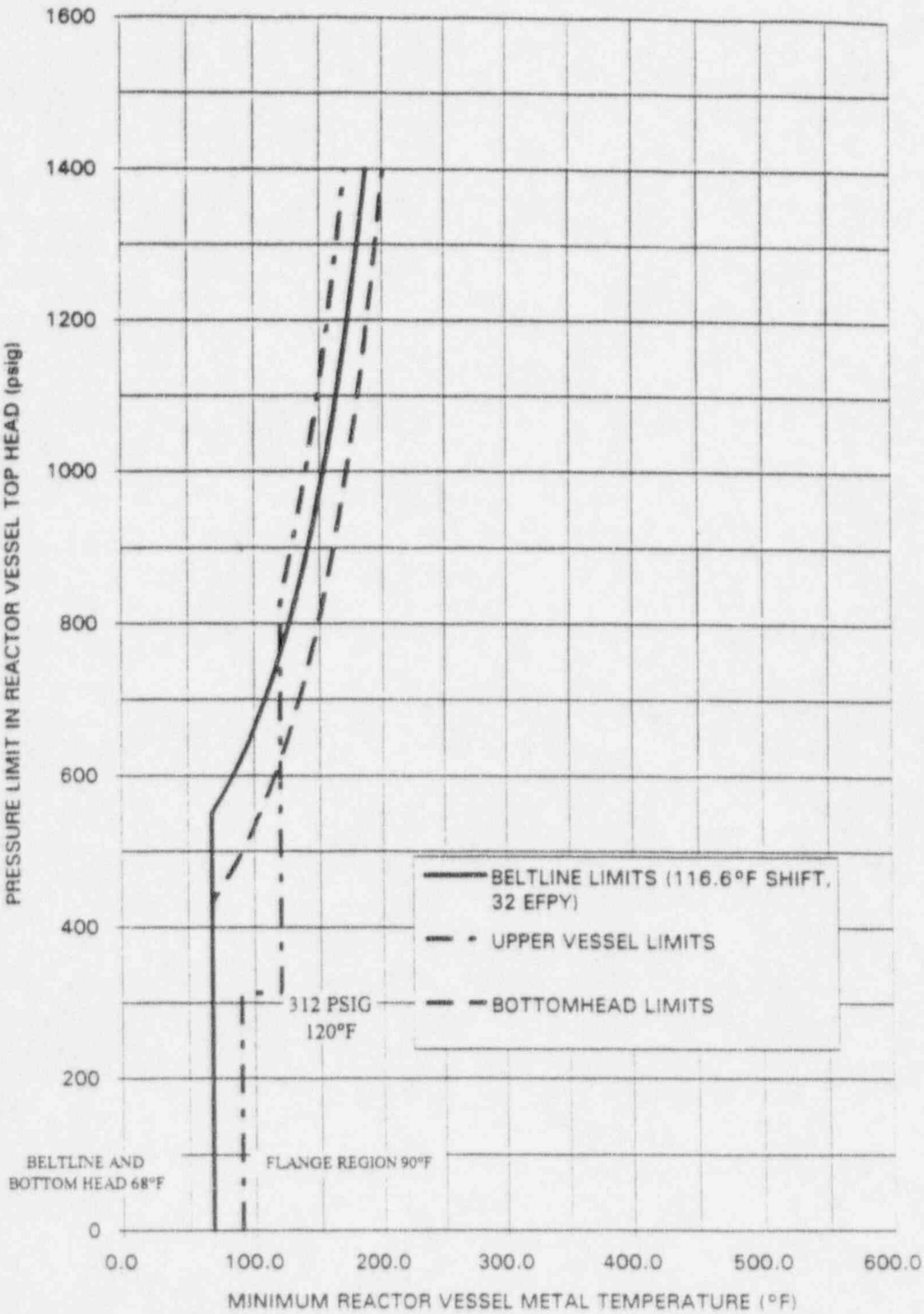


Figure 3.4.9-1 (page 1 of 1)
Pressure/Temperature Limits for
Inservice Hydrostatic and Inservice Leakage Tests

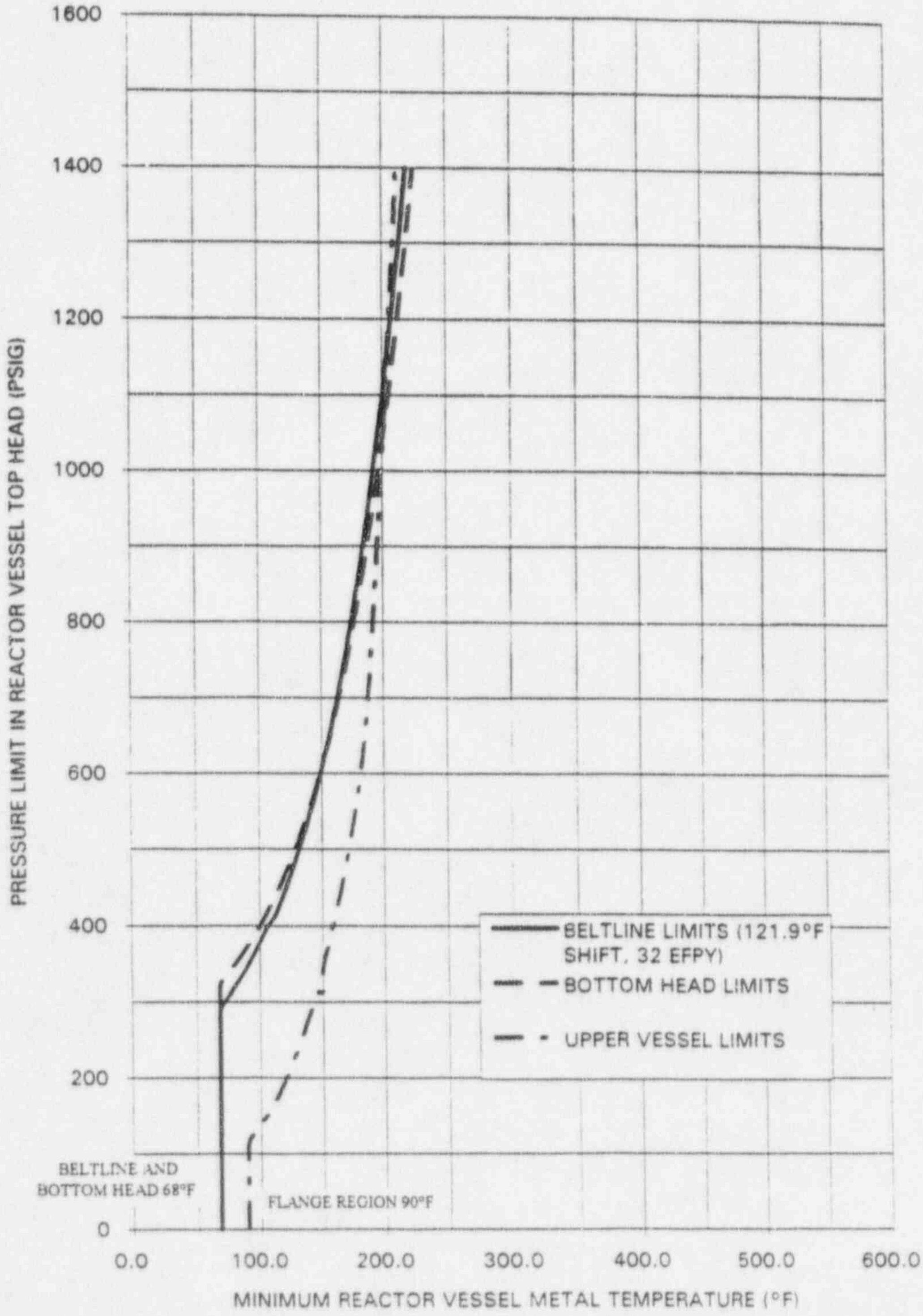


Figure 3.4.9-2 (page 1 of 1)
Pressure/Temperature Limits for Non-Nuclear Heatup, Low Power Physics Tests, and Cooldown Following a Shutdown

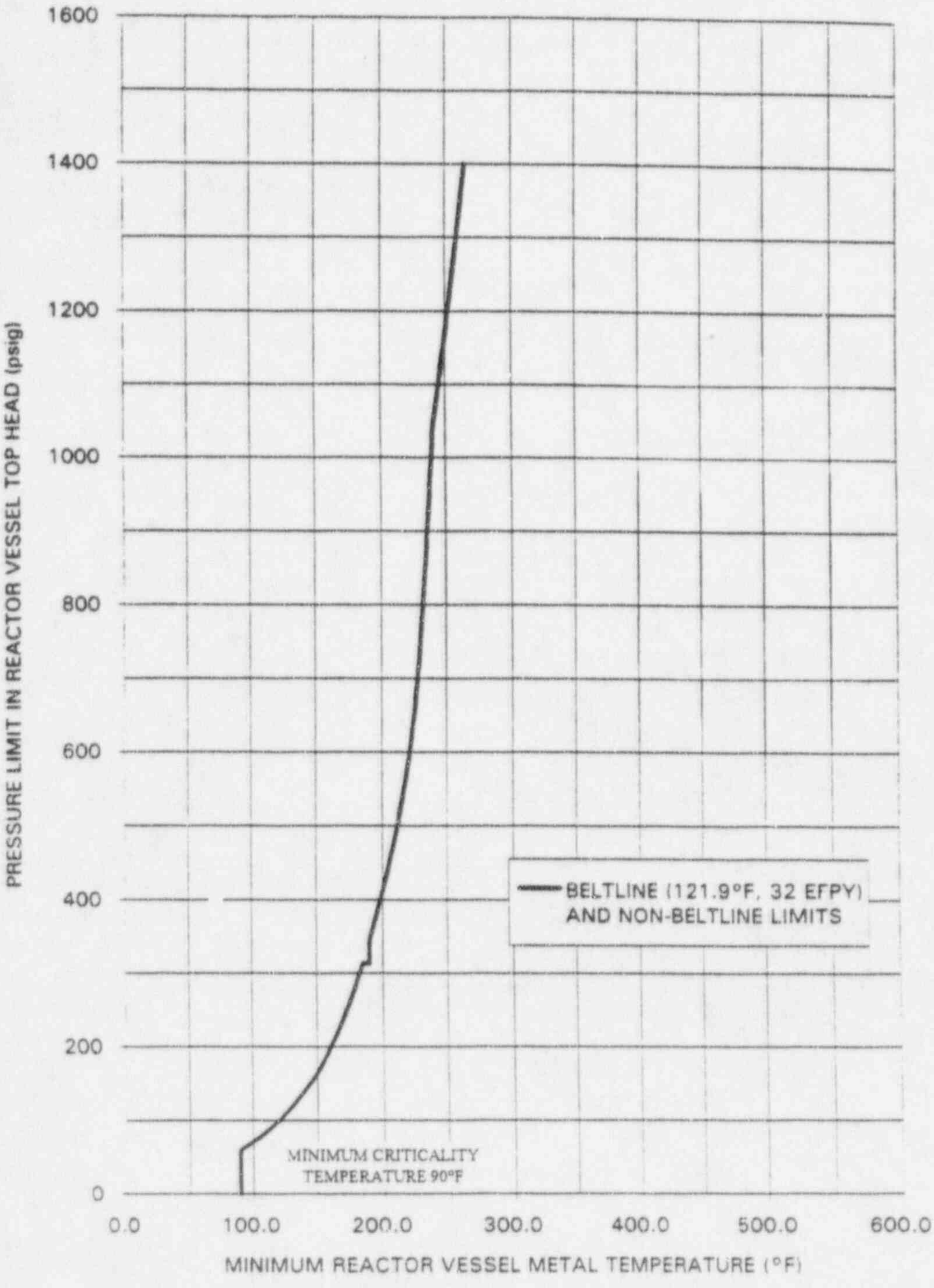


Figure 3.4.9-3 (page 1 of 1)
Pressure/Temperature Limits for Criticality

Attachment 1 to Enclosure 3

Technical Specifications
Unit 1 and Unit 2

Marked-Up Pages

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.	Immediately
	<u>AND</u>		
	C.2	Determine RCS is acceptable for operation.	Prior to entering MODE 2 or 3

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	~~---------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 specified in Figures 3.4.9-1 and 3.4.9-2; and b. RCS heatup and cooldown rates are ≤ 100°F in any 1 hour period.	30 minutes during RCS non-nuclear heatup and cooldown operations, and inservice RCS leak and hydrostatic testing

(continued)

during RCS heatup and cooldown operations and RCS inservice leak and hydrostatic testing.

NOTE
Only required to be met when the reactor is critical

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.9.2	Verify RCS pressure and RCS temperature are within the criticality limits specified in Figure 3.4.9-3.	Once within 15 minutes prior to initial control rod withdrawal for the purpose of achieving criticality and immediately prior to control rod withdrawal for the purpose of achieving criticality.
SR 3.4.9.3	--------------------NOTE-------------------- Only required to be met in MODES 1, 2, 3, and 4 during startup of a recirculation pump. --- Verify the difference between the bottom head coolant temperature and the reactor pressure vessel (RPV) coolant temperature is ≤ 145°F.	Once within 15 minutes prior to starting an idle recirculation pump
SR 3.4.9.4	--------------------NOTE-------------------- Only required to be met in MODES 1, 2, 3, and 4 during startup of a recirculation pump. --- 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 starting an idle recirculation pump

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.4.9.5	------NOTE------ Only required to be ~~performed~~ met when tensioning /detensioning the reactor vessel head bolting studs. ------ Verify reactor vessel flange and head flange temperatures are ≥ 76°F.	Once within 30 minutes prior to tensioning/detensioning the reactor vessel head bolting studs and every 30 minutes thereafter
SR 3.4.9.6 Replace with insert 1 attached.	~~------NOTE------ Not required to be performed until 30 minutes after RCS temperature ≤ 86°F in MODE 4. ------ Verify reactor vessel flange and head flange temperatures are ≥ 76°F.~~	~~30 minutes~~ Replace with insert 2 attached.
~~SR 3.4.9.7~~	~~------NOTE------ Not required to be performed until 12 hours after RCS temperature ≤ 106°F in MODE 4. ------ Verify reactor vessel flange and head flange temperatures are ≥ 76°F.~~	~~12 hours~~

INSERT 1, page 3.4-24

NOTE

Only required to be met when the reactor vessel head is tensioned.

Verify reactor vessel flange and head flange temperatures are ≥ 76°F.

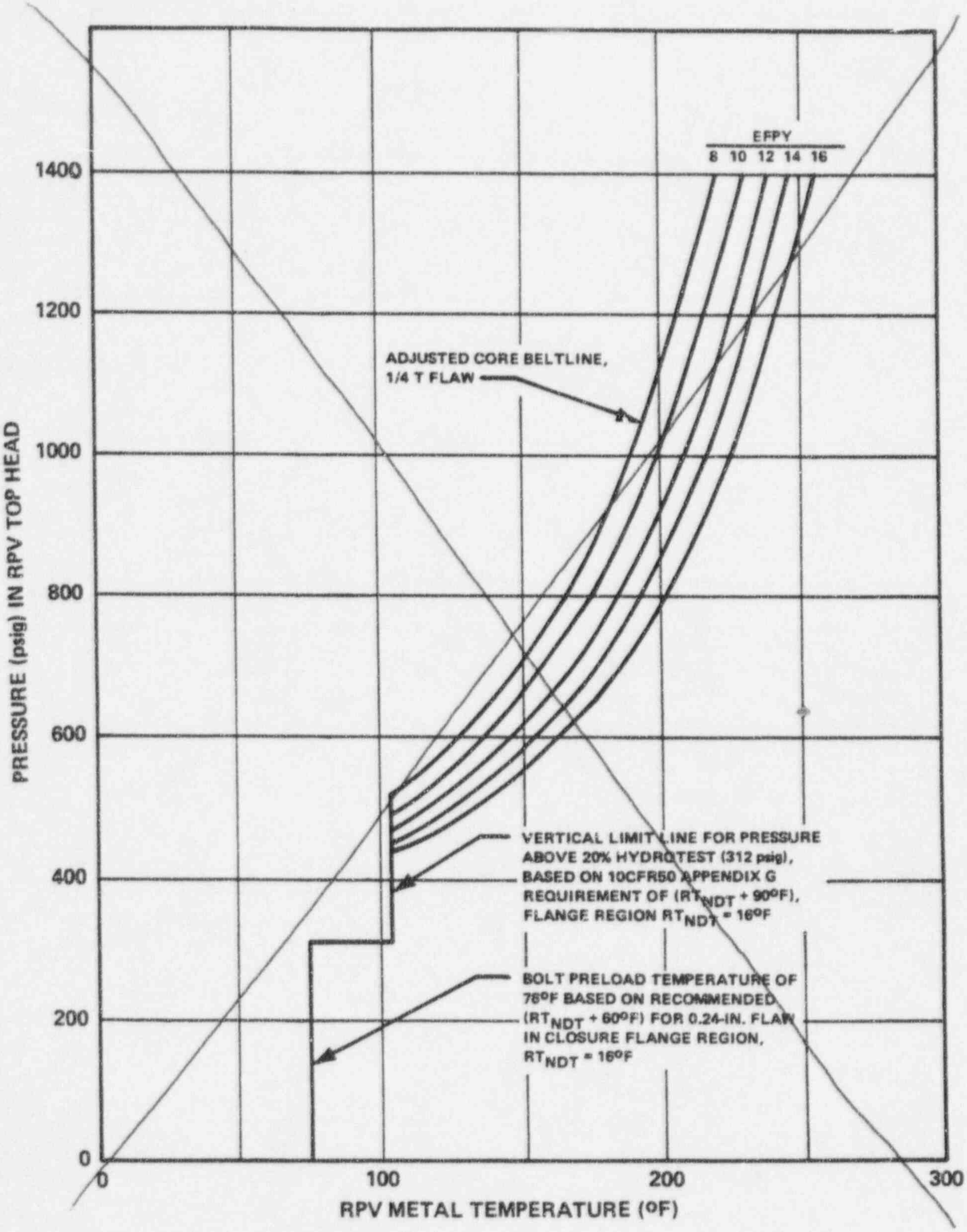
Once within 12 hours after RCS temperature is ≤ 106°F in MODE 4, and 12 hours thereafter.

<u>AND</u>

Once within 30 minutes after RCS temperature is ≤ 86°F in MODE 4, and 30 minutes thereafter.

INSERT 2, page 3.4-24

Unit 1



Replace with attached figure

Figure 3.4.9-1 (page 1 of 1)
Pressure/Temperature Limits for
Inservice Hydrostatic and Inservice Leakage Tests

Replace current Figure 3.4.9-1 (page 1 of 1) with this figure

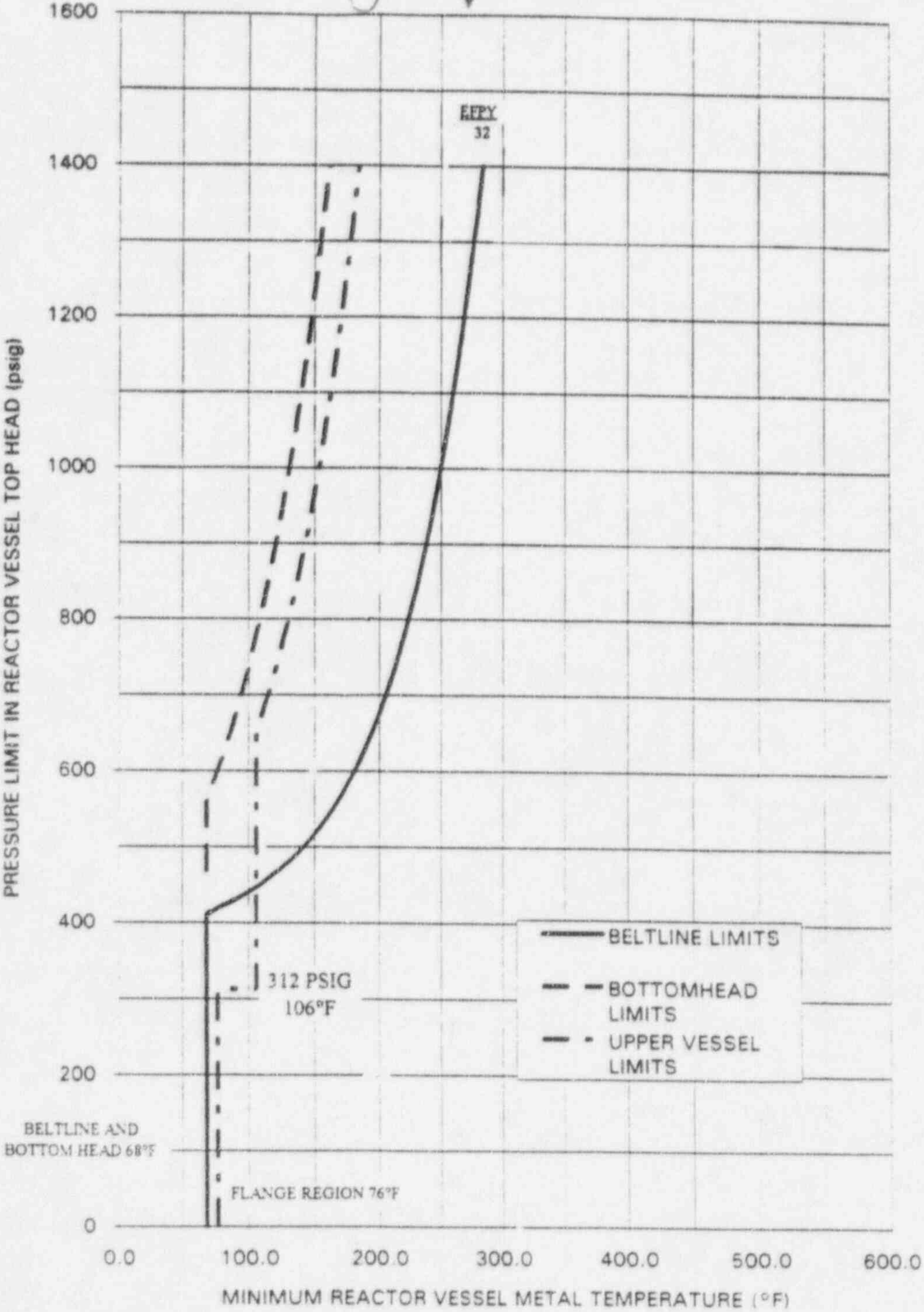


Figure 3.4.9-1 (page 1 of 1)
Pressure/Temperature Limits for
Inservice Hydrostatic and Inservice Leakage Tests

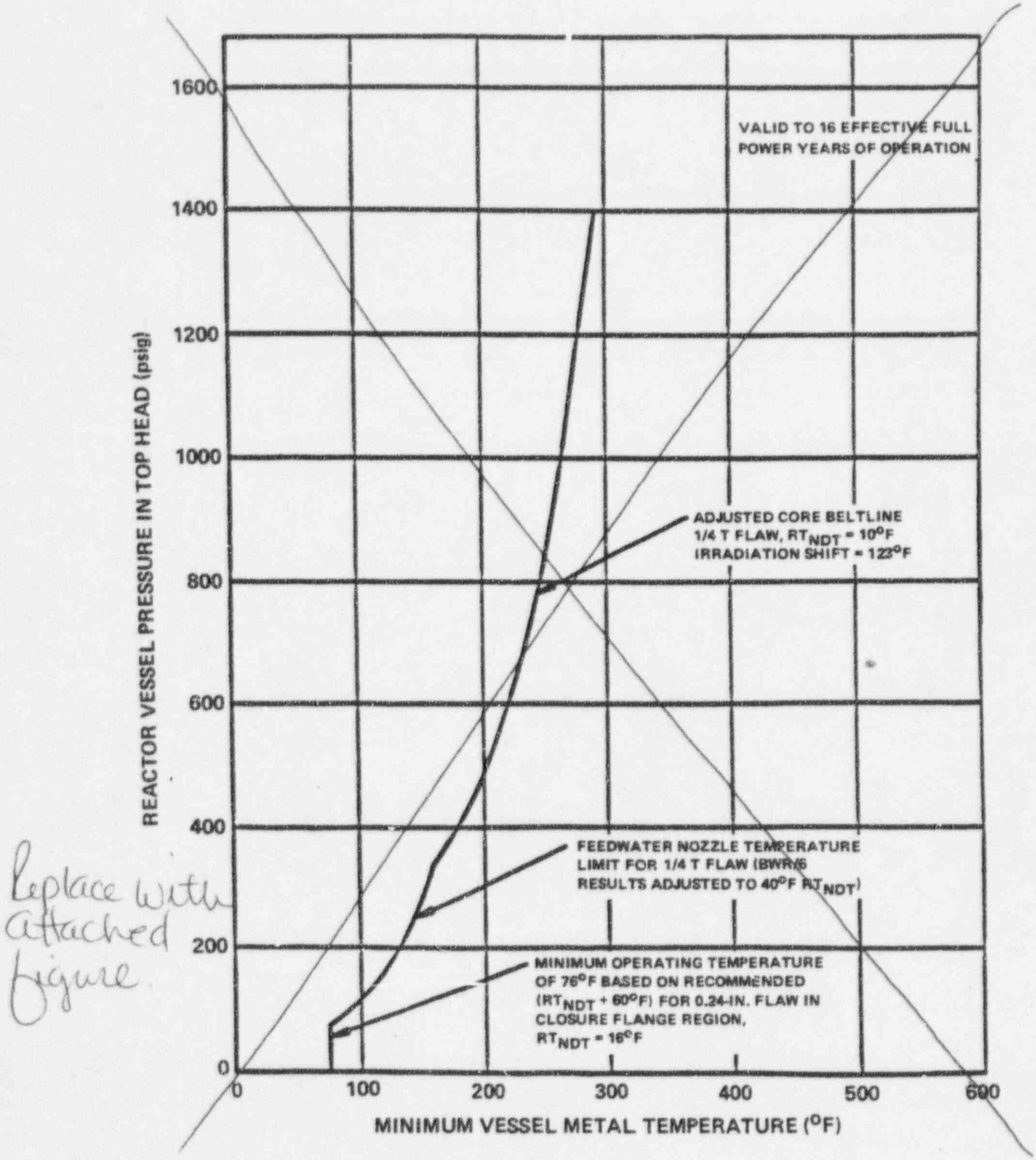


Figure 3.4.9-2 (page 1 of 1)
Pressure/Temperature Limits for Non-Nuclear Heatup,
Low Power Physics Tests, and Cooldown Following a Shutdown

Replace current Figure 3.4.9-2
With this figure

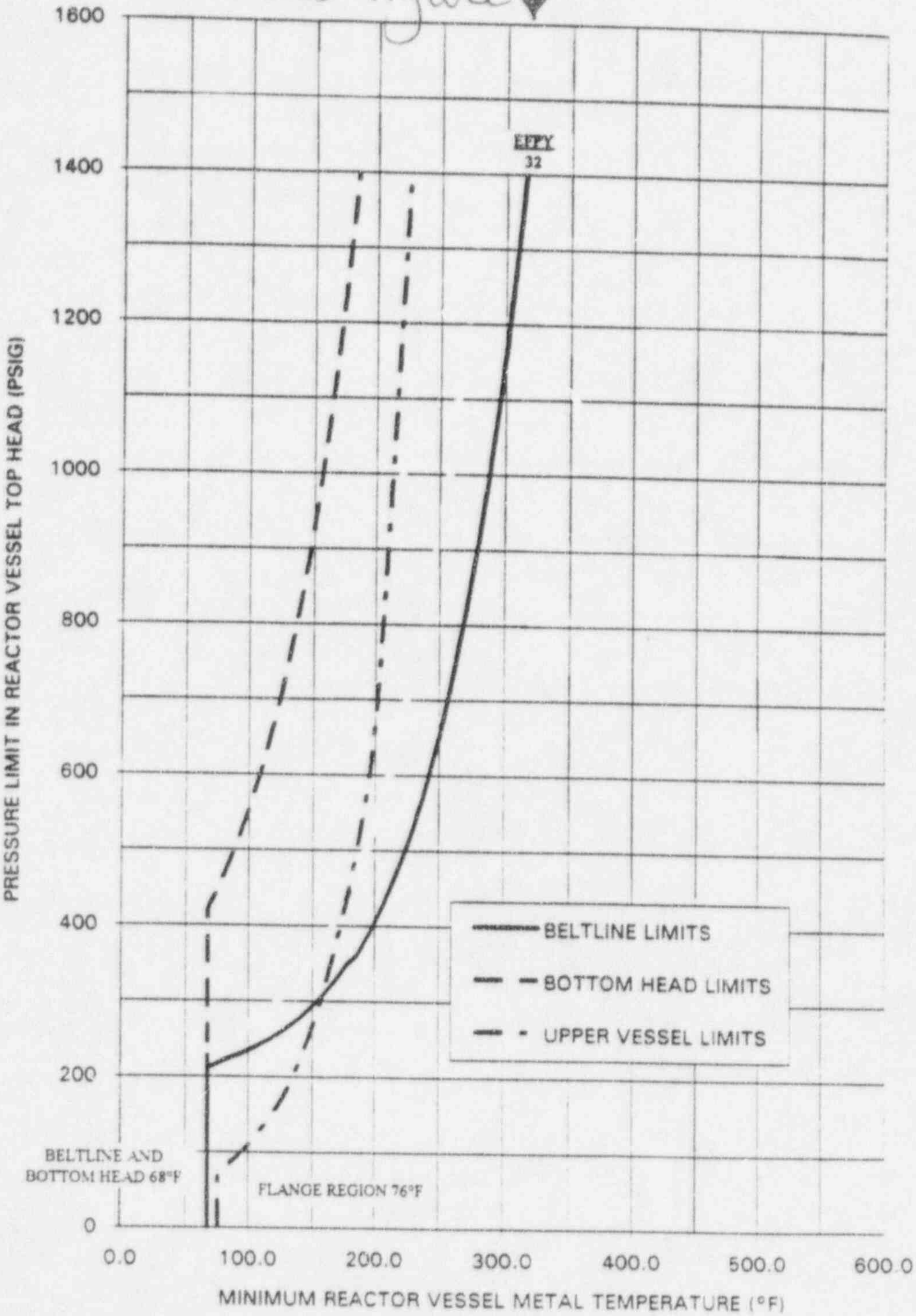
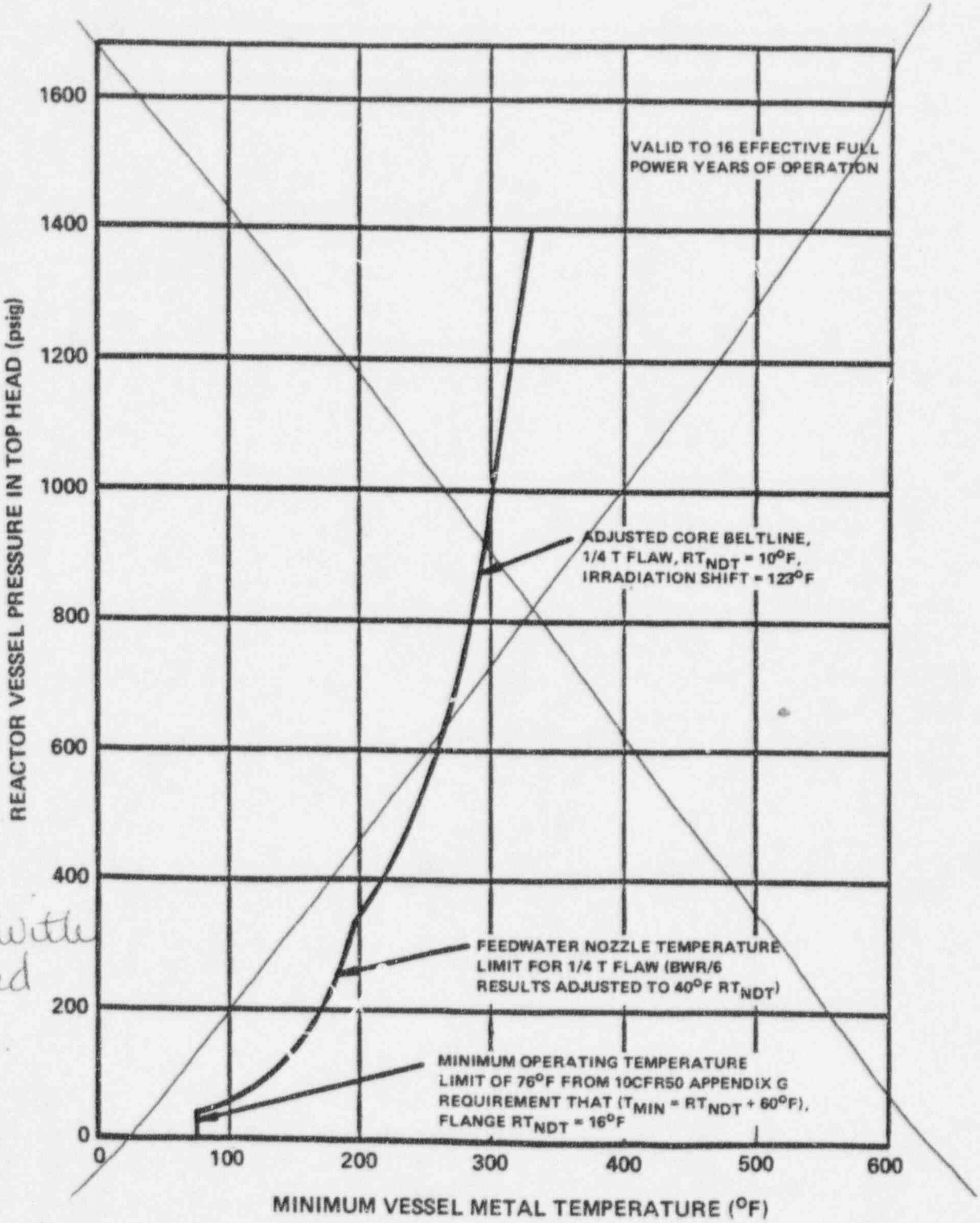


Figure 3.4.9-2 (page 1 of 1)
Pressure/Temperature Limits for Non-Nuclear Heatup,
Low Power Physics Tests, and Cooldown Following a Shutdown



Replace with attached figure.

Figure 3.4.9-3 (page 1 of 1)
Pressure/Temperature Limits for Criticality

Replace current Figure 3.4.9-3 with this figure

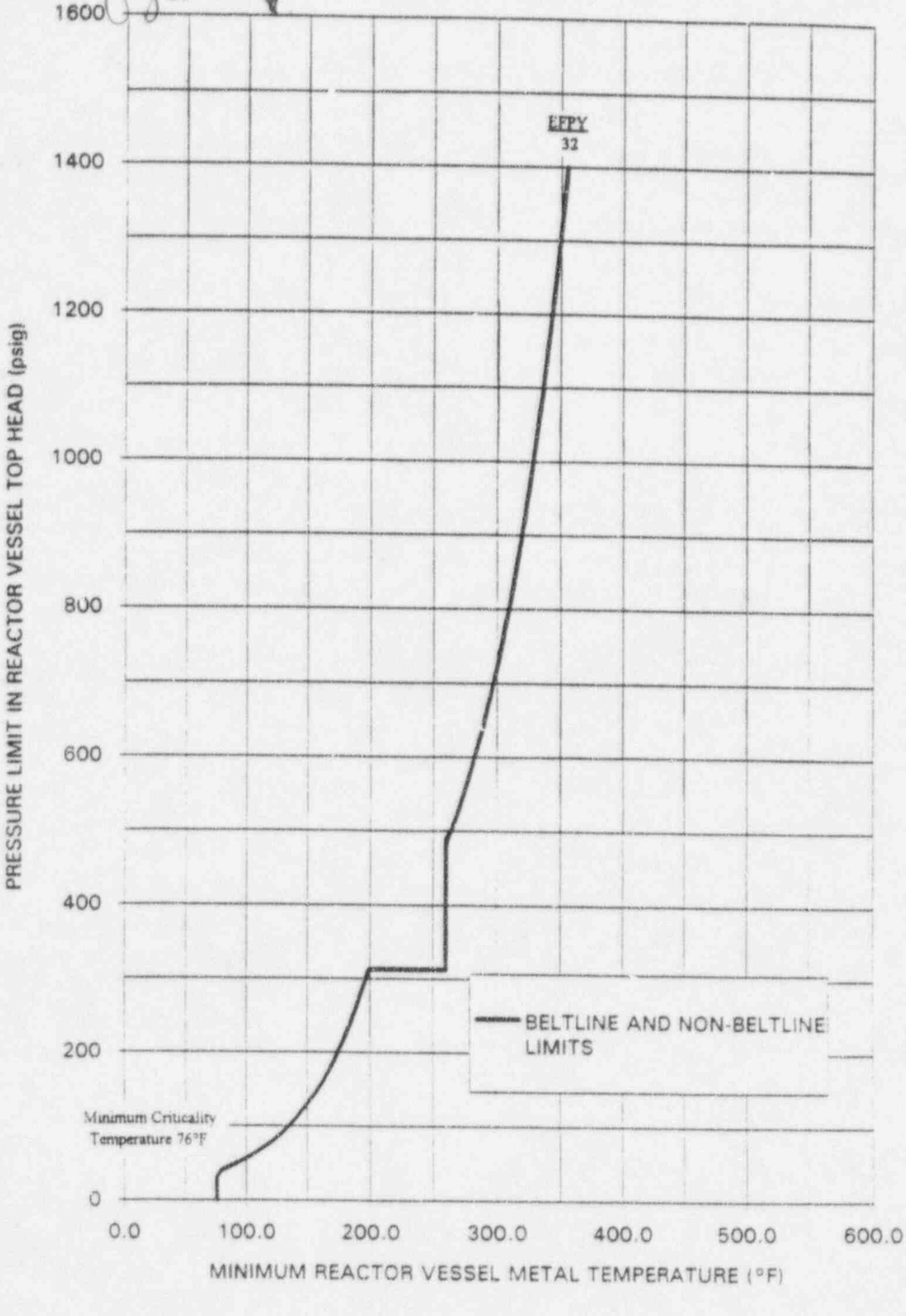


Figure 3.4.9-3 (page 1 of 1)
Pressure/Temperature Limits for Criticality

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.	Immediately
	AND		
	C.2	Determine RCS is acceptable for operation.	Prior to entering MODE 2 or 3

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.9.1	~~-----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 specified in Figures 3.4.9-1 and 3.4.9-2, and b. RCS heatup and cooldown rates are ≤ 100°F in any 1 hour period.	30 minutes during RCS non-nuclear heatup and cooldown operations, and RCS inservice leak and hydrostatic testing

(continued)

during RCS heatup and cooldown operations, and RCS inservice leak and hydrostatic testing.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.9.2	---NOTE--- Only required to be met when the reactor is critical --- Verify RCS pressure and RCS temperature are within the criticality limits specified in Figure 3.4.9-3.	Once within 15 minutes prior to intial control rod withdrawal for the purpose of achieving criticality and immediately prior to control rod withdrawal for the purpose of achieving criticality.
SR 3.4.9.3	---NOTE--- Only required to be met in MODES 1, 2, 3, and 4 during startup of a recirculation pump. --- Verify the difference between the bottom head coolant temperature and the reactor pressure vessel (RPV) coolant temperature is ≤ 145°F.	Once within 15 minutes prior to starting an idle recirculation pump
SR 3.4.9.4	---NOTE--- Only required to be met in MODES 1, 2, 3, and 4 during startup of a recirculation pump. --- 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 starting an idle recirculation pump

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.4.9.5	-----NOTE----- Only required to be ~~performed~~ met when tensioning/detensioning the reactor vessel head bolting studs. ----- Verify reactor vessel flange and head flange temperatures are ≥ 90°F.	Once within 30 minutes prior to tensioning/detensioning of the reactor vessel head bolting studs and every 30 minutes thereafter
SR 3.4.9.6	Replace with insert 1 attached. ~~-----NOTE----- Not required to be performed until 30 minutes after RCS temperature ≤ 100°F in MODE 4. ----- Verify reactor vessel flange and head flange temperatures are ≥ 90°F.~~	Replace with insert 2 attached. ~~30 minutes~~
~~SR 3.4.9.7~~	~~-----NOTE----- Not required to be performed until 12 hours after RCS temperature ≤ 120°F in MODE 4. ----- Verify reactor vessel flange and head flange temperatures are ≥ 90°F.~~	~~12 hours~~

INSERT 1, page 3.4-24

NOTE

Only required to be met when the reactor vessel head is tensioned.

Verify reactor vessel flange and head flange temperatures are ≥ 90°F.

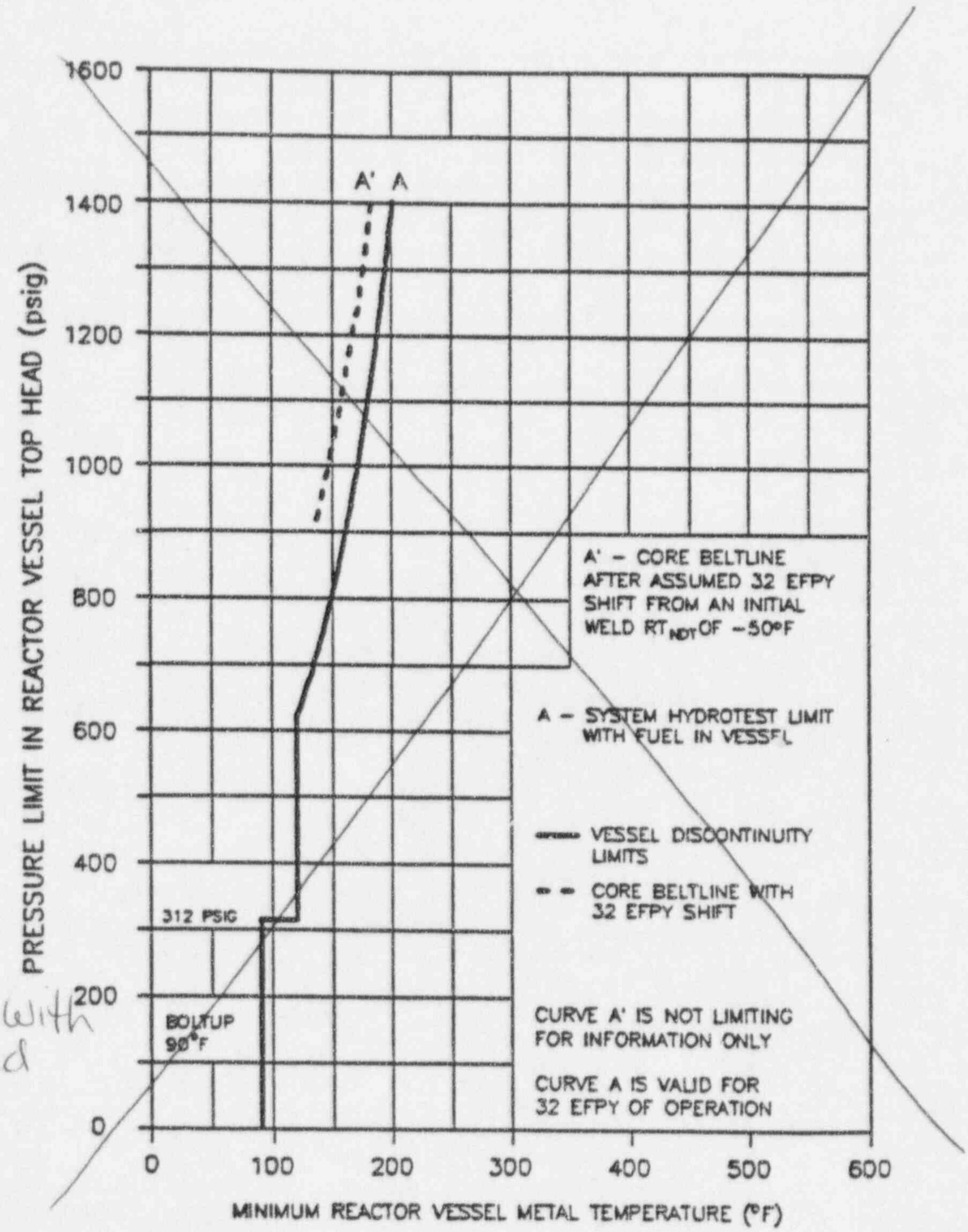
Once within 12 hours after RCS temperature is ≤ 120°F in MODE 4, and 12 hours thereafter.

AND

Once within 30 minutes after RCS temperature is ≤100°F in MODE 4, and 30 minutes thereafter.

INSERT 2, page 3.4-24

Unit 2



Replace with attached figure.

Figure 3.4.9-1 (page 1 of 1)
Pressure/Temperature Limits for
Inservice Hydrostatic and Inservice Leakage Tests

Replace current Figure 3.4.9-1 With this figure.

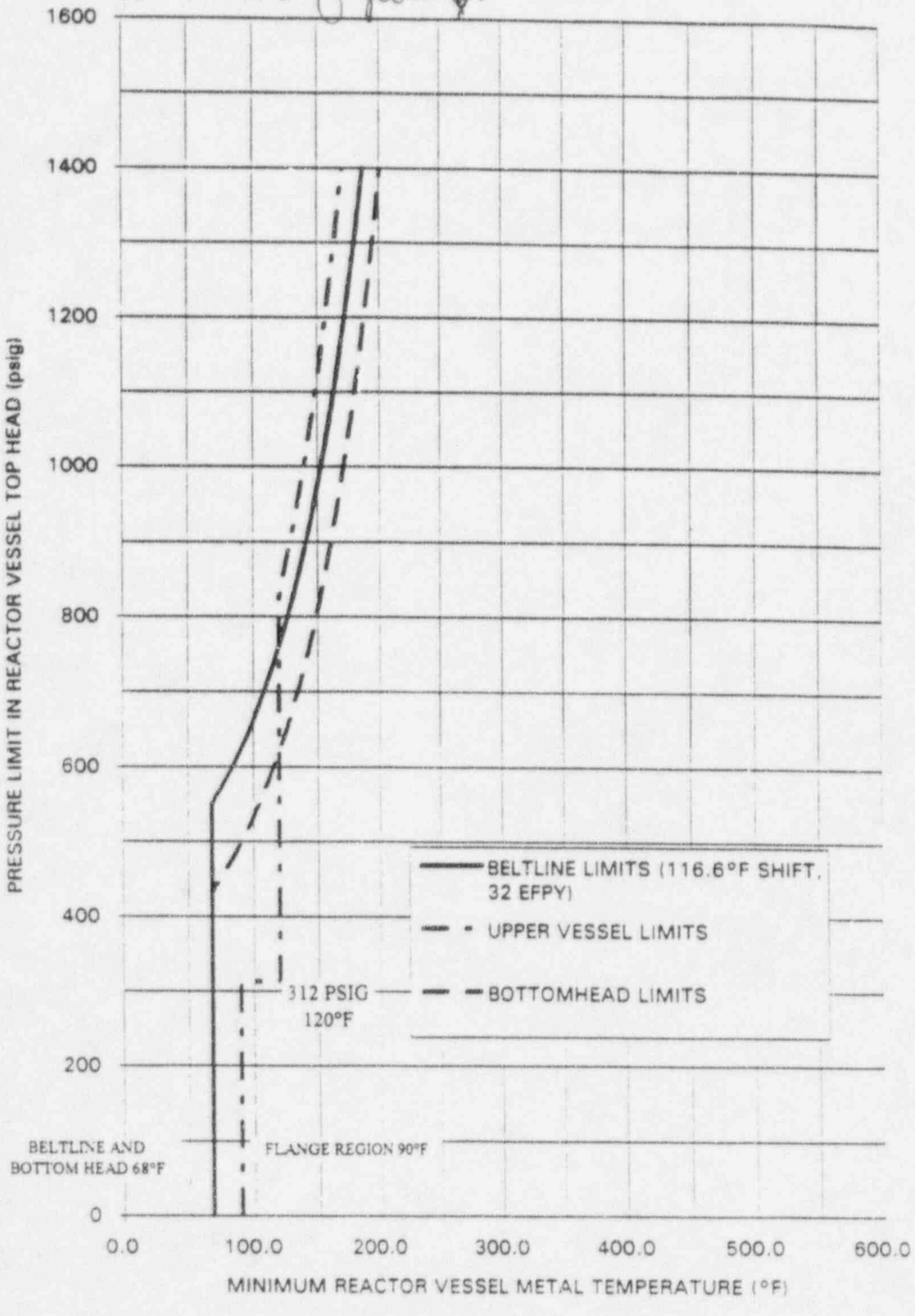
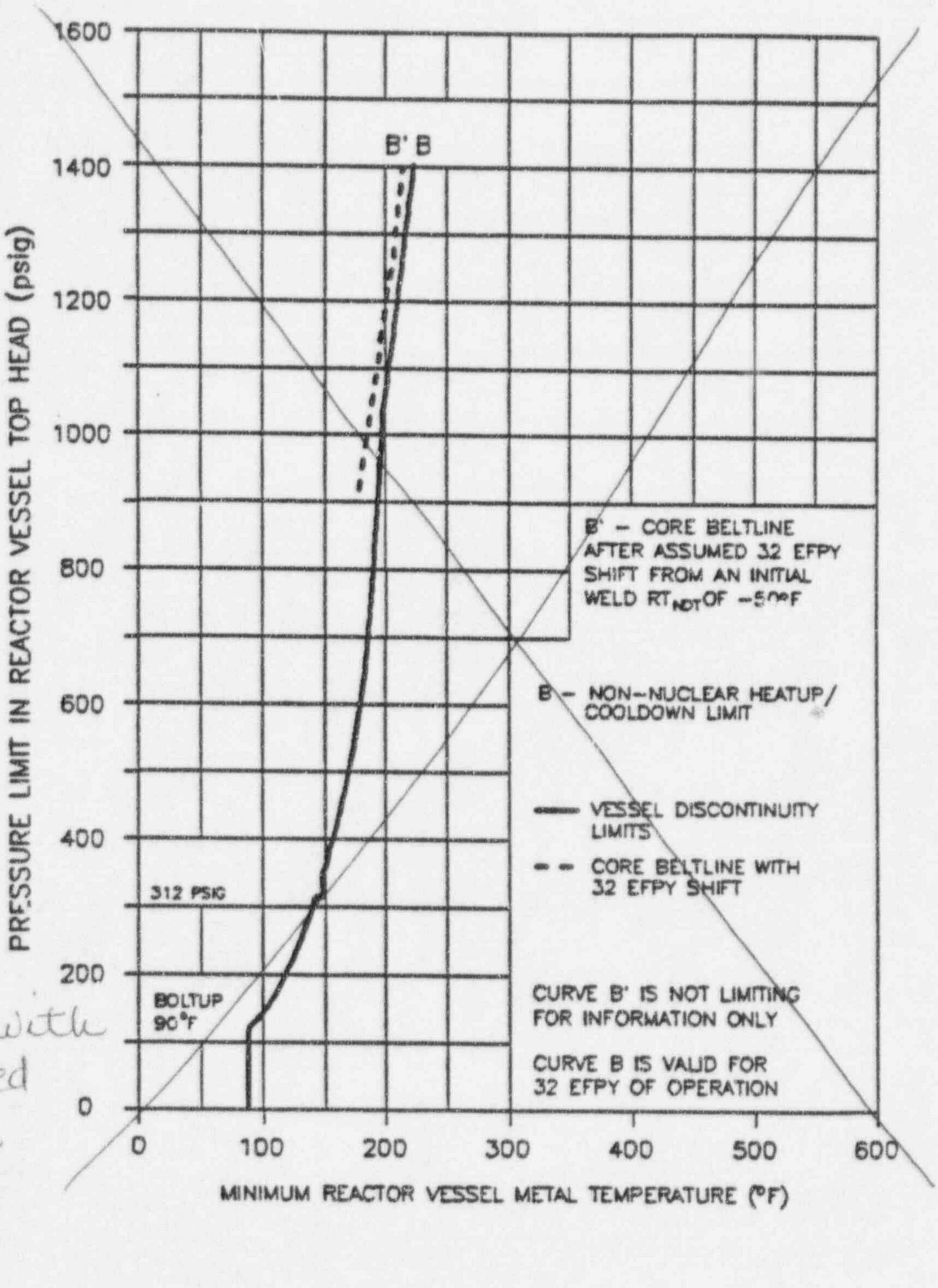


Figure 3.4.9-1 (page 1 of 1)
Pressure/Temperature Limits for
Inservice Hydrostatic and Inservice Leakage Tests



Replace with attached figure.

Figure 3.4.9-2 (page 1 of 1)
Pressure/Temperature Limits for Non-Nuclear Heatup, Low Power Physics Tests, and Cooldown Following a Shutdown

Replace current 3.4.9-2 with this figure ↓

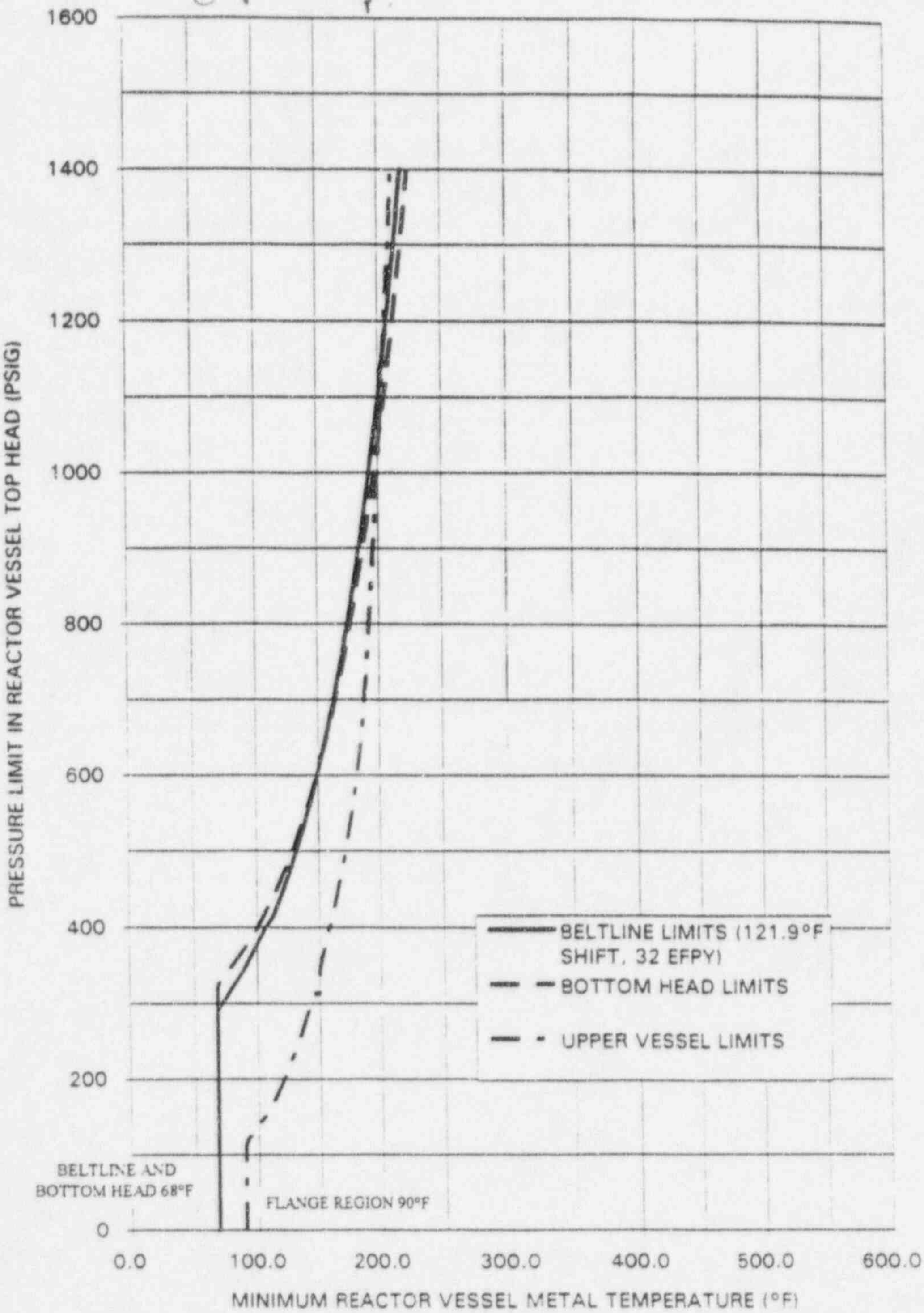
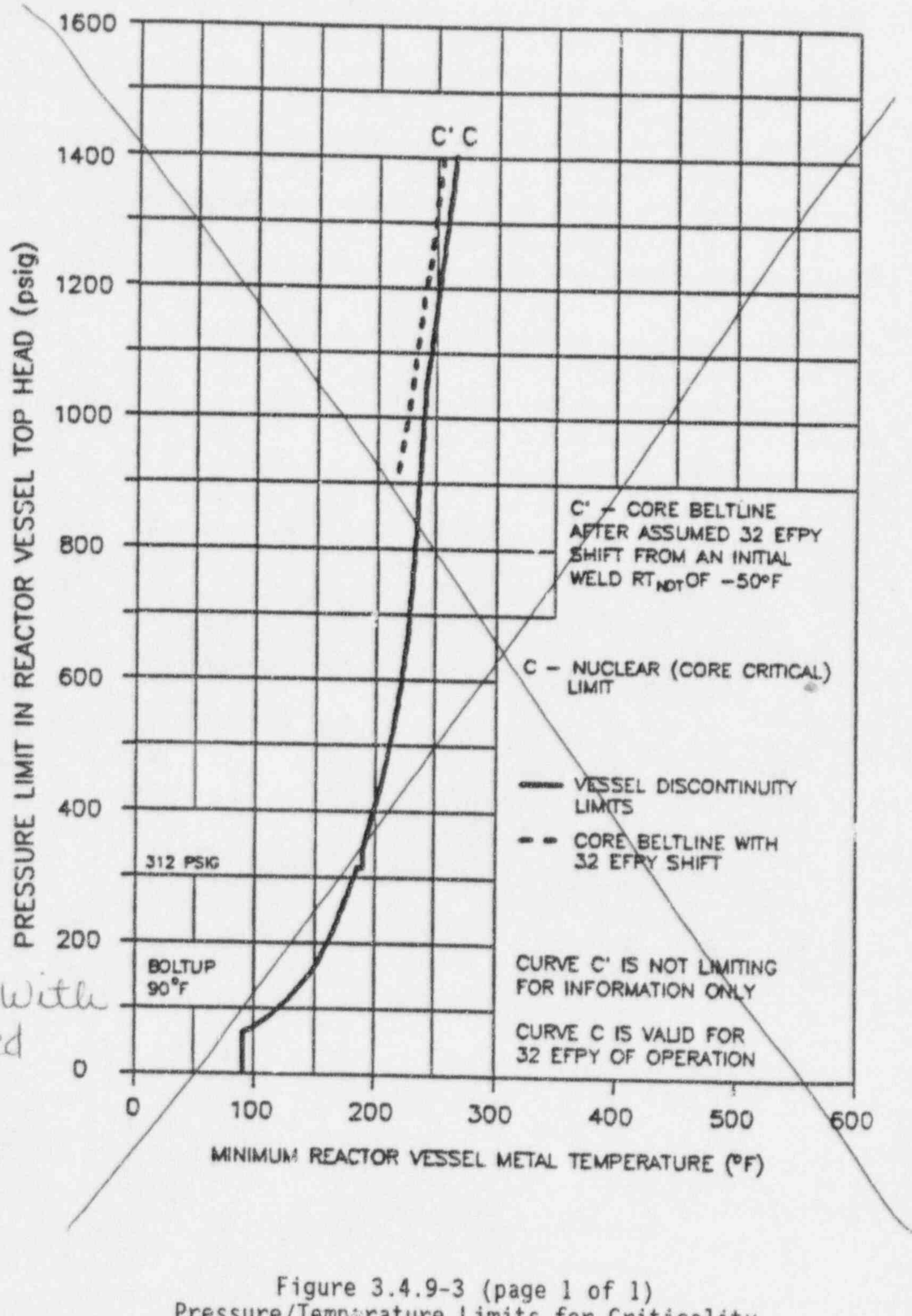


Figure 3.4.9-2 (page 1 of 1)
Pressure/Temperature Limits for Non-Nuclear Heatup, Low Power Physics Tests, and Cooldown Following a Shutdown



Replace with attached figure.

Figure 3.4.9-3 (page 1 of 1)
Pressure/Temperature Limits for Criticality

Replace current Figure 3.4.9-3
With this figure.

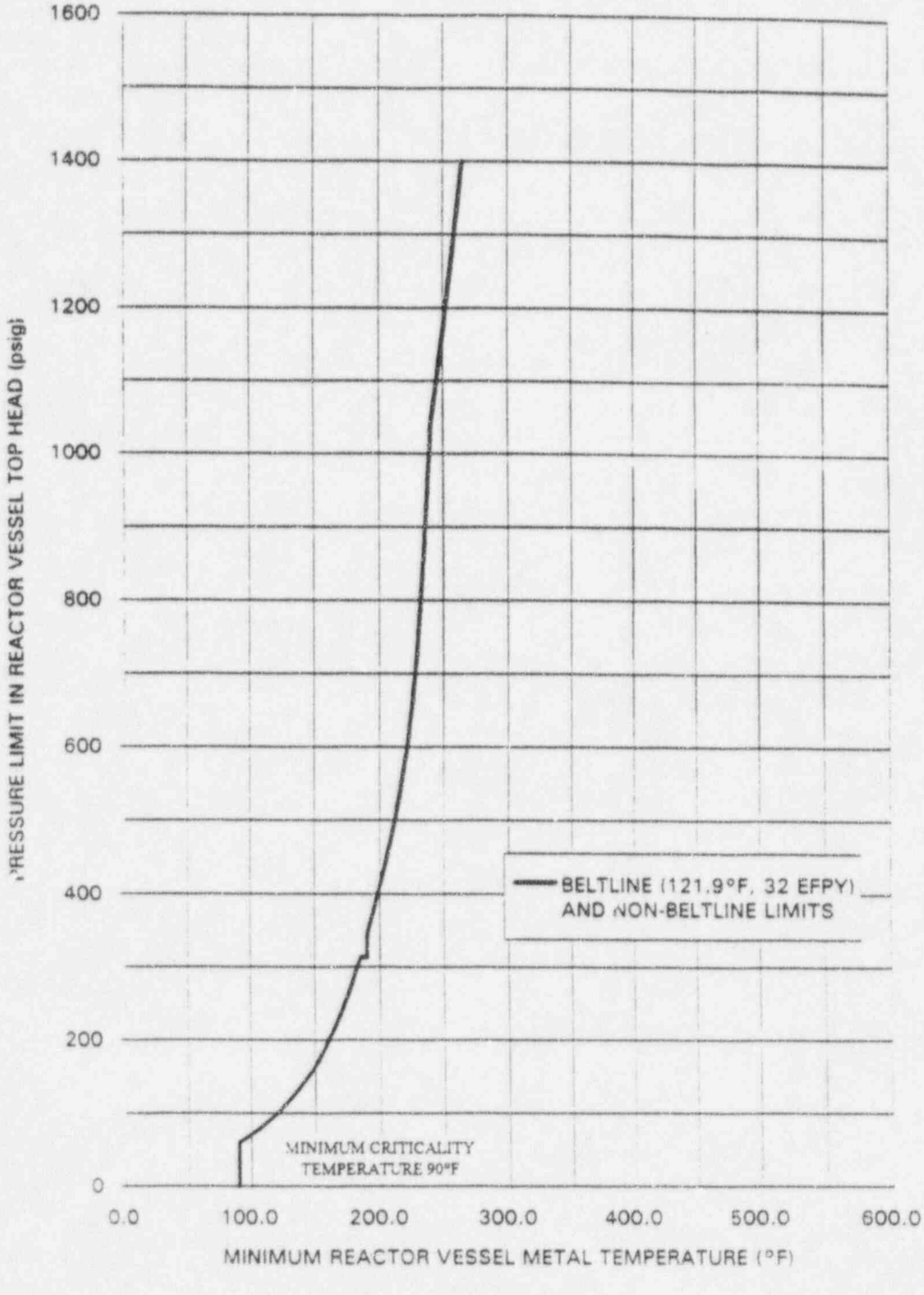


Figure 3.4.9-3 (page 1 of 1)
Pressure/Temperature Limits for Criticality

Attachment 2 to Enclosure 3

FOR INFORMATION

Technical Specifications Bases
Unit 1 and Unit 2

Revised Associated Bases Pages

and

Marked-Up Pages

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.9 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.

This Specification contains P/T limit curves for non-nuclear heatup and cooldown, and inservice leakage and hydrostatic testing, and also limits the maximum rate of change of reactor coolant temperature. The criticality curve provides limits for both nuclear heatup and criticality.

Each P/T limit curve defines an acceptable region of operation for a particular operating condition. 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 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 ASME Code, Section III, Appendix G (Ref. 2).

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

(continued)

BASES

BACKGROUND (continued)

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

The P/T limit curve for inservice leak and hydrostatic testing, and the curve for non-nuclear heatup and cooldown include separate curves for the bottom head, beltline, and upper vessel and flange regions. These curves are derived from stress analysis of these vessel regions.

The criticality limits include the Reference 1 requirement that they be at least 40°F above the heatup curve or the cooldown curve and not lower than the minimum permissible temperature for the inservice leakage 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. 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. References 8 and 12 approved the curves and limits specified in this section. 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 are acceptance limits themselves since they preclude operation in an unanalyzed condition.

(continued)

APPLICABLE SAFETY ANALYSES (continued)

RCS P/T limits satisfy Criterion 2 of the NRC Policy Statement (Ref. 9).

LCO

The elements of this LCO are:

a. RCS pressure and temperature are within the limits specified in Figures 3.4.9-1 and 3.4.9-2 during RCS non-nuclear heatup and cooldown operations, and RCS inservice leak and hydrostatic testing. Additionally, heatup and cooldown rates are ≤ 100°F during any RCS heatup or 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 ≤ 145°F during recirculation pump startup;

c. The temperature difference between the reactor coolant in the respective recirculation loop and in the reactor vessel is ≤ 50°F during recirculation pump startup;

d. RCS pressure and temperature are within the criticality limits specified in Figure 3.4.9-3, prior to achieving criticality; and

e. The reactor vessel flange and the head flange temperatures are ≥ 76°F when tensioning or detensioning the reactor vessel head bolting studs.

f. The reactor vessel flange and head flange temperatures are ≥ 76°F when the reactor vessel head is tensioned.

g. For the case when the vessel head is either off or on but not tensioned and fuel is in the vessel, all three sections of the vessel (upper vessel, beltline, and bottom head) may be lowered to a minimum of 68°F. When the head is being tensioned, or is already tensioned, the beltline and bottom head regions may be lowered to 68°F, as long as there is not any pressure or heatup/cooldown. The upper vessel, however, has a

(continued)

BASES

LCO

g. (continued)

higher minimum temperature requirement with the head tensioned, as previously delineated.

The 68°F temperature is based on fuel shutdown margin considerations, since this is a more restrictive temperature than would be obtained from 10 CFR 50, Appendix G, considerations. With no fuel in the vessel, the temperature may drop to as low as 40°F, because this is the highest qualification temperature to meet toughness requirements for all reactor materials.

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 controls the thermal gradient through the vessel wall and is used as input for calculating the heatup, cooldown, and inservice leakage and hydrostatic testing P/T limit curves. Thus, the LCO for the rate of change of temperature restricts stresses caused by thermal gradients and also ensures the validity of the P/T limit curves.

Violation of the limits places the reactor vessel outside of the bounds of the stress analyses and can increase stresses in other RCS components. The consequences depend on several factors, as follows:

a. The severity of the departure from the allowable operating pressure temperature regime or the severity of the rate of change of temperature;

b. The length of time the limits were violated (longer violations allow the temperature gradient in the thick vessel walls to become more pronounced); and

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

(continued)

BASES (continued)

APPLICABILITY

The potential for violating a P/T limit exists at all times. For example, P/T limit violations could result from ambient temperature conditions that result in the reactor vessel metal temperature being less than the minimum allowed temperature for boltup. Therefore, this LCO is applicable even when fuel is not loaded in the core.

ACTIONS

A.1 and A.2

Operation outside the P/T limits while in MODES 1, 2, and 3 must be corrected so that the RCPB is returned to a condition that has been verified by stress analyses.

The 30 minute Completion Time 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.

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 if continued operation is desired. Several methods may be used, including comparison with pre-analyzed transients in the stress analyses, new analyses, or inspection of the components.

ASME Code, Section XI, Appendix E (Ref. 6), may be used to support the evaluation. However, its use is restricted to evaluation of the vessel beltline.

The 72 hour Completion Time is reasonable to accomplish the evaluation of a mild violation. More severe violations may require special, event specific stress analyses or inspections. A favorable evaluation must be completed if continued operation is desired.

Condition A is modified by a Note requiring Required Action A.2 be completed whenever the Condition is entered. The Note emphasizes the need to perform the evaluation of the effects of the excursion outside the allowable limits. Restoration alone per Required Action A.1 is insufficient because higher than analyzed stresses may have occurred and may have affected the RCPB integrity.

(continued)

BASES

ACTIONS (continued)

B.1 and B.2

If a Required Action and associated Completion Time of Condition A are not met, the plant must be placed in a lower MODE because either the RCS remained in an unacceptable P/T region for an extended period of increased stress, or a sufficiently severe event caused entry into an unacceptable region. Either possibility indicates a need for more careful examination of the event, best accomplished with the RCS at reduced pressure and temperature. With the reduced pressure and temperature conditions, the possibility of propagation of undetected flaws is decreased.

Pressure and temperature are reduced by placing the plant in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

C.1 and C.2

Operation outside the P/T limits in other than MODES 1, 2, and 3 (including defueled conditions) must be corrected so that the RCPB is returned to a condition that has been verified by stress analyses. The Required Action must be initiated without delay and continued until the limits are restored.

Besides restoring the P/T limit parameters to within limits, an evaluation is required to determine if RCS operation is allowed. This evaluation must verify that the RCPB integrity is acceptable and must be completed before approaching criticality or heating up to > 212°F. Several methods may be used, including comparison with pre-analyzed transients, new analyses, or inspection of the components. ASME Code, Section XI, Appendix E (Ref. 6), may be used to support the evaluation; however, its use is restricted to evaluation of the beltline.

Condition C is modified by a Note requiring Required Action C.2 be completed whenever the Condition is entered. The Note emphasizes the need to perform the evaluation of the effects of the excursion outside the allowable limits.

(continued)

BASES

ACTIONS

C.1 and C.2 (continued)

Restoration alone per Required Action C.1 is insufficient because higher than analyzed stresses may have occurred and may have affected the RCPB integrity.

SURVEILLANCE REQUIREMENTS

SR 3.4.9.1

Verification that operation is within limits is required every 30 minutes when RCS pressure and temperature conditions are undergoing planned changes. This Frequency is considered reasonable in view of the control room indication available to monitor RCS status. Also, since temperature change limits are specified in hourly increments, 30 minutes permits a reasonable time for assessment and correction of minor deviations.

Surveillance for heatup, cooldown, or inservice leakage and hydrostatic testing may be discontinued when the criteria given in the relevant plant procedure for ending the activity are satisfied.

Verification of Figures 3.4.9-1 and 3.4.9-2 is required during non-nuclear heatups and cooldowns, and inservice leak and hydrostatic testing. Verification of the ≤ 100°F change in any 1 hour period is required during any heatup or cooldown.

SR 3.4.9.2

A separate figure is used when the reactor is critical. Consequently, the RCS pressure and temperature must be verified within the appropriate limits before withdrawing control rods that will make the reactor critical.

Performing the Surveillance within 15 minutes prior to initial control rod withdrawal for the purpose of achieving criticality provides adequate assurance that the limits will not be exceeded between the time of the Surveillance and the time criticality is achieved.

This SR, for clarity, is modified by a Note stating that it is only required to be met when the reactor is critical and immediately prior to control rod withdrawal for the purpose of achieving criticality.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.9.3 and SR 3.4.9.4

Differential temperatures within the applicable limits ensure that thermal stresses resulting from the startup of an idle recirculation pump will not exceed design allowances. In addition, compliance with these limits ensures that the assumptions of the analysis for the startup of an idle recirculation loop (Ref. 7) are satisfied.

Performing the Surveillance within 15 minutes before starting the idle recirculation pump provides adequate assurance that the limits will not be exceeded between the time of the Surveillance and the time of the idle pump start.

If the 145°F temperature differential specified in SR 3.4.9.3 cannot be determined by direct indication, an alternate method may be used as described below:

The bottom head coolant temperature and the RPV coolant can be assumed to be ≤ 145°F if the following can be confirmed:

a. One or more loop drive flows were > 40 percent of rated flow prior to the RPT,

b. High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) Systems have not injected since the RPT,

c. Feedwater temperature has remained > 300°F since the RPT, and

d. The time between the RPT and restart is < 30 minutes.

General Electric test data from BWR plants shows that stratification up to the 145°F differential does not occur any sooner than 1 hour following the RPT (Refs. 10 and 11). Adding HPCI and RCIC injection, and feedwater temperature constraints provides assurance that the temperature differential will not be exceeded within 30 minutes of the RPT.

An acceptable means of demonstrating compliance with the temperature differential requirement in SR 3.4.9.4 is to compare the temperatures of the operating recirculation loop and the idle loop.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.9.3 and SR 3.4.9.4 (continued)

SR 3.4.9.3 and SR 3.4.9.4 have been modified by a Note that requires the Surveillance to be performed only in MODES 1, 2, 3, and 4. In MODE 5, the overall stress on limiting components is lower. Therefore, ΔT limits are not required.

SR 3.4.9.5 and SR 3.4.9.6

Limits on the reactor vessel flange and head flange temperatures are generally bounded by the other P/T limits during system heatup and cooldown. However, operations approaching MODE 4 from MODE 5 and in MODE 4 with RCS temperature less than or equal to certain specified values require assurance that these temperatures meet the LCO limits.

The flange temperatures must be verified to be above the limits 30 minutes before and while tensioning the vessel head bolting studs to ensure that once the head is tensioned the limits are satisfied. Verification of flange temperatures is also required while detensioning is in progress until all reactor vessel head bolts are completely detensioned. (The head is considered tensioned if one or more bolts are partly or completely tensioned.) When in MODE 4 with RCS temperature ≤ 86°F, 30 minute checks of the flange temperatures are required because of the reduced margin to the limits. When in MODE 4 with RCS temperature ≤ 106°F, monitoring of the flange temperature is required every 12 hours to ensure the temperature is within the limits specified.

The 30 minute Frequency reflects the urgency of maintaining the temperatures within limits, and also limits the time that the temperature limits could be exceeded. The 12 hour Frequency is reasonable based on the rate of temperature change possible at these temperatures.

SR 3.4.9.5 is modified by a Note that requires the Surveillance to be met only when tensioning/detensioning the reactor vessel head bolting studs. SR 3.4.9.6 is modified by a Note that requires the Surveillance to be met when the head is tensioned.

(continued)

BASES (continued)

REFERENCES

1. 10 CFR 50, Appendix G, January 1996.
2. ASME, Boiler and Pressure Vessel Code, Section III, Appendix G.
3. ASTM E 185-82, "Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels," July 1982.
4. 10 CFR 50, Appendix H.
5. Regulatory Guide 1.99, Revision 2, May 1988.
6. ASME, Boiler and Pressure Vessel Code, Section XI, Appendix E.
7. FSAR, Section 14.3.6.2.
8. George W. Rivenbark (NRC) letter to J. T. Beckham, Jr. (GPC), Amendment 126 to the Operating License, dated June 20, 1986.
9. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.
10. GE-NE-668-13-0393, "Recirculation Pump Restart Without Vessel Temperature Indication for E.I. Hatch Nuclear Plant," December 28, 1993.
11. DRF A00-05834/6, "Safety & 10 CFR 50.92 Significant Hazards Consideration Assessment for RPV Stratification Prevention Improvements at Edwin I. Hatch Nuclear Plant Units 1 and 2," April 1994.
12. (To be added when amendment is received.)

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.10 Reactor Steam Dome Pressure

BASES

BACKGROUND	The reactor steam dome pressure is an assumed value in the determination of compliance with reactor pressure vessel overpressure protection criteria and is also an assumed initial condition of design basis accidents and transients.
APPLICABLE SAFETY ANALYSES	The reactor steam dome pressure of ≤ 1058 psig is an initial condition of the vessel overpressure protection analysis of Reference 1. This analysis assumes an initial maximum reactor steam dome pressure and evaluates the response of the pressure relief system, primarily the safety/relief valves, during the limiting pressurization transient. The determination of compliance with the overpressure criteria is dependent on the initial reactor steam dome pressure; therefore, the limit on this pressure ensures that the assumptions of the overpressure protection analysis are conserved. Reference 2 also assumes an initial reactor steam dome pressure for the analysis of design basis accidents and transients used to determine the limits for fuel cladding integrity (see Bases for LCO 3.2.2, "MINIMUM CRITICAL POWER RATIO (MCPR)") and 1% cladding plastic strain (see Bases for LCO 3.2.1, "AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)"). Reactor steam dome pressure satisfies the requirements of Criterion 2 of the NRC Policy Statement (Ref. 3).
LCO	The specified reactor steam dome pressure limit of ≤ 1058 psig ensures the plant is operated within the assumptions of the overpressure protection analysis. Operation above the limit may result in a response more severe than analyzed.
APPLICABILITY	In MODES 1 and 2, the reactor steam dome pressure is required to be less than or equal to the limit. In these

(continued)

BASES

APPLICABILITY (continued)

MODES, the reactor may be generating significant steam and events which may challenge the overpressure limits are possible.

In MODES 3, 4, and 5, the limit is not applicable because the reactor is shut down. In these MODES, the reactor pressure is well below the required limit, and no anticipated events will challenge the overpressure limits.

ACTIONS

A.1

With the reactor steam dome pressure greater than the limit, prompt action should be taken to reduce pressure to below the limit and return the reactor to operation within the bounds of the analyses. The 15 minute Completion Time is reasonable considering the importance of maintaining the pressure within limits. This Completion Time also ensures that the probability of an accident occurring while pressure is greater than the limit is minimized.

B.1

If the reactor steam dome pressure cannot be restored to within the limit within the associated Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.10.1

Verification that reactor steam dome pressure is ≤ 1058 psig ensures that the initial conditions of the vessel overpressure protection analysis is met. Operating experience has shown the 12 hour Frequency to be sufficient for identifying trends and verifying operation within safety analyses assumptions.

(continued)

BASES (continued)

REFERENCES

1. FSAR, Appendix M.

2. FSAR, Section 14.3.

3. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.9 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.

This Specification contains P/T limit curves for non-nuclear heatup and cooldown, and inservice leakage and hydrostatic testing, and also limits the maximum rate of change of reactor coolant temperature. The criticality curve provides limits for both nuclear heatup and criticality.

Each P/T limit curve defines an acceptable region of operation for a particular operating condition. 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 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 ASME Code, Section III, Appendix G (Ref. 2).

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

(continued)

BASES

BACKGROUND (continued)

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

The P/T limit curve for inservice leak and hydrostatic testing, and the curve for non-nuclear heatup and cooldown include separate curves for the bottom head, beltline, and upper vessel and flange regions. These curves are derived from stress analysis of these vessel regions.

The criticality limits include the Reference 1 requirement that they be at least 40°F above the heatup curve or the cooldown curve and not lower than the minimum permissible temperature for the inservice leakage 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. 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. References 8 and 12 approved the curves and limits specified in this section. 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 are acceptance limits themselves since they preclude operation in an unanalyzed condition.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

RCS P/T limits satisfy Criterion 2 of the NRC Policy Statement (Ref. 8).

LCO

The elements of this LCO are:

a. RCS pressure and temperature are within the limits specified in Figures 3.4.9-1 and 3.4.9-2 during RCS non-nuclear heatup and cooldown operations, and RCS inservice leak and hydrostatic testing. Additionally, heatup and cooldown rates are ≤ 100°F during any RCS heatup or 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 ≤ 145°F during recirculation pump startup;

c. The temperature difference between the reactor coolant in the respective recirculation loop and in the reactor vessel is ≤ 50°F during recirculation pump startup;

d. RCS pressure and temperature are within the criticality limits specified in Figure 3.4.9-3, prior to achieving criticality; and

e. The reactor vessel flange and the head flange temperatures are ≥ 90°F when tensioning or detensioning the reactor vessel head bolting studs.

f. The reactor vessel flange and head flange temperatures are ≥ 90°F when the reactor vessel head is tensioned.

g. For the case when the vessel head is either off or on but not tensioned and fuel is in the vessel, all three sections of the vessel (upper vessel, beltline, and bottom head) may be lowered to a minimum of 68°F. When the head is being tensioned, or is already tensioned, the beltline and bottom head regions may be lowered to 68°F, as long as there is not any pressure or heatup/cooldown. The upper vessel, however, has a

(continued)

BASES

LCO

g. (continued)

higher minimum temperature requirement with the head tensioned, as previously delineated.

The 68°F temperature is based on fuel shutdown margin considerations, since this is a more restrictive temperature than would be obtained from 10 CFR 50, Appendix G, considerations. With no fuel in the vessel, the temperature may drop to as low as 50°F, because this is the highest qualification temperature to meet toughness requirements for all reactor materials.

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 controls the thermal gradient through the vessel wall and is used as input for calculating the heatup, cooldown, and inservice leakage and hydrostatic testing P/T limit curves. Thus, the LCO for the rate of change of temperature restricts stresses caused by thermal gradients and also ensures the validity of the P/T limit curves.

Violation of the limits places the reactor vessel outside of the bounds of the stress analyses and can increase stresses in other RCS components. The consequences depend on several factors, as follows:

a. The severity of the departure from the allowable operating pressure temperature regime or the severity of the rate of change of temperature;

b. The length of time the limits were violated (longer violations allow the temperature gradient in the thick vessel walls to become more pronounced); and

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

(continued)

BASES (continued)

APPLICABILITY

The potential for violating a P/T limit exists at all times. For example, P/T limit violations could result from ambient temperature conditions that result in the reactor vessel metal temperature being less than the minimum allowed temperature for boltup. Therefore, this LCO is applicable even when fuel is not loaded in the core.

ACTIONS

A.1 and A.2

Operation outside the P/T limits while in MODES 1, 2, and 3 must be corrected so that the RCPB is returned to a condition that has been verified by stress analyses.

The 30 minute Completion Time 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.

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 if continued operation is desired. Several methods may be used, including comparison with pre-analyzed transients in the stress analyses, new analyses, or inspection of the components.

ASME Code, Section XI, Appendix E (Ref. 6), may be used to support the evaluation. However, its use is restricted to evaluation of the vessel beltline.

The 72 hour Completion Time is reasonable to accomplish the evaluation of a mild violation. More severe violations may require special, event specific stress analyses or inspections. A favorable evaluation must be completed if continued operation is desired.

Condition A is modified by a Note requiring Required Action A.2 be completed whenever the Condition is entered. The Note emphasizes the need to perform the evaluation of the effects of the excursion outside the allowable limits. Restoration alone per Required Action A.1 is insufficient because higher than analyzed stresses may have occurred and may have affected the RCPB integrity.

(continued)

ACTIONS (continued)

B.1 and B.2

If a Required Action and associated Completion Time of Condition A are not met, the plant must be placed in a lower MODE because either the RCS remained in an unacceptable P/T region for an extended period of increased stress, or a sufficiently severe event caused entry into an unacceptable region. Either possibility indicates a need for more careful examination of the event, best accomplished with the RCS at reduced pressure and temperature. With the reduced pressure and temperature conditions, the possibility of propagation of undetected flaws is decreased.

Pressure and temperature are reduced by placing the plant in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

C.1 and C.2

Operation outside the P/T limits in other than MODES 1, 2, and 3 (including defueled conditions) must be corrected so that the RCPB is returned to a condition that has been verified by stress analyses. The Required Action must be initiated without delay and continued until the limits are restored.

Besides restoring the P/T limit parameters to within limits, an evaluation is required to determine if RCS operation is allowed. This evaluation must verify that the RCPB integrity is acceptable and must be completed before approaching criticality or heating up to > 212°F. Several methods may be used, including comparison with pre-analyzed transients, new analyses, or inspection of the components. ASME Code, Section XI, Appendix E (Ref. 6), may be used to support the evaluation; however, its use is restricted to evaluation of the beltline.

Condition C is modified by a Note requiring Required Action C.2 be completed whenever the Condition is entered. The Note emphasizes the need to perform the evaluation of the effects of the excursion outside the allowable limits.

(continued)

BASES

ACTIONS

C.1 and C.2 (continued)

Restoration alone per Required Action C.1 is insufficient because higher than analyzed stresses may have occurred and may have affected the RCPB integrity.

SURVEILLANCE REQUIREMENTS

SR 3.4.9.1

Verification that operation is within limits is required every 30 minutes when RCS pressure and temperature conditions are undergoing planned changes. This Frequency is considered reasonable in view of the control room indication available to monitor RCS status. Also, since temperature change limits are specified in hourly increments, 30 minutes permits a reasonable time for assessment and correction of minor deviations.

Surveillance for heatup, cooldown, or inservice leakage and hydrostatic testing may be discontinued when the criteria given in the relevant plant procedure for ending the activity are satisfied.

Verification of Figures 3.4.9-1 and 3.4.9-2 is required during non-nuclear heatups and cooldowns, and inservice leak and hydrostatic testing. Verification of the $\leq$ 100°F change in any 1 hour period is required during any heatup or cooldown.

SR 3.4.9.2

A separate figure is used when the reactor is critical. Consequently, the RCS pressure and temperature must be verified within the appropriate limits before withdrawing control rods that will make the reactor critical.

Performing the Surveillance within 15 minutes prior to initial control rod withdrawal for the purpose of achieving criticality provides adequate assurance that the limits will not be exceeded between the time of the Surveillance and the time criticality is achieved.

This SR, for clarity, is modified by a Note stating that it is only required to be met when the reactor is critical and immediately prior to control rod withdrawal for the purpose of achieving criticality.

(continued)

SURVEILLANCE REQUIRMENTS (continued)

SR 3.4.9.3 and SR 3.4.9.4

Differential temperatures within the applicable limits ensure that thermal stresses resulting from the startup of an idle recirculation pump will not exceed design allowances. In addition, compliance with these limits ensures that the assumptions of the analysis for the startup of an idle recirculation loop (Ref. 7) are satisfied.

Performing the Surveillance within 15 minutes before starting the idle recirculation pump provides adequate assurance that the limits will not be exceeded between the time of the Surveillance and the time of the idle pump start.

If the 145°F temperature differential specified in SR 3.4.9.3 cannot be determined by direct indication, an alternate method may be used as described below:

The bottom head coolant temperature and the RPV coolant can be assumed to be ≤ 145°F if the following can be confirmed:

a. One or more loop drive flows were > 40 percent of rated flow prior to the RPT,

b. High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) Systems have not injected since the RPT,

c. Feedwater temperature has remained > 300°F since the RPT, and

d. The time between the RPT and restart is < 30 minutes.

General Electric test data from BWR plants shows that stratification up to the 145°F differential does not occur any sooner than 1 hour following the RPT (Refs. 10 and 11). Adding HPCI and RCIC injection, and feedwater temperature constraints provides assurance that the temperature differential will not be exceeded within 30 minutes of the RPT.

An acceptable means of demonstrating compliance with the temperature differential requirement in SR 3.4.9.4 is to compare the temperatures of the operating recirculation loop and the idle loop.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.9.3 and SR 3.4.9.4 (continued)

SR 3.4.9.3 and SR 3.4.9.4 have been modified by a Note that requires the Surveillance to be performed only in MODES 1, 2, 3, and 4. In MODE 5, the overall stress on limiting components is lower. Therefore, ΔT limits are not required.

SR 3.4.9.5 and SR 3.4.9.6

Limits on the reactor vessel flange and head flange temperatures are generally bounded by the other P/T limits during system heatup and cooldown. However, operations approaching MODE 4 from MODE 5 and in MODE 4 with RCS temperature less than or equal to certain specified values require assurance that these temperatures meet the LCO limits.

The flange temperatures must be verified to be above the limits 30 minutes before and while tensioning the vessel head bolting studs to ensure that once the head is tensioned the limits are satisfied. Verification of flange temperatures is also required while detensioning is in progress until all reactor vessel head bolts are completely detensioned. (The head is considered tensioned if one or more bolts are partly or completely tensioned.) When in MODE 4 with RCS temperature ≤ 100°F, 30 minute checks of the flange temperatures are required because of the reduced margin to the limits. When in MODE 4 with RCS temperature ≤ 120°F, monitoring of the flange temperature is required every 12 hours to ensure the temperature is within the limits specified.

The 30 minute Frequency reflects the urgency of maintaining the temperatures within limits, and also limits the time that the temperature limits could be exceeded. The 12 hour Frequency is reasonable based on the rate of temperature change possible at these temperatures.

SR 3.4.9.5 is modified by a Note that requires the Surveillance to be met only when tensioning/detensioning the reactor vessel head bolting studs. SR 3.4.9.6 is modified by a Note that requires the Surveillance to be met when the head is tensioned.

(continued)

BASES (continued)

REFERENCES

1. 10 CFR 50, Appendix G, January 1996.

2. ASME, Boiler and Pressure Vessel Code, Section III, Appendix G.

3. ASTM E 185-82, "Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels," July 1982.

4. 10 CFR 50, Appendix H.

5. Regulatory Guide 1.99, Revision 2, May 1988.

6. ASME, Boiler and Pressure Vessel Code, Section XI, Appendix E.

7. FSAR, Section 15.1.26.

8. Kahtan N. Jabbour (NRC) letter to W. G. Hairston, III (GPC), Amendment 118 to the Operating License, dated January 10, 1992.

9. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

10. GE-NE-668-13-0393, "Recirculation Pump Restart Without Vessel Temperature Indication for E.I. Hatch Nuclear Plant," December 28, 1993.

11. DRF A00-05834/6, "Safety & 10 CFR 50.92 Significant Hazards Consideration Assessment for RPV Stratification Prevention Improvements at Edwin I. Hatch Nuclear Plant Units 1 and 2," April 1994.

12. (To be added when amendment is received.)

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.10 Reactor Steam Dome Pressure

BASES

BACKGROUND	The reactor steam dome pressure is an assumed value in the determination of compliance with reactor pressure vessel overpressure protection criteria and is also an assumed initial condition of design basis accidents and transients.
APPLICABLE SAFETY ANALYSES	The reactor steam dome pressure of ≤ 1058 psig is an initial condition of the vessel overpressure protection analysis of Reference 1. This analysis assumes an initial maximum reactor steam dome pressure and evaluates the response of the pressure relief system, primarily the safety/relief valves, during the limiting pressurization transient. The determination of compliance with the overpressure criteria is dependent on the initial reactor steam dome pressure; therefore, the limit on this pressure ensures that the assumptions of the overpressure protection analysis are conserved. Reference 2 also assumes an initial reactor steam dome pressure for the analysis of design basis accidents and transients used to determine the limits for fuel cladding integrity (see Bases for LCO 3.2.2, "MINIMUM CRITICAL POWER RATIO (MCPR)") and 1% cladding plastic strain (see Bases for LCO 3.2.1, "AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)"). Reactor steam dome pressure satisfies the requirements of Criterion 2 of the NRC Policy Statement (Ref. 3).
LCO	The specified reactor steam dome pressure limit of ≤ 1058 psig ensures the plant is operated within the assumptions of the overpressure protection analysis. Operation above the limit may result in a response more severe than analyzed.
APPLICABILITY	In MODES 1 and 2, the reactor steam dome pressure is required to be less than or equal to the limit. In these

(continued)

BASES

APPLICABILITY (continued)	MODES, the reactor may be generating significant steam and events which may challenge the overpressure limits are possible. In MODES 3, 4, and 5, the limit is not applicable because the reactor is shut down. In these MODES, the reactor pressure is well below the required limit, and no anticipated events will challenge the overpressure limits.
ACTIONS	A.1 With the reactor steam dome pressure greater than the limit, prompt action should be taken to reduce pressure to below the limit and return the reactor to operation within the bounds of the analyses. The 15 minute Completion Time is reasonable considering the importance of maintaining the pressure within limits. This Completion Time also ensures that the probability of an accident occurring while pressure is greater than the limit is minimized. B.1 If the reactor steam dome pressure cannot be restored to within the limit within the associated Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.
SURVEILLANCE REQUIREMENTS	SR 3.4.10.1 Verification that reactor steam dome pressure is ≤ 1058 psig ensures that the initial conditions of the vessel overpressure protection analysis is met. Operating experience has shown the 12 hour Frequency to be sufficient for identifying trends and verifying operation within safety analyses assumptions.

(continued)

BASES (continued)

REFERENCES

1. FSAR, Supplement 5A.
2. FSAR, Section 15.
3. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.9 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.

This Specification contains P/T limit curves for non-nuclear heatup, and cooldown, and inservice leakage and hydrostatic testing, and also limits the maximum rate of change of reactor coolant temperature. The criticality curve provides limits for both nuclear heatup and criticality.

Each P/T limit curve defines an acceptable region of operation for a particular ~~normal operation~~ operating condition. 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 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 ASME Code, Section III, Appendix G (Ref. 2).

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

(continued)

BASES

BACKGROUND (continued)

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

Replace with attached insert.

~~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.~~

The criticality limits include the Reference 1 requirement that they be at least 40°F above the heatup curve or the cooldown curve and not lower than the minimum permissible temperature for the inservice leakage 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. 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. References 8 and 12 approved the curves and limits specified in this section. Since the P/T limits are not derived from any DBA, there are no

(continued)

INSERT FOR PAGE B 3.4-47

The P/T limit curve for inservice leak and hydrostatic testing, and the curve for non-nuclear heatup and cooldown include separate curves for the bottom head, beltline, and upper vessel and flange regions. These curves are derived from stress analysis of these vessel regions.

BASES

APPLICABLE SAFETY ANALYSES (continued)

acceptance limits related to the P/T limits. Rather, the P/T limits are acceptance limits themselves since they preclude operation in an unanalyzed condition.

RCS P/T limits satisfy Criterion 2 of the NRC Policy Statement (Ref. 9).

LCO

The elements of this LCO are:

Replace with insert 1 from next page

a. ~~RCS pressure and temperature are within the limits specified in Figures 3.4.9-1 and 3.4.9-2, and heatup or cooldown rates are ≤ 100°F 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 ≤ 145°F during recirculation pump startup;

c. The temperature difference between the reactor coolant in the respective recirculation loop and in the reactor vessel is ≤ 50°F during recirculation pump startup;

d. RCS pressure and temperature are within the criticality limits specified in Figure 3.4.9-3, prior to achieving criticality; and

e. The reactor vessel flange and the head flange temperatures are ≥ 76°F when tensioning or detensioning the reactor vessel head bolting studs.

See insert #2 attached.

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 controls the thermal gradient through the vessel wall and is used as input for calculating the heatup, cooldown, and inservice leakage and hydrostatic testing P/T limit curves. Thus, the LCO for the rate of change of temperature restricts stresses caused by thermal gradients and also ensures the validity of the P/T limit curves.

(continued)

INSERT 1, page B 3.4-48

RCS pressure and temperature are within the limits specified in Figures 3.4.9-1 and 3.4.9-2 during RCS non-nuclear heatup and cooldown operations, and RCS inservice leak and hydrostatic testing. Additionally, heatup and cooldown rates are $\leq 100^{\circ}F$ during any RCS heatup or cooldown, and inservice leak and hydrostatic testing.

#2

INSERT, PAGE B 3.4-48

f. The reactor vessel flange and head flange temperatures are ≥ 76°F when the reactor vessel is tensioned.

and fuel is in the vessel

g. For the case when the vessel head is either off or on but not tensioned, all three sections of the vessel (upper vessel, beltline, and bottom head) may be lowered to a minimum of 68°F. When the head is being tensioned, or is already tensioned, the beltline and bottom head regions may be lowered to 68°F, as long as there is not any pressure or heatup/cooldown. The upper vessel, however, has a higher minimum temperature requirement with the head tensioned, as previously delineated.

The 68°F temperature is based on fuel shutdown margin considerations, since this a more restrictive temperature than would be obtained from 10 CFR 50, Appendix G, considerations.

With no fuel in the vessel, the temperature may drop to as low as 40°F, because this is the highest qualification temperature to meet toughness requirements for all reactor materials.

BASES

ACTIONS

C.1 and C.2 (continued)

that the RCPB is returned to a condition that has been verified by stress analyses. The Required Action must be initiated without delay and continued until the limits are restored.

Besides restoring the P/T limit parameters to within limits, an evaluation is required to determine if RCS operation is allowed. This evaluation must verify that the RCPB integrity is acceptable and must be completed before approaching criticality or heating up to > 212°F. Several methods may be used, including comparison with pre-analyzed transients, new analyses, or inspection of the components. ASME Code, Section XI, Appendix E (Ref. 6), may be used to support the evaluation; however, its use is restricted to evaluation of the beltline.

Condition C is modified by a Note requiring Required Action C.2 be completed whenever the Condition is entered. The Note emphasizes the need to perform the evaluation of the effects of the excursion outside the allowable limits. Restoration alone per Required Action C.1 is insufficient because higher than analyzed stresses may have occurred and may have affected the RCPB integrity.

SURVEILLANCE REQUIREMENTS

SR 3.4.9.1

Verification that operation is within limits is required every 30 minutes when RCS pressure and temperature conditions are undergoing planned changes. This Frequency is considered reasonable in view of the control room indication available to monitor RCS status. Also, since temperature ~~rate of~~ change limits are specified in hourly increments, 30 minutes permits a reasonable time for assessment and correction of minor deviations.

Surveillance for heatup, cooldown, or inservice leakage and hydrostatic testing may be discontinued when the criteria given in the relevant plant procedure for ending the activity are satisfied.

Replace with insert attached.

~~This SR has been modified with a Note that requires this Surveillance to be performed only during system heatup and~~

(continued)

INSERT, PAGE B 3.4-51

Verification of Figures 3.4.9-1 and 3.4.9-2 is required during non-nuclear heatups and cooldowns, and inservice leak and hydrostatic testing. Verification of the 100°F change in any one hour period is required during any heatup or cooldown. ≤

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.9.1 (continued)

cooldown operations and RCS inservice leakage and hydrostatic testing.

SR 3.4.9.2

A separate ~~limit~~ figure is used when the reactor is approaching criticality. Consequently, the RCS pressure and temperature must be verified within the appropriate limits before withdrawing control rods that will make the reactor critical.

Performing the Surveillance within 15 minutes ~~before~~ prior to initial control rod withdrawal for the purpose of achieving criticality provides adequate assurance that the limits will not be exceeded between the time of the Surveillance and the time ~~of the control rod withdrawal.~~ criticality is achieved

See INSERT attached

SR 3.4.9.3 and SR 3.4.9.4

Differential temperatures within the applicable limits ensure that thermal stresses resulting from the startup of an idle recirculation pump will not exceed design allowances. In addition, compliance with these limits ensures that the assumptions of the analysis for the startup of an idle recirculation loop (Ref. 7) are satisfied.

Performing the Surveillance within 15 minutes before starting the idle recirculation pump provides adequate assurance that the limits will not be exceeded between the time of the Surveillance and the time of the idle pump start.

If the 145°F temperature differential specified in SR 3.4.9.3 cannot be determined by direct indication, an alternate method may be used as described below:

The bottom head coolant temperature and the RPV coolant can be assumed to be ≤ 145°F if the following can be confirmed:

a. One or more loop drive flows were > 40 percent of rated flow prior to the RPT,

(continued)

INSERT, PAGE B 3.4-52

This SR, for clarity, is modified by a Note stating that it is only required to be met when the reactor is critical, and immediately prior to control rod withdrawal for the purpose of achieving criticality.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.9.5, and SR 3.4.9.6~~, and SR 3.4.9.7~~

Limits on the reactor vessel flange and head flange temperatures are generally bounded by the other P/T limits during system heatup and cooldown. However, operations approaching MODE 4 from MODE 5 and in MODE 4 with RCS temperature less than or equal to certain specified values require assurance that these temperatures meet the LCO limits.

The flange temperatures must be verified to be above the limits 30 minutes before and while tensioning the vessel head bolting studs to ensure that once the head is tensioned the limits are satisfied. See insert attached. When in MODE 4 with RCS temperature ≤ 86°F, 30 minute checks of the flange temperatures are required because of the reduced margin to the limits. When in MODE 4 with RCS temperature ≤ 106°F, monitoring of the flange temperature is required every 12 hours to ensure the temperature is within the limits specified.

The 30 minute Frequency reflects the urgency of maintaining the temperatures within limits, and also limits the time that the temperature limits could be exceeded. The 12 hour Frequency is reasonable based on the rate of temperature change possible at these temperatures.

SR 3.4.9.5 is modified by a Note that requires the Surveillance to be ~~performed~~ met only when tensioning or detensioning the reactor vessel head bolting studs. SR 3.4.9.6 is modified by a Note that requires the Surveillance to be met when the head is tensioned. ~~initiated 30 minutes after RCS temperature ≤ 86°F in Mode 4. SR 3.4.9.7 is modified by a Note that requires the Surveillance to be initiated 12 hours after RCS temperature ≤ 106°F in Mode 4. The Notes contained in these SRs are necessary to specify when the reactor vessel flange and head flange temperatures are required to be verified to be within the limits specified.~~

REFERENCES

1. 10 CFR 50, Appendix G, January 1996.
2. ASME, Boiler and Pressure Vessel Code, Section III, Appendix G.

(continued)

INSERT, PAGE B 3.4-53

Verification of flange temperatures is also required while detensioning is in progress until all reactor vessel head bolts are completely detensioned. (The head is considered tensioned if one or more bolts are partly or completely tensioned).

BASES

REFERENCES (continued)

3. ASTM E 185-82, "Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels," July 1982.

4. 10 CFR 50, Appendix H.

5. Regulatory Guide 1.99, Revision 2, May 1988.

6. ASME, Boiler and Pressure Vessel Code, Section XI, Appendix E.

7. FSAR, Section 14.3.6.2.

8. George W. Rivenbark (NRC) letter to J. T. Beckham, Jr. (GPC), Amendment 126 to the Operating License, dated June 20, 1986.

9. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

10. GE-NE-668-13-0393, "Recirculation Pump Restart Without Vessel Temperature Indication for E.I. Hatch Nuclear Plant," December 28, 1993.

11. DRF A00-05834/6, "Safety & 10 CFR 50.92 Significant Hazards Consideration Assessment for RPV Stratification Prevention Improvements at Edwin I. Hatch Nuclear Plant Units 1 and 2," April 1994.

12. (To be added when amendment is received.)

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.9 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.

This Specification contains P/T limit curves for non-nuclear heatup, and cooldown, and inservice leakage and hydrostatic testing, and also limits the maximum rate of change of reactor coolant temperature. The criticality curve provides limits for both nuclear heatup and criticality.

Each P/T limit curve defines an acceptable region of operation for ~~normal operation~~ a particular operating condition. 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 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 ASME Code, Section III, Appendix G (Ref. 2).

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

(continued)

BASES

BACKGROUND (continued)

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

Replace with insert attached.

~~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.~~

The criticality limits include the Reference 1 requirement that they be at least 40°F above the heatup curve or the cooldown curve and not lower than the minimum permissible temperature for the inservice leakage 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. 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 6 8 approved the curves and limits specified in this section. Since the P/T limits are not derived from any DBA, there are no

and 12

(continued)

INSERT FOR PAGE B 3.4-47

The P/T limit curve for inservice leak and hydrostatic testing, and the curve for non-nuclear heatup and cooldown include separate curves for the bottom head, beltline, and upper vessel and flange regions. These curves are derived from stress analysis of these vessel regions.

BASES

APPLICABLE SAFETY ANALYSES (continued)

acceptance limits related to the P/T limits. Rather, the P/T limits are acceptance limits themselves since they preclude operation in an unanalyzed condition.

RCS P/T limits satisfy Criterion 2 of the NRC Policy Statement (Ref. 8).

LCO

The elements of this LCO are:

replace with INSERT 1 on next page

a. ~~RCS pressure and temperature are within the limits specified in Figures 3.4.9-1 and 3.4.9-2, and heatup or cooldown rates are ≤ 100°F 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 ≤ 145°F during recirculation pump startup;

c. The temperature difference between the reactor coolant in the respective recirculation loop and in the reactor vessel is ≤ 50°F during recirculation pump startup;

d. RCS pressure and temperature are within the criticality limits specified in Figure 3.4.9-3, prior to achieving criticality; and

e. The reactor vessel flange and the head flange temperatures are ≥ 90°F when tensioning or detensioning the reactor vessel head bolting studs.

See insert attached.

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 controls the thermal gradient through the vessel wall and is used as input for calculating the heatup, cooldown, and inservice leakage and hydrostatic testing P/T limit curves. Thus, the LCO for the rate of change of temperature restricts stresses caused by thermal gradients and also ensures the validity of the P/T limit curves.

(continued)

INSERT 1, page B 3.4-48

RCS pressure and temperature are within the limits specified in Figures 3.4.9-1 and 3.4.9-2 during RCS non-nuclear heatup and cooldown operations, and RCS inservice leak and hydrostatic testing. Additionally, heatup and cooldown rates are $\leq 100^{\circ}F$ during any RCS heatup or cooldown, and inservice leak and hydrostatic testing.

INSERT 2, PAGE B 3.4-48

f. The reactor vessel flange and head flange temperatures are ≥ 90°F when the reactor vessel is tensioned.

g. For the case when the vessel head is either off or on but not tensioned and fuel is in the vessel, all three sections of the vessel (upper vessel, beltline, and bottom head) may be lowered to a minimum of 68°F. When the head is being tensioned, or is already tensioned, the beltline and bottom head regions may be lowered to 68°F, as long as there is not any pressure or heatup/cooldown. The upper vessel, however, has a higher minimum temperature requirement with the head tensioned, as previously delineated.

The 68°F temperature is based on fuel shutdown margin considerations, since this a more restrictive temperature than would be obtained from 10 CFR 50, Appendix G, considerations. With no fuel in the vessel, the temperature may drop to as low as 50°F, because this is the highest qualification temperature to meet toughness requirements for all reactor materials.

BASES

ACTIONS

C.1 and C.2 (continued)

that the RCPB is returned to a condition that has been verified by stress analyses. The Required Action must be initiated without delay and continued until the limits are restored.

Besides restoring the P/T limit parameters to within limits, an evaluation is required to determine if RCS operation is allowed. This evaluation must verify that the RCPB integrity is acceptable and must be completed before approaching criticality or heating up to > 212°F. Several methods may be used, including comparison with pre-analyzed transients, new analyses, or inspection of the components. ASME Code, Section XI, Appendix E (Ref. 6), may be used to support the evaluation; however, its use is restricted to evaluation of the beltline.

Condition C is modified by a Note requiring Required Action C.2 be completed whenever the Condition is entered. The Note emphasizes the need to perform the evaluation of the effects of the excursion outside the allowable limits. Restoration alone per Required Action C.1 is insufficient because higher than analyzed stresses may have occurred and may have affected the RCPB integrity.

SURVEILLANCE REQUIREMENTS

SR 3.4.9.1

Verification that operation is within limits is required every 30 minutes when RCS pressure and temperature conditions are undergoing planned changes. This Frequency is considered reasonable in view of the control room indication available to monitor RCS status. Also, since temperature ~~rate of~~ change limits are specified in hourly increments, 30 minutes permits a reasonable time for assessment and correction of minor deviations.

Surveillance for heatup, cooldown, or inservice leakage and hydrostatic testing may be discontinued when the criteria given in the relevant plant procedure for ending the activity are satisfied.

Replace with insert attached.

~~This SR has been modified with a Note that requires this Surveillance to be performed only during system heatup and~~

(continued)

INSERT, PAGE B 3.4-51

Verification of Figures 3.4.9-1 and 3.4.9-2 is required during non-nuclear heatups and cooldowns, and inservice leak and hydrostatic testing. Verification of the ≤ 100°F change in any one hour period is required during any heatup or cooldown.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.9.1 (continued)

cooldown operations and RCS inservice leakage and hydrostatic testing.

SR 3.4.9.2

figure

A separate ~~limit~~ is used when the reactor is ~~approaching~~ critical~~ity~~. Consequently, the RCS pressure and temperature must be verified within the appropriate limits before withdrawing control rods that will make the reactor critical.

prior to initial

Performing the Surveillance within 15 minutes ~~before~~ control rod withdrawal for the purpose of achieving criticality provides adequate assurance that the limits will not be exceeded between the time of the Surveillance and the time ~~of the control rod withdrawal~~.

criticality is achieved

See INSERT attached

SR 3.4.9.3 and SR 3.4.9.4

Differential temperatures within the applicable limits ensure that thermal stresses resulting from the startup of an idle recirculation pump will not exceed design allowances. In addition, compliance with these limits ensures that the assumptions of the analysis for the startup of an idle recirculation loop (Ref. 7) are satisfied.

Performing the Surveillance within 15 minutes before starting the idle recirculation pump provides adequate assurance that the limits will not be exceeded between the time of the Surveillance and the time of the idle pump start.

If the 145°F temperature differential specified in SR 3.4.9.3 cannot be determined by direct indication, an alternate method may be used as described below:

The bottom head coolant temperature and the RPV coolant can be assumed to be ≤ 145°F if the following can be confirmed:

a. One or more loop drive flows were > 40 percent of rated flow prior to the RPT,

(continued)

INSERT 2, PAGE B 3.4-52

This SR, for clarity, is modified by a Note stating that it is only required to be met when the reactor is critical, and immediately prior to control rod withdrawal for the purpose of achieving criticality.

BASES

SURVEILLANCE REQUIREMENTS (continued)

and

SR 3.4.9.5, and SR 3.4.9.6, ~~and SR 3.4.9.7~~

Limits on the reactor vessel flange and head flange temperatures are generally bounded by the other P/T limits during system heatup and cooldown. However, operations approaching MODE 4 from MODE 5 and in MODE 4 with RCS temperature less than or equal to certain specified values require assurance that these temperatures meet the LCO limits.

See insert attached.

The flange temperatures must be verified to be above the limits 30 minutes before and while tensioning the vessel head bolting studs to ensure that once the head is tensioned the limits are satisfied. When in MODE 4 with RCS temperature ≤ 100°F, 30 minute checks of the flange temperatures are required because of the reduced margin to the limits. When in MODE 4 with RCS temperature ≤ 120°F, monitoring of the flange temperature is required every 12 hours to ensure the temperature is within the limits specified.

The 30 minute Frequency reflects the urgency of maintaining the temperatures within limits, and also limits the time that the temperature limits could be exceeded. The 12 hour Frequency is reasonable based on the rate of temperature change possible at these temperatures.

SR 3.4.9.5 is modified by a Note that requires the Surveillance to be ~~performed~~ met only when tensioning or detensioning the reactor vessel head bolting studs. SR 3.4.9.6 is modified by a Note that requires the Surveillance to be ~~initiated~~ met when the reactor head is tensioned. ~~30 minutes after RCS temperature ≤ 100°F in Mode 4. SR 3.4.9.7 is modified by a Note that requires the Surveillance to be initiated 12 hours after RCS temperature ≤ 120°F in Mode 4. The Notes contained in these SRs are necessary to specify when the reactor vessel flange and head flange temperatures are required to be verified to be within the limits specified.~~

REFERENCES

1. 10 CFR 50, Appendix G, January 1996.
2. ASME, Boiler and Pressure Vessel Code, Section III, Appendix G.

(continued)

INSERT, PAGE B 3.4-53

Verification of flange temperatures is also required while detensioning is in progress until all reactor vessel head bolts are completely detensioned. (The head is considered tensioned if one or more bolts are partly or completely tensioned).

BASES

REFERENCES (continued)

3. ASTM E 185-82, "Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels," July 1982.

4. 10 CFR 50, Appendix H.

5. Regulatory Guide 1.99, Revision 2, May 1988.

6. ASME, Boiler and Pressure Vessel Code, Section XI, Appendix E.

7. FSAR, Section 15.1.26.

8. Kahtan N. Jabbour (NRC) letter to W. G. Hairston, III (GPC), Amendment 118 to the Operating License, dated January 10, 1992.

9. NRC No. 93-102, "Final Policy Statement on Technical Specification Improvements," July 23, 1993.

10. GE-NE-668-13-0393, "Recirculation Pump Restart Without Vessel Temperature Indication for E.I. Hatch Nuclear Plant," December 28, 1993.

11. DRF A00-05834/6, "Safety & 10 CFR 50.92 Significant Hazards Consideration Assessment for RPV Stratification Prevention Improvements at Edwin I. Hatch Nuclear Plant Units 1 and 2," April 1994.

12. To be added when amendment is received.