ATTACHMENT A

EXISTING TECHNICAL SPECIFICATIONS AND BASES
UNIT 3

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LIMITING CONDITION FOR OPERATION AND SURVEILLANCE REQUIREMENTS

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3/4.4.8 PRESSURE/TEMPERATURE LIMITS

REACTOR COOLANT SYSTEM

LIMITING CONDITION FOR OPERATION

3.4.8.1 With the reactor vessel head bolts tensioned*, the Reactor Coolant System (except the pressurizer) temperature and pressure shall be limited in accordance with the limit lines shown on Figures 3.4-2, 3.4-3, 3.4-4, and 3.4-5 during heatup, cooldown, criticality, and inservice leak and hydrostatic testing with:

a. A maximum heatup as specified by Figure 3.4-3 in any 1-hour period with RCS cold leg temperature less than 153°F. A maximum heatup of 60°F in any 1-hour period with RCS cold leg temperature greater than 153°F.

b. A maximum cooldown as specified by Figure 3.4-5 in any 1-hour period with RCS cold leg temperature less than 126°F. A maximum cooldown of 100°F in any 1-hour period with RCS cold leg temperature greater than 126°F.

c. A maximum temperature change of 10°F in any 1-hour period during inservice hydrostatic and leak testing operations above the heatup and cooldown limit curves.

d. A minimum temperature of 86°F to tension reactor vessel head bolts.

With the reactor vessel head bolts detensioned, the Reactor Coolant System (except the pressurizer) temperature shall be limited to a maximum heatup or cooldown of 60°F in any 1-hour period.

APPLICABILITY: At all times.

ACTION:

With any of the above limits exceeded, restore the temperature and/or pressure to within the limit within 30 minutes; perform an engineering evaluation to determine the effects of the out-of-limit condition on the structural integrity of the Reactor Coolant System; determine that the Reactor Coolant System remains acceptable for continued operations or be in at least HOT STANDBY within the next 6 hours and reduce the RCS T_{avg} and pressure to less than 200°F and 500 psia, respectively, within the following 30 hours.

*With the reactor vessel head bolts detensioned, RCS cold leg temperature may be less than 86°F.

3/4.4.8 PRESSURE/TEMPERATURE LIMITS

REACTOR COOLANT SYSTEM

LIMITING CONDITION FOR OPERATION

SURVEILLANCE REQUIREMENTS

4.4.8.1.1 The Reactor Coolant System temperature and pressure shall be determined to be within the limits at least once per 30 minutes during system heatup, cooldown, and inservice leak and hydrostatic testing operations.

4.4.8.1.2 The reactor vessel material irradiation surveillance specimens shall be removed and examined, to determine changes in material properties, at the intervals required by 10 CFR 50 Appendix H in accordance with the schedule in Table 4.4-5. The results of these examinations shall be used to update Figures 3.4-2 and 3.4-3. Recalculate the Adjusted Reference Temperature based on the greater of the following:

a. The actual shift in reference temperature for plate C-6802-1 as determined by impact testing, or

b. The predicted shift in reference temperature for weld seams 2-203A, 2-203B, or 2-203C as determined by Regulatory Guide 1.99, Revision 2," Radiation Embrittlement of Reactor Vessel Materials," May 1988.

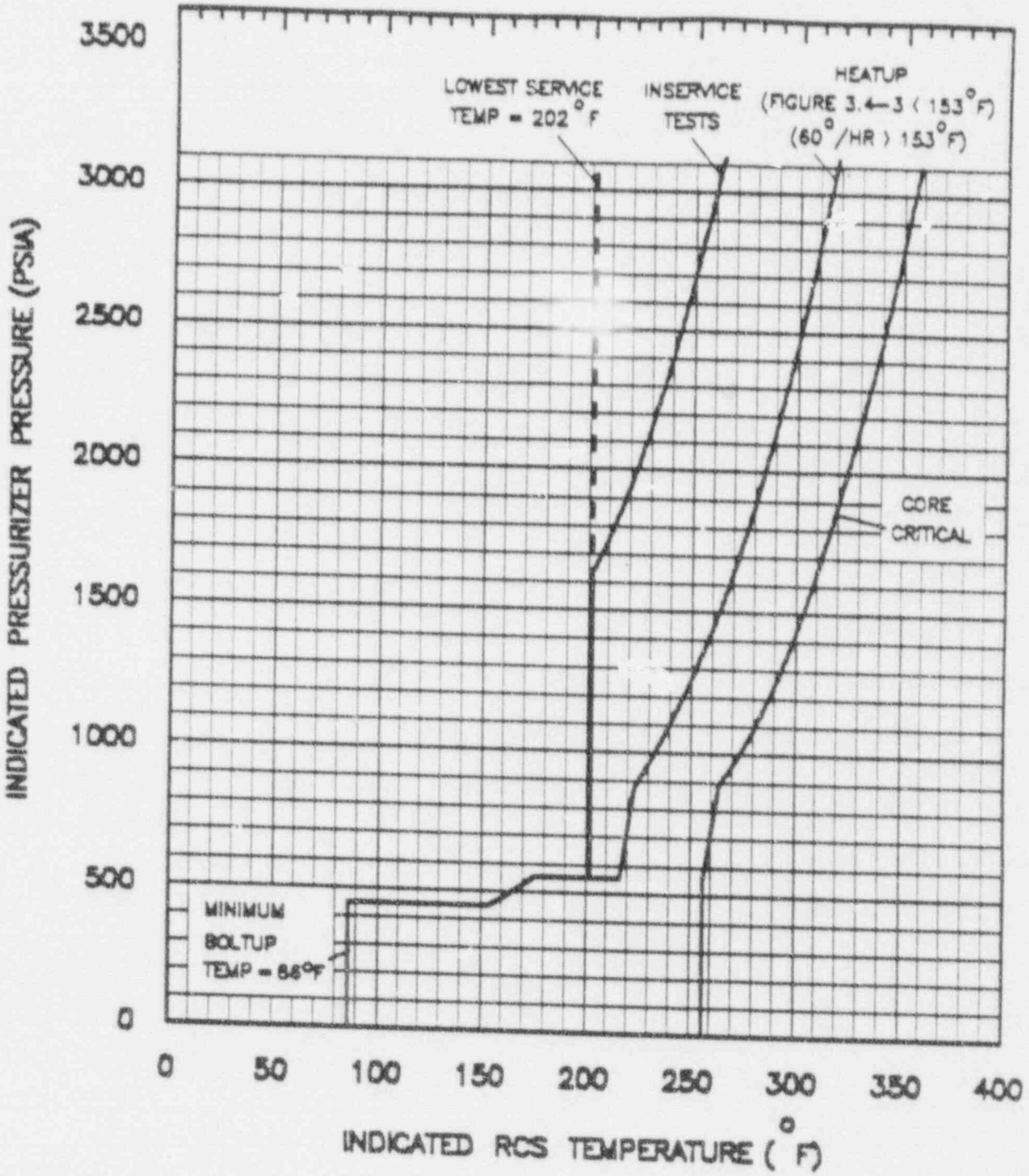
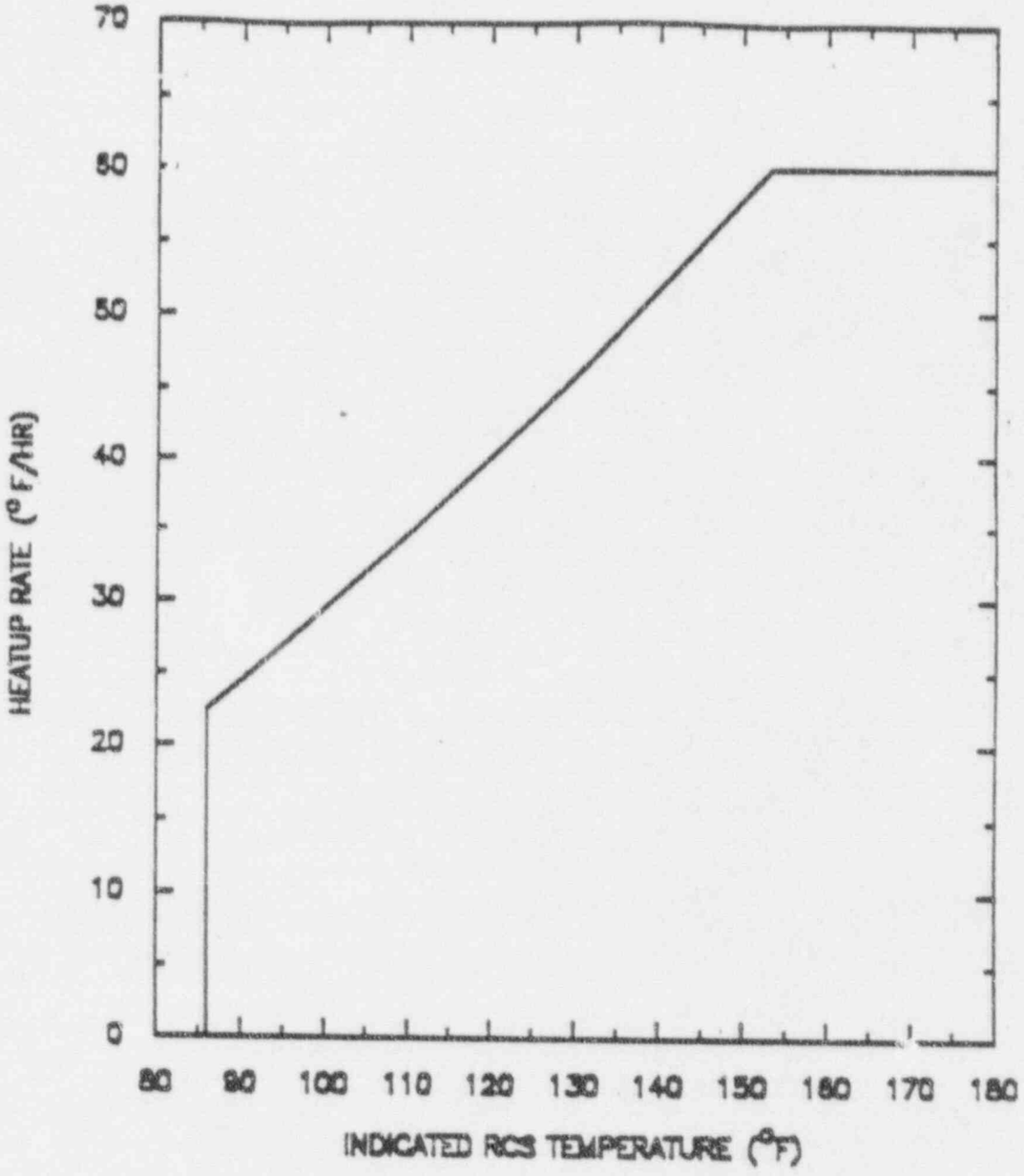


FIGURE 3.4-2

SONGS 3 RCS PRESSURE/TEMPERATURE
LIMITATION FOR 4-8 EFPY



NOTE: A MAXIMUM HEATUP RATE OF 60 °F/HR IS ALLOWED AT ANY TEMPERATURE ABOVE 183°F

FIGURE 3.4-3

SONGS 3 RCS PRESSURE/TEMPERATURE LIMITS
MAXIMUM ALLOWABLE HEATUP RATES (4-8 EFPY)

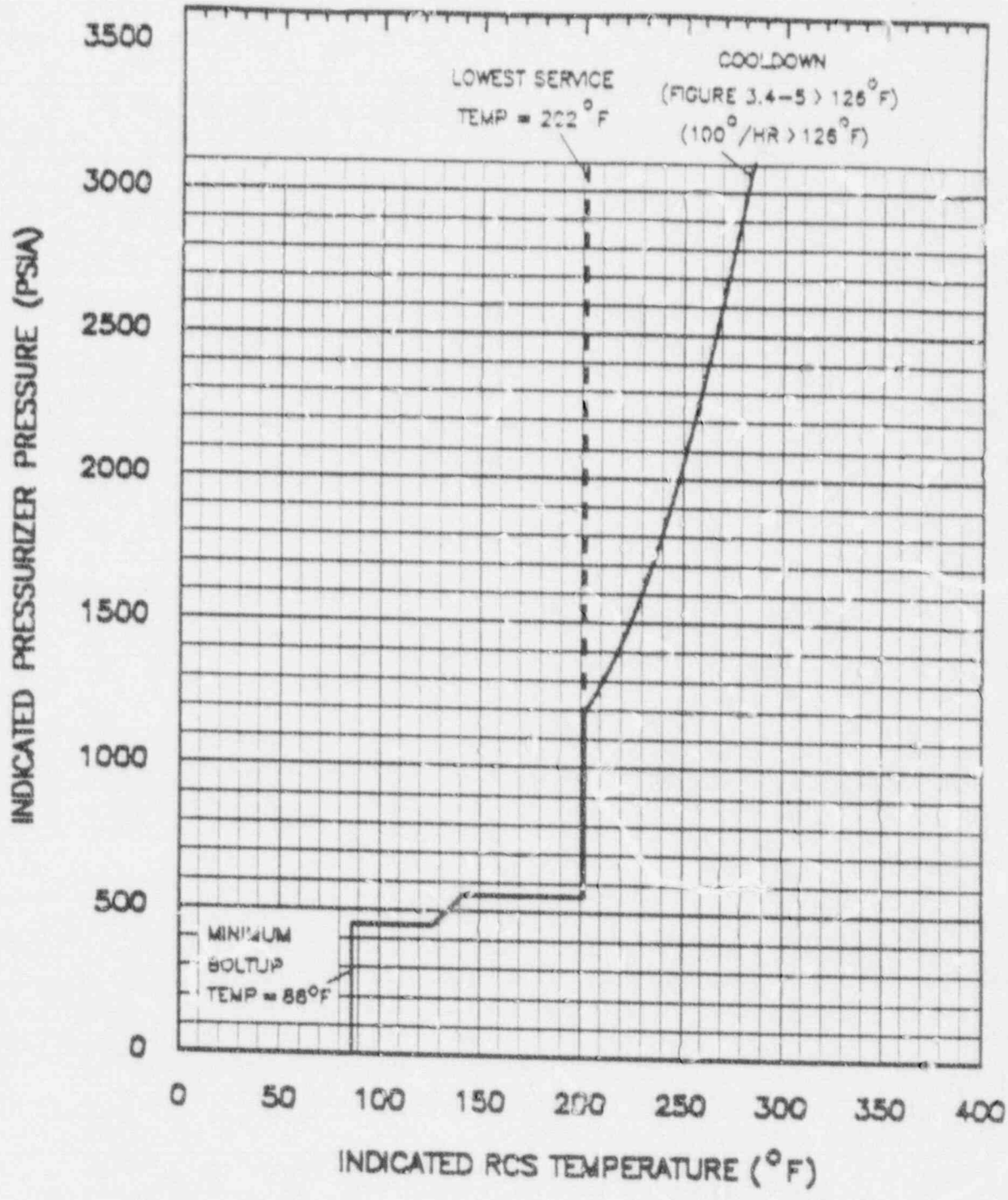
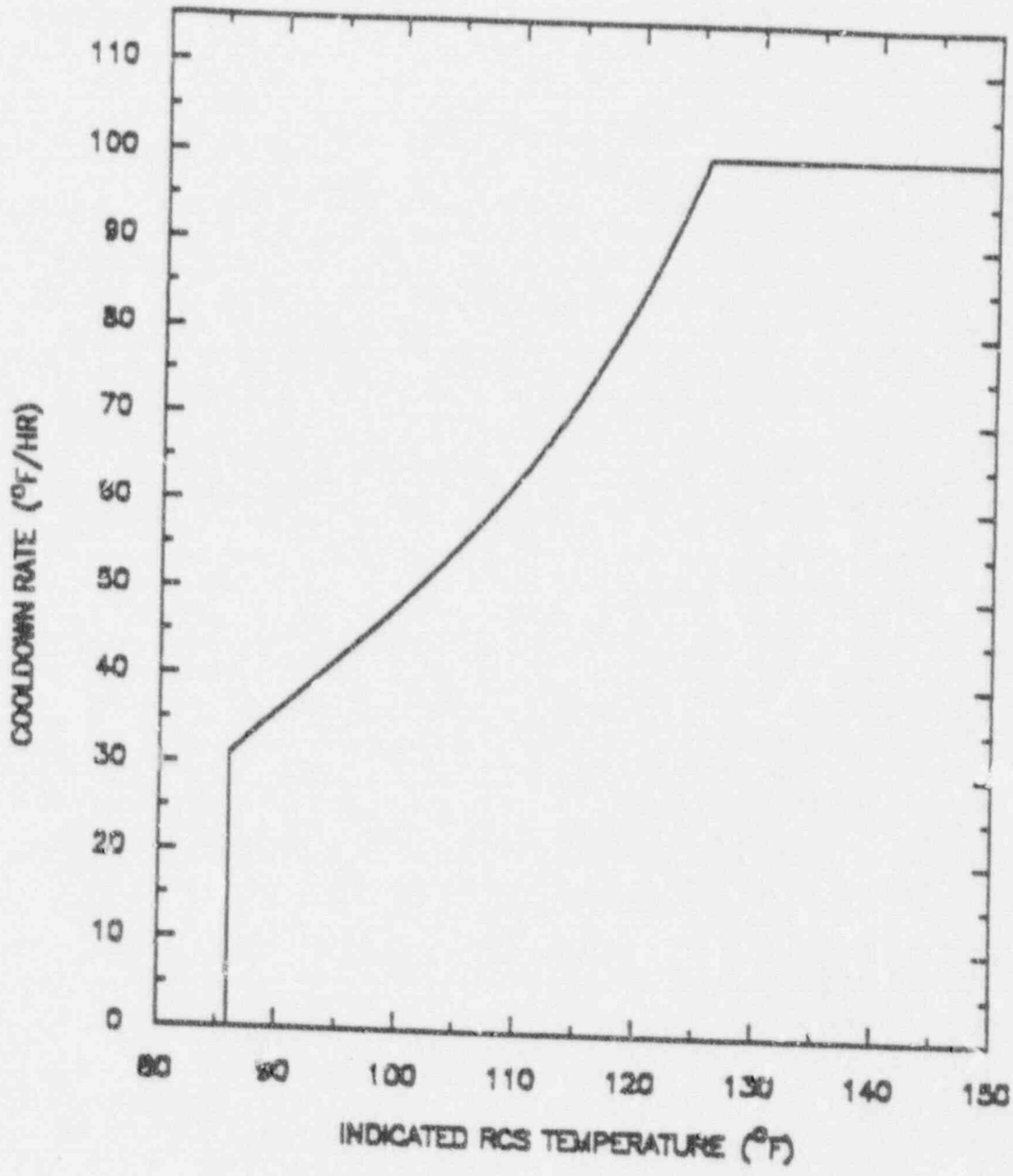


FIGURE 3.4-4

SONGS 3 RCS PRESSURE/TEMPERATURE
LIMITATIONS FOR 4-8 EFPY



NOTE: A MAXIMUM COOLDOWN RATE OF 100°F/HR IS ALLOWED AT ANY TEMPERATURE ABOVE 128°F

FIGURE 3.4-5

SONGS 3 RCS PRESSURE/TEMPERATURE LIMITS
MAXIMUM ALLOWABLE COOLDOWN RATES (4-8 EFPY)

Table 3.4-3

Low Temperature RCS Overpressure Protection Range

Operating Period, EFPY	Cold Leg Temperature, °F	
	During Heatup	During Cooldown
4 to 8	≤ 302	≤ 267

REACTOR COOLANT SYSTEM

OVERPRESSURE PROTECTION SYSTEMS

RCS TEMPERATURE ≤ 302°F

LIMITING CONDITION FOR OPERATION

3.4.P.3.1 No more than two high-pressure safety injection pumps shall be OPERABLE and at least one of the following overpressure protection systems shall be OPERABLE:

a. The Shutdown Cooling System Relief Valve (PSV9349) with:

1) A lift setting of 406 ± 10 psig*, and

2) Relief valve isolation valves 3HV9337, 3HV9339, 3HV9377, and 3HV9378 open

or,

b. The Reactor Coolant System depressurized with an RCS vent of greater than or equal to 5.6 square inches.

APPLICABILITY: MODE 4 when the temperature of any one RCS cold leg is less than or equal to the enable temperatures specified in Table 3.4-3 MODE 5; and MODE 6 when the head is on the reactor vessel and the RCS is not vented.

ACTION:

a. With the SDCS Relief Valve inoperable, reduce T_{avg} to less than 200°F, depressurize and vent the RCS through a greater than or equal to 5.6 square inch vent within the next 8 hours.

b. With one or both SDCS Relief Valve isolation valves in a single SDCS Relief Valve isolation valve pair (valve pair 3HV9337 and 3HV9339 or valve pair 3HV9377 and 3HV9378) closed, open the closed valve(s) or power-lock open the other SDCS Relief Valve isolation valve pair within 24 hours, reduce T_{avg} to less than 200°F, depressurize and vent the RCS through a greater than or equal to 5.6 inch vent within the next 8 hours.

c. With more than two high-pressure safety injection pumps OPERABLE, secure the third high-pressure safety injection pump by racking out its motor curcuit breaker or locking close its discharge valve within 8 hours.

*The lift setting pressure applicable to valve temperatures of less than or equal to 130°F.

REACTOR COOLANT SYSTEM

OVERPRESSURE PROTECTION SYSTEMS

RCS TEMPERATURE > 302°F

LIMITING CONDITION FOR OPERATION

3.4.8.3.2 At least one of the following overpressure protection systems shall be OPERABLE:

a. The Shutdown Cooling System Relief Valve (PSV9349) with:

1) A lift setting of 406 ± 10 psig*, and

2) Relief valve isolation valves 3HV9337, 3HV9339, 3HV9377, and 3HV9378 open, or,

b. A minimum of one pressurizer code safety valve with a lift setting of 2500 psia ± 1%**.

APPLICABILITY: MODE 4 with RCS temperature above that specified in Table 3.4-3.

ACTION:

a. With no safety or relief valve OPERABLE, be in COLD SHUTDOWN and vent the RCS through a greater than or equal to 5.6 square inch vent within the next 8 hours.

b. In the event the SDCS Relief Valve or an RCS vent is used to mitigate an RCS pressure transient, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 30 days. The report shall describe the circumstances initiating the transient, the effect of the SDCS Relief Valve code safety valve or RCS vent on the transient and any corrective action necessary to prevent recurrence.

SURVEILLANCE REQUIREMENTS

4.4.8.3.2.1 The SDCS Relief Valve shall be demonstrated OPERABLE by:

a. Verifying at least once per 72 hours that the SDCS Relief Valve isolation valves 3HV9337, 3HV9339, 3HV9377 and 3HV9378 are open when the SDCS Relief Valve is being used for overpressure protection.

b. Verifying relief valve setpoint at least once per 30 months when tested pursuant to Specification 4.0.5.

4.4.8.3.2.2 The pressurizer code safety valve has no additional surveillance requirements other than those required by Specification 4.0.5.

4.4.8.3.2.3 The RCS vent shall be verified to be open at least once per 12 hours when the vent is being used for overpressure protection, except when the vent pathway is provided with a valve which is locked, sealed, or otherwise secured in the open position, then verify these valves open at least once per 31 days.

*The lift setting pressure applicable to valve temperatures of less than or equal to 130°F.

**The lift setting pressure shall correspond to ambient conditions of the valve at nominal operating temperature and pressure.

PRESSURE/TEMPERATURE LIMITS (Continued)

The heatup and cooldown limit curves (Figures 3.4-2 and 3.4-3) are composite curves which were prepared by determining the most conservative case, with either the inside or outside wall controlling, for any heatup rate of up to 60°F/hr or cooldown rate of up to 100°F/hr. The heatup and cooldown curves were prepared based upon the most limiting value of the predicted adjusted reference temperature at the end of the service period indicated on Figures 3.4-2 and 3.4-3.

The reactor vessel materials have been tested to determine their initial RT_{NDT}; the results of these tests are shown in Table B 3/4.4-1. Reactor operation and resultant fast neutron (E greater than 1 MeV) irradiation will cause an increase in the RT_{NDT}. Therefore, an adjusted reference temperature, based upon the fluence and copper and nickel content of the material in question, can be predicted using FSAR Table 5.2-5 and the recommendations of Regulatory Guide 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials." The heatup and cooldown limit curves, Figures 3.4-2 and 3.4-3, include predicted adjustments for this shift in RT_{NDT} at the end of the applicable service period, as well as adjustments for possible errors in the pressure and temperature sensing instruments.

The actual shift in RT_{NDT} of the vessel material will be established periodically during operation by removing and evaluating, in accordance with ASTM E185-73 and 10 CFR Appendix H, reactor vessel material irradiation surveillance specimens installed near the inside wall of the reactor vessel in the core area. The surveillance specimen withdrawal schedule is shown in Table 4.4-5. Since the neutron spectra at the irradiation samples and vessel inside radius are essentially identical, the measured transition shift for a sample can be applied with confidence to the adjacent section of the reactor vessel taking into account the location of the sample closer to the core than the vessel wall by means of the Lead Factor. The heatup and cooldown curves must be recalculated when the delta RT_{NDT} determined from the surveillance capsule is different from the calculated delta RT_{NDT} for the equivalent capsule radiation exposure.

The pressure-temperature limit lines shown on Figures 3.4-2 and 3.4-3 for reactor criticality and for inservice leak and hydrostatic testing have been provided to assure compliance with the minimum temperature requirements of Appendix G to 10 CFR 50.

The maximum RT_{NDT} for all Reactor Coolant System pressure-retaining materials, with the exception of the reactor pressure vessel, has been determined to be 90°F. The Lowest Service Temperature limit line shown on Figures 3.4-2 and 3.4-3 is based upon this RT_{NDT} since Article NB-2332 (Summer Addenda of 1972) of Section III of the ASME Boiler and Pressure Vessel Code requires the Lowest Service Temperature to be RT_{NDT} + 100°F for piping, pumps and valves. Below this temperature, the system pressure must be limited to a maximum of 20% of the system's hydrostatic test pressure of 3125 psia.

The limitations imposed on the pressurizer heatup and cooldown rates and spray water temperature differential are provided to assure that the pressurizer is operated within the design criteria assumed for the fatigue analysis performed in accordance with the ASME Code requirements.

TABLE B 3/4.4-1

REACTOR VESSEL TOUGHNESS

Piece No.	Code No.	Material	Vessel Location	Drop Weight Results	Temperature of Charpy V-Notch @ 30 ft - lb	@ 50 ft - lb	Minimum Upper Shelf Cv energy for Longitudinal Direction-ft lb
215-01	C-6801-1	A533GRBCL1	Upper Shell Plate	-20	28	64	115
215-01	C-6801-2	A533GRBCL1	Upper Shell Plate	-20	-6	34	106
215-01	C-6801-3	A533GRBCL1	Upper Shell Plate	-20	18	36	115
215-02	C-6802-4	A533GRBCL1	Lower Shell Plate	-30	32	62	115
215-02	C-6802-5	A533GRBCL1	Lower Shell Plate	0	36	64	110
215-02	C-6802-6	A533GRBCL1	Lower Shell Plate	-40	32	100	90
215-03	C-6802-1	A533GRBCL1	Intermediate Shell	-20	56	100	95
215-03	C-6802-2	A533GRBCL1	Intermediate Shell	-20	40	66	113
215-03	C-6802-3	A533GRBCL1	Intermediate Shell	-10	44	80	101
203-02	C-6823	A508CL2	Vessel Flange Forging	0	-30	-15	NA
209-02	C-6824-1	A508CL2	Closure Head Flange Forging	-40	-100	-100	NA
205-02	C-6829-1	A508CL2	Inlet Nozzle Forging	10	-35	-5	109
205-02	C-6829-2	A508CL2	Inlet Nozzle Forging	0	-55	-35	156
205-02	C-6829-3	A508CL2	Inlet Nozzle Forging	10	-25	35	112
205-02	C-6829-4	A508CL2	Inlet Nozzle Forging	10	-30	25	108
205-06	C-6830-1	A508CL2	Outlet Nozzle Forging	-10	-30	-15	125
205-06	C-6830-2	A508CL2	Outlet Nozzle Forging	-10	-20	-5	131
232-01	C-6840-1	A533GRBCL1	Bottom Head Torus	-50	-10	0	107
232-02	C-6841-1	A533GRBCL1	Bottom Head Dome	-40	10	20	99

ATTACHMENT B

PROPOSED TECHNICAL SPECIFICATIONS AND BASES
UNIT 3

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LIMITING CONDITION FOR OPERATION AND SURVEILLANCE REQUIREMENTS

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3/4.4.8 PRESSURE/TEMPERATURE LIMITS

REACTOR COOLANT SYSTEM

LIMITING CONDITION FOR OPERATION

3.4.8.1 With the reactor vessel head bolts tensioned*, the Reactor Coolant System (except the pressurizer) temperature and pressure shall be limited in accordance with the limit lines shown on Figures 3.4-2, ~~3.4-3,~~ 3.4-4, ~~and~~ 3.4-5, 3.4-6, and 3.4-7 during heatup, cooldown, criticality, and inservice leak and hydrostatic testing with:

a. ~~A maximum heatup as specified by Figure 3.4-3 in any 1-hour period with RCS cold leg temperature less than 153°F.~~ A maximum heatup of 60°F in any 1-hour period with RCS cold leg temperature greater than ~~153°~~ or equal to 86° F. Sup 2

b. A maximum cooldown as specified by Figure 3.4-5 in any 1-hour period with RCS cold leg temperature less than ~~126~~ or equal to 147°F. A maximum cooldown of 100°F in any 1-hour period with RCS cold leg temperature greater than ~~126~~ 147°F. Sup 2 Sup 2

c. A maximum temperature change of 10°F in any 1-hour period during inservice hydrostatic and leak testing operations above the heatup and cooldown limit curves.

d. A minimum temperature of 86°F to tension reactor vessel head bolts.

With the reactor vessel head bolts detensioned, the Reactor Coolant System (except the pressurizer) temperature shall be limited to a maximum heatup or cooldown of 60°F in any 1-hour period.

APPLICABILITY: At all times.

ACTION:

With any of the above limits exceeded, restore the temperature and/or pressure to within the limit within 30 minutes; perform an engineering evaluation to determine the effects of the out-of-limit condition on the structural integrity of the Reactor Coolant System; determine that the Reactor Coolant System remains acceptable for continued operations or be in at least HOT STANDBY within the next 6 hours and reduce the RCS T_{avg} and pressure to less than 200°F and 500 psia, respectively, within the following 30 hours.

---

* With the reactor vessel head bolts detensioned, RCS cold leg temperature may be less than 86°F.

3/4.4.8 PRESSURE/TEMPERATURE LIMITS

REACTOR COOLANT SYSTEM

~~LIMITING CONDITION FOR OPERATION~~

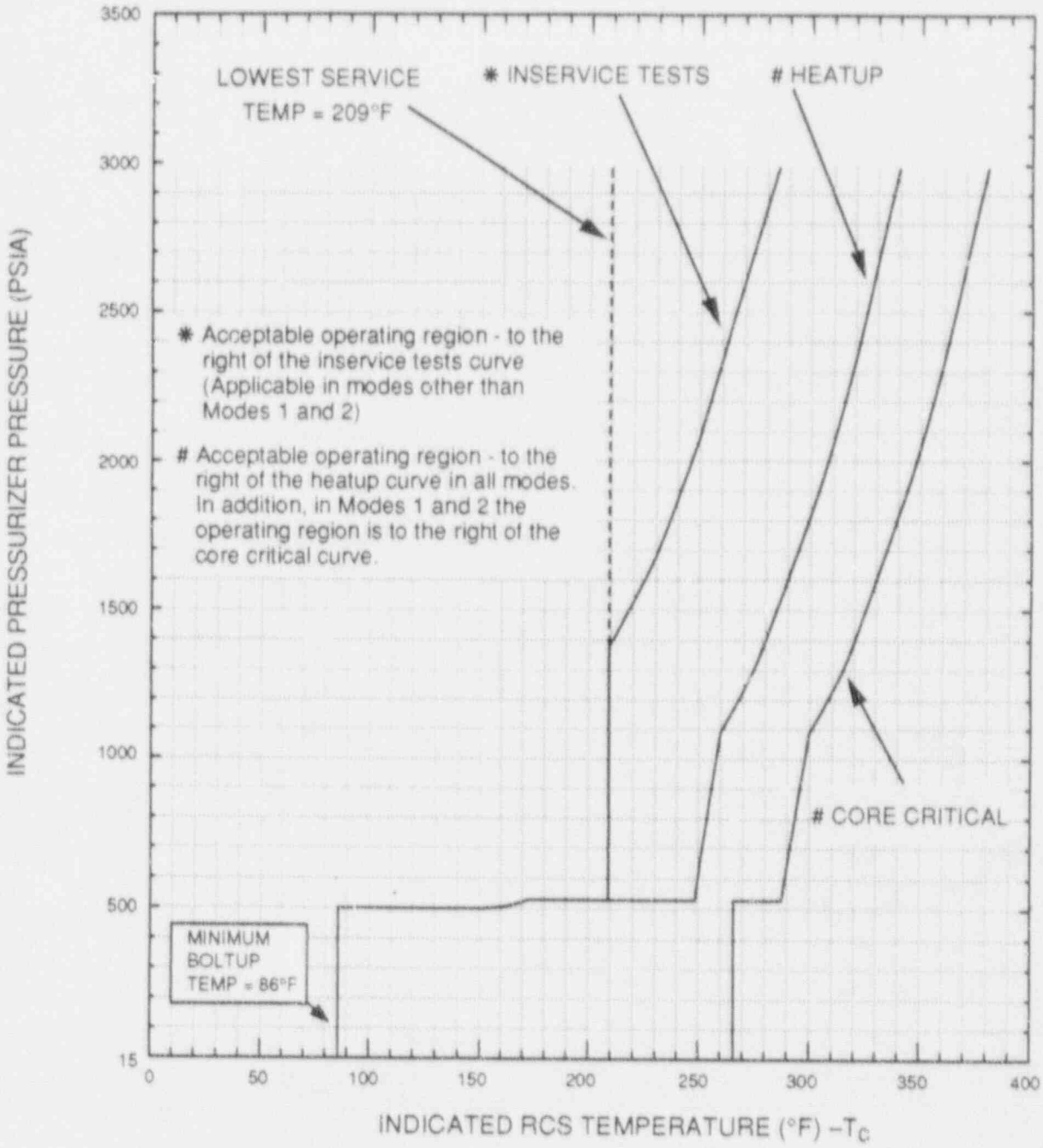
SURVEILLANCE REQUIREMENTS

4.4.8.1.1 The Reactor Coolant System temperature and pressure shall be determined to be within the limits at least once per 30 minutes during system heatup, cooldown, and inservice leak and hydrostatic testing operations.

4.4.8.1.2 The reactor vessel material irradiation surveillance specimens shall be removed and examined, to determine changes in material properties, at the intervals required by 10 CFR 50 Appendix H in accordance with the schedule in Table 4.4-5. The results of these examinations shall be used to update Figures 3.4-2 and ~~3.4-3~~ 3.4-4 through 3.4-7. Recalculate the Adjusted Reference Temperature ~~based on the greater of the following:~~ in accordance with Regulatory Guide 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials," May 1988.

~~a. The actual shift in reference temperature for plate C-6802-1 as determined by impact testing, or~~

~~b. The predicted shift in reference temperature for weld seams 2-203A, 2-203B, or 2-203C as determined by Regulatory Guide 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials," May 1988.~~



sup2

FIGURE 3.4-2

SONGS 3 **HEATUP** RCS PRESSURE/TEMPERATURE
LIMITATIONS ~~FOR 4-8~~ **UNTIL 20** EFPY
Normal Operation

sup2

(Figure 3.4-3 - DELETED)

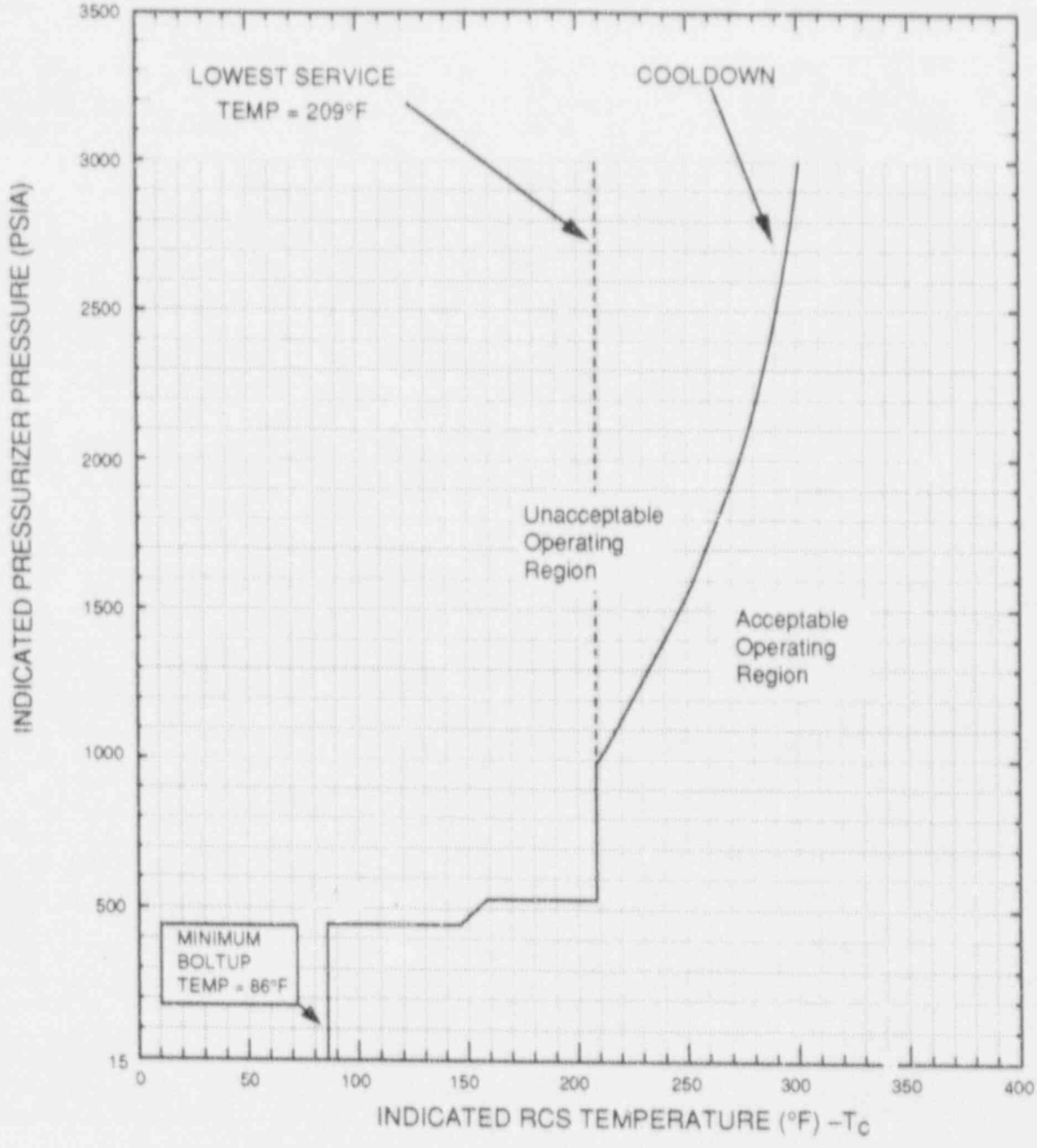
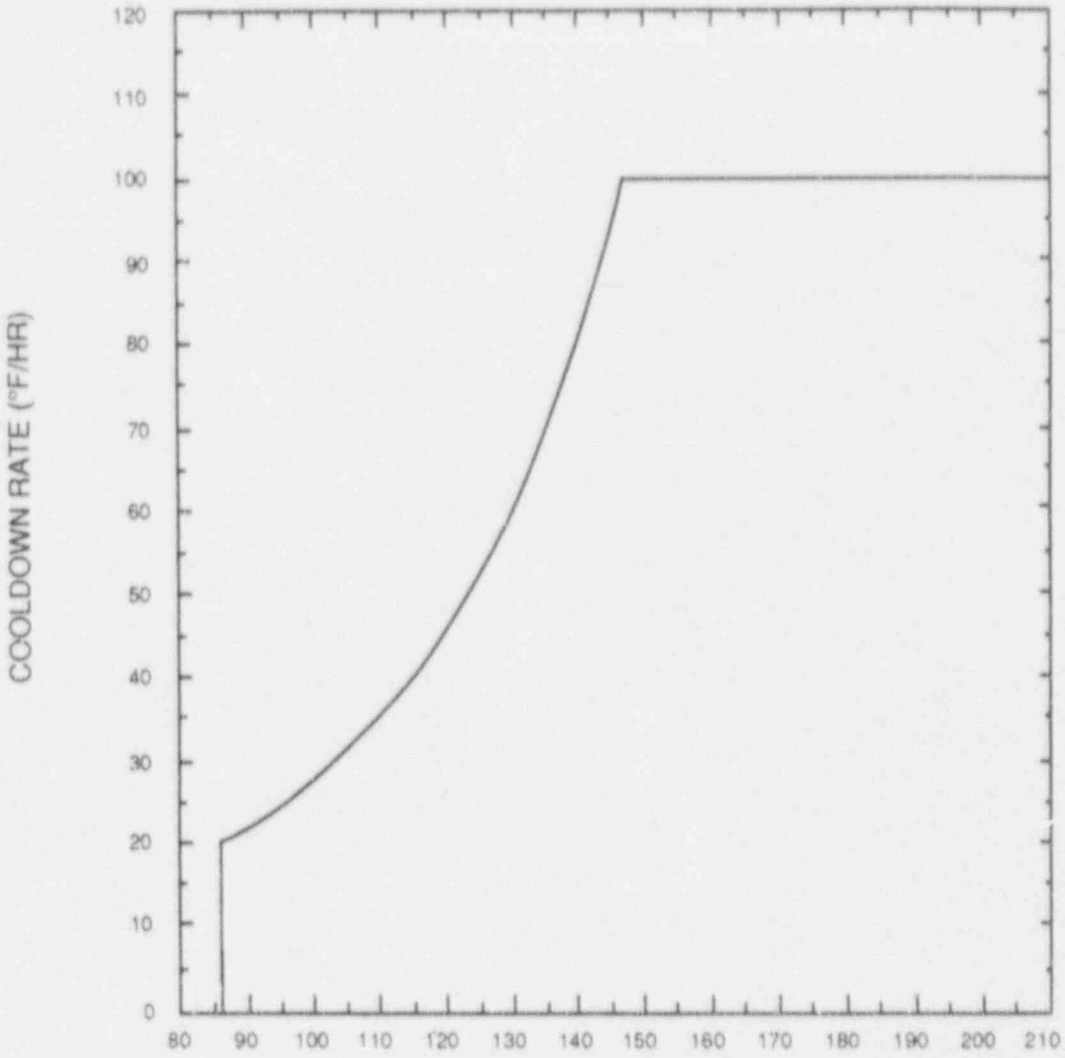


FIGURE 3.4-4

SONGS 3 COOLDOWN RCS PRESSURE/TEMPERATURE
LIMITATIONS ~~FOR 4-8~~ UNTIL 20 EFPY
Normal Operation

Sup 2

Sup 2



Sup 1

NOTE: A MAXIMUM COOLDOWN RATE OF 100°F/HR IS ALLOWED AT ANY TEMPERATURE ABOVE ~~126~~ 147°F

Sup 1

FIGURE 3.4-5

SONGS 3 RCS PRESSURE/TEMPERATURE LIMITS
MAXIMUM ALLOWABLE COOLDOWN RATES (~~4-8~~ UNTIL 20 EFPY)
Normal Operation

Sup 1

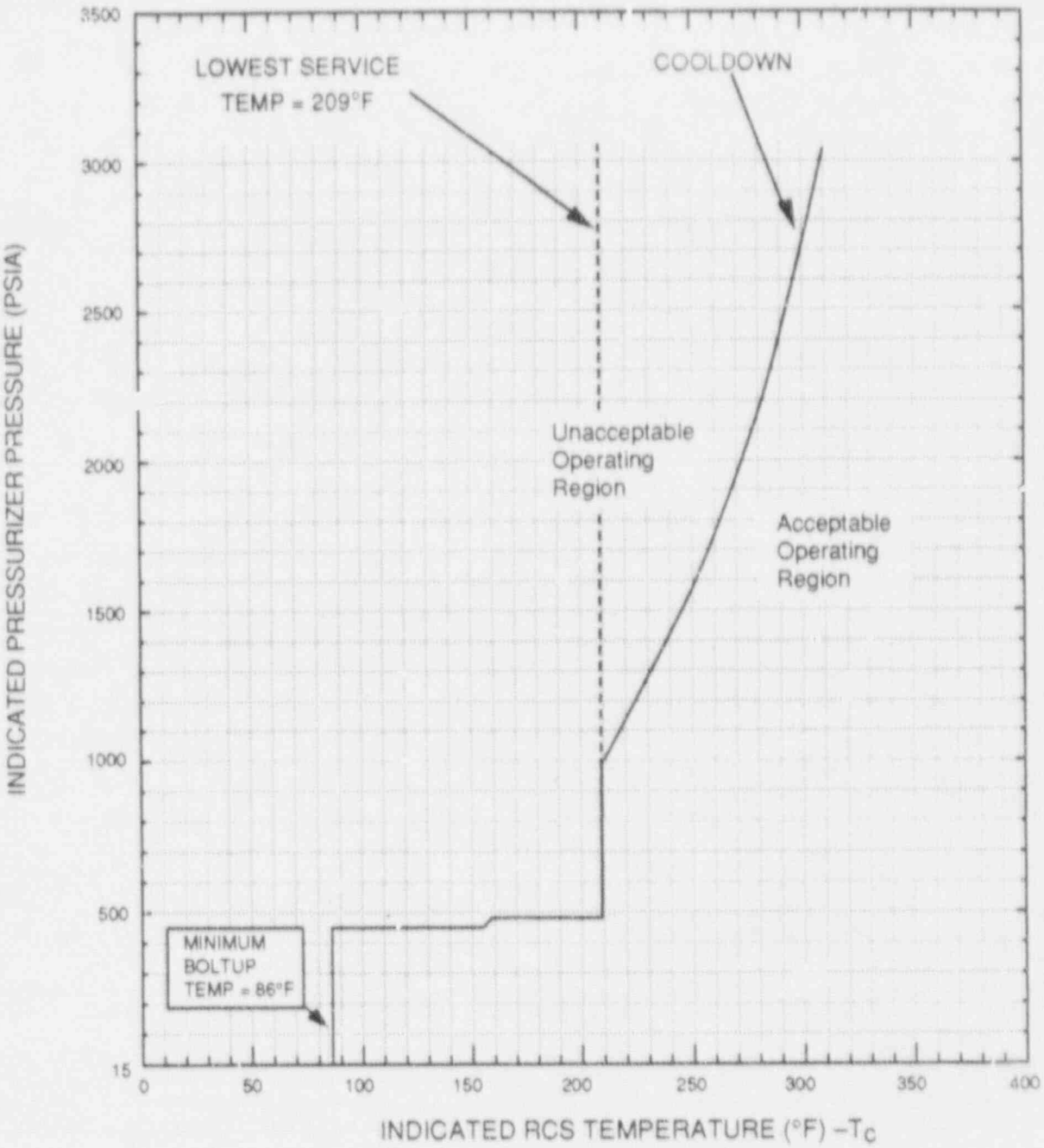
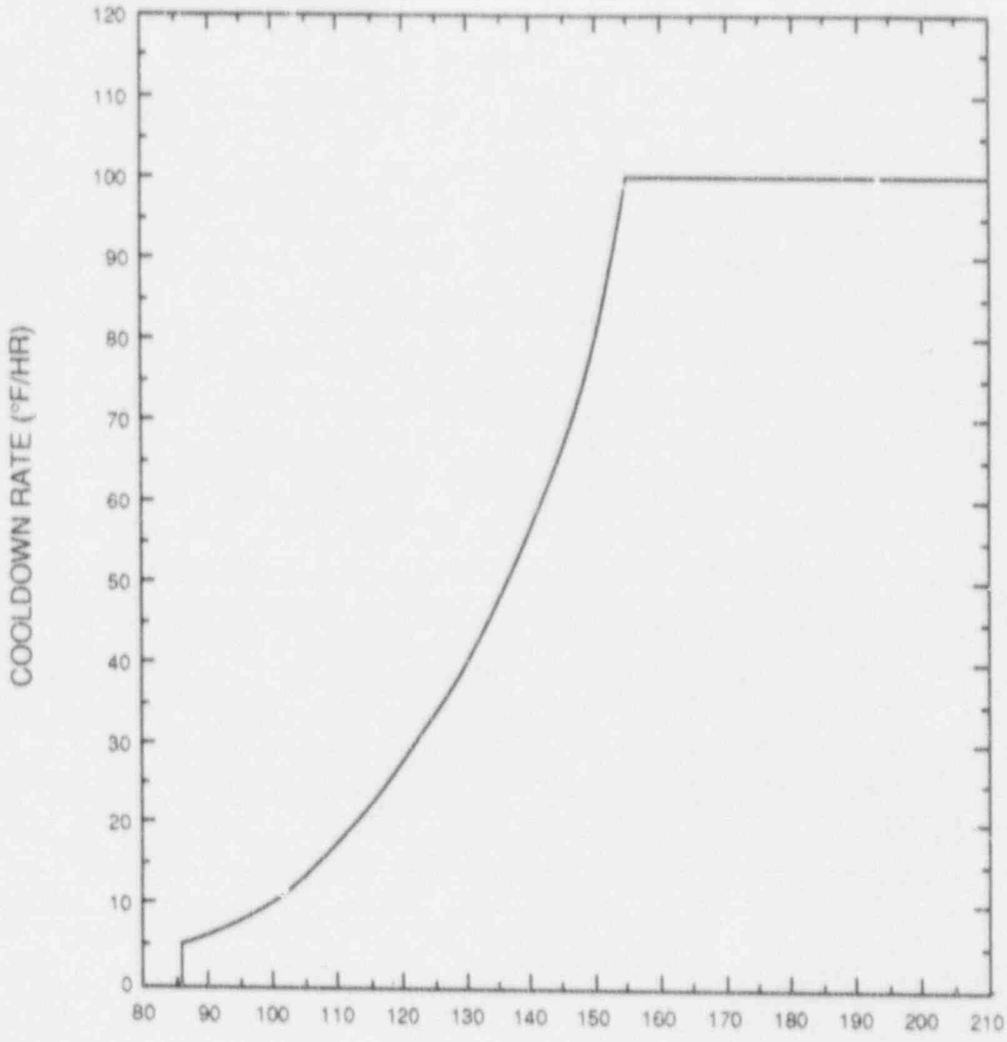


FIGURE 3.4-6

SONGS 3 COOLDOWN RCS PRESSURE/TEMPERATURE
LIMITATIONS UNTIL 20 EFPY
Remote Shutdown Operation

Sup 2

Sup 2



NOTE: A MAXIMUM COOLDOWN RATE OF 100°F/HR IS ALLOWED AT ANY TEMPERATURE ABOVE 155°F

FIGURE 3.4-7

SONGS 3 RCS PRESSURE/TEMPERATURE LIMITS
M[illegible]IM ALLOWABLE COOLDOWN RATES (UNTIL 20 EFPY)
Remote Shutdown Operation

TABLE 3.4-3

Low Temperature RCS Overpressure Protection Range

Operating Period, EFPY	Cold Leg Temperature, °F	
	During Heatup	During Cooldown
~~4 to 8~~ Until 20 (Normal Operation)	≤ ~~302~~ 246	≤ ~~267~~ 225
Until 20 (Remote Shutdown Operation)	*	≤ 225

SUP 2

* Heatup operations are not normally performed from the Remote Shutdown panels.

REACTOR COOLANT SYSTEM

OVERPRESSURE PROTECTION SYSTEMS

RCS TEMPERATURE ≤ ~~302~~ 246°F

Sup 2

LIMITING CONDITION FOR OPERATION

3.4.8.3.1 No more than two high-pressure safety injection pumps shall be OPERABLE and at least one of the following overpressure protection systems shall be OPERABLE:

a. The Shutdown Cooling System Relief Valve (PSV9349) with:

1) A lift setting of 406 ± 10 psig*, and

2) Relief valve isolation valves 3HV9337, 3HV9339, 3HV9377, and 3HV9378 open

or,

b. The Reactor Coolant System depressurized with an RCS vent of greater than or equal to 5.6 square inches.

APPLICABILITY: MODE 4 when the temperature of any one RCS cold leg is less than or equal to the enable temperatures specified in Table 3.4-3; MODE 5; and MODE 6 when the head is on the reactor vessel and the RCS is not vented.

ACTION:

a. With the SDCS Relief Valve inoperable, reduce T_{avg} to less than 200°F, depressurize and vent the RCS through a greater than or equal to 5.6 square inch vent within the next 8 hours.

b. With one or both SDCS Relief Valve isolation valves in a single SDCS Relief Valve isolation valve pair (valve pair 3HV9337 and 3HV9339 or valve pair 3HV9377 and 3HV9378) closed, open the closed valve(s) or power-lock open the other SDCS Relief Valve isolation valve pair within 24 hours, reduce T_{avg} to less than 200°F, depressurize and vent the RCS through a greater than or equal to 5.6 inch vent within the next 8 hours.

c. With more than two high-pressure safety injection pumps OPERABLE, secure the third high-pressure safety injection pump by racking out its motor circuit breaker or locking close its discharge valve within 8 hours.

---

*The lift setting pressure applicable to valve temperatures of less than or equal to 130°F.

REACTOR COOLANT SYSTEM

OVERPRESSURE PROTECTION SYSTEMS

RCS TEMPERATURE ~~>302~~ 246°F

LIMITING CONDITION FOR OPERATION

3.4.8.3.2 At least one of the following overpressure protection systems shall be OPERABLE:

a. The Shutdown Cooling System Relief Valve (PSV9349) with:

1) A lift setting of 406 ± 10 psig*, and

2) Relief valve isolation valves 3HV9337, 3HV9339, 3HV9377, and 3HV9378 open~~, or~~,

or,

b. A minimum of one pressurizer code safety valve with a lift setting of 2500 psia ± 1%**.

APPLICABILITY: MODE 4 with RCS temperature above that specified in Table 3.4-3

ACTION:

a. With no safety or relief valve OPERABLE, be in COLD SHUTDOWN and vent the RCS through a greater than or equal to 5.6 square inch vent within the next 8 hours.

b. In the event the SDCS Relief Valve ~~or an RCS vent~~ is used to mitigate an RCS pressure transient, a Special Report shall be prepared and submitted to the Commission pursuant to Specification 6.9.2 within 30 days. The report shall describe the circumstances initiating the transient, the effect of the SDCS Relief Valve code safety valve ~~or RCS vent~~ on the transient and any corrective action necessary to prevent recurrence.

SURVEILLANCE REQUIREMENTS

4.4.8.3.2.1 The SDCS Relief Valve shall be demonstrated OPERABLE by:

a. Verifying at least once per 72 hours that the SDCS Relief Valve isolation valves 3HV9337, 3HV9339, 3HV9377 and 3HV9378 are open when the SDCS Relief Valve is being used for overpressure protection.

b. Verifying relief valve setpoint at least once per 30 months when tested pursuant to Specification 4.0.5.

4.4.8.3.2.2 The pressurizer code safety valve has no additional surveillance requirements other than those required by Specification 4.0.5.

~~4.4.8.3.2.3 The RCS vent shall be verified to be open at least once per 12 hours when the vent is being used for overpressure protection, except when the vent pathway is provided with a valve which is locked, sealed, or otherwise secured in the open position, then verify these valves open at least once per 31 days.~~

*The lift setting pressure applicable to valve temperatures of less than or equal to 130°F.

**The lift setting pressure shall correspond to ambient conditions of the valve at nominal operating temperature and pressure.

PRESSURE/TEMPERATURE LIMITS (Continued)

The heatup and cooldown limit curves for normal operation (Figures 3.4-2 and 3.4-~~34~~) and the cooldown limit curve for remote shutdown operation (Figure 3.4-6) are composite curves which were prepared by determining the most conservative case, with either the inside or outside wall controlling, for any heatup rate of up to 60°F/hr or cooldown rate of up to 100°F/hr. The limit curves for Remote Shutdown operation are determined using the Total Loop Uncertainties (TLUs) for temperature and pressure for the Remote Shutdown Panel instruments in which the pressure TLUs are higher than those for the Control Room shutdown instruments. The heatup and cooldown curves were prepared based upon the most limiting value of the predicted adjusted reference temperature at the end of the service period ~~indicated on Figures 3.4-2 and 3.4-3~~, and they include adjustments for instrument uncertainties, and static and dynamic heads.

The reactor vessel materials ~~have been~~ were tested prior to reactor startup to determine their initial RT_{NDT}; the results of these tests and the updates resulting from the evaluation of material properties in response to Generic Letter 92-01, "Reactor Vessel Structural Integrity," Revision 1 are shown in Table B 3/4.4-1. Reactor operation and resultant fast neutron (E greater than 1 MeV) irradiation will cause an increase in the RT_{NDT}. Therefore, an adjusted reference temperature, based upon the fluence and copper and nickel content of the material in question, can be predicted using FSAR Table 5.2-~~5~~ 6 and the recommendations of Regulatory Guide 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials." The heatup limit curve (Figure 3.4-2) and the cooldown limit curves, Figures 3.4-24, and 3.4-36, include predicted adjustments for this shift in RT_{NDT} at the end of the applicable service period, as well as adjustments for ~~possible errors in the pre sure and temperature sensing instruments~~ instrument uncertainties, and static and dynamic heads.

sup 2

The actual shift in RT_{NDT} of the vessel material will be established periodically during operation by removing and evaluating, in accordance with ASTM E185-73 and 10 CFR 50 Appendix H, reactor vessel material irradiation surveillance specimens installed near the inside wall of the reactor vessel in the core area. The surveillance specimen withdrawal schedule is shown in Table 4.4-5. Since the neutron spectra at the irradiation samples and vessel inside radius are essentially identical, the measured transition shift for a sample can be applied with confidence to the adjacent section of the reactor vessel taking into account the location of the sample closer to the core than the vessel wall by means of the Lead Factor. The heatup and cooldown curves must be recalculated when the delta RT_{NDT} determined from the surveillance capsule is different from the calculated delta RT_{NDT} for the equivalent capsule radiation exposure.

The pressure-temperature limit lines shown on Figures 3.4-2 ~~and 3.4-3~~ for reactor criticality and for inservice leak and hydrostatic testing have been provided to assure compliance with the minimum temperature requirements of Appendix G to 10 CFR 50.

PRESSURE/TEMPERATURE LIMITS (Continued)

The maximum RT_{NDT} for all Reactor Coolant System pressure-retaining materials, with the exception of the reactor pressure vessel, has been determined to be 90°F. The Lowest Service Temperature limit line shown on Figures 3.4-2, 3.4.4 and 3.4-3 6 is based upon this RT_{NDT} since Article NB-2332 (Summer Addenda of 1972) of Section III of the ASME Boiler and Pressure Vessel Code requires the Lowest Service Temperature to be RT_{NDT} + 100°F for piping, pumps and valves. Below this temperature, the system pressure must be limited to a maximum of 20% of the system's hydrostatic test pressure of 3125 psia.

The limitations imposed on the pressurizer heatup and cooldown rates and spray water temperature differential are provided to assure that the pressurizer is operated within the design criteria assumed for the fatigue analysis performed in accordance with the ASME Code requirements.

The Low Temperature Overpressure Protection (LTOP) enable temperatures are based upon the recommendations of NUREG-0800 Branch Technical Position (BTP) RSB 5-2, Revision 1, "Overpressurization Protection of Pressurized Water Reactors While Operating at Low Temperatures." BTP RSB 5-2, Revision 1 defines the enable temperature as "the water temperature corresponding to a metal temperature of at least RT_{NDT} + 90°F at the beltline location (1/4t or 3/4t) that is controlling in the Appendix G limit calculations."

TABLE B 3/4.4-1

REACTOR VESSEL TOUGHNESS

Piece No.	Code No.	Material	Vessel Location	Drop Weight Results	Temperature of Charpy V-Notch @ 30 °F - lb	@ 50 ft - lb	Minimum Upper Shelf Cv energy for Longitudinal Direction-ft lb
215-01	C-6801-1	A533GRBCL1	Upper Shell Plate	-20	28	64	115
215-01	C-6801-2	A533GRBCL1	Upper Shell Plate	-20	-6	34	106
215-01	C-6801-3	A533GRBCL1	Upper Shell Plate	-20	18	36	115
215-02	C-6802-4	A533GRBCL1	Lower Shell Plate	-30	~~3240~~	~~6270~~	~~1158~~
215-02	C-6802-5	A533GRBCL1	Lower Shell Plate	0	~~3640~~	~~6470~~	~~1106~~
215-02	C-6802-6	A533GRBCL1	Lower Shell Plate	-40	~~3240~~	~~10080~~	~~9092~~
215-03	C-6802-1	A533GRBCL1	Intermediate Shell	-20	~~5680~~	100	~~9594~~ Sup 2
215-03	C-6802-2	A533GRBCL1	Intermediate Shell	-20	40	~~6670~~	1135
215-03	C-6802-3	A533GRBCL1	Intermediate Shell	-10	~~4460~~	80	1015
203-02	C-6823	A508CL2	Vessel Flange Forging	0	-30	-15	NA
209-02	C-6824-1	A508CL2	Closure Head Flange Forging	-40	-100	-30	NA
205-02	C-6829-1	A508CL2	Inlet Nozzle Forging	10	-35	-5	109
205-02	C-6829-2	A508CL2	Inlet Nozzle Forging	0	-55	-35	156
205-02	C-6829-3	A508CL2	Inlet Nozzle Forging	10	-25	35	112
205-02	C-6829-4	A508CL2	Inlet Nozzle Forging	10	-30	25	108
205-06	C-6830-1	A508CL2	Outlet Nozzle Forging	-10	-30	-15	125
205-06	C-6830-2	A508CL2	Outlet Nozzle Forging	-10	-20	-5	131
232-01	C-6840-1	A533GRBCLI	Bottom Head Torus	-50	-10	0	107
232-02	C-6841-1	A533GRBCLI	Bottom Head Dome	-40	10	20	99

ENCLOSURE 3

TECHNICAL SPECIFICATION PAGES CONTAINING THE CHANGES WHICH WERE PREVIOUSLY REQUESTED IN AMENDMENT APPLICATION NO. 101 (PCN-354) DATED SEPTEMBER 3, 1992, AND ARE BEING REQUESTED IN THIS LICENSE AMENDMENT APPLICATION NO. 102 (PCN-359) | Sup2

UNIT 3 | Sup2

LIST OF TABLES

3/4.4.8 PRESSURE/TEMPERATURE LIMITS

REACTOR COOLANT SYSTEM

~~LIMITING CONDITION FOR OPERATION~~ PCN 359

SURVEILLANCE REQUIREMENTS

4.4.8.1.1 The Reactor Coolant System temperature and pressure shall be determined to be within the limits at least once per 30 minutes during system heatup, cooldown, and inservice leak and hydrostatic testing operations.

4.4.8.1.2 The reactor vessel material irradiation surveillance specimens shall be removed and examined, to determine changes in material properties, ~~at the intervals~~ as required by 10 CFR 50 Appendix H. ~~in accordance with the schedule in Table 4.4-5~~ The results of these examinations shall be used to update Figures 3.4-2, and ~~3.4-3~~ 3.4-4 through 3.4-7. Recalculate the Adjusted Reference Temperature ~~based on the greater of the following:~~ in accordance with Regulatory Guide 1.99 Revision 2, "Radiation Embrittlement of Reactor Vessel Materials," May 1988. PCN 354 PCN 359

~~a. The actual shift in reference temperature for plate C-6802-1 as determined by impact testing, or~~

~~b. The predicted shift in reference temperature for weld seams 2-203A, 2-203B, or 2-203C as determined by Regulatory Guide 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials," May 1988.~~

PRESSURE/TEMPERATURE LIMITS (Continued)

The heatup and cooldown limit curves for normal operation (Figures 3.4-2 and 3.4-~~34~~) and the cooldown limit curve for remote shutdown operation (Figure 3.4-6) are composite curves which were prepared by determining the most conservative case, with either the inside or outside wall controlling, for any heatup rate of up to 60°F/hr or cooldown rate of up to 100°F/hr. The limit curves for Remote Shutdown operation are determined using the Total Loop Uncertainties (TLUs) for temperature and pressure for the Remote Shutdown Panel instruments in which the pressure TLUs are higher than those for the Control Room shutdown instruments. The heatup and cooldown curves were prepared based upon the most limiting value of the predicted adjusted reference temperature at the end of the service period ~~indicated on Figures 3.4-2 and 3.4-3~~, and they include adjustments for instrument uncertainties, and static and dynamic heads. PCN 359

The reactor vessel materials ~~have been~~ were tested prior to reactor startup to determine their initial RT_{NDT}; the results of these tests and the updates resulting from the evaluation of material properties in response to Generic Letter 92-01, "Reactor Vessel Structural Integrity," Revision 1 are shown in Table B 3/4.4-1. Reactor operation and resultant fast neutron (E greater than 1 MeV) irradiation will cause an increase in the RT_{NDT}. Therefore, an adjusted reference temperature, based upon the fluence and copper and nickel content of the material in question, can be predicted using FSAR Table 5.2-~~5~~ 6 and the recommendations of Regulatory Guide 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials." The heatup limit curve (Figure 3.4-2) and the cooldown limit curves, Figures 3.4-~~24~~, and 3.4-~~36~~, include predicted adjustments for this shift in RT_{NDT} at the end of the applicable service period, as well as adjustments for ~~possible errors in the pressure and temperature sensing instruments~~ instrument uncertainties, and static and dynamic heads. PCN 359 SUP 1 PCN 359 PCN 359 PCN 359 PCN 359

The actual shift in RT_{NDT} of the vessel material will be established periodically during operation by removing and evaluating, in accordance with ASTM E185-73 and 10 CFR 50 Appendix H, reactor vessel material irradiation surveillance specimens installed near the inside wall of the reactor vessel in the core area. The surveillance specimen withdrawal schedule is ~~shown in Table 4.4-5~~ maintained in the FSAR. Since the neutron spectra at the irradiation samples and vessel inside radius are essentially identical, the measured transition shift for a sample can be applied with confidence to the adjacent section of the reactor vessel taking into account the location of the sample closer to the core than the vessel wall by means of the Lead Factor. The heatup and cooldown curves must be recalculated when the delta RT_{NDT} determined from the surveillance capsule is different from the calculated delta RT_{NDT} for the equivalent capsule radiation exposure. PCN 359 PCN 354

The pressure-temperature limit lines shown on Figures~~-~~ 3.4-2 ~~and 3.4-3~~ for reactor criticality and for inservice leak and hydrostatic testing have been provided to assure compliance with the minimum temperature requirements of Appendix G to 10 CFR 50. PCN 359