ENCLOSURE 1

PROPOSED TECHNICAL SPECIFICATION REVISIONS
BROWNS FERRY NUCLEAR PLANT
UNITS 1, 2, AND 3
(TVA BFNP TS 191)

PROPOSED CHANGES
UNIT 1

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.6.A Thermal and Pressurization Limitations	4.6.A Thermal and Pressurization Limitations

3.6.A Thermal and Pressurization Limitations

3. During heatup by non-nuclear means, except when the vessel is vented or as indicated in 3.6.A.4, during cooldown following nuclear shutdown, or during low-level physics tests, the reactor vessel temperature shall be at or above the temperatures of curve #2 of Figure 3.6.1 until removing tension on the head stud bolts as specified in 3.6.A.5.

4. The reactor vessel shell temperatures during inservice hydrostatic or leak testing shall be at or above the temperatures shown on curve #1 of figure 3.6-1. The applicability of this curve to these tests is extended to non-nuclear heatup and ambient loss cooldown associated with these tests only if the heatup and cooldown rates do not exceed 15°F per hour.

5. The reactor vessel head bolting studs may be partially tensioned (four sequences of the seating pass) provided the studs and flange materials are above 70°F. Before loading the flanges any more, the vessel flange and head flange must be greater than 100°F, and must remain above 100°F while under full tension.

6. The pump in an idle recirculation loop shall not be started unless the temperatures of the coolant within the idle and operating recirculation loops are within 50°F of each other.

7. The reactor recirculation pumps shall not be started unless the coolant temperatures between the dome and the bottom head drain are within 145°F.

4.6.A Thermal and Pressurization Limitations

3. Test specimens representing the reactor vessel, base weld, and weld heat affected zone metal shall be installed inthe reactor vessel adjacent to the vessel wall at the core midplane level. The number and type of specimens will be in accordance with GE report NEDO-10115. The specimens shall meet the intent of ASTM E 185-70. Samples shall be withdrawn at one-fourth and three-fourths service life.

4. Neutron flux wires which were installed adjacent to the reactor vessel wall at the core midplane level were removed during the first refueling outage and tested. The results were used to more accurately determine the neutron fluence in the vessel beltline shell at a depth of one-fourth of the wall thickness. These determined values of neutron fluence and the methods in Regulatory Guide 1.99 were used to predict the changes in reference temperature, RTNDT. After testing the specimens described in 4.6.A.3, Figure 3.6-1 shall be updated if the test results indicate an update is necessary.

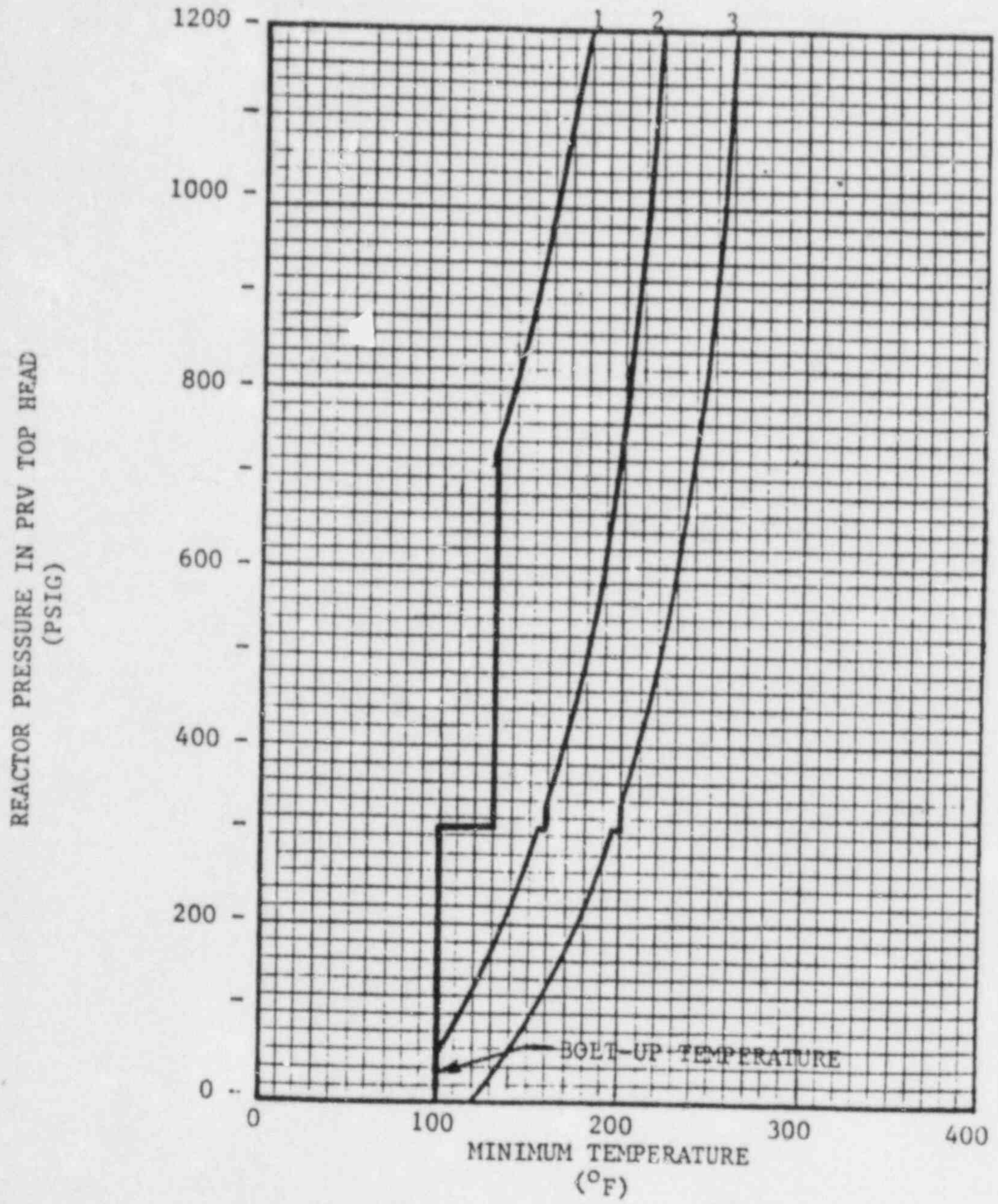
5. When the reactor vessel head bolting studs are tensioned and the reactor is in a cold condition, the reactor vessel shell temperature immediately below the head flange shall be permanently recorded.

6. Prior to and during startup of an idle recirculation loop, the temperature of the reactor coolant in the operating and idle loops shall be permanently logged.

7. Prior to starting a recirculation pump, the reactor coolant temperatures in the dome and in the bottom head drain shall be compared and permanently logged.

8/24/83

Figure 3.6-1



Curve #1
Minimum temperature for pressure tests such as required by Section XI. Minimum temperature of 170°F is required for test pressure of 1,100 psig.

Curve #2
Minimum temperature for mechanical heatup or cooldown following nuclear shutdown.

Curve #3
Minimum temperature for core operation (criticality) includes additional margin required by 10CFR50, Appendix G, Par. IV.A.3 which became effective July 26, 1983.

Notes
These curves include sufficient margin to provide protection against feedwater nozzle degradation. The curves allow for shifts in RT_{NDT} of the reactor vessel beltline materials to compensate for radiation embrittlement for the life of the plant.

DELETED

FIGURE 3.6-2
CHANGE IN CHARPY V TRANSITION TEMPERATURE
VERSUS
NEUTRON EXPOSURE

3.6/4.6 BASES

3.6.A/4.6.A Thermal and Pressurization Limitations

The vessel has been analyzed for stresses caused by thermal and pressure transients. Heating and cooling transients throughout plant life at uniform rates of 100° F per hour were considered in the temperature range of 100 to 546° F and were shown to be within the requirements for stress intensity and fatigue limits of Section III of the ASME Boiler and Pressure Vessel Code (65 Edition including Summer 1966 addenda).

Operating limits on the reactor vessel pressure and temperature during normal heatup and cooldown, and during inservice hydrostatic testing, were established using Appendix G of the Summer 1972 Addenda to Section III of the ASME Boiler and Pressure Vessel Code, 1971 Edition, as a guide. These operating limits assure that a large postulated surface flaw, having a depth of one-quarter of the material thickness, can be safely accommodated in regions of the vessel shell remote from discontinuities. For the purpose of setting these operating limits the reference temperature, RTNDT, of the vessel material was estimated from impact test data taken in accordance with requirements of the Code to which this vessel was designed and manufactured (65 Edition to Summer 1966 addenda.)

The fracture toughness of all ferritic steels gradually and uniformly decreases with exposure to fast neutrons above a threshold value, and it is prudent and conservative to account for this in the operation of the RPV. Two types of information are needed in this analysis: 1) A relationship between the change in fracture toughness of the RPV steel and the neutron fluence (integrated neutron flux), and b) a measure of the neutron fluence at the point of interest in the RPV wall.

A relationship between neutron fluence and change in reference temperature, RT_{NDT}, is provided in Regulatory Guide .99. In turn, this change in reference temperature can be related to a change in the temperature ordinate shown in Figure G-2110-1 in Appendix G of Section III of ASME Boiler and Pressure Vessel Code.

The change in reference temperature at any time period can be determined from the thermal power output of the plant and its relation to the neutron fluence and from Regulatory Guide 1.99. During the first fuel cycle, only calculated neutron fluence values were used. At the first refueling, neutron dosimeter wires which had been installed adjacent to the vessel wall at the core midplane level were removed and tested to determine the neutron fluence. Three sets of mechanical test specimens representing the base metal, weld metal and weld heat affected zone have also been placed adjacent to the vessel wall at the core midplane level. These will be removed and tested as required by 10CFR50, Appendix H. Until such testing is performed, the changes in reference temperature, RT_{NDT}, will be based on the results of the testing of the dosimeter wires and the methods in Regulatory Guide 1.99. The operating pressure-temperature

3.6.A/4.6.A

limits shown in Figure 3.6-1 will be adjusted if necessary when the test results for the mechanical test specimens are available.

As described in paragraph 4.2.5 of the safety analysis report, detailed stress analyses have been made on the reactor vessel for both steady-state and transient conditions with respect to material fatigue. The results of these analyses are compared to allowable stress limits. Requiring the coolant temperature in an idle recirculation loop to be within 50°F of the operating loop temerature before a recirculation pump is started assures that the changes in coolant temperature at the reactor vessel nozzles and bottom head region are acceptable.

The coolant in the bottom of the vessel is at a lower temperaure than that in the upper regions of the vessel when there is no recirculation flow. This colder water is forced up when recirculation pumps are started. This will not result in stresses which exceed ASME Boiler and Pressure Vessel Code, Section III limits when the temperature differential is not greater than 145°F.

The requirements for full tension boltup of the reactor vessel closure are based on the NDT temperature plus 60°F. This is derived from the requirements of the ASME code to which the vessel was built. The NDT temperature of the closure flanges, adjacent head, and shell material is a maximum of 40°F and a maximum of 10°F for the stud material. Therefore, the minimum temperature for full tension boltup is 40°F plus 60°F for a total of 100°F. The partial boltup is restricted to the full loading of eight studs at 70°F, which is stud NDT temperature (10°F) plus 60°F. The neutron radiation fluence at the closure flanges is well below 10^{17} nvt $\geq$ 1 Mev; therefore, radiation effects will be minor and will not influence this temperature.

3.6.B/4.6.B Coolant Chemistry

Materials in the primary system are primarily 304 stainless steel and the Zircaloy cladding. The reactor water chemistry limits are established to prevent damage to these materials. Limits are placed on conductivity and chloride concentrations. Conductivity is limited because it is continously measured and gives an indication of abnormal conditions and the presence of unusual materials in the coolant. Chloride limits are specified to prevent stress corrosion cracking of stainless steel.

PROPOSED CHANGES
UNIT 2

3.6.A Thermal and Pressurization Limitations

3. During heatup by non-nuclear means, except when the vessel is vented or as indicated in 3.6.A.4, during cooldown following nuclear shutdown, or during low-level physics tests, the reactor vessel temperature shall be at or above the temperatures of curve #2 of Figure 3.6.1 until removing tension on the head stud bolts as specified in 3.6.A.5.

4. The reactor vessel shall temperatures during inservice hydrostatic or leak testing shall be at or above the temperatures shown on curve #1 of figure 3.6-1. The applicability of this curve to these tests is extended to non-nuclear heatup and ambient loss cooldown associated with these tests only if the heatup and cooldown rates do not exceed 15°F per hour.

5. The reactor vessel head bolting studs may be partially tensioned (four sequences of the seating pass) provided the studs and flange materials are above 70°F. Before loading the flanges any more, the vessel flange and head flange must be greater than 100°F, and must remain above 100°F while under full tension.

6. The pump in an idle recirculation loop shall not be started unless the temperatures of the coolant within the idle and operating recirculation loops are within 50°F of each other.

7. The reactor recirculation pumps shall not be started unless the coolant temperatures between the dome and the bottom head drain are within 145°F.

4.6.A Thermal and Pressurization Limitations

3. Test specimens representing the reactor vessel, base weld, and weld heat affected zone metal shall be installed inthe reactor vessel adjacent to the vessel wall at the core midplane level. The number and type of specimens will be in accordance with GE report NEDO-10115. The specimens shall meet the intent of ASTM E 185-70. Samples shall be withdrawn at one-fourth and three-fourths service life.

4. Neutron flux wires which were installed adjacent to the reactor vessel wall at the core midplane level were removed during the first refueling outage and tested. The results were used to more accurately determine the neutron fluence in the vessel beltline shell at a depth of one-fourth of the wall thickness. These determined values of neutron fluence and the methods in Regulatory Guide 1.99 were used to predict the changes in reference temperature, RTNDT. After testing the specimens described in 4.6.A.3, Figure 3.6-1 shall be updated if the test results indicate an update is necessary.

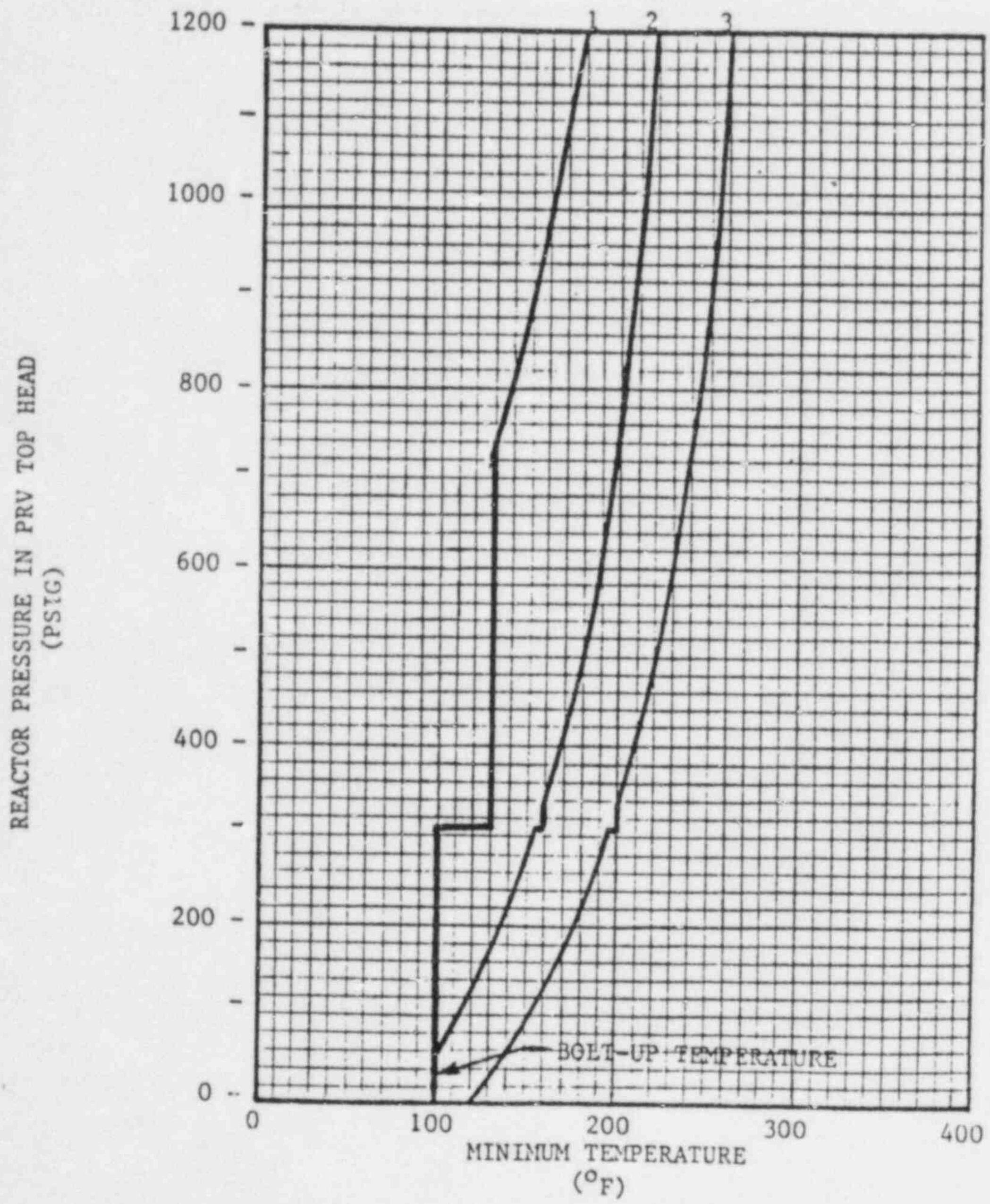
5. When the reactor vessel head bolting studs are tensioned and the reactor is in a cold condition, the reactor vessel shell temperature immediately below the head flange shall be permanently recorded.

6. Prior to and during startup of an idle recirculation loop, the temperature of the reactor coolant in the operating and idle loops shall be permanently logged.

7. Prior to starting a recirculation pump, the reactor coolant temperatures in the dome and in the bottom head drain shall be compared and permanently logged.

8/24/83

Figure 3.6-1



Curve #1
Minimum temperature for pressure tests such as required by Section XI. Minimum temperature of 170°F is required for test pressure of 1,100 psig.

Curve #2
Minimum temperature for mechanical heatup or cooldown following nuclear shutdown.

Curve #3
Minimum temperature for core operation (criticality) includes additional margin required by 10CFR50, Appendix G, Par. IV.A.3 which became effective July 26, 1983.

Notes
These curves include sufficient margin to provide protection against feedwater nozzle degradation. The curves allow for shifts in RT_{NDT} of the reactor vessel beltline materials to compensate for radiation embrittlement for the life of the plant.

DELETED

FIGURE 3.6-2
CHANGE IN CHARPY V TRANSITION TEMPERATURE
VERSUS
NEUTRON EXPOSURE

3.6/4.6 BASES

3.6.A/4.6.A Thermal and Pressurization Limitations

The vessel has been analyzed for stresses caused by thermal and pressure transients. Heating and cooling transients throughout plant life at uniform rates of 100° F per hour were considered in the temperature range of 100 to 546° F and were shown to be within the requirements for stress intensity and fatigue limits of Section III of the ASME Boiler and Pressure Vessel Code (65 Edition including Summer 1966 addenda).

Operating limits on the reactor vessel pressure and temperature during normal heatup and cooldown, and during inservice hydrostatic testing, were established using Appendix G of the Summer 1972 Addenda to Section III of the ASME Boiler and Pressure Vessel Code, 1971 Edition, as a guide. These operating limits assure that a large postulated surface flaw, having a depth of one-quarter of the material thickness, can be safely accommodated in regions of the vessel shell remote from discontinuities. For the purpose of setting these operating limits the reference temperature, RTNDT, of the vessel material was estimated from impact test data taken in accordance with requirements of the Code to which this vessel was designed and manufactured (65 Edition to Summer 1966 addenda.)

The fracture toughness of all ferritic steels gradually and uniformly decreases with exposure to fast neutrons above a threshold value, and it is prudent and conservative to account for this in the operation of the RPV. Two types of information are needed in this analysis: 1) A relationship between the change in fracture toughness of the RPV steel and the neutron fluence (integrated neutron flux), and b) a measure of the neutron fluence at the point of interest in the RPV wall.

A relationship between neutron fluence and change in reference temperature, RT_{NDT}, is provided in Regulatory Guide 1.99. In turn, this change in reference temperature can be related to a change in the temperature ordinate shown in Figure G-2110-1 in Appendix G of Section III of ASME Boiler and Pressure Vessel Code.

The change in reference temperature at any time period can be determined from the thermal power output of the plant and its relation to the neutron fluence and from Regulatory Guide 1.99. During the first fuel cycle, only calculated neutron fluence values were used. At the first refueling, neutron dosimeter wires which had been installed adjacent to the vessel wall at the core midplane level were removed and tested to determine the neutron fluence. Three sets of mechanical test specimens representing the base metal, weld metal and weld heat affected zone have also been placed adjacent to the vessel wall at the core midplane level. These will be removed and tested as required by 10CFR50, Appendix H. Until such testing is performed, the changes in reference temperature, RT_{NDT}, will be based on the results of the testing of the dosimeter wires and the methods in Regulatory Guide 1.99. The operating pressure-temperature

3.6/4.6 BASES

3.6.A/4.6.A

limits shown in Figure 3.6-1 will be adjusted if necessary when the test results for the mechanical test specimens are available.

As described in paragraph 4.2.5 of the safety analysis report, detailed stress analyses have been made on the reactor vessel for both steady-state and transient conditions with respect to material fatigue. The results of these analyses are compared to allowable stress limits. Requiring the coolant temperature in an idle recirculation loop to be within 50°F of the operating loop temerature before a recirculation pump is started assures that the changes in coolant temperature at the reactor vessel nozzles and bottom head region are acceptable.

The coolant in the bottom of the vessel is at a lower temperaure than that in the upper regions of the vessel when there is no recirculation flow. This colder water is forced up when recirculation pumps are started. This will not result in stresses which exceed ASME Boiler and Pressure Vessel Code, Section III limits when the temperature differential is not greater than 145°F.

The requirements for full tension boltup of the reactor vessel closure are based on the NDT temperature plus 60°F. This is derived from the requirements of the ASME code to which the vessel was built. The NDT temperature of the closure flanges, adjacent head, and shell material is a maximum of 40°F and a maximum of 10°F for the stud material. Therefore, the minimum temperature for full tension boltup is 40°F plus 60°F for a total of 100°F. The partial boltup is restricted to the full loading of eight studs at 70°F, which is stud NDT temperature (10°F) plus 60°F. The neutron radiation fluence at the closure flanges is well below 10^{17} nvt $\geq$ 1 Mev; therefore, radiation effects will be minor and will not influence this temperature.

3.6.B/4.6.B Coolant Chemistry

Materials in the primary system are primarily 304 stainless steel and the Zircaloy cladding. The reactor water chemistry limits are established to prevent damage to these materials. Limits are placed on conductivity and chloride concentrations. Conductivity is limited because it is continously measured and gives an indication of abnormal conditions and the presence of unusual materials in the coolant. Chloride limits are specified to prevent stress corrosion cracking of stainless steel.

PROPOSED CHANGES
UNIT 3

3.6 PRIMARY SYSTEM BOUNDARY

4. The reactor vessel shell temperatures during inservice hydrostatic or leak testing shall be at or above the temperatures shown on curve Number 1 of figure 3.6-1. The applicability of this curve to these tests is extended to non-nuclear heatup and ambient loss cool-down associated with these tests only if the heatup and cooldown rates do not exceed 15°F per hour.

5. The reactor vessel head bolting studs may be partially tensioned (four sequences of the seating pass) provided the studs and flange materials are above 70°F. Before loading the flanges any more, the vessel flange and head flange must be greater than 100°F, and must remain above 100°F while under full tension.

6. The pump in an idle recirculation loop shall not be started unless the temperatures of the coolant within the idle and operating recirculation loops are within 50°F of each other.

7. The reactor recirculation pumps shall not be started unless the coolant temperatures between the dome and bottom head drain are within 145°F.

4.6 PRIMARY SYSTEM BOUNDARY

4. Neutron flux wires which were installed adjacent to the reactor vessel wall at the core midplane level were removed during the first refueling outage and tested. The results were used to more accurately determine the neutron fluence in the vessel beltline shell at a depth of one-fourth of the wall thickness. These determined values of neutron fluence and the methods in Regulatory Guide 1.99 were used to predict the changes in reference temperature, RTNDT. After testing the specimens described in 4.6.A.3, Figure 3.6-1 shall be updated if the test results indicate an update is necessary.

5. When the reactor vessel head bolting studs are tensioned and the reactor is in a Cold Condition, the reactor vessel shell temperature immediately below the head flange shall be permanently recorded.

6. Prior to and during startup of an idle recirculation loop, the temperature of the reactor coolant in the operating and idle loops shall be permanently logged.

7. Prior to starting a recirculation pump, the reactor coolant temperatures in the dome and in the bottom head drain shall be compared and permanently logged.

8/24/83

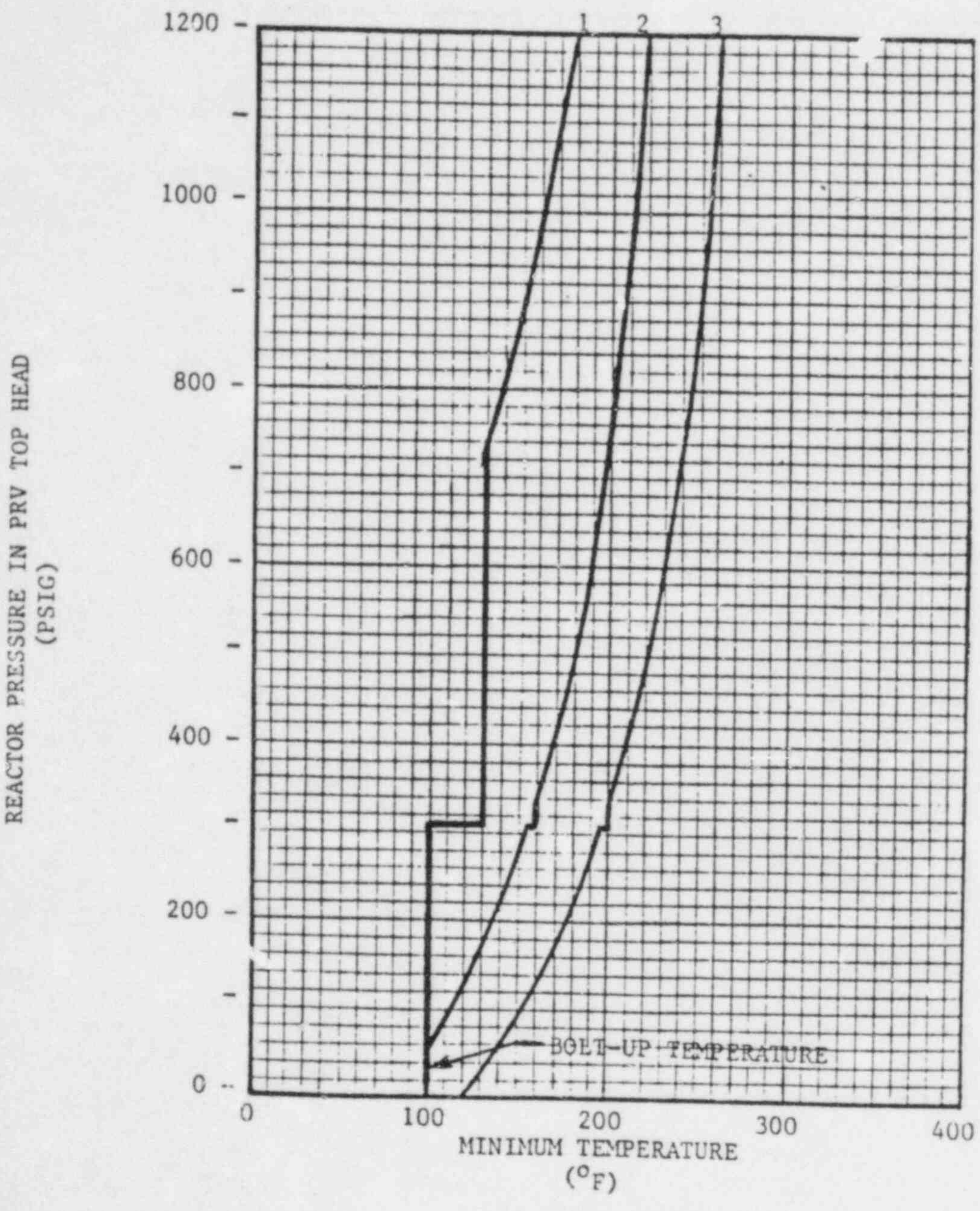


Figure 3.6-1

Curve #1
Minimum temperature for pressure tests such as required by Section XI. Minimum temperature of 170^{o}F is required for test pressure of 1,100 psig.

Curve #2
Minimum temperature for mechanical heatup or cooldown following nuclear shutdown.

Curve #3
Minimum temperature for core operation (criticality) includes additional margin required by 10CFR50, Appendix G, Par. IV.A.3 which became effective July 26, 1983.

Notes
These curves include sufficient margin to provide protection against feedwater nozzle degradation. The curves allow for shifts in RT_{NDT} of the reactor vessel beltline materials to compensate for radiation embrittlement for the life of the plant.

DELETED

FIGURE 3.6-2
CHANGE IN CHARPY V TRANSITION TEMPERATURE
VERSUS
NEUTRON EXPOSURE

3.6/4.6 BASES

3.6.A/4.6.A Thermal and Pressurization Limitations

The vessel has been analyzed for stresses caused by thermal and pressure transients. Heating and cooling transients throughout plant life at uniform rates of 100°F per hour were considered in the temperature range of 100 to 546°F and were shown to be within the requirements for stress intensity and fatigue limits of Section III of the ASME Boiler and Pressure Vessel Code (65 Edition including Summer 1966 addenda).

Operating limits on the reactor vessel pressure and temperature during normal heatup and cooldown, and during inservice hydrostatic testing, were established using Appendix G of the Summer 1972 Addenda to Section III of the ASME Boiler and Pressure Vessel Code, 1971 Edition, as a guide. These operating limits assure that a large postulated surface flaw, having a depth of one-quarter of the material thickness, can be safely accommodated in regions of the vessl shell remote from discontinuities. For the purpose of setting these operating limits the reference temperature, RTNDT, of the vessel material was estimated from impact test data taken in accordance with requirements of the Code to which this vessel was designed and manufactured (65 Edition to Summer 1966 addenda.).

The fracture toughness of all ferritic steels gradually and uniformly decreases with exposure to fast neutrons above a threshold value, and it is prudent and conservative to account for this in the operation of the RPV. Two types of information are needed in this analysis: 1) A relationship between the change in fracture toughness of the RPV steel and the neutron fluence (integrated neutron flux), and b) a measure of the neutron fluence at the point of interest in the RPV wall.

A relationship between neutron fluence and change in reference temperature, RTNDT, is provided in Regulatory Guide 1.99. In turn, this change in reference temperature can be related to a change in the temperature ordinate shown in Figure G-2110-1 in Appendix G of Section III of the ASME Boiler and Pressure Vessel Code.

The change in reference temperature at any time period can be determined from the thermal power output of the plant and its relation to the neutron fluence and from Regulatory Guide 1.99. During the first fuel cycle, only calculated neutron fluence values were used. At the first refueling, neutron dosimeter wires which had been installed adjacent to the vessel wall at the core midplane level were removed and tested to determine the neutron fluence. Three sets of mechanical test specimens representing the base metal, weld metal and weld heat affected zone have also been placed adjacent to the vessel wall at the core midplane level. These will be removed and tested as required by 10 CFR 50, Appendix H. Until such testing is performed, the changes in

reference temperature, RTNDT, will be based on the results of the testing of the dosimeter wires and the methods in Regulatory Guide 1.99. The operating pressure-temperature limits shown in Figure 3.6-1 will be adjusted if necessary when the test results for the mechanical test specimens are available.

As described in paragraph 4.2.5 of the safety analysis report, detailed stress analyses have been made on the reactor vessel for both steady-state and transient conditions with respect to material fatigue. The results of these analyses are compared to allowable stress limits. Requiring the coolant temperature in an idle recirculation loop to be within 50°F of the operating loop temperature before a recirculation pump is started assures that the changes in coolant temperature at the reactor vessel nozzles and bottom head region are acceptable.

The coolant in the bottom of the vessel is at a lower temperature than that in the upper regions of the vessel when there is no recirculation flow. This colder water is forced up when recirculation pumps are started. This will not result in stresses which exceed ASME Boiler and Pressure Vessel Code, Section III limits when the temperature differential is not greater than 145°F.

The requirements for full tension boltup of the reactor vessel closure are based on the NDT temperature plus 60°F. This is derived from the requirements of the ASME code to which the vessel was built. The NDT temperature of the closure flanges, adjacent head, and shell material is a maximum of 40°F and a maximum of 10°F for the stud material. Therefore, the minimum temperature for full tension boltup is 40°F plus 60°F for a total of 100°F. The partial boltup is restricted to the full loading of eight studs at 70°F, which is stud NDT temperature (10°F) plus 60°F. The neutron radiation fluence at the closure flanges is well below 10^{17} nvt $\geq$ 1 Mev; therefore, radiation effects will be minor and will not influence this temperature.

ENCLOSURE 2
DESCRIPTION OF PROPOSED CHANGE TO TECHNICAL SPECIFICATIONS FOR
BROWNS FERRY NUCLEAR PLANT UNITS 1, 2, AND 3
(TVA BFNP TS 191)

Page 175 - Units 1 and 2
Page 186 - Unit 3

Description

This change only updates technical specification 4.6.A.4 to reflect the present status of the neutron flux wires.

Reason

These wires were installed for purposes of experimentally verifying the calculated values of neutron fluence. This proposed change reflects that the wires were removed and the results used to determine the neutron fluence. The new proposed specification outlines planned actions regarding future revisions to the technical specifications concerning reference temperature RT_{NDT}.

No additional justification is needed.

Page 195 - Units 1 and 2
Page 208 - Unit 3

Description

Figure 3.6-2 "Change in Charpy V Transition Temperature versus Neutron Exposure" is to be deleted.

Reason/Justification

Figure 3.6-2 as shown in the technical specifications is not consistent with Regulatory Guide 1.99. We do not consider it appropriate to have this figure in the technical specifications. As necessary in the future, the regulatory guide can be used in lieu of this Figure 3.6-2.

Pages 215 and 216 - Units 1 and 2
Pages 220 and 221 - Unit 3

Description

These proposed changes revise the BASES to more accurately reflect current industry practices regarding determination of changes in reference temperature RT_{NDT}. The change updates the specification BASES to reflect what has been done with neutron dosimeter wires that were installed adjacent to the reactor vessel wall. It also describes what will be done with mechanical test specimens. It describes our future plans for determining changes in reference temperature RT_{NDT}.

Description and Justification (cont.)

Page 194 - Units 1 and 2
Page 207 - Unit 3

Description

Revise figure 3.6-1 as necessary to reflect more realistic, but conservative, values of beltline material RT_{NDT} based on material analyses and testing.

Reason

Provide lower, but conservative, pressure-temperature limits which will eliminate sealing containment prior to pressure testing.

ENCLOSURE 3
JUSTIFICATION AND SAFETY ANALYSIS
(TVA BFNP TS 191)

The pressure-temperature limit curves which are presently implemented at Browns Ferry Nuclear Plant (BFN) are based on a conservative baseline RT_{NDT} in the vessel beltline region to compensate for embrittlement caused by 6.0 effective full power years (EFPY) of accumulated neutron fluence. Thus, the presently used curves are based on a maximum RT_{NDT} of 40 + 36 = 76°F in the vessel beltline region and a maximum RT_{NDT} of 40°F in the vessel closure flange region and the feedwater nozzle.

Combustion Engineering, Inc. (CE), performed material analysis to determine the actual copper content for the limiting vessel beltline materials in units 1, 2, and 3. Examination of the results showed that the maximum copper content is in the unit 2 weld material and is equal to 0.20 percent. Charpy impact testing has been performed at Singleton Materials Engineering Laboratory to determine the baseline RT_{NDT} for the beltline materials in units 1, 2, and 3. The combined end results of the CE analysis and the Singleton testing show that the maximum final RT_{NDT} is in the unit 2 weld material and is equal to 58°F. This value of 58°F is less than the value of 76°F on which the presently used curves are based and therefore provides a basis for relaxing the pressure-temperature limits.

The proposed curves are based on a beltline region 40 EFPY RT_{NDT} of 58°F which is based on actual material testing. The curves also provide relief on minimum temperature for core operation (criticality) as allowed for boiling water reactors by revised 10 CFR 50 appendix G which became effective July 26, 1983. They also include temperature limits as recommended in General Electric Company Service Information Letter 207, November 1979, to protect against further degradation of the feedwater nozzles; therefore, the safety of the plant is not degraded due to the proposed curves.

The revisions proposed for section 4.6.A and bases are being made to reflect surveillance in accordance with Regulatory Guide 1.99. The neutron flux wires were installed for the purpose of experimentally verifying the calculated values of neutron fluence. This proposed change reflects that the wires were removed and tested during the first refueling outage and the results were used to determine the neutron fluence. The proposed specification also outlines planned actions regarding future revisions to the technical specifications concerning reference temperature RT_{NDT}. Figure 3.6-2 as shown in the technical specifications is not consistent with Regulatory Guide 1.99. We do not consider it appropriate to have this figure in the technical specifications. As necessary in the future, the regulatory guide can be used in lieu of this figure 3.6-2. This in no way affects the safety of the plant.

ENCLOSURE 4

BROWNS FERRY NUCLEAR PLANT

SIGNIFICANT HAZARDS CONSIDERATION

FOR

PROPOSED TECHNICAL SPECIFICATION CHANGES

Figure 3.6-1.

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

   No. The revision reflects more realistic, but conservative values of RT_{NDT} for the reactor vessel beltline region and provides a margin of safety which complies with the fracture toughness requirements in 10CRF50, appendix G; therefore, this revision does not involve a significant increase in the probability or consequence of an accident previously evaluated.

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

   No. The new pressure-temperature limit curves provide the required margin of safety and will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

   No. The revision provides a margin of safety which complies with the fracture toughness requirements in 10CFR50, appendix G, and, therefore, does not involve a reduction in a margin of safety.

BROWNS FERRY NUCLEAR PLANT

SIGNIFICANT HAZARDS CONSIDERATION

FOR

PROPOSED TECHNICAL SPECIFICATION CHANGES

T.S. 4.6. A and Bases

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

   No. The revisions are being made to reflect the present status of the flux wires, planned actions regarding testing of the flux wires, and updating the technical specifications with respect to Regulatory Guide 1.99. It does not involve an increase in the probability of any accident.

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

   See #1.

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

   See #1.