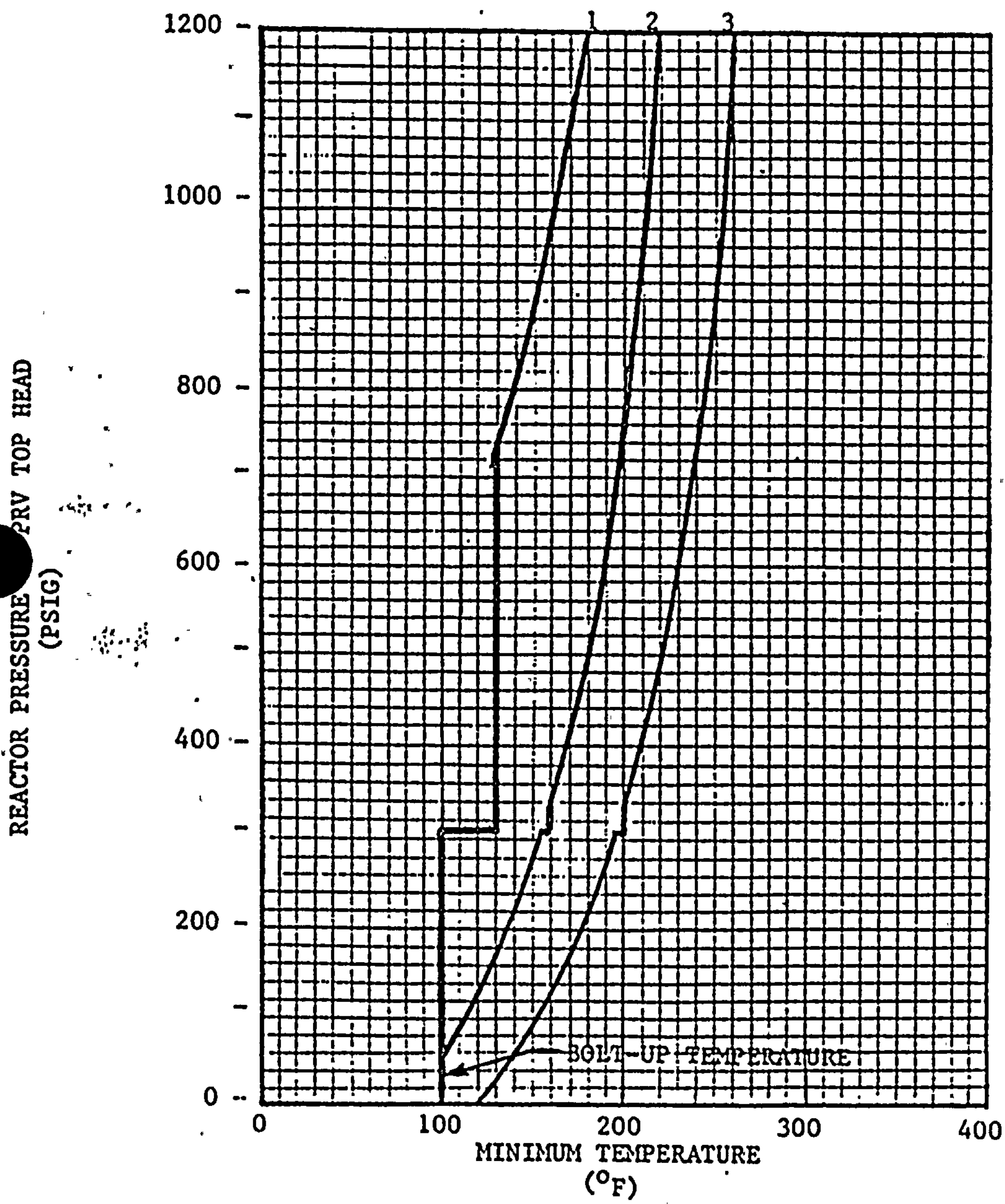
UNIT 1 PROPOSED SPECIFICATIONS

ENCLOSURE 1

PROPOSED TECHNICAL SPECIFICATION REVISIONS
BROWNS FERRY NUCLEAR PLANT
(TVA BFNP TS 191 SUPPLEMENT 1)

9/20/84

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.

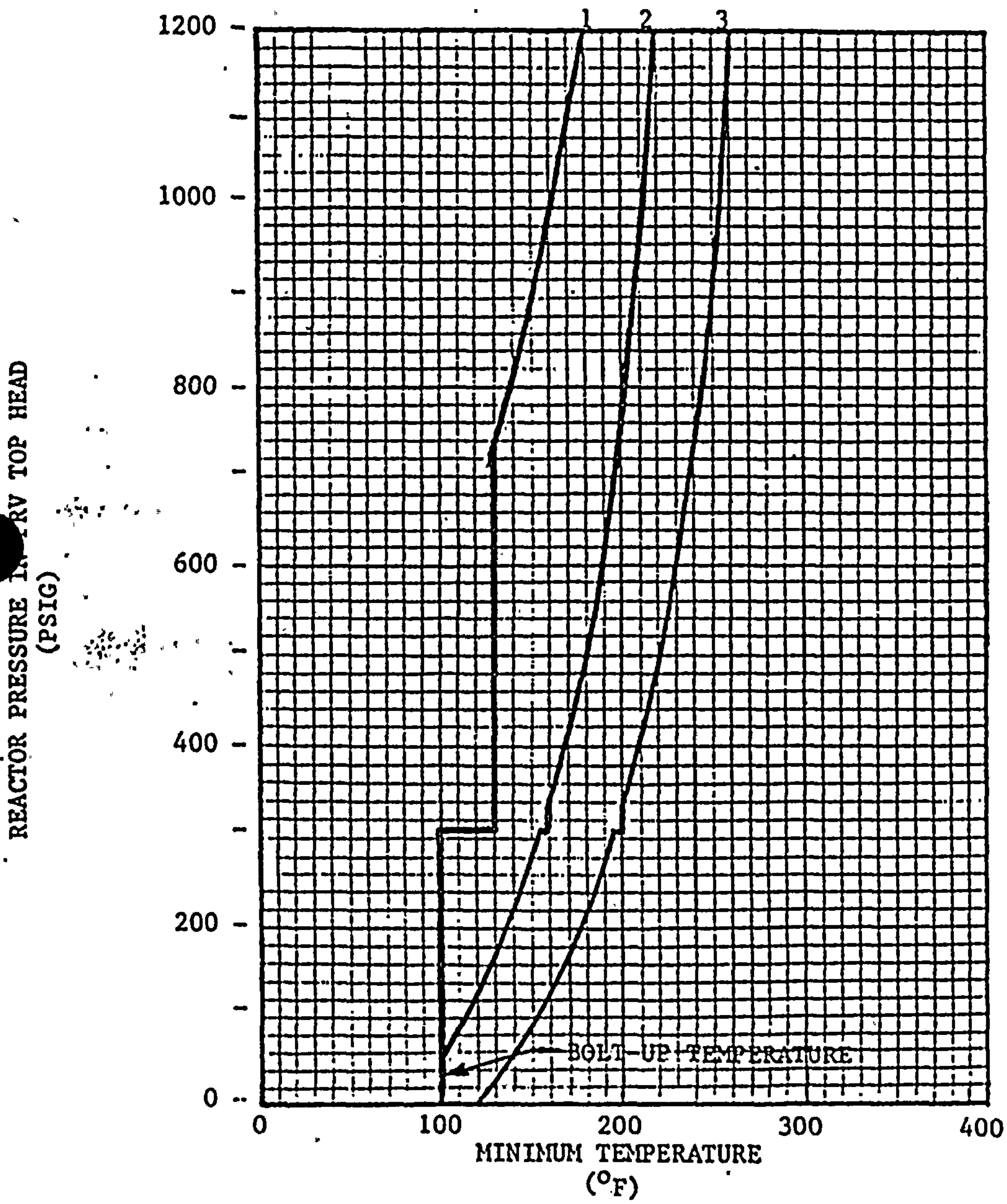
Curve #3
Minimum temperature for core operation (criticality) includes additional margin required by 10CFR50, Appendix G, Par. IV.A.3 which became effective July 26, 1983.

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 12 EFPY.

UNIT 2 PROPOSED SPECIFICATIONS

9/20/84

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.

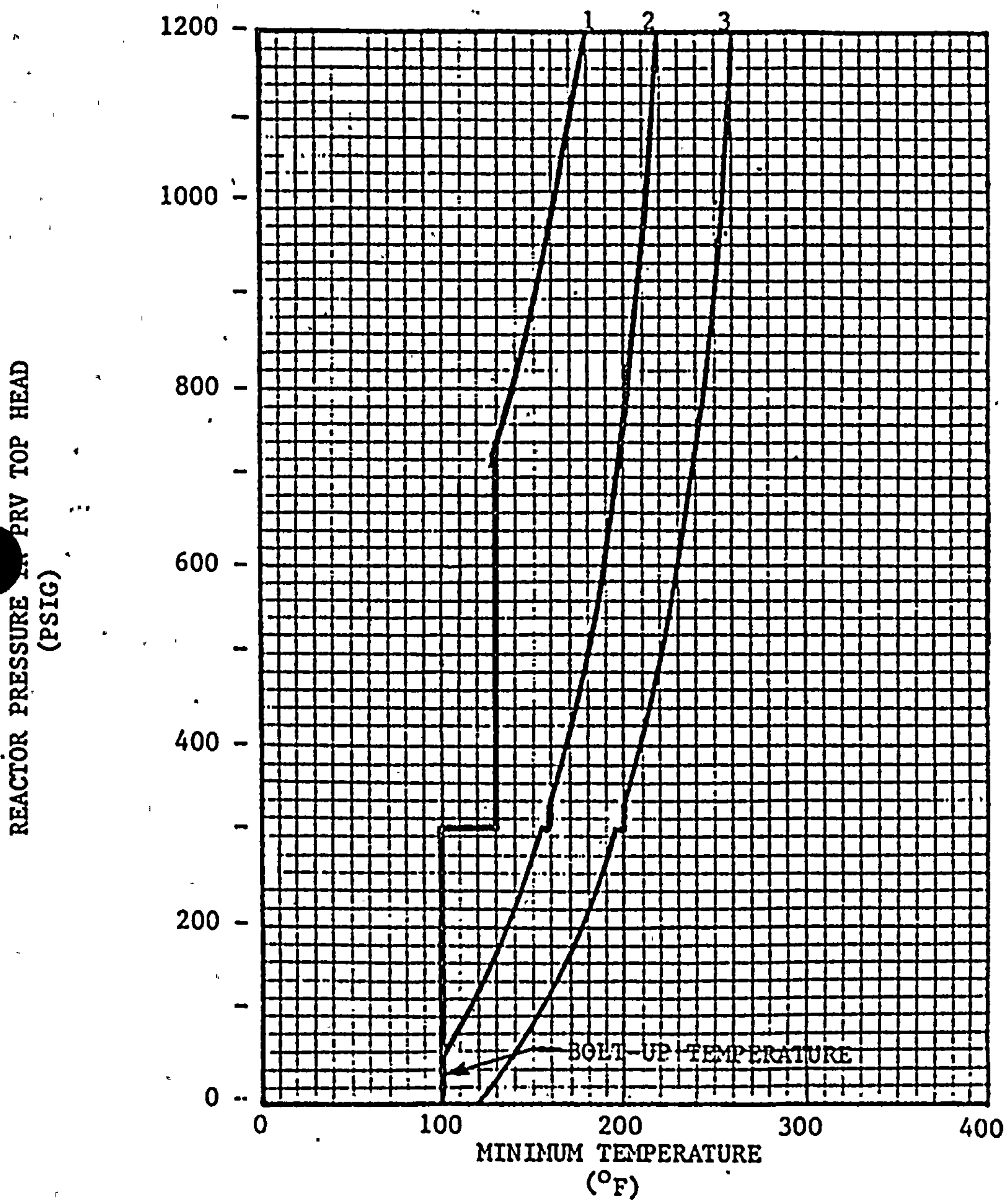
Curve #3
Minimum temperature for core operation (criticality) includes additional margin required by 10CFR50, Appendix G, Par. IV.A.3 which became effective July 26, 1983.

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 12 EFPY.

UNIT 3 PROPOSED SPECIFICATIONS

9/20/84

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 12 EFPY.

ENCLOSURE 2

DESCRIPTION AND JUSTIFICATION AND SAFETY ANALYSIS
(TVA BFNP TS 191 SUPPLEMENT 1)

Description

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

Revise figure 3.6-1 to reflect shifts in RT_{NDT} of the reactor vessel beltline materials to compensate for radiation embrittlement for 12 EFPY.

Justification

To reflect the results of the Babcock and Wilcox report "Browns Ferry Core Region Materials Information (Units 1, 2, and 3)" (BAW-1845-August 1984) and the Southwest Research Institute report "Analysis of the Vessel Wall Neutron Dosimeter From Browns Ferry.

Safety Analysis

See attached reports.

ENCLOSURE 3

BROWNS FERRY NUCLEAR PLANT

SIGNIFICANT HAZARDS CONSIDERATION

FOR

PROPOSED TECHNICAL SPECIFICATION CHANGES

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.

Attachment

Response to NRC Request for Additional Information, dated January 23, 1984, "Reactor Vessel Pressure - Temperature Curves"

The requested additional information regarding reactor vessel beltline materials includes:

a. The heat and lot identification for each weld material.
b. The heat identification for the plate material.
c. The drop weight and/or Charpy V-notch test results for each weld and plate material.
d. The copper, nickel, and phosphorus chemical composition for each weld and plate material.
e. The predicted end-of-life neutron fluence for each material.

The attached report, "Browns Ferry Core Region Materials Information (Units 1, 2, and 3)" (BAW-1845 - August 1984), which was prepared by Babcock and Wilcox (B&W) under contract to TVA addresses items a, b, c, and d. Tables 3-4, 3-5, and 3-6 of this report summarize our response to itmes a through d for units 1, 2, and 3. Some of the values for chemical composition and RT_{NDTs} come from hardcore data, and in some cases, estimates had to be made. These estimates lean toward conservatism in all cases, and the basis for these estimates is provided in the B&W report.

The attached final reort, "Analysis of the vessel Wall Neutron Dosimeter From Frowns Ferry Unit 1 Pressure Vessel, "Southwest Research Institute (SwRI) Project 02-4884-001 dated August 1978, is utilized to respond to item e. Table V on page 17 of this report lists the predicted peak end-of-life neutron fluence for unit 1 at one-fourth thickness to be 1.05 times 10^{18} (cm^{-2}) based on 40 effective full power years (EFPY). This value is also applicable to units 2 and 3. The peak neutron fluence per EFPY at the one-fourth thickness location is 2.6 times 10^{16} (cm^{-2}).

Based on our evaluation of the data presented in Tables 3-4, 3-5, and 3-6 of the B&W report, the circumferential weld (ASA weld WF 154) which joins the MK-57 and MK-58 shell courses on unit 1 is the most limiting material for units 1, 2, and 3 for the interim time period (at least 12 EFPY). This weld (WF-154) has a chemical composition of 0.31 percent Cu, 0.59 percent Ni, and 0.013 percent P and an initial RT_{NDT} equal to 20°F. The weld is located approximately 28 inches below the core midplane.

The predicted vertical distribution of the neutron flux incident on the unit 1 inside surface is shown in Figure 3 on page 14 of the SwRI report. Based on this vertical distribution of flux, the peak neutron fluence at one-fourth thickness equal to 2.6 times 10^{16} (cm^{-2}) per EFPY, and the location of weld WF 154 being 28 inches below the core midplane, it is predicted that the neutron fluence in weld WF 154 at one-fourth thickness is 1.887 times 10^{16} (cm^{-2}) per EFPY.

The pressure-temperature limit curves as submitted in TS-191 will still be adequate if the maximum RT_{NDT} in the beltline material does not exceed 65°F; therefore, based on the initial RT_{NDT} of 20°F for weld WF 154, these curves will be adequate if the shift in RT_{NDT} does not exceed 45°F. By using the chemical composition of 0.31 percent Cu and 0.013 percent P, the predicted neutron fluence equal to 1.887 times 10^{18} (cm^{-2}) per EFPY, and the methods in Regulatory Guide 1.99, Revision 1, it was determined that a 45°F shift in RT_{NDT} will not occur for at least 12 EFPY of operation.

Consequently revisions to Figure 3.6-1 have been provided which supercede all curves previously submitted by TS 191.