Tennessee Valley Authority, Post Office Box 2000, Decatur, Alabama 35609-2000

February 6, 2002

TVA-BFN-TS-414 Supplement 2 10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Gentlemen:

In the Matter of	)	Docket Nos. 50-260
Tennessee Valley Authority	)	50-296

BROWNS FERRY NUCLEAR PLANT (BFN) - REDUCTION IN REQUESTED EFFECTIVE FULL POWER YEARS (EFPY) FOR TECHNICAL SPECIFICATIONS (TS) CHANGE NO. 414 - PRESSURE - TEMPERATURE (P-T) CURVE UPDATE

By letter dated August 17, 2001, TVA submitted a license amendment request for NRC approval of updated P-T curves for BFN Unit 2 and Unit 3. Subsequent to the submittal of that request, the proposed changes to the P-T curves were discussed in teleconferences between members of the NRC staff and TVA personnel on October 18, 2001, on October 31, 2001, and again on November 26, 2001. On December 14, 2001, BFN submitted TS-414 Supplement 1 to provide TVA's response to the issues raised by the NRC staff in these discussions. Subsequent to the submittal of TS-414 Supplement 1, NRC raised additional questions regarding the conservatism of the neutron fluence values used in the calculation of the P-T curves. This Supplement 2 addresses these questions.

The calculations supporting the revised P-T curves are based on an analytically established 32 EFPY neutron fluence of 1.12×10^{18} n/cm^2. The license amendment request was for curves effective until 19.5 EFPY, therefore the proportional fluence value used in calculating the curves was 6.83×10^{17} n/cm^2. Subsequent to the December 14,2001, submittal of Supplement 1, the NRC staff took the technical position that these fluence values did not provide a margin of conservatism sufficient for this application. While TVA differs with the NRC staff on this technical position, we are amending our

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original request as follows in order to add further conservatism.

TVA requests that the P-T curves be approved using the same fluence value, but for a period of 17.2 EFPY for Unit 2 and 13.1 EFPY for Unit 3. This reduces the original requested period by 2.3 EFPY for Unit 2 and 6.4 EFPY for Unit 3, and would extend the current, approved curves by only 1.2 EFPY for Unit 2. The current, approved P-T curves for Unit 3 are valid for 20 EFPY. The following conservatism margins are inherent in using the requested curves for the 17.2 EFPY and 13.1 EFPY intervals.

- BFN Unit 2 and Unit 3 have both undergone thermal power uprates of 5% since they were initially licensed. General Electric (GE) has stated that it is reasonable to assume a fluence increase proportional to the power uprate for uprates of this magnitude. TVA compensated the analytical fluence value used in the P-T curve calculations for the effects of the power uprate by adding 5% to it.
- The analytical flux value increased by the factor of 5% was assumed to have existed over the entire 32 EFPY period of interest for the BFN reactors. In actuality the first 12.2 EFPY of Unit 2 operation and the first 7.4 EFPY of Unit 3 operation occurred at the originally licensed power level with the original, lower flux. As of the date of this letter, Unit 2 has operated for 2.7 EFPY and Unit 3 for 3.4 EFPY at power uprate conditions. Attributing the higher, post-uprate fluence values to the period before uprate implementation provides additional conservatism in the fluence value used in the calculations.
- Analysis of the surveillance capsule removed from Unit 2 during its 1994 refueling outage provided evidence that the actual neutron fluence was substantially lower than the analytical value. Data from this sample, pulled after 8 EFPY of operation, indicated that the 32 EFPY fluence would be on the order of 6.05×10^{17} n/cm^2, well below the 1.12×10^{18} n/cm^2 analytical value used in the calculations.

- The requested P-T curves are calculated using a fluence value of 6.83×10^{17} n/cm^2. The actual predicted fluence value for Unit 2 at 17.2 EFPY is 5.83×10^{17} n/cm^2, and the actual predicted fluence value for Unit 3 at 13.1 EFPY is 4.47×10^{17} n/cm^2. The higher value used in the calculations relative to the actual predicted fluence provides further conservatism in the analysis.

Taken in their totality, the above conservatism factors provide an adequate margin to compensate for any fluence uncertainties resulting from analytical methods used.

TVA is actively preparing a submittal to request extended power uprates for Unit 2 and Unit 3. As part of this work, a fluence calculation using the recently approved Regulatory Guide 1.190 methodology will be performed to establish P-T curves appropriate for extended power uprate operation. The newly calculated curves will be submitted by mid-2003 for NRC approval by early 2004. Approval of the currently requested P-T curves for 17.2 and 13.1 EFPY for Unit 2 and Unit 3, respectively, will cover plant operation until that time.

Use of the requested P-T curves in the upcoming Unit 3 refueling outage will provide substantial industrial safety benefits to workers. This is because the requested curves incorporate relief provided by ASME Code Case N-640 which removes unnecessary restrictions to the pressure-temperature operating window. These restrictions challenge the operations staff during pressure tests to maintain a high temperature within a limited operating window, and the higher temperatures result in greater physical stress on the inspection personnel working in the vicinity of the piping. For these reasons BFN requests approval of the P-T curves by March 1, 2002.

Enclosure 1 to this letter contains the updated, marked up pages of the appropriate TS for Unit 2 and for Unit 3. Enclosure 2 contains the updated copies of the revised pages as they would appear following approval of this request.

TVA has determined that the proposed finding of no significant hazards considerations and environmental impact consideration as submitted in the August 17, 2001 letter remain valid. The technical details of the license amendment request as described in the December 14, 2001 Supplement 1 submittal have not been

changed, therefore no additional review by the BFN Plant Operations Review Committee or the BFN Nuclear Safety Review Board was required. Their previous reviews determined that operation of BFN Units 2 and 3 in accordance with the proposed change will not endanger the health and safety of the public.

TVA's request for exemption from the requirements of 10 CFR 50, Appendix G, which was submitted in conjunction with TS-414 to allow the use of ASME Code Case N-640 as a basis for the revised curves, is not affected by this supplemental submittal.

There are no new commitments contained in this letter. If you have any questions about this change, please telephone me at (256) 729-2636.

Sincerely,

T. E. Abney
Manager of Licensing
and Industry Affairs

Subscribed and sworn to before me
on this 6th day of **February** 2002.

Barbara A. Blanton
Notary Public

My Commission Expires 09/22/02

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ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNITS 2 AND 3

PROPOSED TECHNICAL SPECIFICATION (TS) CHANGE TS-414 SUPPLEMENT 2
MARKED PAGES

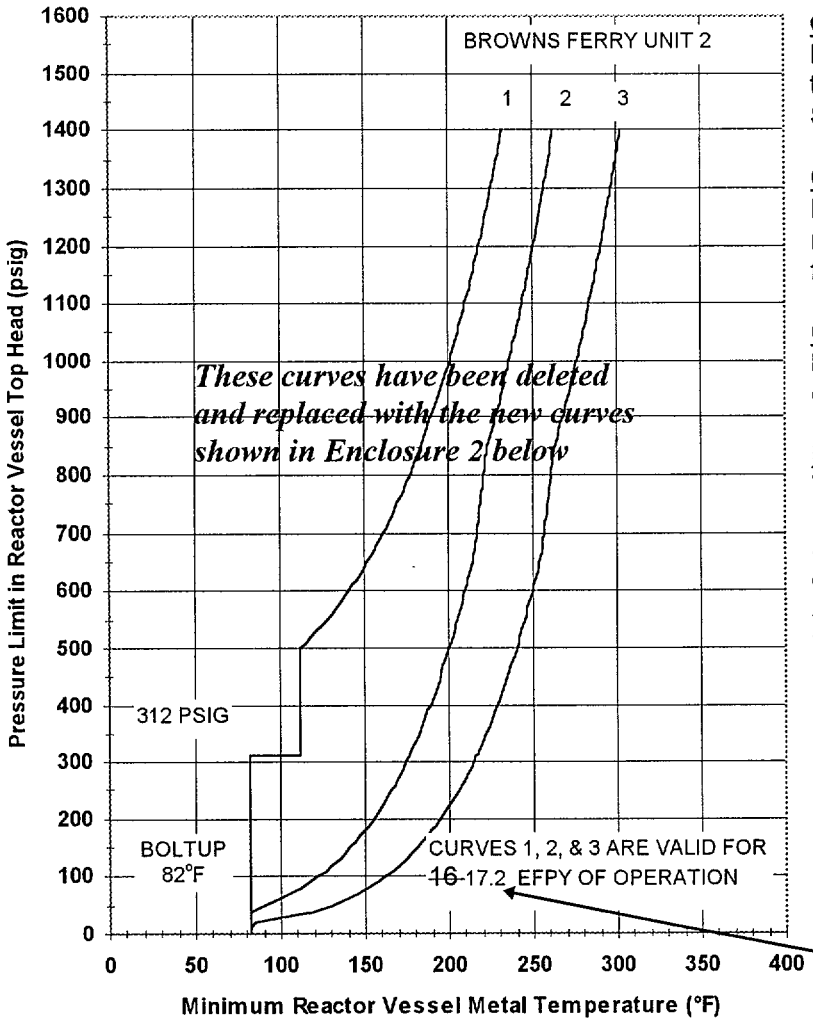
I. AFFECTED PAGE LIST

Unit 2 - page 3.4-29
Unit 3 - page 3.4-29

II. MARKED PAGES

See attached.

Added "ASME" for additional clarity in this note.



Curve No. 1
Minimum temperature for pressure tests such as required by *ASME* Section XI.

Curve No. 2
Minimum temperature for mechanical heatup or cooldown following nuclear shutdown.

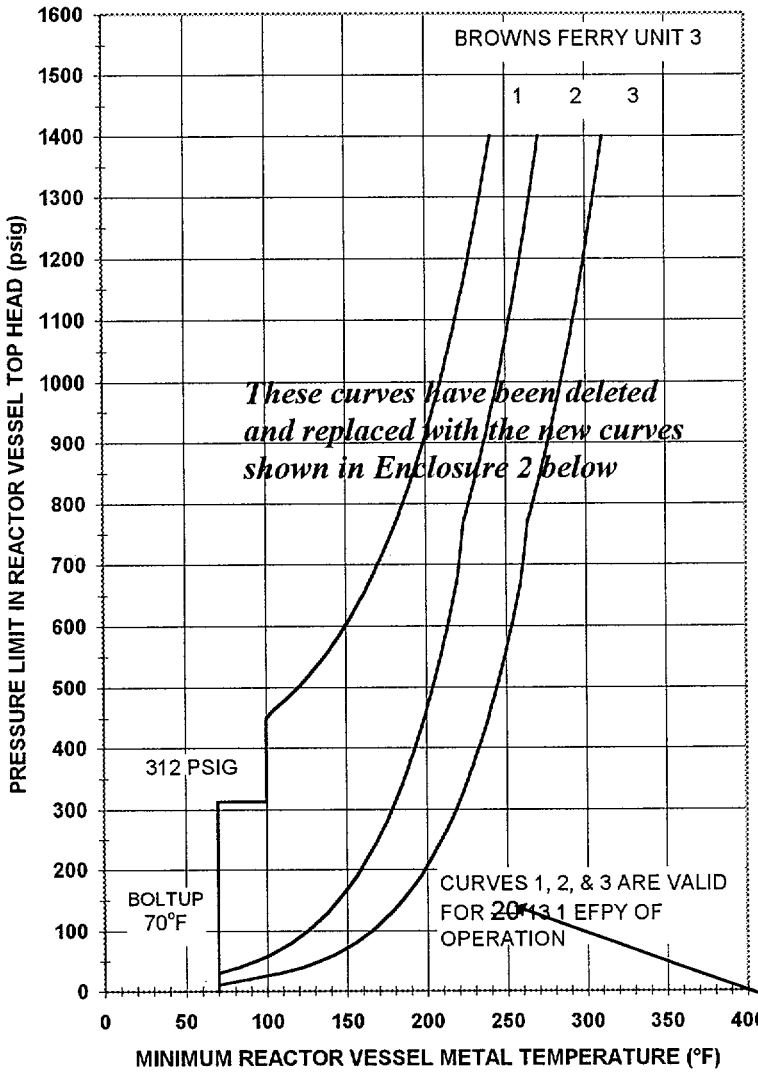
Curve No. 3
Minimum temperature for core operation (criticality).

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, in accordance with Reg. Guide 1.99, Rev. 2, to compensate for radiation embrittlement for ~~16~~ 17.2 EFPY.

The period of valid use of these curves has been changed from 16 to 17.2 EFPY.

Figure 3.4.9-1
Pressure/Temperature Limits

Added "ASME" for additional clarity in this note.



Curve No. 1
Minimum temperature for pressure tests such as required by *ASME* Section XI.

Curve No. 2
Minimum temperature for mechanical heatup or cooldown following nuclear shutdown.

Curve No. 3
Minimum temperature for core operation (criticality).

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, in accordance with Reg. Guide 1.99, Rev. 2, to compensate for radiation embrittlement for ~~20~~ 13.1 EFPY.

The period of valid use of these curves has been changed from 20 to 13.1 EFPY.

Figure 3.4.9-1
Pressure/Temperature Limits

ENCLOSURE 2

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
Units 2 and 3

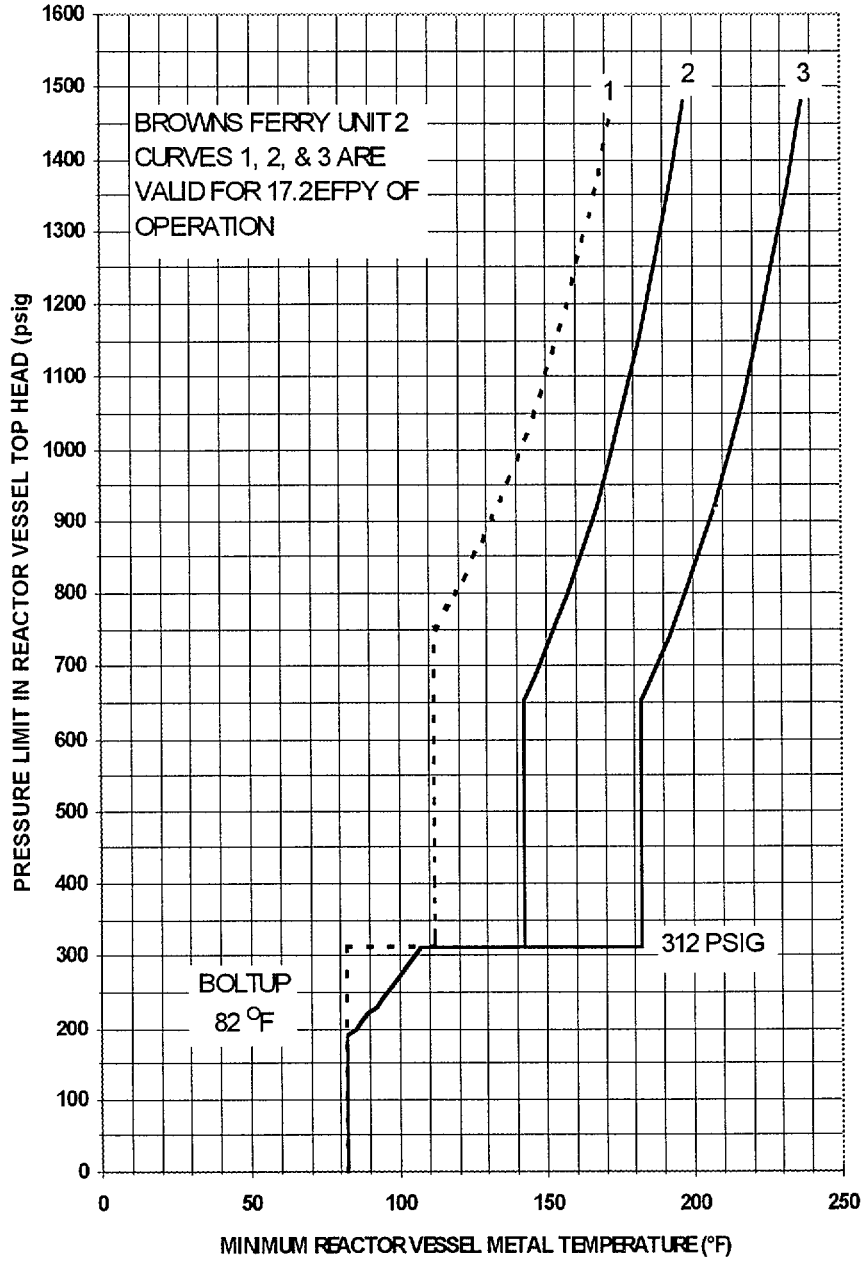
PROPOSED TECHNICAL SPECIFICATION (TS) CHANGE TS-414 SUPPLEMENT 2
REVISED PAGES

I. AFFECTED PAGE LIST

Unit 2 Page 3.4-29
Unit 3 Page 3.4-29

II. REVISED PAGES

See attached.



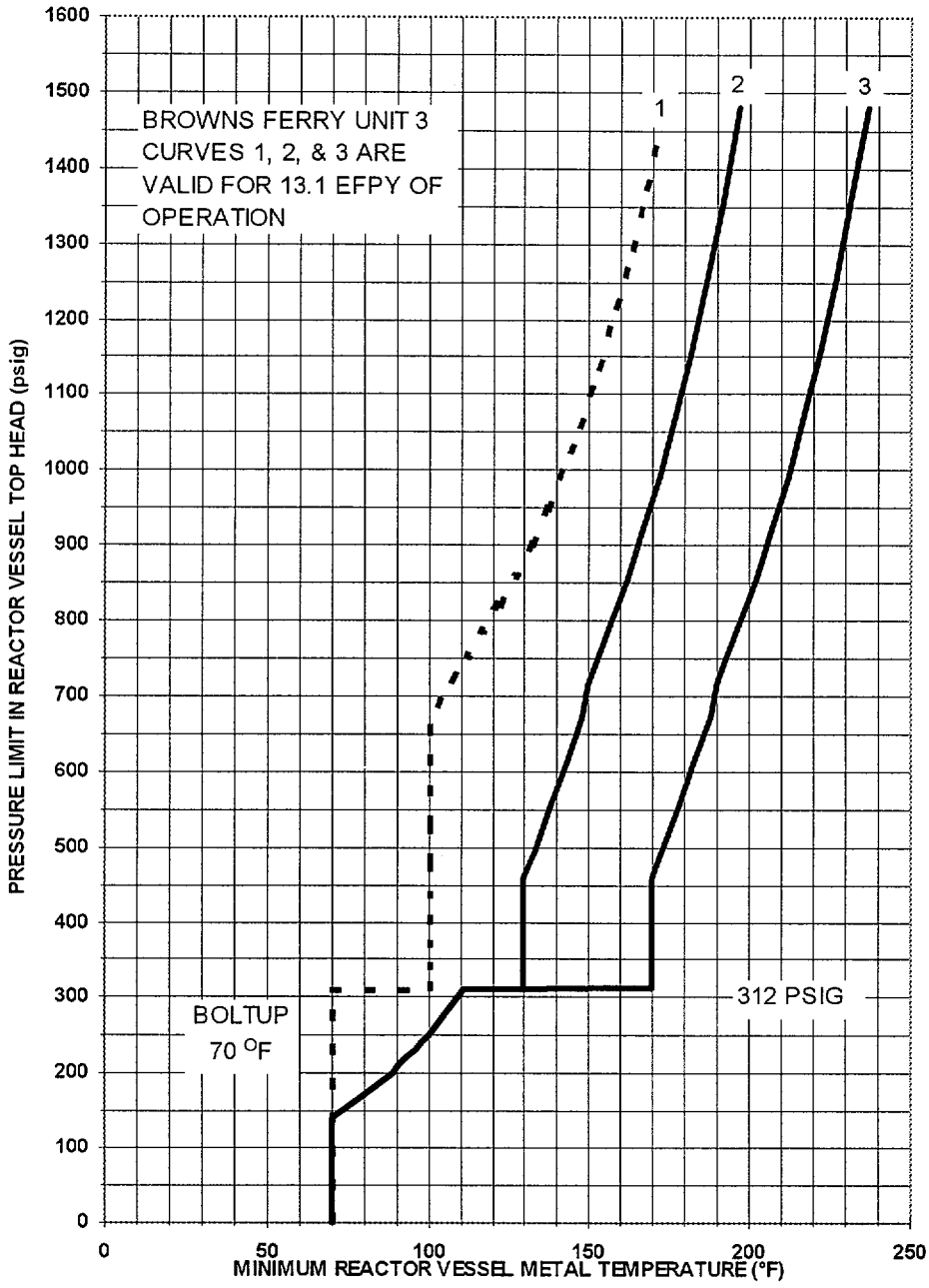
Curve No. 1
Minimum temperature for pressure tests such as required by ASME Section XI.

Curve No. 2
Minimum temperature for mechanical heatup or cooldown following nuclear shutdown.

Curve No. 3
Minimum temperature for core operation (criticality).

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, in accordance with Reg. Guide 1.99, Rev. 2, to compensate for radiation embrittlement for 17.2 EFPY.

Figure 3.4.9-1
Pressure/Temperature Limits



Curve No. 1
Minimum temperature for pressure tests such as required by ASME Section XI.

Curve No. 2
Minimum temperature for mechanical heatup or cooldown following nuclear shutdown.

Curve No. 3
Minimum temperature for core operation (criticality).

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, in accordance with Reg. Guide 1.99, Rev. 2, to compensate for radiation embrittlement for 13.1 EFPY.

Figure 3.4.9-1
Pressure/Temperature Limits