

November 8, 2004

TVA-BFN-TS-430

10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop: OWFN P1-35
Washington, D.C. 20555-0001

Gentlemen:

In the Matter of) Docket No. 50-259
Tennessee Valley Authority)

BROWNS FERRY NUCLEAR PLANT (BFN) - UNIT 1 - TECHNICAL SPECIFICATIONS (TS) CHANGE 430 - RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING POWER RANGE NEUTRON MONITOR UPGRADE WITH IMPLEMENTATION OF AVERAGE POWER RANGE MONITOR AND ROD BLOCK MONITOR TECHNICAL SPECIFICATION IMPROVEMENTS AND MAXIMUM EXTENDED LOAD LINE LIMIT ANALYSES (TAC NO. MC1330)

This letter provides TVA's responses to the NRC request for additional information (Reference 1) regarding proposed Technical Specification (TS) 430.

On November 10, 2003 (Reference 2), TVA requested a TS change (TS 434) to incorporate the necessary TS revisions for the planned replacement of the power range monitoring portion of the existing Neutron Monitoring System with a digital upgrade. NRC requested additional information to support the review of the submittal. The NRC requests and TVA's responses are enclosed.

TVA has determined that the provided information does not affect the no significant hazards considerations associated with the proposed amendment and TS changes. The proposed amendment and TS changes still qualify for a categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9).

U.S. Nuclear Regulatory Commission
Page 2
November 8, 2004

If you have any questions about this submittal, please contact me at (256) 729-2636.

Sincerely,

ORIGINAL SIGNED BY:

T. E. Abney
Manager of Licensing
and Industry Affairs

References:

1. NRC letter, K.N. Jabbour to Karl W. Singer, dated October 19, 2004, "Browns Ferry Nuclear Plant, Unit 1 - Request for Additional Information Regarding the Power Range Neutron Monitor Upgrade (TAC No. MC1330)".
2. TVA letter, T.E. Abney to NRC, dated November 10, 2003, "Browns Ferry Nuclear Plant (BFN) Unit 1 - Technical Specifications (TS) Change 430 - Power Range Neutron Monitor Upgrade with Implementation of Average Power Range Monitor and Rod Block Monitor Technical Specification Improvements and Maximum Extended Load Line Limit Analyses"

U.S. Nuclear Regulatory Commission
Page 3
November 8, 2004

Enclosure

cc (Enclosure):

State Health Officer
Alabama Dept. of Public Health
RSA Tower - Administration
Suite 1552
P.O. Box 303017
Montgomery, AL 36130-3017

U.S. Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, Georgia 30303-3415

Mr. Stephen J. Cahill, Branch Chief
U.S. Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, Georgia 30303-8931

NRC Senior Resident Inspector
Browns Ferry Nuclear Plant
10833 Shaw Road
Athens, AL 35611-6970

Kahtan N. Jabbour, Senior Project Manager
U.S. Nuclear Regulatory Commission
(MS 08G9)
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852-2739

Eva A. Brown, Project Manager
U.S. Nuclear Regulatory Commission
(MS 08G9)
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852-2739

U.S. Nuclear Regulatory Commission
Page 4
November 8, 2004

Enclosure

cc (Enclosure):

A. S. Bhatnagar, LP 6A-C
J. C. Fornicola, LP 6A-C
D. F. Helms, BR 4T-C
R. F. Marks, PAB 1C-BFN
R. G. Jones, NAB 1A-BFN
K. L. Krueger, POB 2C-BFN
J. R. Rupert, NAB 1A-BFN
K. W. Singer, LP 6A-C
M. D. Skaggs, PAB 1E-BFN
E. J. Vigluicci, ET 11A-K
NSRB Support, LP 5M-C
EDMS WT CA - K

S:\lic\submit\TS\TS 430 PRNM formal rai.doc

**TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT, UNIT 1
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
PROPOSED TECHNICAL SPECIFICATION CHANGE 430**

**POWER RANGE NEUTRON MONITOR UPGRADE WITH
IMPLEMENTATION OF AVERAGE POWER RANGE MONITOR AND
ROD BLOCK MONITOR TECHNICAL SPECIFICATION IMPROVEMENTS
AND MAXIMUM EXTENDED LOAD LINE LIMIT ANALYSES**

NRC QUESTION

1. Reference 2, page E1-52 of the November 10, 2003, submittal, GE Report NEDC-32433P, Section 2, page 2-1, states that:

These analyses as presented in this report are based on BFNP Unit 2 Cycle 8 at the current rated thermal power of 3293 MWT [megawatts thermal].

The BFN Unit 1 MELLLA [Maximum Extended Load Line Limit Analyses] given in NEDC-32433P was based on Unit 2 operating conditions. However, the operating conditions of BFNP Unit 1 may not be identical. Please discuss, in detail, why the conclusions given in the topical report for Unit 2 are valid for Unit 1. Also, identify all differences in plant design and operating conditions between the units.

TVA RESPONSE

Technical Specification (TS) TS 430 establishes a baseline for the Unit 1 Power Range Neutron Monitoring (PRNM) system which is identical to that previously submitted for Units 2 and 3. There will be no functional differences between Unit 1 and Units 2 and 3 that affect the PRNM system other than Extended Power Uprate (EPU) and changes in fuel type.

As stated in the Summary for NEDC-32433P, *Maximum Extended Load Limit and ARTS Improvement Program Analyses for Browns Ferry Nuclear Plant Units 1, 2 and 3*, "... the non-fuel dependent evaluations are based on hardware design and geometries, system performance which are similar between the BFNP units. Thus, these non-fuel dependent evaluations are considered applicable

to BFNP Unit 1, 2 and 3 for MELLL region operation. ... The implementation of MELLL operation to BFNP Unit 1 and 3 will be supported by analyses for plant-specific operating limits associated with operation in the MELLL domain, to be performed as part of the cycle-specific reload licensing calculations.”

TVA’s EPU application⁽¹⁾ (TS 431) identifies and evaluates any changes to operating conditions due to EPU. Enclosure 4 of TVA’s application included NEDC-33101P, *Browns Ferry Unit 1 Safety Analysis Report for Extended Power Uprate, Revision 0*, which provided additional information regarding the effects of EPU conditions on the PRNM system.

A cycle specific core reload analysis will be performed for Browns Ferry Unit 1. This Unit 1 cycle specific fuel load analysis will address any impact to fuel differences.

1 TVA letter to NRC, dated June 28, 2004, “Browns Ferry Nuclear Plant (BFN) - Unit 1- Proposed Technical Specifications (TS) Change TS - 431 - Request for License Amendment - Extended Power Uprate (EPU) Operation.”

NRC QUESTION

2. Reference 2, GE Report NEDC-32433P, Section 2, page 2-2 states that:

A portion of these ARTS [Average Power Range Monitor and Rod Block Monitor Technical Specification] limits are intended to be generic for future cycles, utilizing the current GE fuel designs up to GE-13. The application for these generic results for future cycles may need confirmatory verification, especially for future changes in fuel designs, analytical methods or plant configurations.

If TVA decides to load GE-14 fuel for the EPU, then the above criteria apply. However, TVA should confirm that the above conditions are met for other GE fuel designs.

TVA RESPONSE

TVA has decided to utilize GE14 fuel in Unit 1 and this change will be reflected in the Core Operating Limits Report (COLR). TVA has confirmed with GE that the conclusions reached in NEDC-32433P are still valid for GE14 fuel.

As stated in the Summary for NEDC-32433P, the implementation of MELLL operation to BFNP Unit 1 and 3 will be supported by analyses for plant-specific operating limits associated with operation in the MELLL domain, to be performed as part of the cycle-specific reload licensing calculations. Each change in core design is also evaluated in accordance with 10 CFR 50.59. The analyses and results are required to satisfy 10 CFR 50.46 and Appendix K requirements. The cycle specific Reload Licensing Topical Reports for each unit are contained in the Browns Ferry Updated Final Safety Analysis Report.

In general, questions regarding EPU effects on PRNM should be addressed during the review of TS 431 (EPU for Unit 1) or TS 418 (EPU for Units 2 and 3).

NRC QUESTION

3. Reference 2, GE Report NEDC-32433P, Section 10.3.1, page 10-8, states that:

A generic statistical analysis valid for application to BFNP core has been performed and validated for GE fuel designs through the GE13 design.

This analysis may not be valid with any type of fuel. Please confirm that a plant specific, statistically-based, power dependent rod withdrawal error analysis will be performed with the actual core before startup.

TVA RESPONSE

NEDC-32433P is applicable to BFN Unit 1 with the use GE 14 fuel. Changing fuel types, as it relates to generic Average Power Range Monitor (APRM) and Rod Block Monitor (RBM) Technical Specification (ARTS) limits, are handled by Global Nuclear Fuels (GNF) either as a part of the new fuel introduction program, or as part of a cycle specific reload analysis. A set of fuel licensing acceptance criteria have been established for evaluating new fuel designs and for determining the applicability of generic analyses to these new designs. Fuel design compliance with the fuel licensing acceptance criteria constitutes NRC acceptance and approval of the fuel design without specific NRC review (Reference NEDE-24011-P-A-14, General Electric Standard Application for Reactor Fuel).

Each change in core design is also evaluated in accordance with 10 CFR 50.59. The analyses and results are required to satisfy 10 CFR 50.46 and Appendix K requirements. The cycle specific Reload Licensing Topical Reports for each unit are contained in the Browns Ferry Updated Final Safety Analysis Report. A cycle specific core reload analysis, which will include a cycle specific rod withdrawal error analysis, will be performed for Browns Ferry Unit 1. This Unit 1 cycle specific fuel load analysis will address any impact to PRNM setpoints due to fuel differences.

NRC QUESTION

4. Enclosure 1 of the November 10, 2003, submittal, TS Change 13, page E1-12, SR [Surveillance requirement] 3.3.2.1.8

Clarify whether the reactor thermal power (RTP) values listed as 27 percent, 62 percent, and 82 percent will change when EPU is implemented.

TVA RESPONSE

Changes in fuel types or licensed thermal power are not being addressed by proposed Technical Specification 430. Potential changes to the RTP setpoints included in SR 3.3.2.1.8 were evaluated as part of the design analyses performed to support TS 431 (EPU for Unit 1). No changes were required.

These are relative values (i.e., a percentage of rated thermal power). Therefore, the setpoints will have to change at EPU conditions, but the relative percentage of rated thermal power does not change.

Questions regarding EPU effects on the PRNM system should be addressed during the review of TS 431.

NRC QUESTION

5. Enclosure 1, TS Change 14, TS Table 3.3.2.1-1, page E1-13.

Clarify whether the RTP values listed in the footnotes as 29 percent and 90 percent will change when the EPU is implemented. Also, please justify why a bypass timer is not included, since it is part of the Improved Standard TSs. In addition, please justify why the rod block monitor filter time delay is missing, since it is mentioned in NEDC-32433P, Section 11, item 8.

TVA RESPONSE

Changes in fuel types or licensed thermal power are not being addressed by proposed Technical Specification 430. Potential changes to the RTP setpoints included in SR 3.3.2.1.8 were evaluated as part of the design analyses performed to support TS 431 (EPU for Unit 1). No changes were required.

The RTP values are relative values (i.e., a percentage of rated thermal power). Therefore, the setpoints will have to change at EPU conditions, but the relative percentage of rated thermal power does not change.

The 29% value is replaced by 27% in TS 430 (PRNM/ARTS-MELLL) based on the analysis for 3293 MWt conditions. The 27% value did not change for EPU based on the Analytical Limit (AL) value remaining the same for EPU. The upper value of 90% is addressed on a cycle specific basis and will be addressed in the Core Operating Limits Report (COLR).

The Rod Block Monitor (RBM) Bypass Time Delay is a sub-function in the RBM which in the original RBM design is implemented in analog hardware and is, therefore, subject to both drift and component failure. In the replacement NUMAC based PRNM system this time delay is accomplished digitally in the RBM's computer. Once these values are set, they will not change due to drift. Any component failures are identified by the PRNM system continuous self diagnostics and will alarm to alert the operators to any component failures. The requirement to verify the RBM Bypass Time Delay on a regular basis is not required. Therefore, deleting this function and the related surveillances from the Technical Specifications does not decrease safety

margins (Reference NEDC-32410P-A, October 1995, Nuclear Measurement Analysis and Control Power Range Neutron Monitor (NUMAC-PRNM) Retrofit Plus Option III Stability Trip Function). The RBM filter time delay setpoints are addressed by calculation for RBM and support time constants of 0 to 0.5 seconds.

Questions regarding EPU should be addressed during the review of TS 431.

NRC QUESTION

6. Enclosure 1, TS Change 47, page E1-27

Please clarify if the RTP values listed as 27 percent, 29 percent, and 90 percent will change when EPU is implemented.

TVA RESPONSE

Potential changes to the RTP setpoints included in SR 3.3.2.1.8 were evaluated as part of the design analyses performed to support TS 431 (EPU for Unit 1). No changes were required.

These are relative values (i.e., a percentage to rated thermal power). Therefore, the setpoints will have to change at EPU conditions, but the relative percentage of rated thermal power does not change.

Questions regarding EPU effects on the PRNM system should be addressed during the review of TS 431.

NRC QUESTION

7. Enclosure 1, Change 52, Section B 3.4.1 (TS pages B 3.4.-5 and B 3.4-10),

In the applicable safety analyses section and SR 3/4/1-2 bases, a 50 percent core flow is substituted for the current 45 percent core flow value. Please confirm that this value remains valid for EPU.

TVA RESPONSE

This value is valid for EPU conditions.

Changes in fuel types or licensed thermal power are not being addressed by proposed Technical Specification 430. Questions regarding EPU should be addressed during the review of TS 431.