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ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNITS 1, 2, AND 3

TECHNICAL SPECIFICATION (TS)-353S1
POWER RANGE NEUTRON MONITORING

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION (RAI)
DATED FEBRUARY 11, 1998

Below are responses to the four NRC questions provided in the subject RAI on TS-353S1. TS-353S1 was submitted on April 11, 1997, and proposes TS changes to support installation of the Power Range Neutron Monitoring (PRNM) system, implementation of the Average Power Range Monitor (APRM) and Rod Block Monitor (RBM) TS (ARTS) improvements, and the Maximum Extended Load Line Limit (MELLL) analyses.

The proposed changes in TS-353S1 are based on TS-362, originally submitted September 6, 1996. TS-362 is the conversion package of the BFN custom TS to Improved Standard Technical Specification (ISTS) format as described in NUREG-1433 Revision 1, "Standard Technical Specifications for General Electric Boiling Water Reactors (BWR/4)."

Several of the NRC RAI items involve provisions shown on TS-353S1 pages which differ from ISTS, but which are not directly associated with the PRNM/ARTS/MELLL implementation. These TS provisions have been previously justified in the TS-362 submittal. For these cases, a reference to the appropriate TS-362 justification is provided in the RAI response.

NRC QUESTION 1: SURVEILLANCE REQUIREMENTS

Provide corrections or justification for the following surveillance requirements.

a. SR 3.3.1.1.1 - The proposed surveillance frequency for BFN SR 3.3.1.1.1 (CHANNEL CHECK) should be 12 hours instead of 24 hours.

b. SR 3.3.1.1.7 - The proposed surveillance frequency for BFN SR 3.3.1.1.7 (Calibrate the local power range monitors) should be 1000 MWD/T average core exposure instead of the stated 1000 effective full power hours. Change the

surveillance frequency units or describe the equivalence between exposure in units of effective full power hours and burnup in units of MWD/T.

c. To be consistent with the ISTS, change BFN trip function 2.a from "Neutron Flux High, Setdown," to "Neutron Flux - High (Setdown). "

d. To be consistent with the ISTS, change BFN trip function 2.b from "Flow Biased Simulated Thermal Power - High," to "Simulated Thermal Power - High." This trip function has changed, and should be renamed to correspond to the NUMAC-PRNM function name.

e. The notes for proposed BFN SR 3.3.1.1.13 (Perform CHANNEL CALIBRATION) state,

   1. Neutron detectors are excluded.

   2. For Function 2.a. not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2.

   The second note should reference Function 1 (intermediate Range Monitors) instead of Function 2.a (Average Power Range Monitors Neutron Flux - High (Setdown).

f. ISTS SR 3.3.1.1.17 requires staggered response time testing. This SR is not in the proposed BFN TS amendments. Either add ISTS SR 3.3.1.1.17 to BFN TS, or provide a justification for removing response time testing from the TS.

g. If SR 3.3.1.1.17 is added to the BFN TS, add ISTS SR 3.3.1.1.1 7 to BFN Function 2.e (Average Power Range Monitors 2-Out-Of-4 Voter).

TVA RESPONSE TO QUESTION 1

a. The basis for a 24-hour channel check Frequency is provided in TS-362, Justification for Change (JD) to NUREG-1433, P49. Summarizing P49, the current TS (CTS) utilize a 24-hour channel check for the neutron monitoring instrumentation which operating experience has demonstrated is adequate. Therefore, the CTS 24-hour frequency is being retained in proposed TS-362.

b. Proposed BFN Surveillance Requirement (SR) 3.3.1.1.7 in TS-362 and repeated in TS-353S1 has an SR Frequency of 1000 effective full power hours which is the same as CTS. The

ISTS Frequency of 1000 MWD/T is less restrictive than CTS since the ISTS surveillance interval is somewhat longer. This SR Frequency is not related to PRNM/ARTS/MELLL implementation. Therefore, the use of 1000 effective full power hours as currently proposed is acceptable.

c. The recommended changes have been incorporated. Revised TS/Bases changes are enclosed.

d. The retention of the modifier text "flow biased" is a slight deviation from the model TS in NEDC-32410-P-A and was intentional since trip APRM Function 2.b remains flow biased with the PRNM system installation. Therefore, to promote usability and understanding of the proposed TS, BFN prefers the wording as submitted.

e. In TS-353S1, the Channel Calibration SRs for the Intermediate Range Monitors (IRMs) and the Average Power Range Monitors were separated to take advantage of the longer calibration frequency for the APRMs under PRNM. In the TS-353S1 submittal, these are SRs 3.3.1.1.9 and 3.3.1.1.13 respectively. Hence, BFN SR 3.3.1.1.13 is not associated with the IRMs and a reference to Function 1 (IRMs) is not appropriate.

However, in reviewing the design of the PRNM system, we agree that the APRM calibration described in BFN SR 3.3.1.1.13 does not require use of Note 2 since the Function 2.a calibration can be performed in Mode 1. Therefore, Note 2 has been eliminated in entirety in this submittal.

f. BFN CTS do not require response time testing of Reactor Protection System (RPS) instrumentation including neutron monitoring RPS instrumentation. Thus, in the conversion package, TS-362, ISTS SR 3.3.1.1.17 has not been adopted. This justification is provided in TS-362, JD P4. The same basis applies to the PRNM system. Also, note that NRC has previously approved CTS (TS-353R1) for the BFN Unit 2 PRNM installation without response time testing requirements.

g. See previous response.

QUESTION 2: BASES DESCRIPTION OF APRM FUNCTION 2.E

The Bases description of APRM Function 2.e was changed to be consistent with the approved Bases description in NEDC-32410P-A. The first paragraph of the revised Bases description states,

> Three of the four APRM channels are required to be OPERABLE for each of the APRM Functions. This Function (Inop) provides assurance that a minimum number of APRMs are OPERABLE .....

The description in NEDC-32410P-A states,

> Three of the four APRM channels are required to be OPERABLE for each of the APRM Functions. This Function (Inop) provides assurance that the minimum number of APRMs are OPERABLE ....

The use of the underlined definite article, the, should be used instead of the underlined indefinite article, a, because only the definite article establishes a specific relationship to the TS requirements.

TVA RESPONSE TO QUESTION 2

The BASES have been modified to insert "the" for the "a" in the subject provision. (Note that the NRC comment is applicable to Function 2.d in the BFN TS)

QUESTION 3: ADDITION OF REFERENCE 12 TO THE TS BASES

TS-353S1 adds Reference 12 (NEDC-32410P-A) to the Bases discussion of TS LCO 3.3.1.1 Actions A.1, A-2, B.1, and B.2. This reference is correct, except the reference number should be 11 for BFN Unit 1.

TVA RESPONSE TO QUESTION 3

The existing Unit 1 TS-353S1 mark-up and typed pages correctly show the new reference as Reference 12. Therefore, no changes are needed.

QUESTION 4: PAGE B 3.3-50, SECTION B 3.3.2.1

The scope of the BFN TS Bases discussion for SR 3.3.2.1.4 is not consistent with the scope of the ISTS discussion. The ISTS discussion states:

> The RBM setpoints are automatically varied as a function of power. Three Allowable Values are specified in Table 3.3.2.1 -1, each within a specific power range. The power at which the control rod block Allowable Values automatically change are based on the APRM signal's input to each RBM channel. Below the minimum power setpoint, the RBM is automatically bypassed. These power Allowable Values must be verified periodically to be less than or equal to the specified values. If any power range channel can be placed in the conservative condition (i.e., enabling the proper RBM setpoint). If placed in this condition, the SR is met and the RBM channel is not considered inoperable. As noted, neutron detectors are excluded from the Surveillance because they are passive devices, with minimal drift, and because of the difficulty of simulating a meaningful signal. Neutron detectors are adequately tested in SR 3.3.1.1.2 and SR 3.3.1.1-8. The 18 month Frequency is based on the actual trip setpoint methodology utilized for these channels.

The proposed BFN TS Bases discussion states,

> A CHANNEL CALIBRATION is a complete check of the instrument loop and sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

As noted, neutron detectors are excluded from the CHANNEL CALIBRATION because they are passive devices, with minimal drift, and because of the difficulty of simulating a meaningful signal. Neutron detectors are adequately tested in SR 3.3.1.1.2 and SR 3.3.1.1.7.

The Frequency is based upon the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

Increase the scope of the Bases discussion to be consistent with the ISTS.

TVA RESPONSE TO QUESTION 4

ISTS SR 3.3.2.1.4 (RBM setpoint verification) and ISTS SR 3.3.2.1.7 (channel calibration) correspond to BFN SRs 3.3.2.1.8 and 3.3.2.1.4 respectively. Our review indicates that the subject BFN SR Bases discussions correspond with the applicable ISTS Bases discussions and no changes are needed.

ENCLOSURE 2
TENNESSEE VALLEY AUTHORITY (TVA)
BROWNS FERRY NUCLEAR PLANT (BFN)
UNITS 1, 2, and 3

PROPOSED TECHNICAL SPECIFICATIONS (TS) CHANGE TS-353S1
SUMMARY DESCRIPTION OF SUPPLEMENTAL CHANGES

Proposed Change 1 (RAI Item 1.c)

In Table 3.3.1.1-1, the description for Function 2.a is changed from Neutron Flux - High, Setdown to Neutron Flux - High, (Setdown). Associated Bases are likewise changed. One Bases page from Section 3.3.1.2 is also affected.

Basis for Proposed Change 1

This change is made for consistency with the Model TS presented in NEDC-32410-P-A for the Power Range Neutron Monitoring (PRNM) system.

Proposed Change 2 (RAI Item 1.e)

For SR 3.3.1.1.13, the second Note is deleted. Bases are likewise modified.

Basis for Proposed Change 2

Note 2 provides a 12-hour allowance to perform the channel calibration for Function 2.a, Average Power Range Monitor (APRM), Neutron Flux - High (Setdown) when switching from Mode 2 to 1. The PRNM system design, however, allows the calibration of this APRM function in Mode 1. Therefore, the 12-hour Note 2 allowance is not needed.

Proposed Change 3 (RAI Item 2)

In the Bases description for TS Section 3.3.1.1, APRM Function 2.d, the article "a" was changed to "the" as shown in the attached mark-ups.

Basis for Proposed Change 3

This change is made for consistency with the Model TS presented in NEDC-32410-P-A for the PRNM system.

Proposed Change 4 (Not Related to RAI)

The Rod Block Monitor (RBM) range breaks listed in Surveillance Requirement (SR) 3.3.2.1.8 and Table 3.3.2.1-1 (and associated BASES) have been reduced by 1% as shown in the attached marked-up TS pages and TS BASES changes. Also, the analytic Minimum Critical Power Ratio (MCPR) limits in the footnotes to Table 3.3.2.1-1 for which RBM operability is not required, which are currently explicitly listed, are proposed to be relocated to the Core Operating Limits Report (COLR).

Basis for Proposed Change 4

The final issue of the setpoint calculations for the PRNM/ARTS/MELLL installation (TVA calculation ED-Q2092-900118) resulted in a 1% downward shift in power range break point for the RBM operating ranges. The RBM range breaks are specifically listed in SR 3.3.2.1.8 and Table 3.3.2.1-1 (and associated BASES) in proposed TS-353S1. Accordingly, in this change package, the appropriate power range values have been reduced by 1% as shown in the attached marked-up TS pages and TS BASES changes.

Also, the MCPR limits in the footnotes to Table 3.3.2.1-1 are relocated for COLR. This change is consistent with the relocation of similar nuclear fuel related parameters to the COLR and a similar TS change has been approved for Peach Bottom.