Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

April 9, 2012

10 CFR 50.4

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

Browns Ferry Nuclear Plant, Unit 3
Facility Operating License No. DPR-68
NRC Docket No. 50-296

Subject: **Browns Ferry Nuclear Plant, Unit 3 Core Operating Limits Report to Support Fuel Loading for Cycle 16 Operation**

In accordance with the requirements of Technical Specification 5.6.5.d, the Tennessee Valley Authority is submitting the Browns Ferry Nuclear Plant, Unit 3 Cycle 16, Core Operating Limits Report (COLR), Revision 0. This Unit 3 COLR was issued as an interim measure to include Shutdown Margin Limit in support of fuel loading for Cycle 16 (Mode 5 operation). A revision to the COLR will be issued prior to Cycle 16 startup covering all licensed power levels of operation (Modes 1 through 5).

There are no new commitments contained in this letter. If you have any questions please contact Tom Hess at (423) 751-3487.

Respectfully,

J. W. Shea
Manager, Corporate Nuclear Licensing

Enclosure: Core Operating Limits Report, (105% OLTP), for Cycle 16 Operation
TVA-COLR-BF3C16, Revision 0

cc: See Page 2

D030
NRR

cc: (w/ Enclosure)

NRC Regional Administrator - Region II
NRC Senior Resident Inspector - Browns Ferry Nuclear Plant

Enclosure
Tennessee Valley Authority
Browns Ferry Nuclear Plant
Unit 3

Core Operating Limits Report, (105% OLTP), for Cycle 16 Operation
TVA-COLR-BF3C16, Revision 0

(See Attached)

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QA Document
Pages Affected: All
BFE-3238, Revision 0

TVA NPG

Nuclear Fuel Engineering - BWRFE
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Browns Ferry Unit 3 Cycle 16

Core Operating Limits Report, (105% OLTP)

TVA-COLR-BF3C16 Revision 0 (Final)
(Revision Log, Page v)

March 2012

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Date: March 21, 2012

Table of Contents

Total Number of Pages = 12 (*including review cover sheet*)

TVA NPG
Nuclear Fuel Engineering - BWRFE
1101 Market Street, Chattanooga TN 37402

Date: March 21, 2012

List of Tables

TVA NPG
Nuclear Fuel Engineering - BWRFE
1101 Market Street, Chattanooga TN 37402

Date: March 21, 2012

List of Figures

None

TVA NPG
Nuclear Fuel Engineering - BWRFE
1101 Market Street, Chattanooga TN 37402

Date: March 21, 2012

Revision Log

Number	Page	Description
0-R0	All	New document

Nomenclature

APLHGR	Average Planar LHGR
APRM	Average Power Range Monitor
AREVA NP	Vendor (Framatome, Siemens)
BOC	Beginning of Cycle
BSP	Backup Stability Protection
BWR	Boiling Water Reactor
CAVEX	Core Average Exposure
CD	Coast Down
CMSS	Core Monitoring System Software
COLR	Core Operating Limits Report
CPR	Critical Power Ratio
CRWE	Control Rod Withdrawal Error
CSDM	Cold SDM
DIVOM	Delta CPR over Initial CPR vs. Oscillation Magnitude
EOC	End of Cycle
EOOS	Equipment OOS
FFTR	Final Feedwater Temperature Reduction
FFWTR	Final Feedwater Temperature Reduction
FHOOS	Feedwater Heaters OOS
ft	Foot: english unit of measure for length
GWd	Giga Watt Day
HTSP	High TSP
ICA	Interim Corrective Action
ICF	Increased Core Flow (beyond rated)
IS	In-Service
kW	kilo watt: SI unit of measure for power.
LCO	License Condition of Operation
LFWH	Loss of Feedwater Heating
LHGRFAC	LHGR Multiplier (Power or Flow dependent)
LPRM	Low Power Range Monitor
LRNB	Generator Load Reject, No Bypass
MAPFAC	MAPLHGR multiplier (Power or Flow dependent)
MCPR	Minimum CPR
MSRV	Moisture Separator Reheater Valve

MSRVOOS	MSRV OOS
MTU	Metric Ton Uranium
MWd/MTU	Mega Watt Day per Metric Ton Uranium
NEOC	Near EOC
NRC	United States Nuclear Regulatory Commission
NSS	Nominal Scram Speed
NTSP	Nominal TSP
OLMCPR	MCPR Operating Limit
OOS	Out-Of-Service
OPRM	Oscillation Power Range Monitor
OSS	Optimum Scram Speed
PBDA	Period Based Detection Algorithm
Pbypass	Power, below which TSV Position and TCV Fast Closure Scrams are Bypassed
PLU	Power Load Unbalance
PLUOOS	PLU OOS
PRNM	Power Range Neutron Monitor
RBM	Rod Block Monitor
RPS	Reactor Protection System
RPT	Recirculation Pump Trip
RPTOOS	RPT OOS
SDM	Shutdown Margin
SLMCPR	MCPR Safety Limit
SLO	Single Loop Operation
TBV	Turbine Bypass Valve
TBVIS	TBV IS
TBVOOS	Turbine Bypass Valves OOS
TIP	Transversing In-core Probe
TIPOOS	TIP OOS
TLO	Two Loop Operation
TSP	Trip Setpoint
TSSS	Technical Specification Scram Speed
TVA	Tennessee Valley Authority

References

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Methodology References

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4. EMF-85-74(P) Revision 0 Supplement 1(P)(A) and Supplement 2(P)(A), **RODEX2A (BWR) Fuel Rod Thermal-Mechanical Evaluation Model**, Siemens Power Corporation, February 1998.

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14. EMF-2209(P)(A) Revision 3, **SPCB Critical Power Correlation**, Siemens Power Corporation, September 2009.

15. EMF-2361(P)(A) Revision 0, **EXEM BWR-2000 ECCS Evaluation Model**, Framatome ANP Inc., May 2001.

16. EMF-2292(P)(A) Revision 0, **ATRIUM™-10: Appendix K Spray Heat Transfer Coefficients**, Siemens Power Corporation, September 2000.

17. EMF-CC-074(P)(A), Volume 4, Revision 0, **BWR Stability Analysis: Assessment of STAIF with Input from MICROBURN-B2**, Siemens Power Corporation, August 2000.

18. BAW-10255(P)(A), Revision 2, **Cycle-Specific DIVOM Methodology Using the RAMONA5-FA Code**, Framatome ANP, Inc., May, 2008.

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1 Introduction

In anticipation of cycle startup, it is necessary to describe the expected limits of operation.

1.1 Purpose

The primary purpose of this document is to satisfy requirements identified by unit technical specification section 5.6.5. This document may be provided, upon final approval, to the NRC.

1.2 Scope

This version of the COLR is specifically intended to support the refueling outage. Consequently, this document only covers MODE 5 operation of the unit. Operation outside MODE 5 will be addressed in a future COLR revision. This document will discuss the following areas:

- Shutdown Margin (SDM) Limit
  (Technical Specification 3.1.1)

1.3 Fuel Loading

The core will contain all AREVA NP, Inc., ATRIUM-10 fuel. Nuclear fuel types used in the core loading are shown in Table 1.1. The core shuffle and final loading were explicitly evaluated for BOC cold shutdown margin performance as documented in Reference 1.

1.4 Acceptability

Limits discussed in this document were generated based on NRC approved methodologies per References 2 through 18.

Table 1.1 Nuclear Fuel Types*

Fuel Description	Original Cycle	Number of Assemblies	Nuclear Fuel Type (NFT)	Fuel Names (Range)
ATRIUM-10 A10-4218B-15GV80-FCC	14	108	4	FCC001-FCC216
ATRIUM-10 A10-4218B-13GV80-FCC	14	72	5	FCC219-FCC290
ATRIUM-10 A10-3831B-15GV80-FCD	15	200	6	FCD001-FCD200
ATRIUM-10 A10-3403B-9GV80-FCD	15	20	7	FCD257-FCB276
ATRIUM-10 A10-3392B-10GV80-FCD	15	34	8	FCD221-FCB256
ATRIUM-10 A10-4218B-15GV80-FCC	15	2	9	FCC217-FCC218
ATRIUM-10 A10-4218B-13GV80-FCC	15	4	10	FCC307-FCC310
ATRIUM-10 A10-3757B-10GV80-FCC	15	40	11	FCC335-FCC374
ATRIUM-10 A10-3440B-11GV80-FCE	16	144	12	FCE001-FCE144
ATRIUM-10 A10-3826B-13GV80-FCE	16	44	13	FCE145-FCE188
ATRIUM-10 A10-4075B-13GV80-FCE	16	48	14	FCE189-FCE236
ATRIUM-10 A10-4081B-12GV80-FCE	16	48	15	FCE237-FCE284

* The table identifies the expected fuel type breakdown in anticipation of final core loading. The final composition of the core depends upon uncertainties during the outage such as discovering a failed fuel bundle, or other bundle damage. Minor core loading changes, due to unforeseen events, will conform to the safety and monitoring requirements identified in this document.

2 Shutdown Margin Limit

(Technical Specification 3.1.1)

Assuming the strongest OPERABLE control blade is fully withdrawn, and all other OPERABLE control blades are fully inserted, the core shall be sub-critical and meet the following minimum shutdown margin:

SDM > 0.38% dk/k