

Browns Ferry 1 Areva Fuel Transition

NRC Meeting – White Flint
January 28, 2009

Agenda

- Transition Overview
- Discuss Deliverables and Schedule
- Methods Discussion
- BLEU Overview

Transition Overview

Background

- Browns Ferry 2 and 3 were transitioned to ATRIUM™-10 fuel starting in 2004 with Unit 3 Cycle 12
 - Primary driver was the ability to utilize Blended Low Enriched Uranium (BLEU) feed material
 - First BLEU reload was Unit 2 Cycle 14 in 2005
- TVA economic analysis in 2007 showed it was advantageous to terminate the GNF contract and transition Unit 1 to BLEU
- TVA transition of Unit 1 to BLEU fuel will be Fall of 2010
 - Plan is to use BLEU on Unit 1 for Cycles 9 and 10
- Unit 1 will use ATRIUM-10 fuel
 - Same proven fuel design as currently used on BFN 2 and 3

Background (cont)

- Transition status
 - GNF data to model legacy Cycles 7 and 8 provided to Areva
 - Modeling of legacy cycles nearing completion
 - Reload milestone schedule established
- Transition plan
 - Initial Tech Spec submittal one year in advance
 - Supporting information provided in stages, consistent with the reload schedule
 - Submittals will include documentation similar to what was submitted for Brunswick
 - Information and analyses applicable for all units not re-submitted
 - LOCA break spectrum report
 - MAPLHGR limits if Unit 1 fuel types bounded by existing limits

Planned Deliverables and Schedule

Tech Spec Change Request

- Tech Spec 4.2.1 – Fuel Assemblies
 - Current wording consistent with use of ATRIUM-10 fuel and BLEU
 - No change required
- Tech Spec 4.3.1 – Criticality
 - Current wording is K-eff based with no fuel design specific restrictions
 - No change required
- Tech Spec 3.2 – Power Distribution Limits
 - LCO wording states the thermal limits shall be maintained in compliance with the values in the COLR
 - Any vendor unique thermal limits administration captured in COLR
 - No change required

Tech Spec Change Request

- Tech Spec 5.6.5 – COLR
 - Requirement 5.6.5.b lists the approved analytical methods used to determine COLR limits
 - Current Unit 1 wording only lists GNF methods
 - Tech Spec will be changed to list the appropriate Areva analysis methods
 - Change request will be provided one year in advance
 - Target date for submittal 10/1/2009
- Tech Spec 2.1.1.2 (SLMCPR) has potential to change
 - Separate Tech Spec change request if required

Supporting Information Submittals

- Thermal Hydraulic Design Report 12/22/09
- ANP-2637 - BWR Licensing
Methodology Compendium 12/22/09
- SLMCPR Tech Spec (if required) 02/03/10
- Fuel Cycle Design Report 03/29/10
- Reload Safety Report 04/16/10

Methods Aspects

Methods to be Used

- All methods that will be used are NRC approved
 - No open topical issues
- List of approved Areva methods will be added to Tech Spec 5.6.5.b

Approved Methodologies

COLR TS References – Mechanical Analysis

- XN-NF-81-58(P)(A), RODEX2 Fuel Rod Thermal-Mechanical Response Evaluation Model.
- XN-NF-85-67(P)(A), Generic Mechanical Design for Exxon Nuclear Jet Pump BWR Reload Fuel.
- EMF-85-74(P)(A), RODEX2A (BWR) Fuel Rod Thermal-Mechanical Evaluation Model
- ANF-89-98(P)(A), Generic Mechanical Design Criteria for BWR Fuel Designs

Approved Methodologies

COLR TS References – Neutronic Analysis

- XN-NF-80-19(P)(A) Volume 1, Exxon Nuclear Methodology for Boiling Water Reactors – Neutronic Methods for Design and Analysis.
- XN-NF-80-19(P)(A) Volume 4, Exxon Nuclear Methodology for Boiling Water Reactors: Application of the ENC Methodology to BWR Reloads.
- EMF-2158(P)(A), Siemens Power Corporation Methodology for Boiling Water Reactors: Evaluation and Validation of CASMO-4/MICROBURN-B2.
- XN-NF-80-19(P)(A) Volume 3, Exxon Nuclear Methodology for Boiling Water Reactors, THERMEX: Thermal Limits Methodology Summary Description

Approved Methodologies

COLR TS References – Transient Analysis

- XN-NF-84-105(P)(A) Volume 1, XCOBRA-T: A Computer Code for BWR Transient Thermal-Hydraulic Core Analysis.
- ANF-524(P)(A), ANF Critical Power Methodology for Boiling Water Reactors.
- ANF-913(P)(A) Volume 1, COTRANSA2: A Computer Program for Boiling Water Reactor Transient Analyses.
- ANF-1358(P)(A), The Loss of Feedwater Heating Transient in Boiling Water Reactors.

Approved Methodologies

COLR TS References – CPR and LOCA

- EMF-2209(P)(A), SPCB Critical Power Correlation
- EMF-2245(P)(A), Application of Siemens Power Corporation's Critical Power Correlations to Co-Resident Fuel.
- EMF-2361(P)(A), EXEM BWR-2000 ECCS Evaluation Model.
- EMF-2292(P)(A), ATRIUM™-10: Appendix K Spray Heat Transfer Coefficients.