July 7, 2005

- LICENSEE: Tennessee Valley Authority
- FACILITIES: Browns Ferry Nuclear Plant, Units 2 and 3
- SUBJECT: SUMMARY OF JUNE 7 8 2005 MEETING WITH THE TENNESSEE VALLEY AUTHORITY AND FRAMATOME, ANP REGARDING APPLICABILITY OF FRAMATOME FUEL ANALYSIS METHODS FOR EXTENDED POWER UPRATE CONDITIONS (TAC NOS. MC6454 AND MC6455)

On June 7 - 8, 2005, the U.S. Nuclear Regulatory Commission (NRC) staff met with Tennessee Valley Authority (TVA) and Framatome, ANP representatives at NRC Headquarters in Rockville, Maryland. The objective of the meeting was to allow TVA/Framatome to provide information supporting the position that the extended power uprate (EPU) methodology used to perform analyses for the Browns Ferry Nuclear Plant (BFN) Units 2 and 3 cores is still valid at uprated conditions. The meeting was closed to the general public as a result of the proprietary nature of the information being discussed. Enclosure 1 contains a list of attendees, and Enclosure 2 is a non-proprietary copy of Framatome's handout distributed during the meeting.

BACKGROUND

By letter dated June 25, 2004, TVA, submitted an amendment request for Units 2 and 3. The proposed amendment would change the Units 2 and 3 operating licenses to increase the maximum authorized power level from 3458 Megawatt thermal (MWt) to 3952 MWt. This change represents an increase of approximately 15 percent above the current maximum authorized power level. The proposed amendment would also change the BFN Licensing Bases and any associated technical specifications for containment overpressure, remove the upper bound limitation on peak cladding temperature, and revise the maximum ultimate heat sink temperature.

The NRC staff reviewed TVA's request and concluded that it did not provide technical information in sufficient detail to enable them to make an independent assessment regarding the acceptability of the proposal in terms of regulatory requirements and the protection of public health and safety. On January 21, 2005, the licensee provided draft responses to the concerns raised by the NRC staff in a letter dated November 18, 2004.

Subsequently, in February a series of conference calls were held to discuss additional concerns. This meeting was scheduled to allow TVA to address why the analyses performed for the Browns Ferry cores would be still valid at uprated conditions. To facilitate the meeting, a series of questions were provided to TVA/Framatome in advance of the meeting.

DISCUSSION

Framatome addressed their philosophy for determining whether the analytical methods and code systems are being applied within the NRC-approved applicability ranges for the neutronic

Contact: Eva Brown, NRR/DLPM/PDII-2 (301) 415-2315 and thermal-hydraulic conditions predicted for EPU conditions. Discussions were conducted addressing the validity of calculational and measurement uncertainties applied in the thermal limits analyses for the predicted EPU neutronic and thermal-hydraulic core and fuel conditions. The presentations also addressed whether the analytical models and correlations simulating physical phenomena (e.g., critical heat flux correlations, void /quality correlations, two phase pressure drop correlations) were applied within the NRC-approved validation or benchmarking ranges.

During the discussion, the NRC staff clarified a misconception regarding a contention that the process for EPU is essentially the same as a standard reload analyses. Typically, a bounding analysis is provided for licensing actions, but for the EPU TVA only submitted an equilibrium analysis which may not bound the actual core conditions. Therefore, without a bounding analysis, the safety evaluation for the BFN EPU, if approved, would likely restrict the linear heat generation rate (LHGR), maximum average planar LHGR, operating limit minimum critical power ration (CPR), and safety limit CPR to within the limits of the equilibrium analysis. It was noted that this more limiting approval would likely result in TVA being required by Title 10, Code of Federal Regulations Section 50.59 to submit an additional amendment to the NRC for approval prior to use of the actual core.

Additionally, the NRC staff noted that the BFN EPU fuels analyses are a combination of analyses performed by both General Electric (GE) and Framatome. As the NRC staff has concerns with how the fuels analyses methodology is calculated in the expanded operating domain for GE as well, resolution of the NRC staff's concerns with the BFN Units 2 and 3 analyses are potentially tied to resolution of the GE operating domain concerns. The NRC staff indicated that a request for additional information would be provided relating to some of the outstanding questions and that other concerns will be reviewed at Framatome during a meeting in August 2005.

At the conclusion of the meeting, the NRC staff, the licensee and the fuel vendor acknowledged that the meeting was highly beneficial in improving the understanding of the issues. The NRC staff indicated that the information presented was of high quality, at an excellent level of detail and went a long way towards supporting the vendor's position that the analytical methods and code systems are being applied within the NRC-approved applicability ranges. No commitments were made by the licensee and no regulatory decisions were made by the NRC staff during the proceedings.

/RA/

Eva A. Brown, Project Manager, Section 2 Project Directorate II Division of Licensing Project Management Office of Nuclear Reactor Regulation

Docket Nos. 50-260 and 50-296

Enclosures: 1. List of Attendees 2. Non-Proprietary Version of Framatome Presentation

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OFFICE	PDII-2/PM	PDII-2/LA	PDII-2/SC
NAME	EBrown	BClayton	MMarshall
DATE	07/07/05	07/07/05	07/07/05

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SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNITS 2 AND 3 — SUMMARY OF JUNE 7-8 2005 MEETING REGARDING APPLICABILITY OF FRAMATOME FUEL ANALYSIS METHODS FOR EXTENDED POWER UPRATE CONDITIONS (TAC NOS. MC3743 AND MC3744)

Date: <u>July 7, 2005</u>

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<u>Meeting Participants</u> <u>Meeting with Tennessee Valley Authority and Framatome ANP</u> <u>Regarding Fuel Analysis Methodology</u> <u>June 7-8, 2005</u>

NRC Frank Akstulewicz Edwin Hackett Zena Abdullahi George Thomas Anthony Attard Tai Huang Shani Lewis Jose Arroyo Margaret Chernoff Eva Brown <u>TVA</u> William Crouch D. Tony Langley Larry Walker Ed Hartwig Thomas Newton Earl Riley

FRAMATOME

Jerald Holm David Garber Michael Garrett Ralph Grummer Doug Pruitt Thomas Keheley

INDUSTRY Eric Geyer, Progress Energy John Geosits, PPL Susquehanna

BROWNS FERRY NUCLEAR PLANT

Mr. Karl W. Singer Tennessee Valley Authority cc:

Mr. Ashok S. Bhatnagar, Senior Vice President Nuclear Operations Tennessee Valley Authority 6A Lookout Place 1101 Market Street Chattanooga, TN 37402-2801

Mr. Larry S. Bryant, General Manager Nuclear Engineering Tennessee Valley Authority 6A Lookout Place 1101 Market Street Chattanooga, TN 37402-2801

Site Vice President Browns Ferry Nuclear Plant Tennessee Valley Authority P.O. Box 2000 Decatur, AL 35609

General Counsel Tennessee Valley Authority ET 11A 400 West Summit Hill Drive Knoxville, TN 37902

Mr. John C. Fornicola, Manager Nuclear Assurance and Licensing Tennessee Valley Authority 6A Lookout Place 1101 Market Street Chattanooga, TN 37402-2801

Plant Manager Browns Ferry Nuclear Plant Tennessee Valley Authority P.O. Box 2000 Decatur, AL 35609 Mr. Fredrick C. Mashburn Senior Program Manager Nuclear Licensing Tennessee Valley Authority 4X Blue Ridge 1101 Market Street Chattanooga, TN 37402-2801

Manager Licensing and Industry Affairs Browns Ferry Nuclear Plant Tennessee Valley Authority P.O. Box 2000 Decatur, AL 35609

Senior Resident Inspector U.S. Nuclear Regulatory Commission Browns Ferry Nuclear Plant 10833 Shaw Road Athens, AL 35611-6970

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

Chairman Limestone County Commission 310 West Washington Street Athens, AL 35611