



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

December 7, 2017

LICENSEE: Tennessee Valley Authority

FACILITY: Browns Ferry Nuclear Plant, Units 1, 2, and 3

SUBJECT: SUMMARY OF NOVEMBER 8, 2017, PRE-APPLICATION MEETING WITH TENNESSEE VALLEY AUTHORITY REGARDING A LICENSE AMENDMENT REQUEST TO IMPLEMENT MAXIMUM EXTENDED LOAD LINE LIMIT ANALYSIS PLUS FOR BROWNS FERRY NUCLEAR PLANT (CAC NOS. MG0101, MG0102, AND MG0103; EPID L-2017-LRM-0034)

On November 8, 2017, a Category 1 public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) staff, representatives of Tennessee Valley Authority (TVA, the licensee), and TVA's contractors (General Electric Hitachi (GEH) and AREVA) at NRC Headquarters, One White Flint North, 11555 Rockville Pike, Rockville, Maryland. The purpose of the meeting was for TVA to present its planned License Amendment Request (LAR) to implement Maximum Extended Load Line Limit Analysis Plus (MELLLA+) for Browns Ferry Nuclear Plant, Units 1, 2, and 3 (Browns Ferry). The meeting notice and agenda, dated October 24, 2017, are available in the Agencywide Documents Access and Management System (ADAMS) under Accession No. ML17299A083. A list of attendees is provided in the enclosure to this meeting summary.

The licensee's presentation document, which was provided prior to the meeting and attached to the meeting notice, is available under ADAMS Accession No. ML17291A521. During the meeting, the licensee presented an overview of MELLLA+ and its benefits for Browns Ferry. The licensee explained that the licensed flow window would be between 99 percent and 105 percent (100 percent to 104 percent with administrative margin) core flow at the recently approved extended power uprate (EPU) power levels. MELLLA+ raises the maximum allowed rod line license flow window to 85 percent to 105 percent core flow at rated EPU power. The licensee presented a list of benefits of implementing MELLLA+ for Browns Ferry including: reduction in the number of end of cycle down-powers, fewer control rod manipulations to manage reactivity, improved core instability detection algorithm, and increased station capacity factor during the operating cycle. TVA's presentation included discussions of: Project Goals, Submittal Format and Content/Approach, and Electronic Reading Room Use. The licensee presented a comparison between the planned MELLLA+ LAR for Browns Ferry and the LAR for Brunswick, which is currently under review by the NRC staff. Specifically, the licensee discussed details associated with AREVA fuel related reports, Browns Ferry unit differences, demonstration of long term anticipated transient without scram (ATWS) MELLLA+ margins with ATRIUM 10XM fuel, ATWS with instability analysis, use of GEH Detect and Suppress Solution – Confirmation Density (DSS-CD), the Monte Carlo benchmark report, and emergency core cooling system net positive suction head (NPSH) evaluation. The NRC staff asked clarifying questions throughout the presentation and provided observations on key issues.

The licensee stated that similar to the Browns Ferry EPU LAR, it will follow and address the issues associated with proposed Title 10 of *Code of Federal Regulations* (10 CFR) Section 50.46c and proposed revised regulatory guidance associated with treatment of reactivity initiated accidents (RIAs). The NRC staff took an action to internally discuss how to consider the issues associated with 10 CFR 50.46c and RIAs and clarify during the acceptance review. The NRC staff and the licensee discussed issues related to the use of GEH DSS-CD for Browns Ferry. The NRC staff asked the licensee about the applicability of DSS-CD to certain fuel types. The licensee took an action to demonstrate the applicability of DSS-CD to ATRIUM 10XM fuel and to provide plant-specific discussions in its LAR.

The NRC staff asked TVA to include a discussion about containment accident pressure (CAP) associated with MELLLA+, since TVA does not rely on CAP credit for Browns Ferry as approved in the EPU amendments. TVA confirmed that the NPSH limiting conditions at MELLLA+ are consistent with those at EPU conditions.

TVA discussed its planned schedule regarding submittal of the MELLLA+ LAR and its relation to the Browns Ferry units' outages. The licensee is planning to submit the MELLLA+ LAR in February 2018 with implementation for all three units within 60 days of NRC approval. The NRC staff and TVA staff are considering holding post-application meetings and regulatory audits to facilitate review of this LAR.

The following action items were developed during the meeting:

1. The NRC staff will internally discuss the approach for review of the Browns Ferry MELLLA+ LAR attachments addressing proposed 10 CFR 50.46c requirements and revised guidance regarding RIA analysis.
2. The DSS-CD License Topical Report (LTR) is applicable to GE fuel designs. TVA will demonstrate the acceptability of expanding the DSS-CD LTR applicability to other fuel types (ATRIUM 10XM) via, for example, TRACG sensitivity studies.
3. TVA will provide containment analyses sensitivity studies in the LAR.
4. TVA will coordinate with the NRC Project Manager to select an optimum time to schedule an audit and walk-through of the Browns Ferry MELLLA+ LAR detailing differences from the Brunswick LAR. This audit and walk-through will allow the NRC staff to focus its review resources on differences from Brunswick.
5. TVA will coordinate with the NRC Project Manager to select an optimum time to schedule an audit of GEH and AREVA analyses supporting the Browns Ferry MELLLA+ LAR.
6. For fuel parameter sensitivity studies, TVA will address whether the same parameter ranges as Brunswick are used and explain the bases for any differences.

No regulatory decisions were made at the meeting. No members of the public attended the meeting and no Public Meeting Feedback forms were received.

Please direct any inquiries to me at 301-415-1447 or [Farideh.Saba@nrc.gov](mailto:Farideh.Saba@nrc.gov).

*Farideh E Saba*

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Plant Licensing Branch II-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-259, 50-260, 50-296

Enclosure:  
List of Attendees

cc: Listserv

LIST OF ATTENDEES

NOVEMBER 8, 2017, PRE-APPLICATION PUBLIC MEETING

WITH TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3

MAXIMUM EXTENDED LOAD LINE LIMIT PLUS

| <b>Name</b>      | <b>Organization</b>                 |
|------------------|-------------------------------------|
| Farideh Saba     | Nuclear Regulatory Commission (NRC) |
| Andrew Hon       | NRC                                 |
| Ahsan Sallman    | NRC                                 |
| Mathew Panicker  | NRC                                 |
| Nathanael Hudson | NRC                                 |
| Joshua Borrromeo | NRC                                 |
| Eric Oesterle    | NRC                                 |
| Ravi Grover      | NRC                                 |
| DaBin Ki         | NRC                                 |
| Shie-Jeng Peng   | NRC                                 |
| Diana Woodyatt   | NRC                                 |
| Jerry Dozier     | NRC                                 |
| Kathy Gibson*    | NRC                                 |
|                  |                                     |
| Gerard Doyle     | Tennessee Valley Authority (TVA)    |
| Pete Donahue     | TVA                                 |
| Dan Green        | TVA                                 |
| Ed Schrull       | TVA                                 |
| Greg Storey      | TVA                                 |
| William Baker    | TVA                                 |
| William Bird     | TVA                                 |
| Larry King*      | General Electric Hitachi (GEH)      |
| Lisa Schichlein* | GEH                                 |
| Tim Enfinger*    | GEH                                 |
| David McBurney*  | AREVA                               |
| Scott Tylinski*  | AREVA                               |
| Earl Riley*      | AREVA                               |
|                  |                                     |
| Aaron Wysocki*   | Oak Ridge National Laboratory       |
|                  |                                     |

\*Participated by phone

Enclosure

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| RidsNrrDssSnpb Resource       | RidsNrrDssStsb Resource    |
| RidsNrrDra Resource           | RidsNrrDe Resource         |
| RidsNrrDssSrxb Resource       | MPanicker, NRR             |
| TWertz, NRR                   | JBorromeo, NRR             |
| ASallman, NRR                 | SPeng, NRR                 |
| AHon, NRR                     | DWoodyatt, NRR             |
| JBowen, OEDO                  | DKi, NRR                   |
| EOesterle, NRR                | RGrover, NRR               |
| NHudson, RES                  | KGibson, RES               |
| JDozier, NRR                  | DWoodyatt, NRR             |

**ADAMS Accession No. ML17325B305**

**\* by an email**

| OFFICE | DORL/LPL2-2/PM         | DORL/LPL2-2/LA | DSS/SRXB/BC(A)* | DORL/LPL2-2/BC            | DORL/LPL2-2/PM |
|--------|------------------------|----------------|-----------------|---------------------------|----------------|
| NAME   | FSaba<br>(RSchaaf for) | BClayton       | JWhitman        | UShoop<br>(PBuckberg for) | FSaba          |
| DATE   | 11/30/2017             | 11/30/2017     | 11/28/2017      | 12/05/2017                | 12/07/2017     |

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