



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

June 23, 2016

Mr. Joseph W. Shea
Vice President, Nuclear Licensing
Tennessee Valley Authority
1101 Market Street, LP 3R-C
Chattanooga, TN 37402-2801

SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3 – SUMMARY REPORT FOR THE APRIL 19 - 21, 2016, AUDIT IN SUPPORT OF REPLACEMENT STEAM DRYER REVIEW ASSOCIATED WITH EXTENDED POWER UPRATE LICENSE AMENDMENT REQUEST (CAC NOS. MF6741, MF6742, AND MF6743)

Dear Mr. Shea:

By letter dated September 21, 2015, as supplemented by letters dated November 13, December 15 (2 letters), and December 18, 2015, Tennessee Valley Authority (TVA, the licensee) submitted a license amendment request (LAR) for the Browns Ferry Nuclear Plant, Units 1, 2, and 3. The proposed amendment would increase the authorized maximum steady-state reactor core power level for each unit from 3,458 megawatts thermal (MWt) to 3,952 MWt. This LAR represents an increase of approximately 20 percent above the original licensed thermal power level of 3,293 MWt, and an increase of approximately 14.3 percent above the current licensed thermal power level of 3,458 MWt.

On March 21, 2016, the U. S. Nuclear Regulatory Commission (NRC) staff forwarded, by electronic mail (email), a draft request for additional information (RAI) to TVA. On March 31, 2016, the NRC staff held a conference call to provide the licensee with an opportunity to clarify any portion of the draft RAI and discuss the timeframe for which TVA may provide the requested information. Subsequently, the NRC staff determined an audit would be the most effective approach to establish an understanding of the draft RAIs to allow the NRC staff to issue finalized RAIs and for the licensee to provide quality and timely responses.

The audit was held at the EXCEL Services Corporation facility in Rockville, Maryland, from April 19 to 21, 2016. The audit plan dated April 11, 2016, is available in ADAMS under Accession No. ML16085A301. A list of audit attendees is provided in Enclosure 1.

During the audit, the licensee provided to the NRC staff a package that included the NRC staff's draft RAIs that were emailed to TVA on March 21, 2016, TVA's draft responses and the supplemental information that would support completion of the NRC staff's review. The NRC staff and its contractors reviewed the information provided in the package and discussed it with the TVA staff and the General Electric Hitachi (TVA contractor) staff.

As the result of this audit, the NRC staff could finalize the draft RAIs. The NRC's letter dated June 3, 2016 (ADAMS Accession No. ML16144A645), documents the finalized RAIs associated with the replacement steam dryers and the agreed upon RAI response dates. The licensee was

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able to identify RAI responses that would be revised to provide additional clarifications. Enclosure 2 to this letter provides the audit summary report.

If you have any questions, please contact me at (301) 415-1447 or Farideh.Saba@nrc.gov.

Sincerely,

A handwritten signature in black ink that reads "Farideh E Saba". The signature is written in a cursive, flowing style.

Farideh E. Saba, Senior Project Manager
Plant Licensing II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

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

Enclosures:

1. List of Attendees
2. Summary Report for Audit

cc w/encls: Distribution via Listserv

LIST OF ATTENDEES
APRIL 19 - 21, 2016, AUDIT OF TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3
REPLACEMENT STEAM DRYER REVIEW
ASSOCIATED TO EXTENDED POWER UPRATE
LICENSE AMENDMENT REQUEST

| Name | Affiliation | Entrance | 04/19 | 04/20 | 04/21 | Exit |
|-----------------------|--------------------|-----------------|--------------|--------------|--------------|-------------|
| Siva Lingam | NRC | X | | | | |
| Ben Beasley | NRC | X | | | | X |
| Chakrapani Basavaraju | NRC | X | X | X | X | X |
| Michael Breach | NRC | X | X | | X | X |
| Yong Li | NRC | X | | | | X |
| Farideh Saba | NRC | X | X | X | X | X |
| Samir Ziada | NRC Contractor | X | X | X | | |
| Vik Shah | NRC Contractor | X | X | X | | |
| Steve Hambric | NRC Contractor | X | X | X | | |
| Gerard Doyle | TVA | X | X | X | X | X |
| Dan Green | TVA | X | X | X | X | X |
| Pete Donahue | TVA | X | X | X | X | X |
| Eric Frevold | TVA | X | X | X | X | X |
| Gordon Williams | TVA | | X | X | X | X |
| Tao Wu | GEH | X | X | X | X | X |
| Dan Pappone | GEH | X | X | X | X | X |
| Dan Sampson | GEH | X | X | X | X | X |

SUMMARY REPORT FOR APRIL 19 - 21, 2016, AUDIT
AT EXCEL FACILITY IN ROCKVILLE, MARYLAND
REVIEW OF EXTENDED POWER UPRATE
LICENSE AMENDMENT REQUEST
TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3
DOCKET NOS. 50-259, 50-260, AND 50-296

By letter dated September 21, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15282A152), as supplemented by letters dated November 13, December 15 (2 letters), and December 18, 2015 (ADAMS Accession Nos. ML15317A361, ML15351A097, ML15351A113, and ML15355A413, respectively), Tennessee Valley Authority (TVA, the licensee) submitted a license amendment request (LAR) for Browns Ferry Nuclear Plant (BFN), Units 1, 2, and 3. The proposed amendment would increase the authorized maximum steady-state reactor core power level for each unit from 3,458 megawatt thermal (MWt) to 3,952 MWt. This LAR represents an increase of approximately 20 percent above the original licensed thermal power level of 3,293 MWt, and an increase of approximately 14.3 percent above the current licensed thermal power level of 3,458 MWt.

On March 21, 2016, the U.S. Nuclear Regulatory Commission (NRC) staff forwarded, by electronic mail (email), a draft request for additional information (RAI) to TVA. On March 31, 2016, the NRC staff held a conference call to provide the licensee with an opportunity to clarify any portion of the draft RAI and discuss the timeframe for which TVA may provide the requested information. Subsequently, the NRC staff determined an audit would be the most effective approach to establish an understanding of the draft RAIs to allow the NRC staff to issue finalized RAIs and for the licensee to provide quality and timely responses.

The audit was held at the EXCEL Services Corporation facility in Rockville, Maryland, from April 19 to 21, 2016. The audit plan dated April 11, 2016, is available in ADAMS under Accession No. ML16085A301. A list of attendees in the entrance meeting, audit days, and exit meeting was shown in Enclosure 1. The following NRC staff and NRC contractors participated in the audit discussions.

| Area of Review | Assigned Auditor |
|-------------------------|---|
| Project Manager | Farideh Saba (NRC) |
| Lead Technical Reviewer | Chakrapani Basavaraju (NRC) |
| Technical Reviewer | Michael Breach (NRC) |
| Technical Reviewer | Vikram Shah (NRC Contractor from Argonne National Laboratory) |
| Technical Reviewer | Stephen Hambric (NRC Contractor from Pennsylvania State University) |
| Technical Reviewer | Samir Ziada (NRC Contractor from McMaster University, Canada) |

The audit team held an entrance meeting on April 19, 2016. At this meeting, following the introduction, TVA and its contractor, General Electric Hitachi (GEH), provided a short history about steam dryers at Browns Ferry and TVA plans for replacing the existing steam dryers with new ones (aka, replacement steam dryers), which TVA plans to install at the site after approval of the EPU LAR.

During the audit, the licensee presented to the NRC staff, a package that included the NRC staff's 42 draft RAIs that were emailed to TVA on March 21, 2016, draft responses to all draft RAIs, except RAI 30 that was not supported by GEH, and the supplemental information that would support the NRC staff's review. The NRC staff and its contractors reviewed the information provided in the package and discussed it with the TVA and GEH staff. There was open communication throughout the audit and it was conducted in accordance with the audit plan with no known deviation. From the 41 draft RAIs that were discussed during the audit, the NRC staff and TVA staff agreed on deleting 2.5 RAIs (2 RAIs and part of another one), but adding 1.5 RAIs (one new RAI and a new part to another RAI). It was also agreed to keep the RAI numbering sequence as it was with the draft RAIs. Also, the NRC staff agreed to revise 7 RAIs to add clarification to the questions. The TVA staff found out that the licensee should provide additional clarification or perform additional work so that it can provide a better response to 25 of 41 draft RAIs. Specifically, TVA determined that it needs more time to be able to provide a resolution to 5 of the staff's draft RAIs pertinent to the association with the safety relief valve loading.

At the conclusion of the audit, the NRC staff conducted an exit meeting on April 21, 2016. At this meeting, the staff provided a summary of audit results in each subject area defined in the audit scope. The NRC staff and TVA staff both agreed that the audit helped the licensee to better focus on the scope of NRC's draft RAIs. The audit also provided the NRC staff with a better understanding of TVA's submittals and approach for responding to the NRC staff's RAIs. Additionally, NRC staff utilized results of the audit to finalize and issue the RAIs, which are documented in the NRC letter dated June 3, 2016 (ADAMS Accession Nos. ML16144A645 (pubic) and ML16144A643 (non-public)).

Subsequent to the audit, TVA requested a clarification conference with the NRC staff to discuss some of the RAIs associated with safety relief valve loading (EMCB-RAIs 14, 15, 16, and 18). Further, the NRC staff and the TVA staff determined to discuss these RAIs in a meeting at the NRC Headquarters. Currently, a closed meeting, due to the proprietary nature of the information, is scheduled on June 23, 2016. The meeting summary will be issued within 30 days from June 23, 2016.

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able to identify RAI responses that would be revised to provide additional clarifications. Enclosure 2 to this letter provides the audit summary report.

If you have any questions, please contact me at (301) 415-1447 or Farideh.Saba@nrc.gov.

Sincerely,

/RA/

Farideh E. Saba, Senior Project Manager
Plant Licensing II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

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

Enclosures:

1. List of Attendees
2. Summary Report for Audit

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MBreach, NRR

CBasavaraju, NRR

ADAMS Accession No.: ML16168A026

*** By email**

| OFFICE | DORL/LPLII-2/PM | DORL/LPLII-2/LA | DE/EMCB/BC(A)* | DORL/LPLII-2/BC(A) | DORL/LPLII-2/PM |
|--------|-----------------|-----------------|----------------|--------------------|-----------------|
| NAME | FSaba | BClayton | YLi | TOrf | FSaba |
| DATE | 06/21/16 | 6/21/16 | 06/21/16 | 6/22/16 | 6/23/16 |

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