



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

April 8, 2015

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

**SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3 - REQUEST FOR
ADDITIONAL INFORMATION REGARDING LICENSE AMENDMENT
REQUEST TO REVISE MAIN STEAM ISOLATION VALVE LEAKAGE
(TAC NOS. MF3124, MF3125, AND MF3126)**

Dear Mr. Shea:

By letter dated November 22, 2013 (Agencywide Documents Access and Management System (ADAMS) Package Accession No. ML14015A402), as supplemented by letter dated September 30, 2014 (ADAMS Accession No. ML14275A247), Tennessee Valley Authority (TVA, the licensee) submitted a license amendment request to adopt a change to the technical specifications to decrease the allowable leakage rate criteria for the main steam isolation valves.

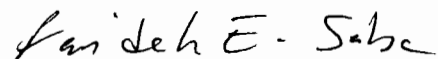
The U.S. Nuclear Regulatory Commission (NRC) staff reviewed the licensee's submittals and determined that additional information is needed. The enclosure to this letter contains the staff's followup request for additional information (RAI) specific to the TVA response to ARCB RAI 5 in the September 30, 2014, submittal. On February 23, 2015, the NRC staff forwarded, by e-mail, a draft of the probabilistic risk assessment (PRA) RAI to the TVA staff. On March 2 and 18, 2015, the NRC staff and TVA staff held a conference call and a closed meeting, respectively, to provide the licensee with the opportunity to clarify any portion of the draft PRA RAI and discuss TVA's proposed response to the requested information. At the conclusion of the March 18, 2015, meeting, the NRC staff agreed to add clarification to the draft ARCB RAI 5-1. The finalized ARCB question was e-mailed to your staff on March 31, 2015 (see enclosed RAI). As indicated in the March 31, 2015, e-mail, please respond to the enclosed RAI by April 30, 2015, so that the NRC staff may complete its review.

J. Shea

- 2 -

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 style with a clear, legible font.

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

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

Enclosure:
Request for Additional Information

cc w/enclosure: Distribution via Listserv

REQUEST FOR ADDITIONAL INFORMATION
LICENSE AMENDMENT REQUEST TO CHANGE TECHNICAL SPECIFICATIONS
TO REVISE MAIN STEAM ISOLATION VALVE LEAKAGE
TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2, AND 3
DOCKET NOS. 50-259, 50-260, AND 50-296

By letter dated November 22, 2013 (Agencywide Documents Access and Management System (ADAMS) Package Accession No. ML14015A402), as supplemented by letter dated September 30, 2015 (ADAMS Accession No. ML14275A247), Tennessee Valley Authority (TVA, the licensee) submitted a license amendment request to adopt a change to the technical specifications to decrease the allowable leakage rate criteria for the main steam isolation valves. The U.S. Nuclear Regulatory Commission (NRC), Division of Risk Assessment, Radiation Protection and Consequence Branch (ARCB) staff has reviewed the information that the licensee submitted and determined that the following additional information is required to complete the evaluation.

ARCB RAI [Request for Additional Information] 5-1

TVA's response to the ARCB staff's RAI 5, dated September 30, 2014 (ADAMS Accession No. ML14275A247), indicated that TVA's credited deposition is based on input parameters and assumptions (i.e., aerosol size - diameter range and distribution) from AEB 98-03, "Assessment of Radiological Consequences for the Perry Pilot Plant Application using the Revised (NUREG-1465) Source Term" (ADAMS Accession No. ML011230531). On March 7, 2006, the NRC staff issued Regulatory Issue Summary (RIS) 2006-04, "Experience with Implementation of Alternative Source Terms" (ADAMS Accession No. ML053460347). The RIS provided the NRC staff's experience with the implementation of alternative source terms and stated that any licensee that uses the AEB 98-03 assumptions should provide a justification that the assumptions are applicable to its plant's particular design. The RIS also stated that the choice of an effective settling velocity in any volume should account for the distribution of particle sizes in that volume.

The NRC staff also contracted Sandia National Laboratories to perform a reassessment of deposition in the main steam lines using MELCOR. The results of this evaluation provided in a report entitled "Analysis of Main Steam Isolation Valve Leakage in Design Basis Accidents Using MELCOR 1.8.6 and RADTRAD," Sandia Report, SAND2008-6601, dated October 2008 (ADAMS Accession No. ML083180196) and experiments of over-heated irradiated fuel (i.e., "On the nature of aerosols produced during a severe accident of a water-cooled nuclear reactor," M. P. Kissane, *Nuclear Engineering and Design*, Volume 238(10), pages 2792-2800) indicate that the deposition calculated using AEB 98-03 inputs and assumptions yield non-conservative results.

Enclosure

Given that the deposition calculated using AEB 98-03 inputs and assumptions yield non-conservative results, RAI-5 response in the TVA's September 30, 2014, submittal neither provides an adequate justification for continued use of the AEB 98-03 assumptions, nor provides an adequate basis for approval of the proposed changes. It is essential that the licensee provide an adequate technical basis for the modeling of aerosol deposition (i.e., aerosol time and spatial dependent effects, lambda vs. filters, etc.) in the steam lines and condenser. Using the knowledge of the limitations of the AEB 98-03 model, provide a model for the aerosol deposition credited in the steam lines and condenser and justify the model (i.e., inputs and assumptions, such as the aerosol sizes and distributions, and the methods used). Provide a revised dose analysis reflecting any updates to the deposition model and provide enough information so that the NRC staff can perform an independent assessment of the deposition model and dose analysis.

J. Shea

- 2 -

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

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

Enclosure:
Request for Additional Information

cc w/enclosure: Distribution via Listserv

DISTRIBUTION:

PUBLIC	RidsNrrPMBrownsFerry	RidsNrrDraArcb
LPL2-2 r/f	RidsACRS_MailCTR	LRonewicz, NRR
RidsNrrDorlLpl2-2	RidsRgn2MailCenter	
RidsNrrLABClayton	MBlumberg, NRR	

ADAMS Accession No.: ML15091A684

*by memo

OFFICE	LPL2-2/PM	LPL2-2/LAiT	LPL2-2/LA	ARCB/BC*	LPL2-2/BC	LPL2-2/PM
NAME	FSaba	LRonewicz	BClayton	UShoop	SHelton	FSaba
DATE	4/7/15	4/2/15	4/2/15	03/30/15	4/8/15	4/8/15

OFFICIAL RECORD COPY