From:	Buckberg, Perry
To:	Williams, Gordon Robert
Cc:	Hulvey, Kimberly Dawn; Shoop, Undine; Green, Kimberly
Subject:	Sequoyah Nuclear Plant, Request for Additional Information Regarding the Hydrologic Analysis LAR (EPID L-2020-LLA-0004)
Date:	Tuesday, April 14, 2020 2:09:00 PM
Attachments:	IQVB RAIs for Sequoyah Hydrologic Analysis LAR L-2020-LLA-0004 4-14-2020.pdf Revised Draft RAIs e-mail for Sequoyah Hydrologic Analysis LAR -L-2020-LLA-0004.pdf

Gordon,

In a letter dated January 14, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20016A396), as supplemented by a letter dated February 18, 2020 (ADAMS Accession No. ML20049H184), Tennessee Valley Authority (TVA) submitted a license amendment request (LAR) for Sequoyah Nuclear Plant related to the new Sequoyah Nuclear Plant hydrologic analysis. The Nuclear Regulatory Commission's (NRC's) staff has reviewed the information in the submittals and has determined that additional information is needed in order for the NRC staff to complete its review.

The NRC staff's Quality Assurance Vendor Inspection branch has identified areas where additional information is needed to support their review and a Request for Additional Information (RAI) is attached. Drafts of the RAI provided to your staff on March 16, 2020, and March 23, 2020, are attached. As discussed in a clarification call earlier today, the NRC staff requests your response to the RAI within 30 days of the date of this email.

If you have any questions, please contact Perry Buckberg at (301) 415-1383 or perry.buckberg@nrc.gov.

U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation

Perry Buckberg
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REQUEST FOR ADDITIONAL INFORMATION (RAI)

LICENSE AMENDMENT REQUEST TO REVISE

UFSAR RESULTING FROM NEW HYDROLOGIC ANALYSIS

SEQUOYAH NUCLEAR PLANT UNITS 1 AND 2

EPID NO: L-2020-LLA-0004

In a letter dated January 14, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20016A396), as supplemented by a letter dated February 18, 2020 (ADAMS Accession No. ML20049H184), Tennessee Valley Authority (TVA) submitted a license amendment request (LAR) for Sequoyah Nuclear Plant related to a new hydrologic analysis. The NRC staff has reviewed the information in the submittals and has determined that additional information is needed in order for the Nuclear Regulatory Commission staff to complete its review.

RAI-IQVB-1

Title 10 of the *Code of Federal Regulations* (10 CFR) 50.34(b)(6)(ii) requires information to be provided regarding the managerial and administrative controls to be used to assure safe operation, including a discussion of how applicable requirements within Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," are satisfied. In the February 18, 2020, Supplement TVA stated, in part, "The dedication of the [Probable Maximum Precipitation (PMP)] Evaluation Tool was performed under the Barge Design Solutions (Barge) Nuclear Quality Assurance (QA) program...The Barge QA program has been audited and accepted by TVA and is on the TVA Acceptable Supplier List (ASL)...While the [Aeronautical Reconnaissance Coverage Geographic Information System (ArcGIS)] and [Quantum GIS (QGIS)] evaluation tools were not dedicated, the calculations performed using these tools were checked by either hand calculations or using alternative software in accordance with Barge procedures for design calculations and computer program applications, under the Barge QA program, which complies with NQA-1 Part II Subpart 2.7 Paragraph 202 and is consistent with similar TVA process control procedures under the TVA QA Program. The ArcGIS software functions that are outside of the functions included in the PMP Evaluation Tool [Software Dedication Report (SDR)], as noted above, were checked using QGIS as the alternate software in accordance with NQA-1 Part II Subpart 2.7 Paragraph 202 under the Barge QA Program."

In accordance with NQA-1-2008 and the 2009 Addenda, Part II, Subpart 2.7, Paragraph 202, "The appropriate software engineering elements, described in para. 202 of this Subpart, shall define the control points and associated reviews. Reviews of software shall ensure compliance with the approved software design requirements...When review alone is not adequate to determine if requirements are met, alternate calculations shall be used, or tests shall be developed and integrated into the appropriate activities of the software development cycle."

The NRC staff reviewed the supplemental information provided by TVA and finds that the following additional information is needed to determine whether the procurement and use of the ArcGIS and QGIS evaluation tools are appropriately controlled under TVA's QA program in

accordance with the requirements of Appendix B to 10 CFR Part 50. Specifically, the NRC staff requests TVA to provide the following:

a) Information to clarify how hand calculations are used to verify the outputs of any of the tools used, including the PMP Evaluation Tool, ArcGIS and QGIS.

b) For cases where the output of one software tool is used to verify the output of another software tool (e,g., QGIS used to verify ArcGIS), information to demonstrate that these tools are sufficiently diverse (e.g., use of different software developers, different calculation methods, different software algorithms, different programming languages used to develop the tools) such that the potential for these tools to produce the same erroneous outputs are significantly reduced.

c) Information supporting the dedication of the PMP Evaluation Tool performed by Barge Design Solutions, including the dedication plan, the critical characteristics of the tool, the acceptance methods used, and documents (e.g., PMP Evaluation Tool SDR) demonstrating that commercial grade dedication was implemented adequately.

RAI-IQVB-2

Part 21 of 10 CFR defines the term "dedication," in part, as, "an acceptance process undertaken to provide reasonable assurance that a commercial grade item to be used as a basic component will perform its intended safety and, in this respect deemed equivalent to an item designed and manufactured under a 10 CFR Part 50, Appendix B quality assurance program. In all cases, the dedication process must be conducted in accordance with applicable provisions of 10 CFR Part 50, Appendix B." Criterion III, "Design Control" of Appendix B to 10 CFR Part 50, requires, in part, that "Measures shall also be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems and components... Design changes, including field changes, shall be subject to design control measures commensurate with those applied to the original design and be approved by the organization that performed the original design unless the applicant designates another responsible organization." In Attachment A to LAR to Enclosure 5, TVA stated, in part, that "The [Probable Maximum Precipitation (PMP) Evaluation] Tool was used, as provided, as part of commercial grade dedication, with the following minor modifications." This attachment identified four modifications made to PMP Evaluation Tool and the rationale for making these modifications.

The NRC staff evaluated the information presented by TVA regarding these modifications to the previous dedicated PMP Evaluation Tool and finds that additional information is needed to support the staff's safety evaluation. Specifically, the NRC staff requests that TVA provide information to demonstrate that the minor modifications made to the PMP Evaluation Tool do not invalidate the results of the dedication of this tool and that these modifications were conducted under TVA's quality assurance program, as required by Criterion III of Appendix B to 10 CFR Part 50.

From:	Buckberg, Perry
To:	"Williams, Gordon Robert"
Cc:	Hulvey, Kimberly Dawn
Subject:	Revised Draft RAIs - Hydrologic Analysis LAR (L-2020-LLA-0004)
Date:	Monday, March 23, 2020 10:19:00 AM
Attachments:	Revised Draft IQVB RAIs for Sequoyah Hydrologic Analysis LAR -L-2020-LLA-0004.docx

Gordon,

The attached revised draft software related RAIs were revised as a result of the March 20 clarification call. Please review to ensure that there is no proprietary information contained in the draft RAIs, that the questions are understandable, that the regulatory basis is clear and to determine if the information was previously docketed. Please let me as soon as possible if a clarification phone call is needed and/or if a response should be expected within 30 days from the issuance of these as final RAIs.

U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation

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DRAFT

REQUEST FOR ADDITIONAL INFORMATION

LICENSE AMENDMENT REQUEST TO REVISE

UFSAR RESULTING FROM NEW HYDROLOGIC ANALYSIS

SEQUOYAH NUCLEAR PLANT UNITS 1 AND 2

EPID NO: L-2020-LLA-0004

In a letter dated January 14, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20016A396), as supplemented by a letter dated February 18, 2020 (ADAMS Accession No. ML20049H184), Tennessee Valley Authority (TVA) submitted a license amendment request (LAR) for Sequoyah Nuclear Plant related to a new hydrologic analysis. The NRC staff has reviewed the information in the submittals and has determined that additional information is needed in order for the NRC staff to complete its review.

Question 1

Title 10 of the *Code of Federal Regulations* (10 CFR) 50.34(b)(6)(ii) requires information to be provided regarding the managerial and administrative controls to be used to assure safe operation, including a discussion of how applicable requirements within Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," are satisfied. In the February 18, 2020, Supplement TVA stated, in part, "The dedication of the [Probable Maximum Precipitation (PMP)] Evaluation Tool was performed under the Barge Design Solutions (Barge) Nuclear Quality Assurance (QA) program...The Barge QA program has been audited and accepted by TVA and is on the TVA Acceptable Supplier List (ASL)...While the ArcGIS and [Quantum GIS (QGIS)] evaluation tools were not dedicated, the calculations performed using these tools were checked by either hand calculations or using alternative software in accordance with Barge procedures for design calculations and computer program applications, under the Barge QA program, which complies with NQA-1 Part II Subpart 2.7 Paragraph 202 and is consistent with similar TVA process control procedures under the TVA QA Program. The ArcGIS software functions that are outside of the functions included in the PMP Evaluation Tool [Software Dedication Report (SDR)], as noted above, were checked using QGIS as the alternate software in accordance with NQA-1 Part II Subpart 2.7 Paragraph 202 under the Barge QA Program."

In accordance with NQA-1-2008 and the 2009 Addenda, Part II, Subpart 2.7, Paragraph 202, "The appropriate software engineering elements, described in para. 202 of this Subpart, shall define the control points and associated reviews. Reviews of software shall ensure compliance with the approved software design requirements...When review alone is not adequate to determine if requirements are met, alternate calculations shall be used, or tests shall be developed and integrated into the appropriate activities of the software development cycle."

The NRC staff reviewed the supplemental information provided by TVA and finds that the following additional information is needed to determine whether the procurement and use of the ArcGIS and QGIS evaluation tools are appropriately controlled under TVA's QA program in

accordance with the requirements of Appendix B to 10 CFR Part 50. Specifically, the NRC staff requests TVA to provide the following:

1) Information to clarify how hand calculations are used to verify the outputs of any of the tools used, including the PMP Evaluation Tool, ArcGIS and QGIS.

2) For cases where the output of one software tool (e.g., QGIS) is used to verify the output of another software tool (ArcGIS), information to demonstrate that these tools are sufficiently diverse (e.g., use of different software developers, different calculation methods, different software algorithms, different programming languages used to develop the tools) such that the potential for these tools to produce the same erroneous outputs are significantly reduced.

3) Information supporting the dedication of the PMP Evaluation Tool performed by Barge Design Solutions, including the dedication plan, the critical characteristics of the tool, the acceptance methods used, and documents (e.g., PMP Evaluation Tool SDR) demonstrating that commercial grade dedication was implemented adequately.

Question 2

10 CFR Part 21 defines the term "dedication," in part as, "an acceptance process undertaken to provide reasonable assurance that a commercial grade item to be used as a basic component will perform its intended safety and, in this respect deemed equivalent to an item designed and manufactured under a 10 CFR Part 50, Appendix B quality assurance program. In all cases, the dedication process must be conducted in accordance with applicable provisions of 10 CFR Part 50, Appendix B." Criterion III, "Design Control" of Appendix B to 10 CFR Part 50, requires, in part, that "Measures shall also be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems and components... Design changes, including field changes, shall be subject to design control measures commensurate with those applied to the original design and be approved by the organization that performed the original design unless the applicant designates another responsible organization." In Attachment A to LAR to Enclosure 5, TVA stated in part, that "The [Probable Maximum Precipitation (PMP) Evaluation] Tool was used, as provided, as part of commercial grade dedication, with the following minor modifications." This attachment identified four modifications made to PMP Evaluation Tool and the rationale for making these modifications.

The NRC staff evaluated the information presented by TVA regarding these modifications to the previous dedicated PMP Evaluation Tool and finds that additional information is needed to support the staff's safety evaluation. Specifically, the NRC staff requests that TVA provide information to demonstrate that the minor modifications made to the PMP Evaluation Tool do not invalidate the results of the dedication of this tool and that these modifications were conducted under TVA's quality assurance program, as required by Criterion III of Appendix B to 10 CFR Part 50.

From:	Buckberg, Perry
To:	"Williams, Gordon Robert"
Cc:	Hulvey, Kimberly Dawn
Subject:	Draft RAIs - Hydrologic Analysis LAR (L-2020-LLA-0004)
Date:	Monday, March 16, 2020 12:06:00 PM
Attachments:	Draft IQVB RAIs for Sequoyah Hydrologic Analysis LAR -L-2020-LLA-0004.docx

Gordon,

Attached are draft software related RAIs. Please review to ensure that there is no proprietary information contained in the draft RAIs, that the questions are understandable, that the regulatory basis is clear and to determine if the information was previously docketed. Please let me as soon as possible if a clarification phone call is needed and/or if a response should be expected within 30 days from the issuance of these as final RAIs.

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DRAFT

REQUEST FOR ADDITIONAL INFORMATION

LICENSE AMENDMENT REQUEST TO REVISE

UFSAR RESULTING FROM NEW HYDROLOGIC ANALYSIS

SEQUOYAH NUCLEAR PLANT UNITS 1 AND 2

EPID NO: L-2020-LLA-0004

In a letter dated January 14, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20016A396), as supplemented by a letter dated February 18, 2020 (ADAMS Accession No. ML20049H184), Tennessee Valley Authority (TVA) submitted a license amendment request (LAR) for Sequoyah Nuclear Plant related to a new hydrologic analysis. The NRC staff has reviewed the information in the submittals and has determined that additional information is needed in order for the NRC staff to complete its review.

Question 1

Title 10 of the *Code of Federal Regulations* (10 CFR) 50.34(b)(6)(ii) requires information to be provided regarding the managerial and administrative controls to be used to assure safe operation, including a discussion of how applicable requirements within Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," are satisfied. In the February 18, 2020, Supplement TVA stated, in part, "The dedication of the [Probable Maximum Precipitation (PMP)] Evaluation Tool was performed under the Barge Design Solutions (Barge) Nuclear Quality Assurance (QA) program...The Barge QA program has been audited and accepted by TVA and is on the TVA Acceptable Supplier List (ASL)...While the ArcGIS and [Quantum GIS (QGIS)] evaluation tools were not dedicated, the calculations performed using these tools were checked by either hand calculations or using alternative software in accordance with Barge procedures for design calculations and computer program applications, under the Barge QA program, which complies with NQA-1 Part II Subpart 2.7 Paragraph 202 and is consistent with similar TVA process control procedures under the TVA QA Program. The ArcGIS software functions that are outside of the functions included in the PMP Evaluation Tool [Software Dedication Report (SDR)], as noted above, were checked using QGIS as the alternate software in accordance with NQA-1 Part II Subpart 2.7 Paragraph 202 under the Barge QA Program."

In accordance with NQA-1-2008 and the 2009 Addenda, Part II, Subpart 2.7, Paragraph 202, "The appropriate software engineering elements, described in para. 202 of this Subpart, shall define the control points and associated reviews. Reviews of software shall ensure compliance with the approved software design requirements...When review alone is not adequate to determine if requirements are met, alternate calculations shall be used, or tests shall be developed and integrated into the appropriate activities of the software development cycle."

The NRC staff reviewed the supplemental information provided by TVA and finds that the following additional information is needed to determine whether the procurement and use of the ArcGIS and QGIS evaluation tools are appropriately controlled under TVA's QA program in

accordance with the requirements of Appendix B to 10 CFR Part 50. Specifically, the NRC staff requests TVA to provide the following:

1) Information to demonstrate that either:
   a. the hand calculations performed to verify the output ArcGIS and QGIS evaluation tools can independently determine the correctness of the tool outputs, or
   b. any alternate software used to supplement the hand calculations for verifying the correctness of the ArcGIS and QGIS tool outputs was developed under an Appendix B to 10 CFR Part 50 compliant QA program.

2) Information supporting the dedication of the PMP Evaluation Tool performed by Barge Design Solutions, including the dedication plan, the critical characteristics of the tool, the acceptance methods used, and documents (e.g., PMP Evaluation Tool SDR) demonstrating that commercial grade dedication was implemented adequately.

Question 2

10 CFR Part 21 defines the term "dedication," in part as, "an acceptance process undertaken to provide reasonable assurance that a commercial grade item to be used as a basic component will perform its intended safety and, in this respect deemed equivalent to an item designed and manufactured under a 10 CFR Part 50, Appendix B quality assurance program. In all cases, the dedication process must be conducted in accordance with applicable provisions of 10 CFR Part 50, Appendix B." Criterion III, "Design Control" of Appendix B to 10 CFR Part 50, requires, in part, that "Measures shall also be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems and components... Design changes, including field changes, shall be subject to design control measures commensurate with those applied to the original design and be approved by the organization that performed the original design unless the applicant designates another responsible organization." In Attachment A to LAR to Enclosure 5, TVA stated in part, that "The [Probable Maximum Precipitation (PMP) Evaluation] Tool was used, as provided, as part of commercial grade dedication, with the following minor modifications." This attachment identified four modifications made to PMP Evaluation Tool and the rationale for making these modifications.

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