



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

January 25, 2024

Shawn Gibby  
Vice President  
Nuclear Engineering  
Duke Energy  
525 S. Tryon St.  
Charlotte, NC 28202

SUBJECT: WILLIAM B. MCGUIRE NUCLEAR STATION, UNITS 1 AND 2 – AUDIT SUMMARY IN SUPPORT OF THE LICENSE AMENDMENT REQUESTS TO ADOPT TSTF-505, REVISION 2, “PROVIDE RISK-INFORMED EXTENDED COMPLETION TIMES – RITSTF [RISK-INFORMED TSTF] INITIATIVE 4B,” AND 10 CFR 50.69 “RISK-INFORMED CATEGORIZATION AND TREATMENT OF STRUCTURES, SYSTEMS AND COMPONENTS FOR NUCLEAR POWER REACTORS,” (EPIDS L-2023-LLA-0021, L-2023-LLA-0022)

Dear Mr. Gibby:

By letters dated February 16 and 17, 2023 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML23047A465 and ML23048A022), respectively, Duke Energy Carolinas, LLC (the licensee, Duke Energy) submitted license amendment requests (LARs) to amend the licenses for McGuire Nuclear Station, Units 1 and 2, Renewed Facility Operating License Nos. NPF-9 and NPF-17, (McGuire) respectively. The proposed LARs would adopt Technical Specifications Task Force Traveler 505, Revision 2, “*Provide Risk-informed Extended Completion Times, RITSTF Initiative 4b*” (TSTF-505) and adopt the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.69, “*Risk-informed categorization and treatment of structures, systems and components for nuclear power reactors.*”

The U.S. Nuclear Regulatory Commission (NRC) staff reviewed the licensee's submittal and determined that a regulatory audit would assist in the timely completion of the licensing review process. The NRC staff issued the regulatory audit plan on April 18, 2023 (ML23094A183).

The NRC staff conducted the regulatory audit from May 1 to December 8, 2023. The results of the regulatory audit will be used by the NRC staff to finalize requests for additional information.

The audit summary report is provided as an enclosure to this letter.

S. Gibby

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If you have any questions, please contact me at (301) 415-3867 or via email at [John.Klos@nrc.gov](mailto:John.Klos@nrc.gov).

Sincerely,

*/RA/*

John Klos, Project Manager  
Plant Licensing Branch II-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-369 and 50-370

Enclosure:

1. Audit Summary

cc: Listserv

## AUDIT SUMMARY

### LICENSE AMENDMENT TO ADOPT

#### TSTF-505, REVISION 2, AND 10 CFR 50.69

#### DUKE ENERGY CAROLINAS, LLC

#### MCGUIRE NUCLEAR STATION, UNITS 1 AND 2

#### DOCKET NOS. 50-369 AND 50-370

### 1.0 INTRODUCTION

By letters dated February 16 and 17, 2023 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML23047A465 and ML23048A022), respectively, Duke Energy Carolinas, LLC (the licensee, Duke Energy) submitted license amendment requests (LARs) to amend the licenses for McGuire Nuclear Station, Units 1 and 2, Renewed Facility Operating License Nos. NPF-9 and NPF-17, (McGuire) respectively. The proposed LARs would adopt Technical Specifications Task Force Traveler 505, Revision 2, "*Provide Risk-informed Extended Completion Times, RITSTF Initiative 4b*" (TSTF-505) and adopt the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.69, "*Risk-informed categorization and treatment of structures, systems and components for nuclear power reactors.*"

The U.S. Nuclear Regulatory Commission (NRC) staff reviewed the licensee's submittal and determined that a regulatory audit would assist in the timely completion of the licensing review process. The NRC staff issued the regulatory audit plan on April 18, 2023 (ML23094A183) which detailed the logistics, scheduling and audit request items in the plan's attachment.

The NRC staff conducted the regulatory audit from May 1 to December 8, 2023. The results of the regulatory audit will be used by the NRC staff to finalize requests for additional information (RAIs), as necessary.

The regulatory audit was performed consistent with NRC Office of Nuclear Reactor Regulation (NRR) Office Instruction LIC-111, Revision 1, "*Regulatory Audits*" (ML19226A274).

### 2.0 AUDIT ACTIVITIES AND OBSERVATIONS

The NRC audit team consisted of NRC staff and contract support from the Pacific Northwest National Laboratory (PNNL). Section 3.0 of this audit summary lists the individuals that took part in or attended the audit.

The NRC project manager discussed the audit plan, its logistics and scheduled the regulatory audit with the licensee on May 1, 2023. The regulatory audit was conducted from May 1 through December 8, 2023. The NRC audit team used an internet-based portal provided by the licensee to review primarily non-docketed information related to the application. Audit meetings with the licensee were held from June 27 through June 28, 2023, and from October 3 through October 4,

Enclosure

2023, to facilitate technical discussions of audit member questions and candidate items that may require submission on the docket.

Technical discussions were focused on the following major areas: probabilistic risk assessment (PRA), external hazards and flood hazard screening, technical specifications (TS) and limited condition of operations (LCO) scope applicability, and electrical engineering and included questions and discussion of the detailed topics of seismic risk contribution analysis, extreme wind analysis, high wind PRA acceptability, equipment performance monitoring, and open-phased condition.

On October 4, 2023, the NRC staff provided a brief conclusion of the formal audit meetings including audit objectives that were met and details on the path forward. There were no open items from audit discussions and no deviations from the audit plan. Documents that were provided as part of the audit that were reviewed by the NRC staff are listed in Section 4.0 of this audit summary. Duke Energy plans to submit a supplement to the LARs to provide additional docketed information.

By letter dated November 2, 2023 (ML23306A032) the licensee provided a supplement that details the technical discussion related to the audit questions. The NRC staff reviewed the licensee’s supplement to assess if any additional information was needed and determined that no additional information would be needed to complete its review of the subject LAR.

### 3.0 AUDIT PARTICIPANTS

#### NRC Audit Team

Name	E-mail	LARs		Review Area (Organization)
		TSTF-505	50.69	
John Klos <sup>(1)</sup>	<a href="mailto:John.Klos@nrc.gov">John.Klos@nrc.gov</a>	X	X	Plant Licensing Branch LPL II-1 (LPL2-1)
Todd Hilsmeier	<a href="mailto:Todd.Hilsmeier@nrc.gov">Todd.Hilsmeier@nrc.gov</a>	X <sup>(2)</sup> <sup>(3)</sup>	X	PRA Licensing Branch A (APLA)
Malcolm Patterson	<a href="mailto:Malcolm.Patterson@nrc.gov">Malcolm.Patterson@nrc.gov</a>	X	X <sup>(2)</sup>	
De (Wesley) Wu	<a href="mailto:De.Wu@nrc.gov">De.Wu@nrc.gov</a>	X	X	PRA Licensing Branch C (APLC)
Keith Tetter	<a href="mailto:Keith.Tetter@nrc.gov">Keith.Tetter@nrc.gov</a>	X	X <sup>(3)</sup>	
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Khoi Nguyen	<a href="mailto:Khoi.Nguyen@nrc.gov">Khoi.Nguyen@nrc.gov</a>	X		
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Norbert Carte	<a href="mailto:Norbert.Carte@nrc.gov">Norbert.Carte@nrc.gov</a>	X	X	Instrumentation and Controls Branch (EICB)
Gurjendra Bedi	<a href="mailto:Gurjendra.Bedi@nrc.gov">Gurjendra.Bedi@nrc.gov</a>	X	X	Mechanical Engineering and Inservice Testing Branch (EMIB)
Dan Widrevitz	<a href="mailto:Dan.Widrevitz@nrc.gov">Dan.Widrevitz@nrc.gov</a>		X	Vessels and Internals Branch (NVIB)
Stephen Cumblidge	<a href="mailto:Stephen.Cumblidge@nrc.gov">Stephen.Cumblidge@nrc.gov</a>		X	Piping and Head Penetrations (NPHP)
Brian Lee	<a href="mailto:Brian.Lee@nrc.gov">Brian.Lee@nrc.gov</a>	X	X	Containment and Plant Systems Branch (SCPB)
David Nold	<a href="mailto:David.Nold@nrc.gov">David.Nold@nrc.gov</a>	X	X	

Name	E-mail	LARs		Review Area (Organization)
		TSTF-505	50.69	
Christopher Jackson	<a href="mailto:Christopher.Jackson@nrc.gov">Christopher.Jackson@nrc.gov</a>	X	X	Nuclear Systems Performance Branch (SNSB)
Andrea Russell	<a href="mailto:Andrea.Russell@nrc.gov">Andrea.Russell@nrc.gov</a>	X		Technical Specifications Branch (STSB)
Steve Short <sup>(4)</sup>	<a href="mailto:Steve.Short@pnnl.gov">Steve.Short@pnnl.gov</a>	X	X	Pacific Northwest National Laboratory (PNNL)
Mark Wilk <sup>(4)</sup>	<a href="mailto:Mark.Wilk@pnnl.gov">Mark.Wilk@pnnl.gov</a>	X	X	

Notes:

- (1) NRR Division of Operating Reactor Licensing Project Manager
- (2) Technical Lead
- (3) Contracting Officer Representative
- (4) NRC Contractor

#### 4.0 DOCUMENTS REVIEWED

The licensee provided an extensive list of supporting documents (e.g., analyses, calculations, reports, drawings, and procedures) on the McGuire document portal available during the audit period. Below lists the documents available on the portal that the NRC audit team reviewed during the audit.

#### Application Specific Documents

- MCC-1535.00-00-0252, MNS 50.69 and TSTF-505 LAR Support Calculation, Revision 1, February 2023.
- AD-OP-ALL-0212, Risk Informed Completion Time Program Calculations, Revision 1, August 2022.

#### PRA Documents

- MCC-1535.00-00-0221, MNS Fire PRA Uncertainty and Sensitivity Studies, Revision 2, November 2022.
- MCC-1535.00-00-0243, McGuire Phoenix PRA Electronic Risk Assessment Tool (ERAT) Documentation, Revision 0, January 2019.
- AD-NF-ALL-0501, Electronic Risk Assessment Tool (ERAT), Revision 7, April 2023.
- AD-WC-ALL-0240, On-line Risk Management Process, Revision 3, April 2021.
- MCC-1535.00-00-0158, MNS FPRA (Fire PRA) Application Calculation, Revision 3, September 2013.
- AD-NF-NGO-0502, Probabilistic Risk Assessment (PRA) Model Technical Adequacy, Revision 5, February 2022.
- MCC-1535.00-00-0220, MNS Fire PRA Quantification Notebook, Revision 2, November 2022.
- MCC-1535.00-00-0204, McGuire Nuclear Station PRA Peer Review F&O Resolutions, Revision 8, November 2022.
- Documentation addressing TSTF-505 and 50.69 Audit Request Item 4, Cross-tied MNS Systems Modeled in the PRA.

#### External Hazards

- Improved Seismic Penalty Approach for Risk-Informed Completion Time (RICT), Duke Energy Contract Report 030319.13.05.01-001, Revision B.

- EPRI 3002018232, High Wind Loss of Offsite Power Durations and Recovery, October 2020.
- EPRI 3002020744, Investigation of Seismic Probabilistic Risk Assessment (SPRA) Quantification to Simplify PRA Models Used to Assess Risk-Informed Completion Times, June 2021.
- MCC-1535.00-00-0003, LLNL Seismic Hazard Curve Sensitivity Study for the McGuire IPEEE, Revision 14, April 1994.
- MCC-1535.00-00-0049, McGuire External Events - Seismic Analysis, Revision 0, December 2005.
- MCC-1535.00-00-0178, MR5 High Winds Quantification Notebook, Revision 4, November 2022.
- RP/0/B/5700/027, McGuire Severe Weather Preparation, Revision 13.
- RP/0/A/5700/006, McGuire Natural Disasters, Revision 036.

#### **Updated Final Safety Analysis Report (UFSAR)**

- Figure 8-3 of McGuire's UFSAR, Revision 24, (ML23257A246), Appendix 8B, "Figures," titled "Single Line Diagram Typical Auxiliary Distribution System," October 13, 2018.
- Figure 8-16 of McGuire UFSAR, Revision 24, Appendix 8B, "Figures," titled, "One Line Diagram Main Station Buses," April 13, 2020.
- Figure 8-17 of McGuire UFSAR, Revision 24, Appendix 8B, "Figures," titled, "One Line Diagram Station Main Buses," April 13 2020.
- Figure 8-34 of McGuire UFSAR, Revision 24, Appendix 8B, "Figures," titled, "Single Line Diagram – 125 VDC and 240/120 VAC Auxiliary Control Power Systems," April 5, 2011.

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