



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

September 15, 2023

Mr. Fadi Diya
Senior Vice President and
Chief Nuclear Officer
Ameren Missouri
Callaway Energy Center
8315 County Road 459
Steedman, MO 65077

SUBJECT: CALLAWAY PLANT, UNIT NO. 1 – REGULATORY AUDIT SUMMARY
REGARDING LICENSE AMENDMENT AND REGULATORY EXEMPTION
REQUESTS FOR FUEL TRANSITION TO FRAMATOME GAIA FUEL
(EPIDS L-2022-LLA-0150 AND L-2022-LLE-0030)

Dear Mr. Diya:

By letter dated October 12, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22285A115), as supplemented by letters dated December 1, 2022, May 9, 2023, June 21, 2023, and August 3, 2023 (ML22335A497, ML23129A793, ML23172A145, and ML23215A196, respectively), Union Electric Company, doing business as Ameren Missouri (the licensee), pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.90, "Application for amendment of license, construction permit, or early site permit," requested an amendment and regulatory exemptions regarding the use of Framatome GAIA fuel for Callaway Plant, Unit No. 1 (Callaway).

The proposed amendment would revise the Callaway Technical Specifications to allow use of Framatome GAIA fuel with M5 as a fuel cladding material. Since the Framatome GAIA fuel will use M5 fuel rod cladding, a 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," and 10 CFR Part 50, Appendix K, "ECCS [Emergency Core Cooling System] Evaluation Models," exemption request is included as part of this licensing amendment request (LAR).

To support its review of the LAR, the U.S. Nuclear Regulatory Commission (NRC) staff conducted a regulatory audit virtually using an online portal. The NRC staff requested information during the initial phase of the audit, which was uploaded to the online portal by the licensee, for NRC staff's review. The virtual regulatory audit meeting was held between the NRC staff and the licensee representatives from April 3–5, 2023, during which the NRC staff held discussions with the licensee. The audit was kept open to submit additional audit questions and to conduct follow-up audit discussions. The regulatory audit summary report is enclosed with this letter.

F. Diya

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If you have any questions, please contact me at 301-415-8371 or via email at Mahesh.Chawla@nrc.gov.

Sincerely,

/RA/

Mahesh L. Chawla, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosure:
Regulatory Audit Summary

cc: Listserv

REGULATORY AUDIT SUMMARY

IN SUPPORT OF LICENSE AMENDMENT AND REGULATORY EXEMPTION

REQUESTS FOR FUEL TRANSITION TO FRAMATOME GAIA FUEL

UNION ELECTRIC COMPANY

CALLAWAY PLANT, UNIT NO. 1

DOCKET NO. 50-483

1.0 BACKGROUND

By letter dated October 12, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22285A115), as supplemented by letters dated December 1, 2022, May 9, 2023, June 21, 2023, and August 3, 2023 (ML22335A497, ML23129A793, ML23172A145, and ML23215A196, respectively), Union Electric Company, doing business as Ameren Missouri (the licensee), pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.90, "Application for amendment of license, construction permit, or early site permit," requested an amendment and regulatory exemptions regarding the use of Framatome GAIA fuel for Callaway Plant, Unit No. 1 (Callaway).

The proposed amendment would revise the Callaway Technical Specifications to allow use of Framatome GAIA fuel with M5 as a fuel cladding material. Since the Framatome GAIA fuel will use M5 fuel rod cladding, a 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," and 10 CFR Part 50, Appendix K, "ECCS [Emergency Core Cooling System] Evaluation Models," exemption request is included as part of this licensing amendment request (LAR). The information submitted in support of the LAR is under final review in accordance with the Office of Nuclear Reactor Regulation (NRR) Office Instruction LIC-101, Revision 6, "License Amendment Review Procedures" (ML19248C539).

The U.S. Nuclear Regulatory Commission (NRC) staff conducted a regulatory audit in accordance with the NRR Office Instruction LIC-111, "Regulatory Audits" (ML19226A274). The regulatory audit is a planned license or regulation-related activity that includes the examination and evaluation of primarily non-docketed information. The regulatory audit is conducted with the intent to gain understanding, to verify information, and/or to identify information that will require docketing to support the basis of a licensing or regulatory decision. Performing a regulatory audit of the licensee's information is expected to assist the NRC staff in efficiently conducting its review or gain insights on the licensee's processes or procedures. Information that the NRC staff relies upon to make the safety determination must be submitted on the docket.

During the regulatory audit, the NRC staff reviewed documents, responses to audit questions, and held discussions with members of Ameren Missouri and its contractors. The purpose of the audit was to gain an understanding of the information needed to support the NRC staff's licensing decision regarding the LAR and to develop requests for additional information (RAIs).

However, the NRC staff may review supporting information retained as records under 10 CFR 50.71, "Maintenance of records, making of reports," and/or 10 CFR 54.37, "Additional records and recordkeeping requirements," which, although not required to be submitted as part

of the licensing action, would help the NRC staff better understand the licensee's submitted information.

2.0 AUDIT ACTIVITIES AND OBSERVATIONS

2.1 Desk and Virtual Audit

The desk audit was conducted by the NRC staff consistent with the regulatory audit plan dated March 20, 2023 (ML23068A377). The NRC staff provided the list of documents needed in the audit plan along with audit questions. The licensee uploaded the requested documents to an electronic portal and provided access to the NRC audit team. The NRC staff reviewed the documents during the "desk-audit" phase made available by the licensee in an electronic reading room.

The second phase of the audit was conducted virtually in meetings between the dates of April 3–5, 2023, and subsequent follow-up meetings. Detailed discussions were held on various topics between the audit team members and the licensee, aided by information needs identified by the NRC staff in the audit plan, as supplemented, along with the licensee's presentations and prepared responses to audit questions.

In addition, the NRC requested via emails dated April 17, 2023 (ML23107A181), and April 24, 2023 (ML23114A230), that responses be provided to additional questions discussed during a call held on April 20, 2023. At the conclusion of the audit activities, the NRC requested that the licensee's responses to selected questions from the audit be transmitted via a letter, which was subsequently provided by the supplemental letter dated May 9, 2023. Following review of the responses provided in the supplement dated May 9, 2023, a call was held on June 8, 2023, during which the NRC staff requested that additional information be provided regarding four items, which was provided by the licensee in the supplemental letter dated June 21, 2023.

The NRC staff used the information gathered from the audit to determine whether additional information is warranted on the docket to support rendering of an NRC staff finding. The audit plan dated March 20, 2023, provides a list of the information that the NRC staff reviewed throughout the audit.

3.0 RESULTS OF THE AUDIT

The NRC staff did not make any regulatory decisions regarding the LAR during the audit. At the audit exit meeting held on April 5, 2023, and during subsequent meetings, the NRC staff reviewed the proposed resolution to the audit questions with the licensee, and reached a consensus regarding the questions, which were resolved and closed. The licensee provided the response to the remainder of the questions on the docket in the supplements dated May 9, 2023, and June 21, 2023. After reviewing the supplemented information, the NRC staff has not identified the need for any RAI.

List of Participants

U.S Nuclear Regulatory Commission (NRC) Audit Team

NRC Staff	Role
Mahesh Chawla	Project Manager, NRR ¹ /DORL ² /LPL43
Ahsan Sallman	Senior Nuclear Engineer, NRR/DSS ⁴ /SNSB ⁵
Santosh Bhatt	Nuclear Engineer, NRR/DSS/SNSB
Mathew Panicker	Nuclear Engineer, NRR/DSS/SFNB ⁶
Ravi Grover	Safety and Plant Systems Engineer, NRR/DSS/STSB ⁷
Gerry Stirewalt	Senior Environmental Project Manager, NMSS ⁸ /REFS ⁹ /ERNB ¹⁰
Donald Palmrose	Senior Reactor Engineer, NMSS/REFS/ERNB

Ameren Missouri – Callaway Plant, Unit 1 (Callaway) Team

Thomas Elwood – Supervisor, Licensing and Regulatory Affairs
Thomas Forland – Licensing Engineer
Brian Richardson – Supervisor, Reactor Engineering and Safety Analysis
James Knaup – Reactor Engineer
Justen Vinyard – Reactor Engineer
Chris Ehmke – Reactor Engineer
Jonathan Cordz – Safety Analysis Engineer
Kurt Linsenhardt – Safety Analysis Engineer
Larry Russell – Project Manager, consultant
James McInvale – Reactor Engineering consultant
Donald Rickard – Licensing consultant
Garry Chapman – Engineering consultant

Framatome personnel include:

Rick Williamson – Contract Manager
Tom Gardner – Project Manager
Morris Byram – Licensing/Reg Affairs
John Adams – Safety Analysis Supervisor
Tim Lindquist – Safety Analysis Engineer
Jackson Breakell – TH Engineer
Mike Bingham – TH Engineer
Brittany Williams – LOCA Engineer
Nathan Hottle – LOCA Supervisor
Mirielle Cortes – LOCA Engineer
Mike Aldrich – Fuel Performance (Thermal-Mechanics) Engineer

¹ Office of Nuclear Reactor Regulation (NRR)

² Division of Operating Reactor Licensing (DORL)

³ Plant Licensing Branch IV

⁴ Division of Safety Systems

⁵ Nuclear Systems Performance Branch

⁶ Nuclear Methods and Fuel Analysis Branch

⁷ Technical Specifications Branch

⁸ Office of Nuclear Material Safety and Safeguards

⁹ Division of Rulemaking, Environmental, and Financial Support

¹⁰ Environmental New Reactor Branch

Michael Harris – Fuel Performance (T-M) Engineer
Brian Painter – Structural Mechanics Engineer
Dan Colleran – Structural Mechanics Supervisor
Kevin Roberts – Neutronics Engineer
Kevin Segard – Neutronics Engineer
Michelle Guzzardo – Neutronics Supervisor
Graeme Leitch – Mechanical Design Engineer

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ADAMS Accession No.: ML23206A199

***by email**

OFFICE	NRR/DORL/LPL4/PM	NRR/DORL/LPL4/LA	NRR/DSS/SFNB/BC
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NAME	JO'Hara (for K Erwin)	JDixon-Herrity	MChawla
DATE	08/02/2023	09/15/2023	09/15/2023

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