

**From:** Chawla, Mahesh  
**Sent:** Monday, March 28, 2022 11:20 AM  
**To:** Elwood, Thomas B  
**Cc:** Smith, Steve; Russell, Andrea; Klein, Paul; Yoder, Matthew; Tsao, John; Vettori, Robert; Lehman, Bryce; Parks, Benjamin; Ma, John; Hoffman, Robert; Dixon-Herrity, Jennifer  
**Subject:** Callaway Plant, Unit 1 - Draft RAIs - License Amendment and Regulatory Exemptions for a Risk-Informed approach to address Generic Safety Issue - 191 and Respond to Generic Letter 2004-02 ( EPIDs L-2021-LLA-0059 and L-2021-LLE-0021)

Dear Mr. Elwood,

By letter dated March 31, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21090A184), as supplemented by letters dated May 27, 2021 (ADAMS Accession No. ML21147A222), July 22, 2021 (ADAMS Accession No. ML21203A192), August 23, 2021 (ADAMS Accession No. ML21237A135), October 7, 2021 (ADAMS Accession No. ML21280A378), January 27, 2022 (ADAMS Accession No. ML22027A804), and March 8, 2022 (ADAMS Accession No. ML22068A027), Union Electric Company, dba 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 for the licensee's final resolution to addressing the concerns of Generic Safety Issue (GSI)-191, "Assessment of Debris Accumulation on PWR [Pressurized-Water Reactor] Sump Performance," and for responding to Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors." Additionally, in accordance with the provisions of 10 CFR 50.12, "Specific exemptions," the licensee requested exemptions from certain requirements of 10 CFR 50.46(a)(1), and Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, specifically General Design Criterion (GDC) 35, "Emergency core cooling," GDC 38, "Containment heat removal," and GDC 41, "Containment atmosphere cleanup." The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing the application and has determined that the following additional information is required in order to complete review of the subject license amendment and the regulatory exemptions.

**REQUEST FOR ADDITIONAL INFORMATION (RAI):**

**RAI No.: 1**

**Regulatory Requirement:** Section 51.30(a) of Title 10 of the Code of Federal Regulations requires, in part, that an environmental assessment include a brief discussion of the environmental impacts of the proposed action and alternatives, as appropriate.

**Background:** In reviewing Ameren Missouri's Callaway, Unit 1, Fourth (Post-Audit) Supplement to Request for License Amendment and Regulatory Exemptions for Risk-Informed Approach to Address GSI-191 and Respond to GL 2004-02 dated January 27, 2022 (ADAMS accession no. ML22027A804), NRC staff has determined that environmental impacts (specifically, additional worker dose and radiologically contaminated waste) could occur in association with the No Action Alternative (i.e., complete compliance with the existing provisions in 10 CFR 50.46(a)(1) and the relevant General Design Criteria), should the subject exemptions and associated license amendment request not be granted. NRC requires this dose and waste information to inform its environmental review.

**Request: a)** Enclosure 1 of Ameren Missouri's Fourth Supplement, i.e., Request for Exemptions for Callaway Risk-Informed Approach to Resolution for Generic Letter 2004-02, states that the minimum dose associated with replacement of insulation in containment is "estimated to be greater than 50 person-rem". In order to support the staff's evaluation of potential worker dose impacts, NRC requests that Ameren Missouri provide a more definitive value or upper range for this estimate.

**b)** Enclosure 1 also states that compliance with 10 CFR 50.46(a)(1) and the relevant General Design Criteria would entail removal and disposal of significant amounts of insulation. In order to support the staff's evaluation of potential waste management impacts, NRC requests that Ameren Missouri provide the estimated volume (cubic feet) of radiologically contaminated waste that would be generated from the replacement of the existing insulation addressed in Enclosure 1.

#### **RAI No: 2**

**Regulatory Requirement:** 10 CFR 40.46 requires that plants maintain the ability to provide long-term core cooling following any initial LOCA response. To ensure that this cooling is available, licensees demonstrate that flashing will not occur at the ECCS strainer so that flow to the ECCS pumps is not interrupted.

**Background:** In Enclosure 3 of submittal dated March 31, 2021, the licensee provided the methodology used to demonstrate that flashing would not occur. The NRC discussed this information with the licensee during an audit conducted virtually from August 10 to August 12, 2021 (ADAMS Accession No. ML21238A138) and the licensee submitted additional information regarding the flashing analysis in submittal dated January 27, 2022 (ADAMS Accession No. MLML22027A804). In this submittal the licensee stated that approximately 10 percent of the available pressure in containment is required to prevent flashing at the strainer for the large break loss of coolant accident (LBLOCA). The NRC staff agrees that the need to credit only 10 percent of the available pressure, based on a design basis calculation, demonstrates that there is large margin to flashing. However, the long-term cooling period spans a period during which the pool temperature and containment pressure change significantly. The NRC staff could not determine how the 10 percent value was derived.

**Request:** Clarify whether the 10 percent value is based on the time at which the minimum margin to flashing occurs and that it is based on the pressure predictions for the LBLOCA, not the main steam line break. If it is not based on the time of minimum margin, provide the margin to flashing based on the time at which the margin to flashing is at its minimum.

***Please arrange a clarification call with NRC staff to discuss the requested information. In case of any further questions, you can contact me. Thanks***

Sincerely,

Mahesh Chawla, Project Manager  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
ph: 301-415-8371  
Docket No. 50-483

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