

From: Paulette Torres
Sent: Friday, June 14, 2024 11:49 AM
To: Brooks, Caleb
Cc: Edward Helvenston; Holly Cruz (She/Her/Hers); Dan Beacon (He/Him); Ben Adams; Ayesha Athar; Greg Oberson (He/Him); Donna Williams; Grunloh, Timothy P; Foyto, Les; Nicolas, Michael; Devitt, Peter; Conlon, Kelly; Vary, Beth; Tim.Parkes@onr.gov.uk; Ivaylo Stanev
Subject: Regulatory Audit Plan for the "University of Illinois Urbana-Champaign High-Temperature Gas-Cooled Research Reactor: Fuel Qualification Methodology" Topical Report (EPID: L-2024-NFN-0003)
Attachments: UIUC Fuel Qualification Methodology Topical Report Regulatory Audit Plan.pdf

Caleb S. Brooks, Ph.D.
Associate Professor
University of Illinois at Urbana-Champaign
Department of Nuclear, Plasma, and Radiological Engineering
Talbot Laboratory, Room 111C, MC-234
104 South Wright St, Urbana, IL 61801

Dear Dr. Brooks:

By letter dated March 11, 2024, (Agencywide Documents Access and Management System (ADAMS) Package Accession No. ML24071A237), University of Illinois Urbana-Champaign (UIUC) resubmitted Release 1 of the topical report (TR), "University of Illinois Urbana-Champaign High-Temperature Gas-Cooled Research Reactor: Fuel Qualification Methodology." The TR incorporates the updates to the Ultra Safe Nuclear Corporation (USNC) Micro Modular Reactor (MMR) fuel design. By email dated April 4, 2024 (ML24093A219), the U.S. Nuclear Regulatory Commission (NRC) staff accepted the UIUC Fuel Qualification Methodology (FQM) TR for review.

The NRC and the Canadian Nuclear Safety Commission (CNSC) are collaborating on the review of this FQM TR under the NRC/CNSC Memorandum of Cooperation dated August 2019 (ML19275D578) to promote and achieve efficiencies for planned licensing applications for its reactor technology in both countries through early regulatory engagements by familiarizing both regulators with its fuel design for USNC MMRs in the United States and Canada. As a result, CNSC staff is participating in this audit. The joint review will not affect the proposed applicability of the FQM TR for use by UIUC. The Office for Nuclear Regulation (ONR), United Kingdom independent nuclear regulator, will participate in the audit activities as an observer.

This audit will be conducted in accordance with the guidance provided in the Office Instruction LIC 111, "Regulatory Audits," (ML19226A274).

This will be a virtual audit using an on-line portal. The audit entrance will be held on approximately July 2024. The audit will continue as necessary to conclude approximately October 2024. The contents of the audit plan are provided as an enclosure.

If you have any questions, please contact Paulette Torres at (301) 415-5656 or by electronic mail at Paulette.Torres@nrc.gov, or Edward Helvenston at (301) 415-4067 or by electronic mail at Edward.Helvenston@nrc.gov.

Respectfully,

Paulette A. Torres
Non-Power Production and Utilization Facility Licensing (UNPL)
Division of Advanced Reactors and Non-Power Production and Utilization Facilities (DANU)
Office of Nuclear Reactor Regulation (NRR)
(301) 415-5656
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Project No.: 99902094
EPID: L-2024-NFN-0003
Enclosure: As stated
Cc: GovDelivery Subscribers

Concurrence on Audit Plan

OFFICE	NRR/DANU/UNPL/PM	NRR/DANU/UTB1/BC	NRR/DANU/UNPL/BC(A)
NAME	PTorres	GOberson	HCruz
DATE	06/13/2024	06/14/2024	06/14/2024

Hearing Identifier: NRR_DRMA
Email Number: 2519

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High-Temperature Gas-Cooled Research Reactor Fuel Qualification Methodology Topical Report (EPID
L-2024-NFN-0003)

Sent Date: 6/14/2024 11:48:54 AM
Received Date: 6/14/2024 11:48:00 AM
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Options

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Reply Requested:	No
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**REGULATORY AUDIT PLAN FOR THE "UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN
HIGH-TEMPERATURE GAS-COOLED RESEARCH REACTOR: FUEL QUALIFICATION
METHODOLOGY" TOPICAL REPORT
(EPID: L-2024-NFN-0003)**

APPLICANT INFORMATION

Applicant: University of Illinois Urbana-Champaign (UIUC)

Applicant Address: Department of Nuclear, Plasma, and Radiological
Engineering
Talbot Laboratory, Room 111C, MC-234
104 South Wright St., Urbana, IL 61801

Plant Name: UIUC High-Temperature Gas-Cooled Research Reactor

Project No.: 99902094

Background:

University of Illinois Urbana-Champaign (UIUC) plans to construct a Micro Modular Reactor (MMR), designed by Ultra Safe Nuclear Company (USNC), and is engaged in pre-application discussions with the U.S. Nuclear Regulatory Commission (NRC) staff regarding the planned high temperature gas cooled MMR reactor design. As part of pre-application activities, UIUC has submitted various topical reports and white papers. On March 11, 2024 (Agencywide Documents Access and Management System (ADAMS) Package Accession No. (ML24071A237), UIUC resubmitted Release 1 of the topical report (TR), "University of Illinois Urbana-Champaign High Temperature Gas-cooled Research Reactor: Fuel Qualification Methodology." The TR describes the methodology UIUC plans to use to qualify fully encapsulated ceramic matrix (FCM) fuel for use in the planned MMR at UIUC. The Canadian Nuclear Safety Commission (CNSC) staff is participating in this audit. The NRC/CNSC joint review will not affect the proposed applicability of the Fuel Qualification Methodology (FQM) TR for use by UIUC. The Office for Nuclear Regulation (ONR), United Kingdom independent nuclear regulator, will participate in the audit activities as an observer.

Purpose:

The purpose of the audit is to allow the NRC and CNSC staff to (1) efficiently gain an understanding of the detailed information supporting the TR; (2) verify information; and/or (3) identify information that will require docketing to support the development of the safety evaluation report.

Regulatory Audit Basis:

The basis for the audit is the regulations in Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, “Domestic Licensing of Production and Utilization Facilities,” Section 50.34, “Contents of applications; technical information,” which indicate the information that is required to be included in a preliminary safety analysis report or final safety analysis report supporting a construction permit or operating license application, respectively. The subject TR provides a methodology that will be used to qualify FCM fuel which will serve as the primary heat-producing structure, system, and component (SSCs) important to safety in the MMR at UIUC. UIUC may reference approved topical reports to support future licensing applications related to the planned MMR.

Regulatory Audit Scope:

The regulatory audit will follow guidance in NRR Office Instruction LIC-111, “Regulatory Audits” (ML19226A274). This audit will focus on information provided by UIUC in an online reference portal and during virtual meetings. This audit will provide the NRC staff with information related to the NRC staff’s evaluation of the TR. Specific audit discussion topics associated with this audit may be provided in subsequent correspondence, such as an email.

Information and Other Material Necessary for the Regulatory Audit:

UIUC should be prepared to provide supporting information, references, data, etc. to support explanations and/or answers associated with any questions provided. Specific questions and discussion topics to support this audit will be communicated to UIUC via e-mail and will be entered as a public record in ADAMS, as appropriate.

Audit Team:

Paulette Torres	Project Manager (NRC)
Ed Helvenston	Project Manager (NRC)
Dan Beacon	Technical Reviewer (NRC)
Ben Adams	Technical Reviewer (NRC)
Ayesha Athar	Technical Reviewer (NRC)
Gregory Oberson	Branch Chief, Technical (NRC)
Holly Cruz	Branch Chief, Licensing (NRC)
Michael Nicolas	Project Manager (CNSC)
Peter Devitt	Project Manager (CNSC)
Kelly Conlon	Subject Matter Expert (CNSC)
Beth Vary	Director of Advanced Reactor Assessment Division (CNSC)
Tim Parkes	Head of Regulation for Advanced Nuclear Technologies (ONR)- Observer
Ivaylo Stanev	Lead of HGTR Project (ONR)-Observer

Additional audit team members may be added by the project manager and communicated to UIUC as needed.

Audit Logistics:

Entrance Meeting: TBD July 2024
Exit Meeting: Approximately October 2024

Audit meetings will take place in a virtual format, using Microsoft Teams, or via other, similar platform. Audit meetings will be scheduled on an as needed basis after the entrance meeting and, as appropriate, once the NRC and CNSC staff has had the opportunity to read any documents placed in the online reference portal. The audit will begin approximately in July 2024, and projected to end October 2024, but continue as necessary, with activities occurring intermittently during the audit period.

The audit period may be reduced or extended, dependent on the NRC and CNSC staff and UIUC progress in addressing the audit topics. Additional audit activities may be planned as necessary to support the NRC staff's understanding of information needed to complete the review of the topical report.

To improve the efficiency of the audit, UIUC, the NRC and CNSC staff discussed the use of an online reference portal, established by UIUC, that would allow the NRC, CNSC and ONR staff limited read-only access to the material, relevant documents and other technical information placed in the online reference portal. The use of the online reference portal is acceptable provided that UIUC establishes measures to limit access to specific NRC staff (e.g., based on NRC e-mail addresses or the use of passwords which will only be assigned to the NRC staff directly involved in the audit on a need-to-know basis), and to make the documents read-only (i.e., prevent NRC staff from saving, copying, downloading, or printing any documents) and appropriate processes for CNSC staff. The conditions associated with the online reference portal must be maintained throughout the audit process. The NRC, CNSC and ONR staff who should initially be granted access to the portal are those listed in the "Team Members" section above. As needed, the NRC Project Manager may provide UIUC with the names of additional NRC, CNSC and ONR staff members who are added to the audit team and should be granted access.

Special Requests:

The NRC and CNSC staffs requests that UIUC provide subject matter expert(s), if necessary, to discuss the details of the audit material.

CNSC staff also requests that UIUC/USNC provide a presentation to give a walkthrough on the FQM TR.

Deliverables:

An audit report will be issued within 90 days following the exit meeting. The NRC points of contact for this audit are Paulette Torres at Paulette.Torres@nrc.gov and Edward Helvenston at Edward.Helvenston@nrc.gov.

References:

Title 10 of the *Code of Federal Regulations*.