



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

November 18, 2022

Dr. Rusty Towell
Director of NEXT Lab
Abilene Christian University
ACU Box 28208
Abilene, TX 28208

SUBJECT: ACCEPTANCE FOR DOCKETING OF THE MOLTEN SALT RESEARCH
REACTOR CONSTRUCTION PERMIT APPLICATION SUBMITTED BY
ABILENE CHRISTIAN UNIVERSITY (EPID: L-2022-NFW-0002)

Dear Dr. Towell:

By letter dated August 12, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22227A202), as supplemented by letter dated October 14, 2022 (ML22293B816), Abilene Christian University (ACU) submitted to the U.S. Nuclear Regulatory Commission (NRC) staff, an application for a construction permit for a molten salt research reactor (MSRR), pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," and Section 104c of the Atomic Energy Act of 1954, as amended. The MSRR is to be constructed in Abilene, Texas. The purpose of this letter is to inform you of the results of the NRC staff's acceptance review of this application.

The NRC staff performed an acceptance review and determined that ACU submitted sufficient information in accordance with 10 CFR 2.101, "Filing of Application,;" 10 CFR 50.33, "Contents of applications; general information,;" 10 CFR 50.34, "Contents of application; technical information;" and 10 CFR 51.41, "Requirement to submit environmental information." The acceptance review is intended to confirm that the NRC staff has sufficient information to initiate detailed safety and environmental reviews and to complete these reviews on a predictable schedule.

The NRC staff performed the acceptance review of the construction permit application in accordance with 10 CFR Part 2, "Agency Rules of Practice and Procedure," Part 50, and the agency's procedures, assessing the various criteria and considerations specified in the agency's procedures associated with accepting an application. The NRC staff concluded that the application is acceptable for docketing. However, the NRC staff's determination does not preclude requests for additional information (RAIs) as the review proceeds. The docket number established for the MSRR is 50-610.

The NRC staff will conduct its safety-focused review based on the guidance in NUREG-1537, "Guidelines for the Preparation and Review of Applications for the Licensing of Non-Power Reactors," Part 1, "Format and Content" (ML042430055) and Part 2, "Standard Review Plan and Acceptance Criteria" (ML042430048), and ORNL Technical Report (ORNL/TM-2020/1478) "Proposed Guidance for Preparing and Reviewing a Molten Salt Non-Power Reactor application" (ML20219A771).

During the acceptance review, the NRC staff identified several technical topics related to the MSRR application that will likely require increased focus by ACU and the NRC staff to ensure timely completion of the review. These topics include the following:

- Research and development programs necessary to confirm the adequacy of the MSRR design.
- Properties of graphite used in MSRR components.
- Potential corrosion and degradation mechanisms of metallic MSRR components.
- Use of effluent tanks in the fuel handling enclosure and how this may affect the proposed maximum hypothetical accident.
- Management and disposal of transuranic-contaminated low-level waste generated by the MSRR.

Based on the results of the acceptance review and aided by the work that was accomplished during the pre-application audit, the NRC staff estimates that it will complete and issue the Final Safety Evaluation Report by May 2024. This date could change due to several factors, such as the timeframe for resolution of technical issues, unanticipated changes to the scope of the review, unsolicited supplements to the application, design changes, or other unanticipated factors. The NRC staff will provide a review schedule with key milestones and resource estimates within 30 days of the issuance of this letter.

A notice of acceptance for docketing will be published by the *Office of the Federal Register*.

If you have any questions, please contact Richard Rivera at (301) 415-7190 or via email at Richard.Rivera@nrc.gov, or Edward Helvenston at (301) 415-4067 or via email at Edward.Helvenston@nrc.gov.

Sincerely,



Signed by Rivera, Richard
on 11/18/22

Richard Rivera, Project Manager
Advanced Reactor Licensing Branch 1
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

Docket No. 50-610

Enclosure:
As stated

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