

TRTR Conference –
June 21, 2023

Welcome to NRC Day

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June 21, 2023

Non-Power Production and Utilization Facility Licensing Branch – Overview

Josh Borromeo, Chief UNPL

Meet the UNPL Branch Chief



Josh Borromeo,
Chief UNPL

B.S. Mechanical Engineering, The Pennsylvania State University

Westinghouse Electric Company, Engineer with focus on Loss-of-Coolant Accident Analysis

Nuclear Regulatory Commission

- Reactor Systems Engineer
- Technical Assistant
- Acting Branch Chief in NRR and NMSS
- Chief of UNPL since April 2021

UNPL Branch Staff

Mike Balazik
Patrick Boyle
Holly Cruz
Duane Hardesty
Ed Helvenston
Justin Hudson
Andrew Miller
Cindy Montgomery
Paulette Torres
Linh Tran
Geoffrey Wertz
Xiaosong Yin

Currently 12 full-time staff

New hires in the past year:
- Andrew Miller

Actively hiring additional PMs

Leveraging technical staff of the agency to support reviews and build bench strength

DANU Management Team

DANU is actively engaging staff to become familiar with NPUF technology and licensing

Division Management

Mo Shams, Director

Jeremy Bowen, Deputy Director

Jon Greives, Acting Deputy Director

Branch Chiefs

Josh Borrromeo, NPUF Licensing Branch

Travis Tate, NPUF Oversight Branch

Andrew Proffitt, Advanced Reactor Licensing Branch 1

Michael Wentzel, Advanced Reactor Licensing Branch 2

Steven Lynch, Advanced Reactor Policy Branch

Candace de Messieres, Advanced Reactor Technical Branch 1

Greg Oberson, Advanced Reactor Technical Branch 2

Communication

*Key for workload
planning, efficiently
completing projects,
and issue resolution*

Contact your PM, contact the
UNPL Branch Chief, or contact
anyone on DANU management
team!



Some of the completed actions this past year

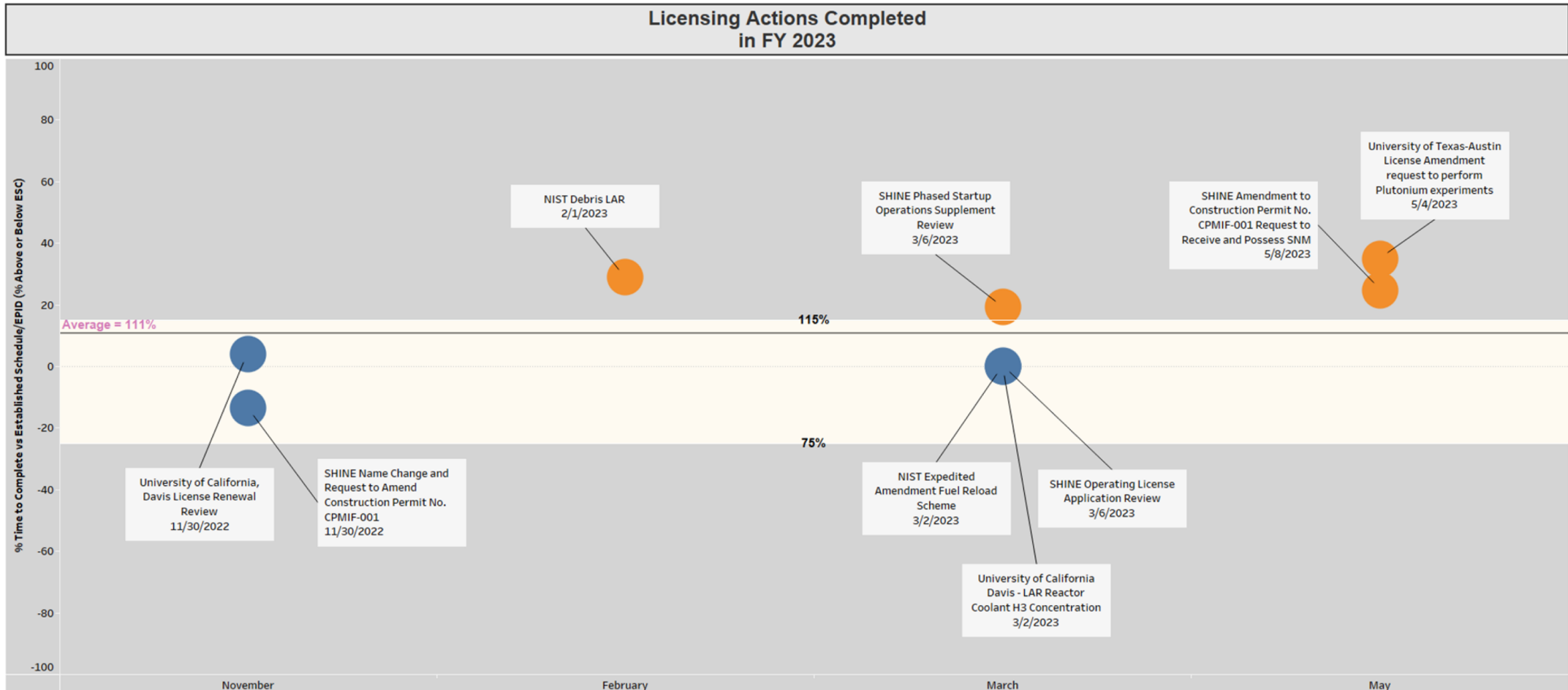
- Authorized NIST restart and issued multiple supporting LARs
- SHINE Operating License and Environmental Review
- Univ of California at Davis License Renewal
- UC Davis Reactor Coolant H3 Concentration LAR
- Univ of Texas at Austin Plutonium Experiments LAR



Some of the ongoing projects

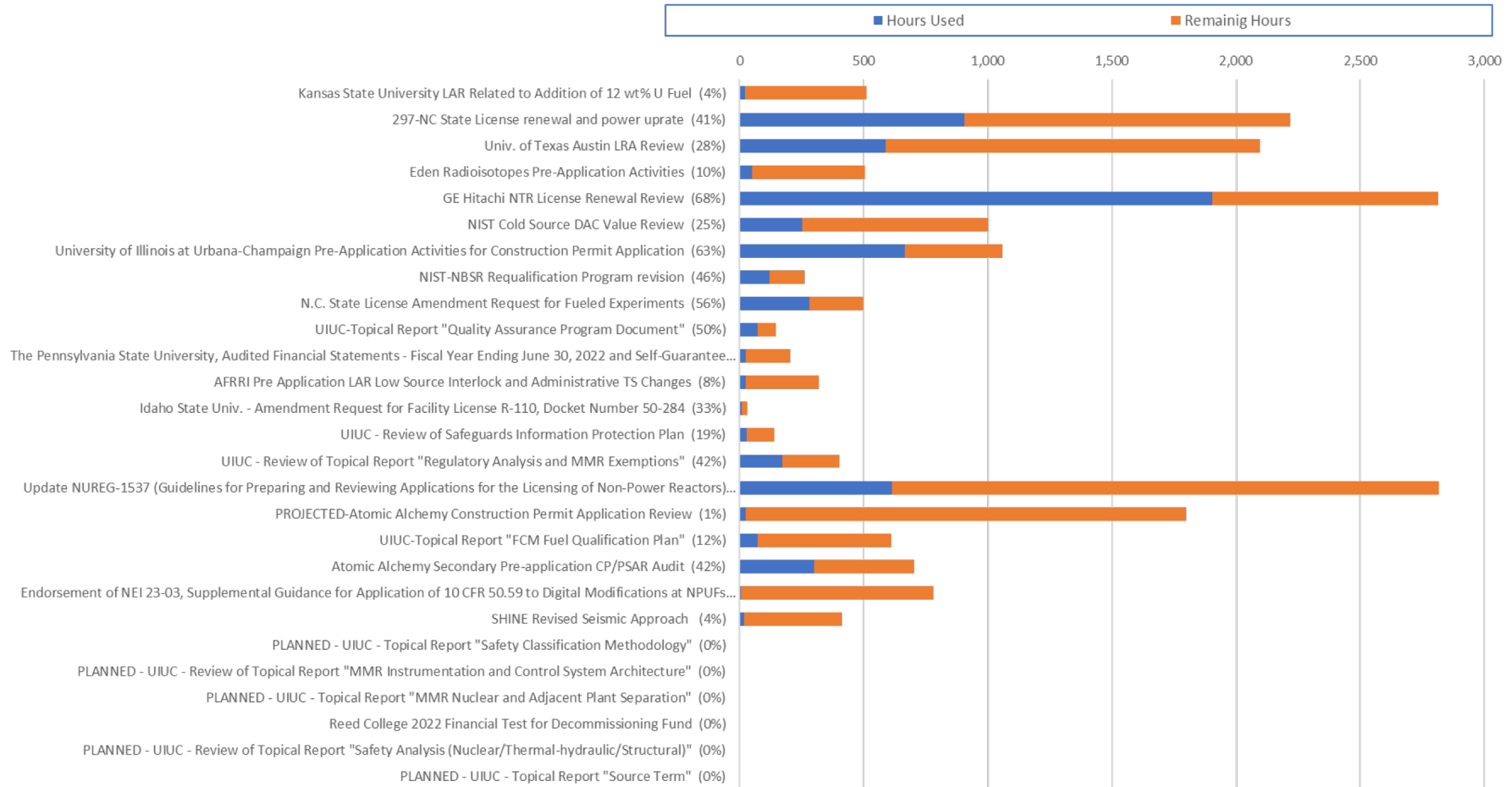
- Univ Texas, NC State, and GE License Renewals (near completion)
- NC State license for fueled experiments
- Atomic Alchemy pre-application Activities
- UIUC pre-application activities
- Kairos Hermes and Abilene Christian Univ construction permit and environmental review applications
- Review to endorse NEI 23-03 on 10 CFR 50.59 changes for digital applications as a supplement to NEI 21-06.
- Enhancements to update NUREG-1537
- Indirect license transfer from GE Company to GE-Vernova
- Information Notice

Licensing Actions - Timeliness



Licensing Actions - Hours

Current Work Load & Level of Effort





NIST Test Reactor Restart

- NIST completed activities necessary to restart, and the NRC issued a letter authorizing restart on March 9, 2023
- License amendment 14 was issued on February 1, 2023, approving revisions to the FSAR related to a small quantity of debris remaining in the primary coolant system following cleanup efforts
- NIST increased monitoring of coolant and confinement air samples detected low levels of fission products which remain below reporting requirements
- Increased oversight (inspections) continues, related to long-term actions with a focus on efforts to improve facility safety culture as part of the confirmatory order



SHINE Operating License Review

- Safety Evaluation issued in Feb. 2023
 - ACRS issued letter in Dec. 2022 recommending issuance of operating license
- Final Environmental Impact Statement issued in Jan. 2023
- Issued permit amendment in Apr. 2023 for SHINE to receive and possess special nuclear material in the form of neutron detectors to support facility construction
- Construction of the facility is ongoing
 - Issued an Order in Nov. 2022 extending the latest date of construction completion to Dec. 2025
- NRC continues to provide construction oversight and perform inspections



Information Notice on Recent Human Performance Issues at NPUFs

- Information Notice on Safety Culture events at NRC-licensed NPUFs issued this month.
- Highlighted public information on events at several NPUF licensees that were attributed, at least in part, to procedure and human performance issues.
- Solicited and incorporated applicable comments.
- Acknowledges that many of the issues identified in the Information Notice were "identified through an event," or self-revealed and corrected by the licensees.
- Intended to inform recipients to consider actions, as appropriate, to avoid similar problems. No NRC response is required.



NUREG-1537 Guidance Updates

- An infrastructure update to guidance for licensing NPUFs
 - guidance updates based on recent reviews to facilitate better applications and staff reviews
 - Splitting 1996 version into 5 volumes to better address unique technology
 - Volume 1 – Heterogeneous reactors
 - Volume 2 – Aqueous fueled systems
 - Volume 3 – Radioisotope production facilities
 - Volume 4 – Molten salt facilities
 - Volume 5 – Environmental reports
- not intended to significantly change the existing guidance unless it is truly needed (fatal flaw).
- The goal is to use stakeholder input to improve the guidance
 - remain risk-informed
 - cognizant of the difference in safety-significance between a power reactor and an NPUF
 - within the spirit of minimum regulation
- Volumes will be published for public comment one-at-a-time beginning with Volume 1, Part 1 and 2



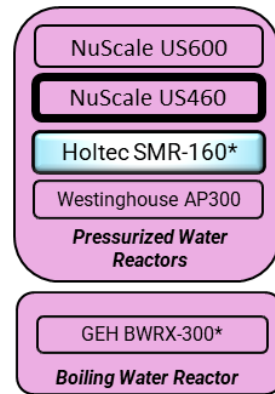
Proposed Guidance on the 50.59 Process for digital applications (NEI 23-03)

- The Nuclear Energy Institute submitted NEI 23-03, “Supplemental Guidance for Application of 10 CFR 50.59 to Digital Modifications at Non-power Production or Utilization Facilities”
 - Submitted on behalf of TRTR for endorsement
 - Submitted as a supplement to NEI 21-06, “Guideline for 10 CFR 50.59 Implementation at Non-power Production or Utilization Facilities”
- NRC staff started its review the week of May 29, 2023
 - Holding monthly public meetings with TRTR members
 - Review schedule is based on an eight month review
- Use of NEI 23-03 during the NRC’s review for endorsement is at the discretion of the Non-Power Production or Utilization Facility (NPUF) licensees.
 - Any such use is at the licensee’s risk until any regulatory guide endorsement is published

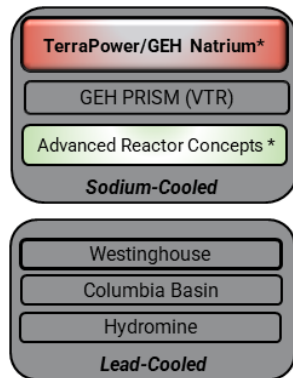
Advanced Reactor Reviews

Advanced Reactor Landscape

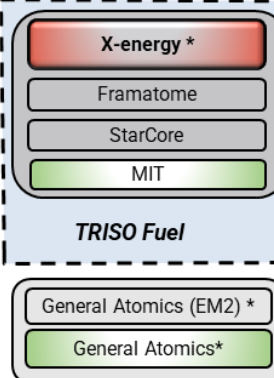
Small Modular Light Water Reactors (SMR)



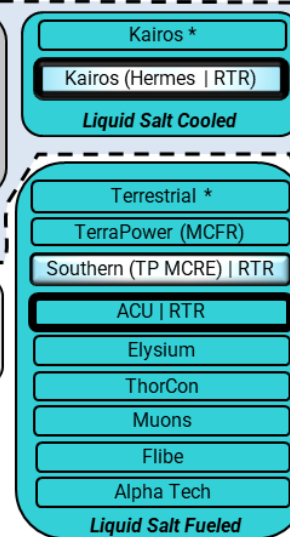
Liquid Metal Cooled Fast Reactors (LMFR)



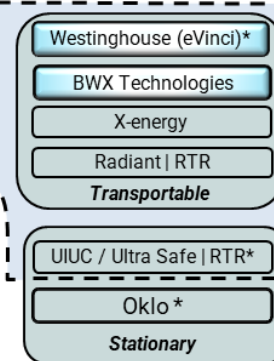
High-Temperature Gas-Cooled Reactors (HTGR)



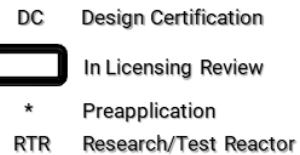
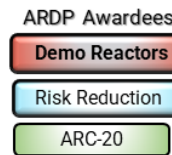
Molten Salt Reactors (MSR)



Micro Reactors

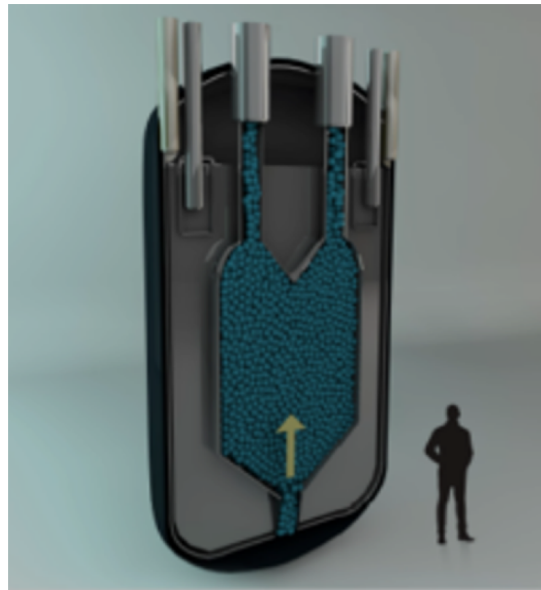


LEGEND





Kairos Power- Hermes Test Reactor



LEARN MORE

- Kairos Hermes [review webpage](#)

DESIGN FEATURES

- 35 MWth test reactor for technology development
- Fluoride salt-cooled high temperature reactor using TRISO fuel in a pebble bed configuration

APPLICATION REVIEW STATUS

- Construction Permit (CP) Application submitted in Sep 2021 / docketed in Nov 2021
- Safety Evaluation completed in April 2023

NEXT MILESTONES

- Final Safety Evaluation of the Hermes CP application and Final Environmental Impact Statement by Sep 2023
- Mandatory Hearing

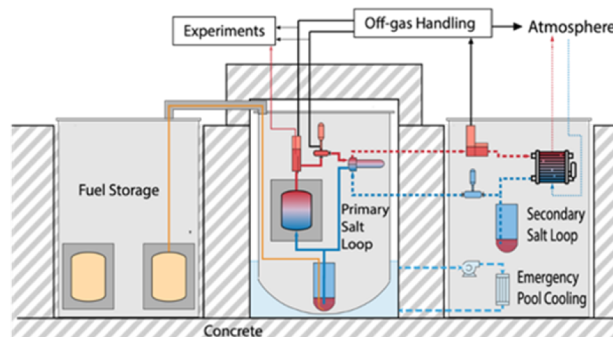


Abilene Christian University - MSRR



DESIGN FEATURES

- Molten Salt Research Reactor (MSRR)
- Less than 1 MWth – used for researching molten salt fuel and reactor characteristics
- Liquid-fueled – uranium dissolved in molten salt



APPLICATION REVIEW STATUS

- Construction Permit Application submitted in Aug 2022 / docketed in Nov 2022
- Several review audits ongoing / developing Draft Safety Evaluation

NEXT MILESTONES

- Draft Environmental Assessment – Oct 2023
- Advanced Safety Evaluation - Jan 2024
- Final Safety Evaluation and Environmental Assessment by May 2024

LEARN MORE

- ACU - MSRR [review webpage](#)



We make the safe use of nuclear technology possible

DANU is committed to continually improving to achieve this goal:

- Risk informed decisions
- New and improved processes
- Metrics to benchmark progress
- Enhanced tools to track projects



Commitment to TRTR and Current Challenges

- The nuclear industry is undergoing rapid change
- DANU staff is reviewing new designs, new applicants, and different technology
- DANU remains committed to efficiently licensing the existing research and test reactor fleet
- DANU remains committed to reviewing licensing actions in a timely fashion to support licensees' missions to conduct research and education
- Contact your PM to understand changes!



Opportunities to Continue Improving

- UNPL is conducting planning activities for 2025 and beyond
- Advanced notice of potential licensing actions would help the NRC in planning, so that we have the right resources available to conduct reviews
- Let us know during Q&As or in breakout sessions:
 - How NRC can enhance regulatory certainty
 - Suggestions for improvement



Contact Info:

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Facility Licensing

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