



## 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 Borromeo, 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

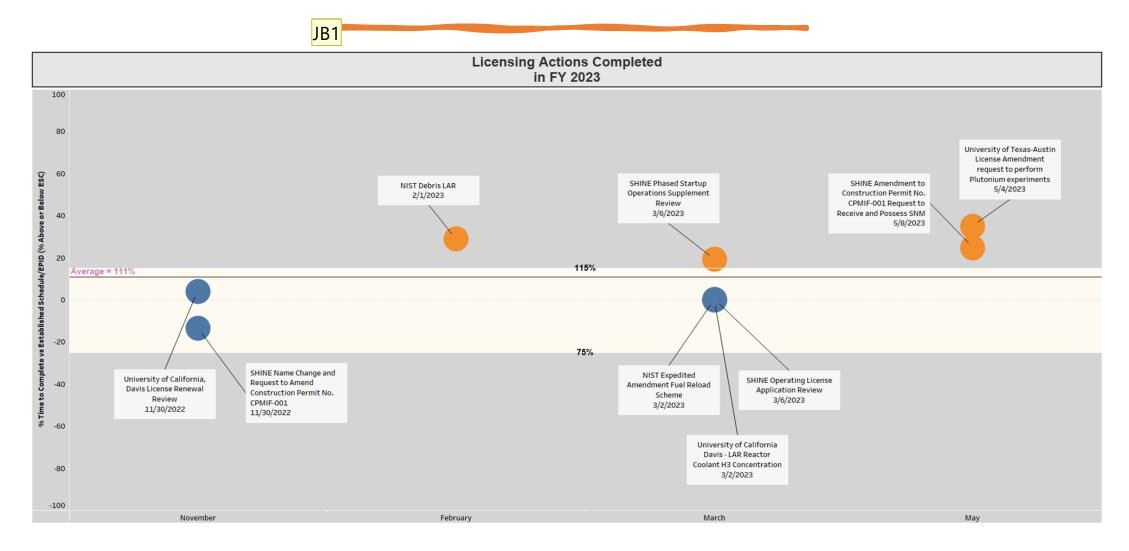
- Authorized NIST restart and issued multiple supporting LARs
- SHINE Operating License and Environmental Review
- Univ of California at Davis License Renewal
- UC Davis Reactor Coolant H3 Concentration LAR
- Univ of Texas at Austin Plutonium Experiments LAR



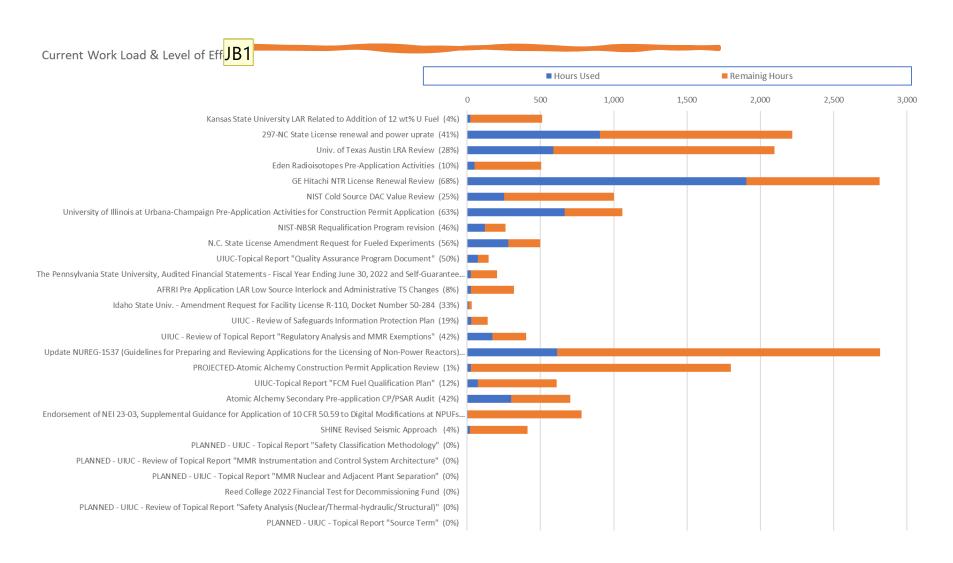
#### Some of the ongoing projects

- 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 PB3 ene 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-CM2
- Indirect license transfer from GE Company to GE-Vernova
- Information Notice

# Licensing Actions - Timeliness



### Licensing Actions - Hours





#### 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

JB<sup>\*</sup>

- 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 NRClicensed 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

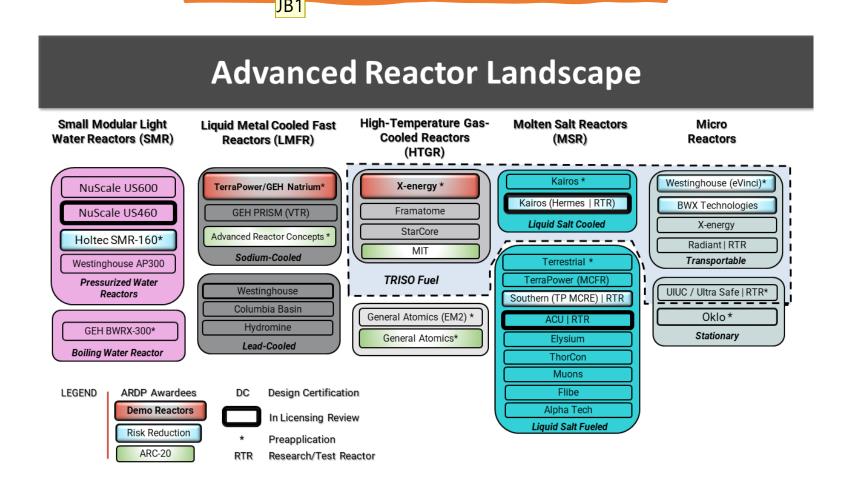
- An infrastructure update to guidance for licensing NPUFs
  - guidance updates based on recent reviews to facilitate better applications and staff reviews
  - Splitting 1996 version into 5 volumes to better address unique technology
    - Volume 1 Heterogeneous reactors
    - Volume 2 Aqueous fueled 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
  - cognitive 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)

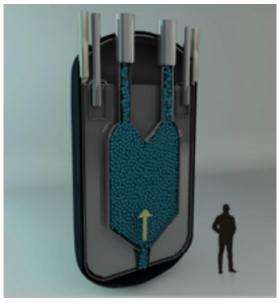
- The Nuclear Energy Institute submitted NEI 23-03, "Supplemental Guidance for Application of 10 CFR 50.59 to Digital Modifications at Non-power Production or Utilization Facilities"
  - Submitted on behalf of TRTR for endorsement
  - Submitted as a supplement to NEI 21-06, "Guideline for 10 CFR 50.59 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





#### Kairos Power- Hermes Test Reactor



#### **LEARN MORE**

o Kairos Hermes <u>review webpage</u>

#### **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

# Fuel Storage Primary Secondary Salt Loop Emergency Pool Cooling

#### **APPLICATION REVIEW STATUS**

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

#### LEARN MORE

o ACU - MSRR review webpage

#### **NEXT MILESTONES**

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



# 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

