

FY23 LLNL NCSP Overview and Accomplishments

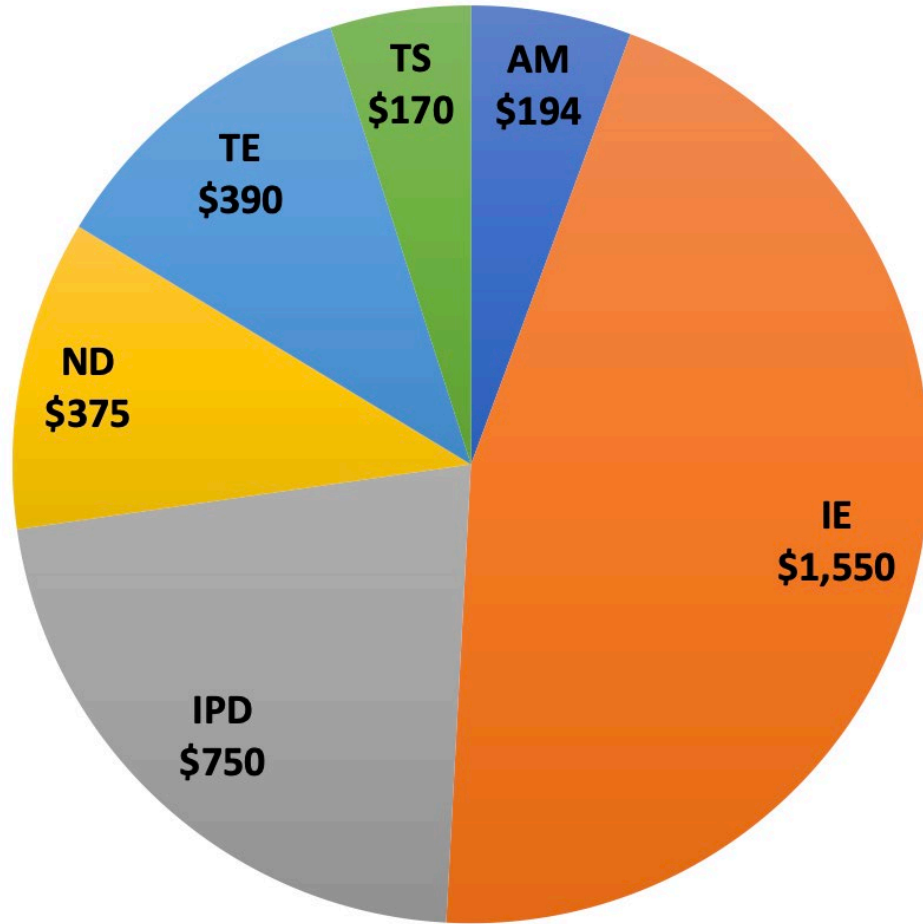
Presented at the FY23 NCSP Technical Program Review

February 20, 2024

Catherine Percher, LLNL NCSP Task Manager



FY23 LLNL Budget Information- \$3.429M



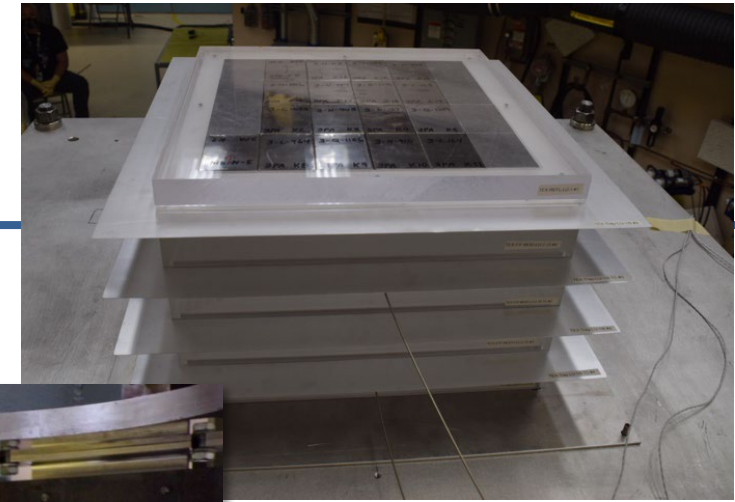
LLNL Budget by Element, \$K

Year	Carryover (\$K)
FY22	\$719
FY23	\$405

2023 Major IE Accomplishments

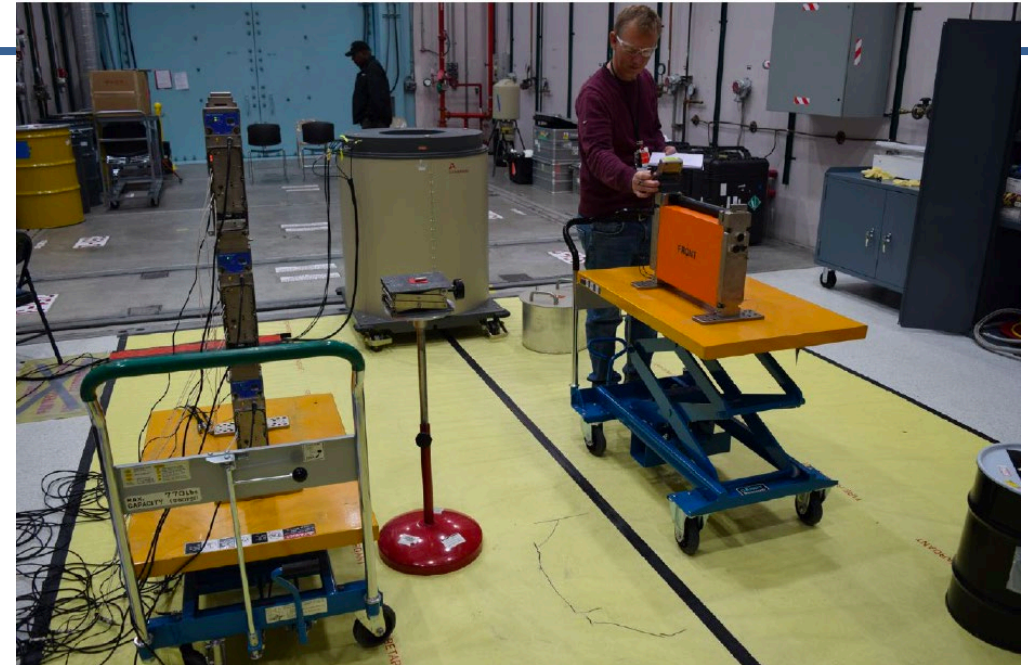
Thermal-Epithermal eXperiments (TEX)

- **MIHL**- Submitted fourth TEX benchmark to ICSBEP (TEX-Pu for Thermal Scattering Law), closing out the IER (C. Percher presentation)
- **MIHL**- Completed final three TEX-HEU experiments at NCERC incorporating hafnium, high priority for Naval Reactors partners
- **MIHL**- Began testing with vacuum chamber and chiller set-up for Low Temperature TEX experiments and published results (E. Aboud/J. Glesmann presentation)
- Completed Final Design for IER 499 (TEX-HEU with Chlorine) incorporating containerized and compacted NaCl as the chlorine-bearing material of choice (A. Aboud Presentation)



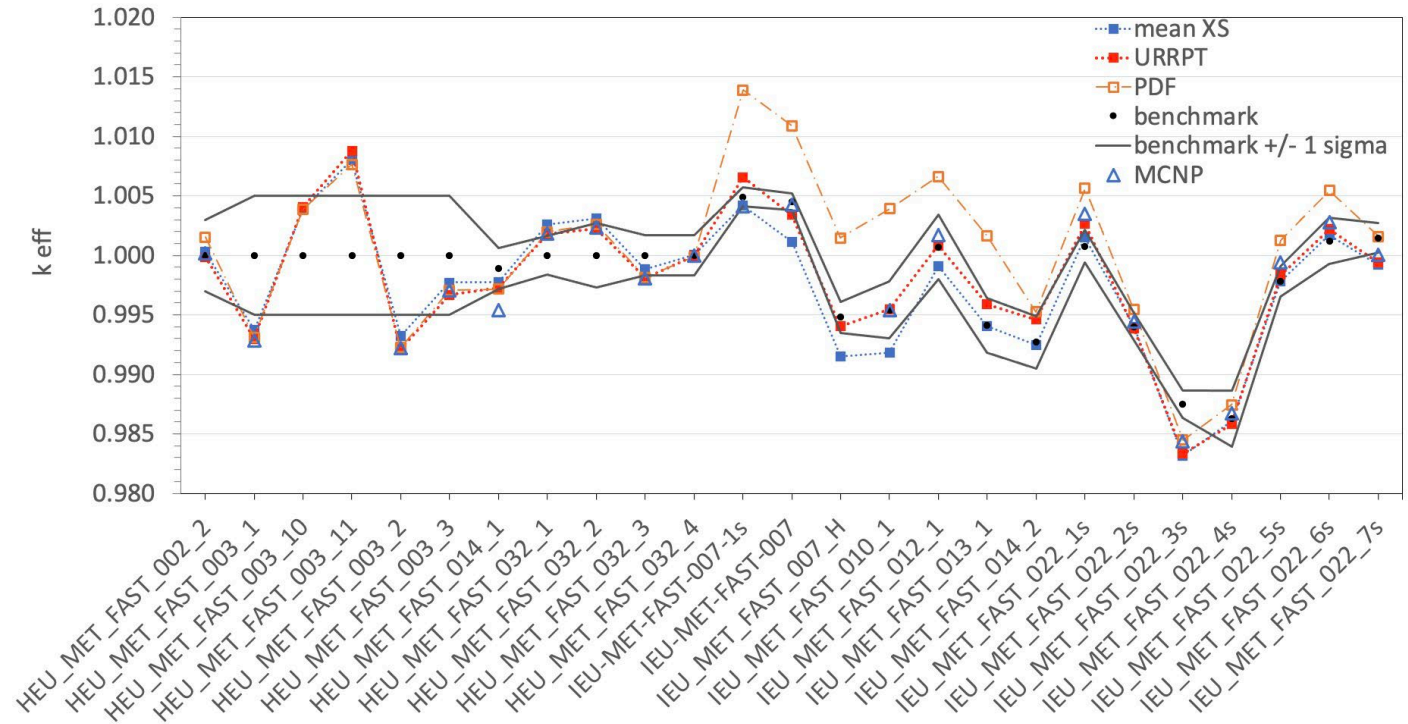
2023 Major IE Accomplishments (continued)

- **MIHL**- Resumed 5 Year Measurement Campaign of Nuclear Materials with the Atomic Weapons Establishment at DAF- two measurement campaigns (S. Varghese presentation)
- Completed Experimental Execution Report for IER 518: High Multiplication Subcritical Measurements at SNL (J. Norris presentation)
- Completed Armed Forces Radiobiology Research Institute (AFRRI) reactor field characterization in advance of 2024 international dose intercomparison exercise (A. Tamashiro presentation)



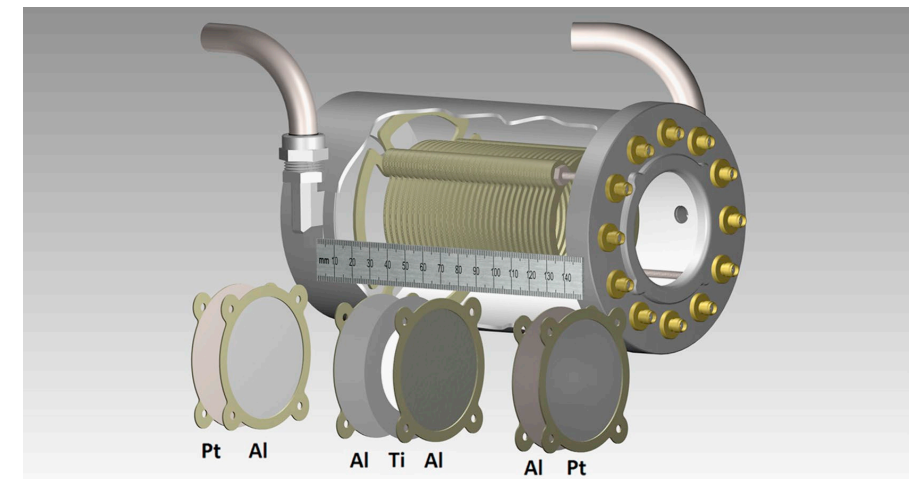
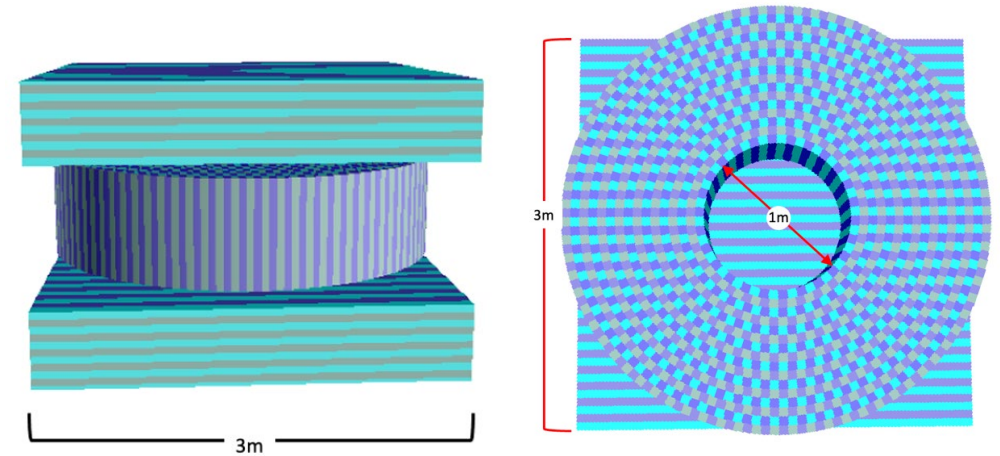
2023 Analytical Methods Accomplishments

- Extensively tested the ENDF-VIII.1 beta-2 release, including processing the full library with FUDGE at several temperatures for use in both continuous energy and multigroup transport applications
- Released Fudge-6.4 on Github
 - <https://github.com/LLNL/fudge>
- Completed additional COG benchmarks for international intercomparison
 - PU: 766 U233: 193 MIX: 356 HEU: 1054
 - IEU: 206 LEU: 807 SPEC: 10 β -eff: 32



2023 Nuclear Data Accomplishments

- Completed scoping study to evaluate ^6Li Doped Scintillator Array for Fission Correlation Studies
 - Capitalizes on PROSPECT detector design used for simultaneous measurements of gammas and neutrons
 - Investigated the effects of increasing the ^6Li loading in the EJ-309 scintillator by three times
 - T. Classen presentation
- Completed early procurements for Parallel Plate Avalanche Counter (PPAC) assembly for ^{233}U measurement at LANSCE



2023 Training and Education Accomplishments

- Provided lecture and experimental instruction for 2-week NCSP Hands-on Courses and 1-week Manager's course
- Collaborated with UC Berkeley Nuclear Engineering Department to teach a Nuclear Criticality Safety semester course as part of an NCS pipeline
 - Criticality evaluation term project
 - Hands-on approach to critical experiments using the LLNL Inherently Safe Subcritical Assembly
- S. Coleman won Best Poster at ICNC 2023 for work describing the criticality evaluation term project for the UC Berkeley course



2023 IPD Accomplishments

- Maintained NCSP Website, generated registration pages for meetings through CVENT, collaborated on Learning From Experience Database
- ICSBEP Activities (C. Percher presentation)
 - C. Percher is the ICSBEP Chair
 - Coordinated NCSP-relevant ICSBEP evaluation reviews, including independent review by LLNL of two evaluations
 - Provided editing and publication support for the 2022/2023 version of the ICSBEP handbook
- Pulsed Spheres Benchmark: Added additional physics details and experimental details based on unpublished reports (A. Tamashiro presentation)



NUCLEAR CRITICALITY SAFETY PROGRAM
U.S. DEPARTMENT OF ENERGY

NCSP Home Program Management Integral Experiments Nuclear Data Analytical Methods Information Preservation Training & Education Nondestructive Assay Program

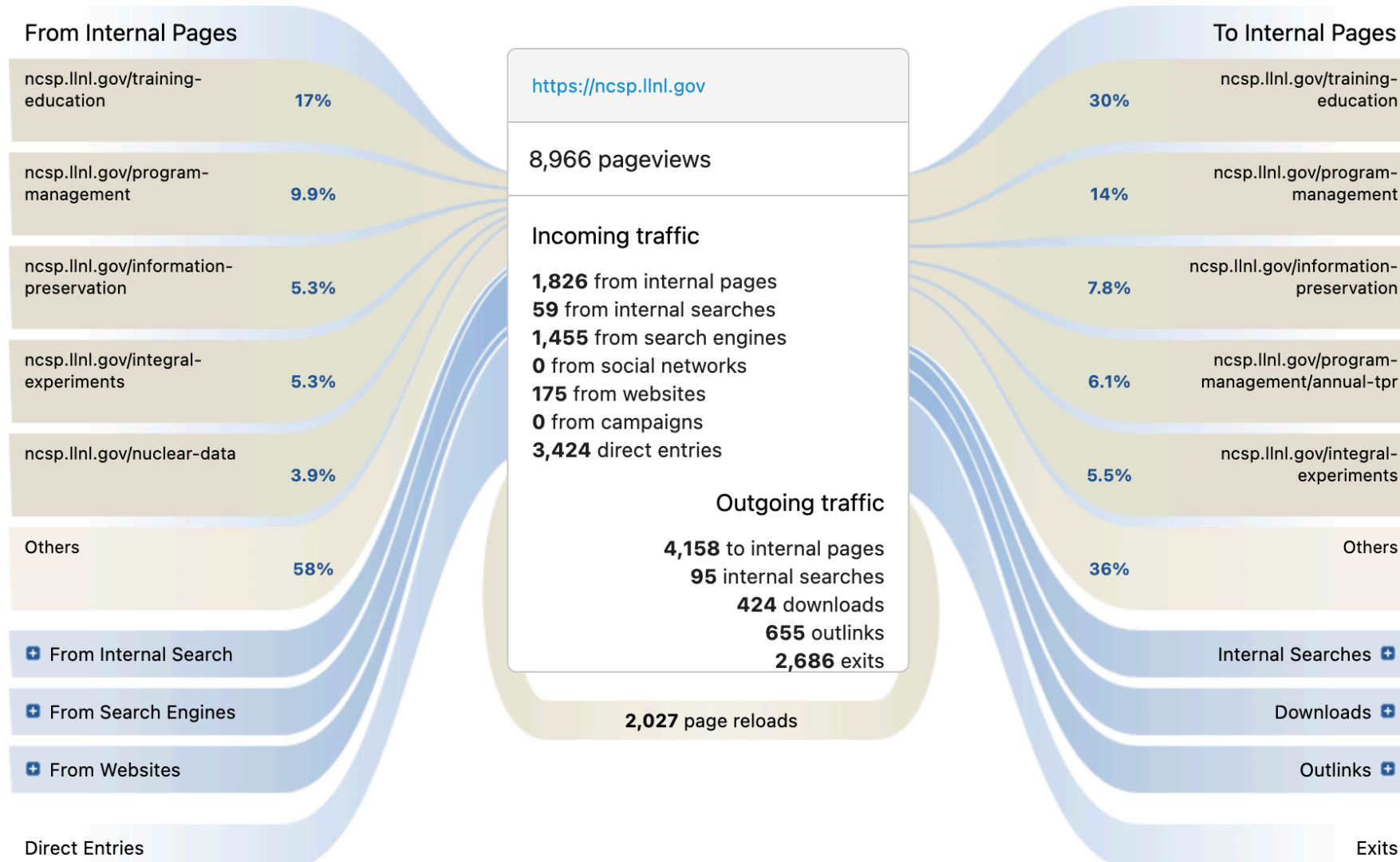
2024 Annual NCSP Technical Program Review
Hosted by Brookhaven National Laboratory
February 20-22, 2024

Hyatt Place Long Island/East End
451 East Main Street
Riverhead, NY

Find out more



FY23 NCSP Website Statistics- Up 20% Over FY22





Disclaimer

This document was prepared as an account of work sponsored by an agency of the United States government. Neither the United States government nor Lawrence Livermore National Security, LLC, nor any of their employees makes any warranty, expressed or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States government or Lawrence Livermore National Security, LLC. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States government or Lawrence Livermore National Security, LLC, and shall not be used for advertising or product endorsement purposes.

This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under contract DE-AC52-07NA27344. Lawrence Livermore National Security, LLC