

# Brief Overview of the DOE/NNSA Nuclear Criticality Safety Program

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ORNL is managed by UT-Battelle, LLC for the US Department of Energy



# Background / History–Mission Vision–Organization

## Early history

- Defense Nuclear Facilities Safety Board (DNFSB) Recommendations:
  - 93-2 (3/23/1993): Need for a general-purpose critical experiment capability that will ensure safety in handling and storage of fissionable material.
  - 97-2 (5/19/1997): Need for improved criticality safety practices and programs to alleviate potential adverse impacts on safety and productivity of DOE operations.
- DOE Implementation Plan for 93-2 and 97-2 recommendations resulted in establishment of the US NCSP



Defense Nuclear Facilities Safety Board

## NCSP 5-year plan

### Mission

Provide sustainable expert leadership, direction and the technical infrastructure necessary to develop, maintain, and disseminate the essential technical tools, training, and data required to support safe, efficient fissionable material operations within DOE.

### Vision

Continually improving, adaptable, and transparent program that communicates and collaborates globally to incorporate technology, practices, and programs to be responsive to the essential technical needs of those responsible for developing, implementing, and maintaining nuclear criticality safety.

**FY23 Budget \$29.08M**



<https://ncsp.llnl.gov/>

## NCSP organization



**TS** – Technical Support

**MT** – Management team

**TMs** – Task managers

**CSSG** – Criticality Safety Support Group

**CSCT** – Criticality Safety Coordinating Team

**NDAG** – Nuclear Data Advisory Group

# Technical Program Element Activities

**SCALE**

**AMPX**

**MCNP6**

**NJOY**

**AM**

**ND**

**IPD**

**NCSP  
Goals**

**TE**

**IE**

**TS**

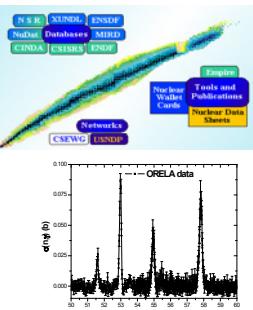
Succession  
Planning



**NDA  
Program**



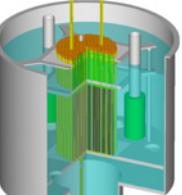
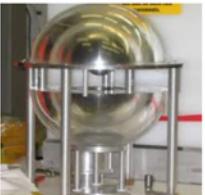
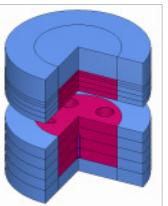
Program  
Execution



**SAMMY**



**linac**  
The Gaerttner LINAC Center

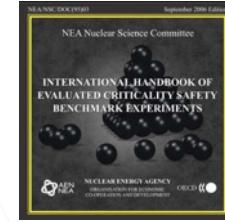


**MCNP6**

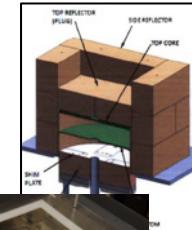
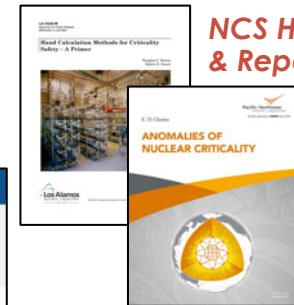
**AM**

**NJOY**

**ICSBEP**



**NCSP Website**  
<https://ncsp.llnl.gov>



# Current NCSP Work Sites



# 2022 NCSP TPR Best Paper Award Winners

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## **Preliminary Chlorine Worth Study Benchmark Evaluation**

1:00–1:20PM MST

Jeffrey A. Favorite (LANL), Theresa E. Cutler (LANL), Travis J. Grove (LANL)

 [Summary](#)

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## **ORNL Neutron Cross Section Measurements of 90Zr**

1:20–1:40PM MST

Klaus H. Guber (ORNL)

 [Summary](#)

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## **Four New Plutonium Thermal Epithermal eXperiments (TEX) Critical Configurations Optimized to Test Thermal Scattering Laws**

1:40–2:00PM MST

Catherine M. Percher (LLNL), Mark A. Lee (C.S. Engineering), Rene G. Sanchez (LANL), Travis J. Grove (LANL), Joetta M. Goda (LANL)

 [Summary](#)

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## **TEX-HEU: Baseline Assemblies Benchmark and Results, HEU-MET-MIXED-021**

2:00–2:20PM MST

Jesse D. Norris (LLNL), David Heinrichs (LLNL), Catherine M. Percher (LLNL)

 [Summary](#)

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## **Design of Critical Experiments Targeting Epithermal Cross Sections of Tantalum**

2:20–2:40PM MST

David E. Ames (Sandia), Gary A. Harms (Sandia), Elijah Lutz (Sandia)

 [Summary](#)

# Questions

