



# The Purpose of the DOE/NNSA Nuclear Criticality Safety Program Technical Program Review

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February 20, 2024  
2024 NCSP Technical Program Review



## 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**



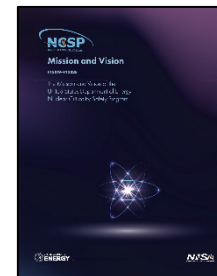
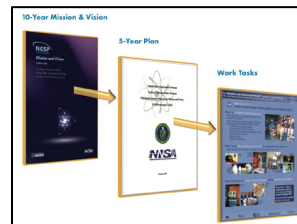
## NCSP 5-year plan

### Mission

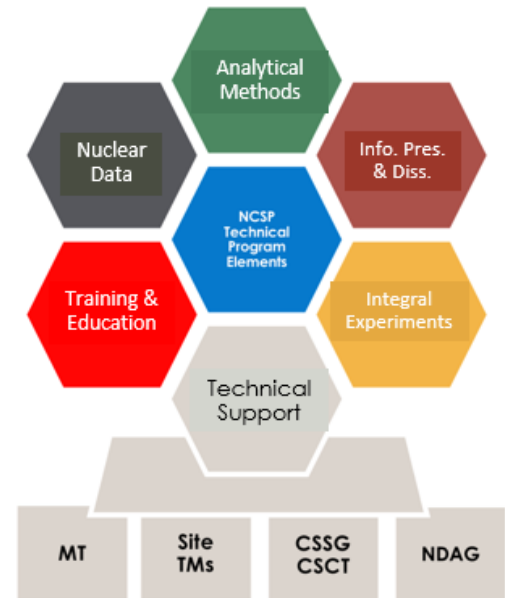
Provide sustainable expert leadership, direction and the technical infrastructure necessary to develop, maintain, and disseminate the essential technical tools, training, and data required to support safe, efficient fissionable material operations within DOE.

### 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.

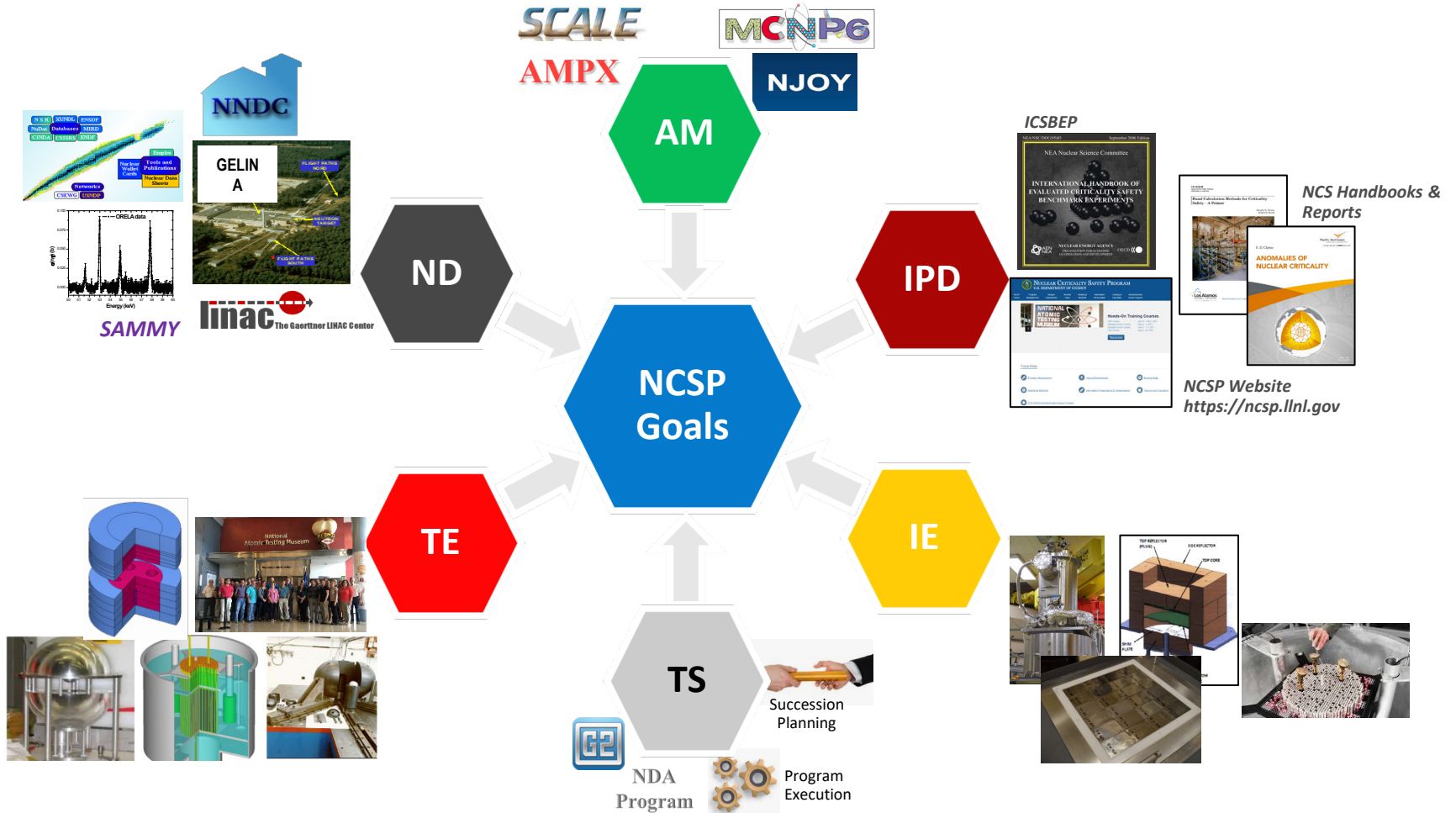


## NCSP Organization

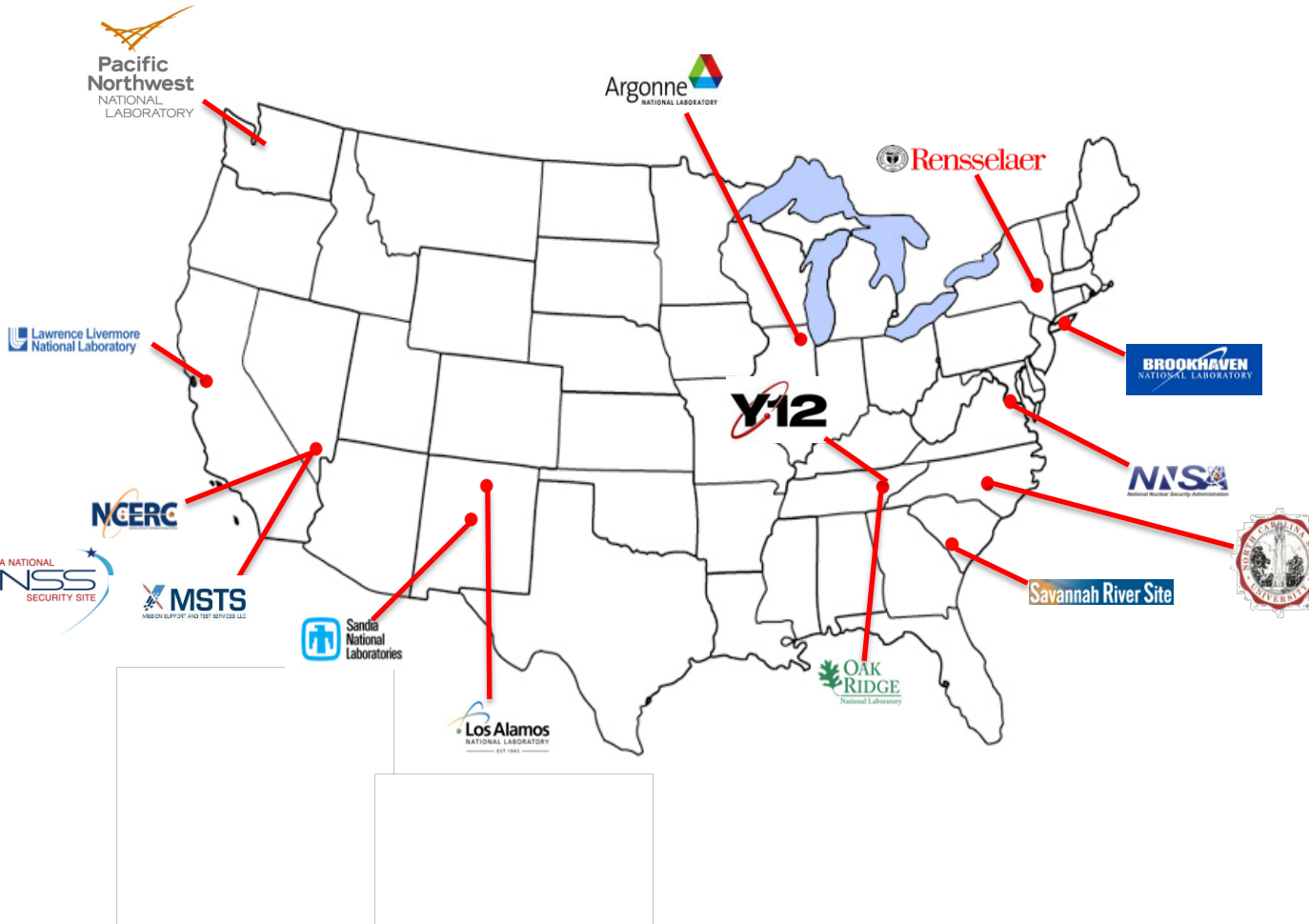


- TS – Technical Support
- MT – Management team
- TMs – Task managers
- CSSG – Criticality Safety Support Group
- CSCT – Criticality Safety Coordinating Team
- NDAG – Nuclear Data Advisory Group

# Technical Program Element Activities




# Current NCSP Work Sites



# FY2023 DOE/NNSA Nuclear Criticality Safety Program (NCSP) Technical Program Review (TPR)



- TPR Agenda
  - FY 2023 CSSG Summary
  - Site Program Managers report FY23 budget, status report, and highlights to NCSP Manager Dr. Angela Chambers
  - International collaboration discussions: AWE, IRSN, CEA
  - Technical presentations by NCSP sites by technical program element
    - Invited talks (non-NCSP)
- Collaborations
  - Nuclear Data Advisory Group – Mike Zerkle (NNL), Chair



**NCSP Technical Program Review Meeting and Joint Meetings**  
**PRELIMINARY AGENDA**  
 Sandia National Laboratory  
 February 21-24, 2023

*Meeting agenda subject to change.*

Meeting	Date/Time (All times are Mountain Time)	Lead
<b>Tuesday, February 21, 2023</b>		
TECHNICAL PROGRAM REVIEW MEETING	8:00am – 5:00pm	Angela Chambers (NNSA) Doug Bowen (ORNL)
<b>Wednesday, February 22, 2023</b>		
TECHNICAL PROGRAM REVIEW MEETING	8:00am – 5:00pm	Angela Chambers (NNSA) Doug Bowen (ORNL)
<b>Thursday, February 23, 2023</b>		
TECHNICAL PROGRAM REVIEW MEETING	8:00am – 3:30pm	Angela Chambers (NNSA) Doug Bowen (ORNL)

**NUCLEAR CRITICALITY SAFETY PROGRAM (NCSP) TECHNICAL PROGRAM REVIEW**  
 February 21-24, 2023  
 Hosted by: Sandia National Laboratories  
 The Clyde Hotel, Enchantment Ballroom  
 Albuquerque, New Mexico

**AGENDA**

No.	Time (Monsday)	NCSP SITE	TOPIC/PRESENTATION TITLE	PRESENTER	DURATION (Min.)
<b>Tuesday, February 21, 2023</b>					
1	8:00	NCSP	Welcome from NCSP	Angela Chambers	0:30
2	8:10	SNL	Welcome from Sandia National Laboratory Management	Dr. David Epps, Senior Manager, Nuclear Facility and Applied Technologies	0:10
3	8:30	NCSP	The DOE/NNSA Nuclear Criticality Safety Program and the Purpose of the Technical Program Review	Doug Bowen	0:30
4	8:30	NCSP	Presentation on CSSG	David Hayes	0:15
<b>NCSP MANAGER INVITED SITE REPORTS</b>					
5	8:45	LANL		Joetta Goda	0:15
6	9:00	LLNL		Catherine Fischer	0:15
7	9:15	MSTI	Site Program Manager Discussions on the Following Topics: 1. FY23 Budget and Spending, 2. Provide Highlights for FY22 including AWR items, 3. Highlights for the technical talks to be given at this TPR	Sylvia Wright-Rieder	0:15
8	9:30	ORNL		Doug Bowen	0:15
9	9:45	PNNL		Travis Zipperer	0:10
10	9:55	PPH		Yaron Danon	0:15
<b>Break (Refreshments)</b>					
10:30					
11	10:25	SNL		Gary Herms	0:15
12	10:40	SRS	Site Program Manager Discussions (Continued)	David Erickson	0:10
13	10:50	V-12		Kevin Reynolds	0:10
14	11:00	BNL		Gustavo Nebre	0:15
<b>INTERNATIONAL COLLABORATIONS</b>					





- NCSP TPR held at the Clyde Hotel in Albuquerque, NM
  - Hosted by Sandia National Laboratory
  - 108 registered attendees
- First post-COVID in-person TPR
- Presentation summary
  - 80 presentations
    - non-technical presentations
    - Status reports from international collaborators
      - AWE, IRSN, JRC/GEEL, & CEA
    - Technical presentation and task manager status reports
    - 5 invited talks



**2023 NCSP TPR  
Participants**



- 2023 ANS Winter Meeting – Washington, DC
  - Angela Chambers chose 5 TPR presentations as “best papers”
  - These authors were invited to prepare full paper summaries and presentations for the ANS Nuclear Criticality Safety Division “Recent Nuclear Criticality Safety Program Technical Accomplishments” session
  - Congratulations for all these authors!

## Papers

### Progress Towards the Reality of Low-Temperature Critical Experiments with Low-Temperature TEX

1:00–1:20PM EST

Eric About (LLNL), Jesse Norris (LLNL), Catherine Percher (LLNL), Nick Killingsworth (LLNL), Paul Yap-Chiongco (LLNL), Venkata Ravindra (National Nuclear Laboratory), Alfie O’Neill (National Nuclear Laboratory), Deborah Hill (National Nuclear Laboratory), Steve Graham (National Nuclear Laboratory)

 [Paper](#)

 [Presentation Slides \(Admins Only\)](#)

### Development of Shielding Benchmarks Using the Godiva IV Assembly

1:20–1:40PM EST

Riley Cumberland (ORNL)

 [Paper](#)

 [Presentation Slides \(Visible to Attendees\)](#)

### Critical Experiments Targeting the Epithermal/Intermediate Cross Sections of Tantalum

1:40–2:00PM EST

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

 [Paper](#)

### Godiva IV Burst Reproducibility and Diagnostic Testing

2:00–2:20PM EST

Joetta M. Goda (LANL), Travis Grove (LANL), Bruce Pierson (PNNL), Danielle Redhouse (Sandia), Robert A. Weldon Jr. (LANL)

 [Paper](#)

### Preliminary Analysis of the LLNL Measurements for the Joint LLNL, LANL, and IRSN High Multiplication Subcritical Measurements

2:20–2:40PM EST

Jesse Norris (LLNL)

 [Paper](#)

- Thank you!
  - Brookhaven National Laboratory (BNL) for hosting this year's TPR
  - Cat Dunn & Letty Krejci, Gustavo Nobre, & David Brown, Primary TPR organizers from BNL
  - Marsha Henley, NCSP Management Team POC for the TPR
  - Pam Williams, LLNL – NCSP website POC
- TPR “rules”
  - TPR scheduled 8am - 5pm each day
  - Most presentations are 15 min. long; a few are shorter
  - **The purpose provide the NCSP Manager, Dr. Angela Chambers, a status report of FY23 work**
  - Dr. Chambers will select the top 5 or 6 papers as “best papers”
    - Those chosen will be invited to submit a paper summary at the 2024 Winter ANS meeting for the “NCSP Technical Accomplishments” NCSD Session at NCSP expense
- Doug or Marsha can assist with side-bar meetings with the NCSP manager



# Questions

