

ORNL NCSP Training and Education Support for FY2023

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2024 NCSP Technical Program Review

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U.S. DEPARTMENT OF
ENERGY

ORNL Approved Training and Education Tasks for FY2023

ORNL Training and Education (TE) Tasks	Budget (\$K)
ORNL-TE1	
Manage and Provide Instruction for the DOE Nuclear Criticality Safety Training and Education Program	240
ORNL-TE11	
Revision of the LA-12808 Nuclear Criticality Safety Guide	Carryover
ORNL-TE14	
Nuclear Criticality Safety Training and Pipeline Development	100
Grand Total	340

ORNL TE1—Manage and Provide Instruction for the DOE Nuclear Criticality Safety Training and Education Program

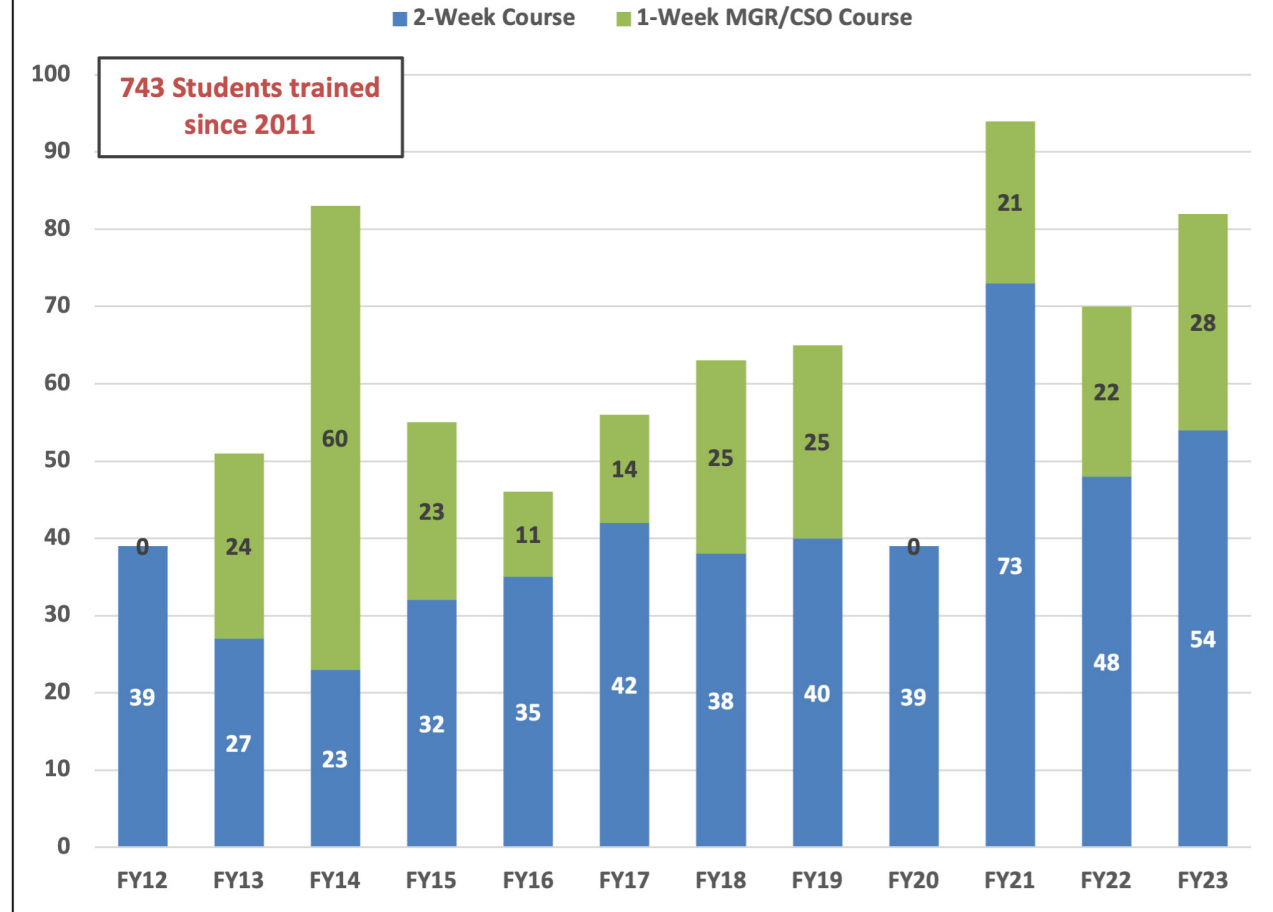
- Q1
 - Archived FY 2022 course materials in accordance with the course procedure
 - Planning for the 2-week hands-on course in Jan 2023 was initiated
- Q2
 - Planned and executed the 2-week Hands–on course (26 NATM/13 Sandia/14 NCERC) from Jan. 23 – Feb. 02, 2023
 - One student attended Sandia portion due to failing course the in FY2022
 - Planning for the 1-week Sandia Manager/CSO course in April 2023 was initiated
- Q3
 - Planning for the 1-week NCERC Manager/CSO course in June 2023 was initiated
 - 1-week CSO/Manager Sandia course completed on schedule April 17-21, 2023, for 15 students
 - 1-week CSO/Manager NCERC course completed on schedule June 5-9, 2023, for 13 students
- Q4
 - Planned and executed the 2-week Hands–on course (29 NATM/15 Sandia/12 NCERC) from Aug. 7 – 18, 2023
 - One student became sick with COVID and another had a family illness and had to leave the second week

**743 Students trained through
FY23Q4 since 2011**

NCSP Training and Education Course Statistics

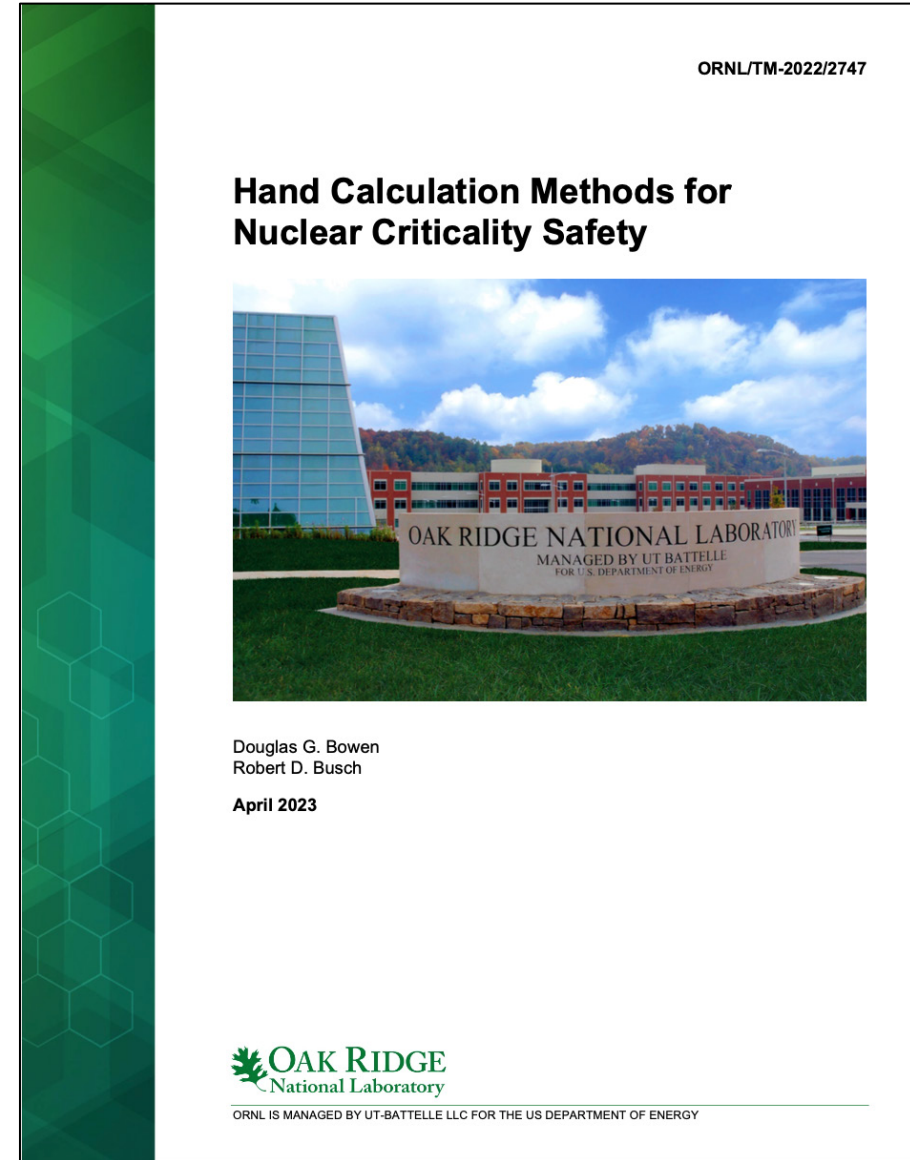
- Capacity for the 2- week course
 - 16 students at Sandia
 - 15 students at NCERC
- Capacity for the 1-week MGR/CSO course is
 - 16 students at Sandia
 - 15 students at NCERC
- FY2023 total capacity
 - 2-week course x 2 courses per year: 62
 - 1-week course x 2 courses per year: 31
- FY2024
 - Offering an additional MGR course at Sandia/NCERC
 - Allows for 62 total students in this course
 - Total capacity for both courses:
 - 124 students per year

NCSP Training Course Attendance Summary



ORNL TE3—Hand-Calculation Primer Expansion, ORNL/TM-2022-2747

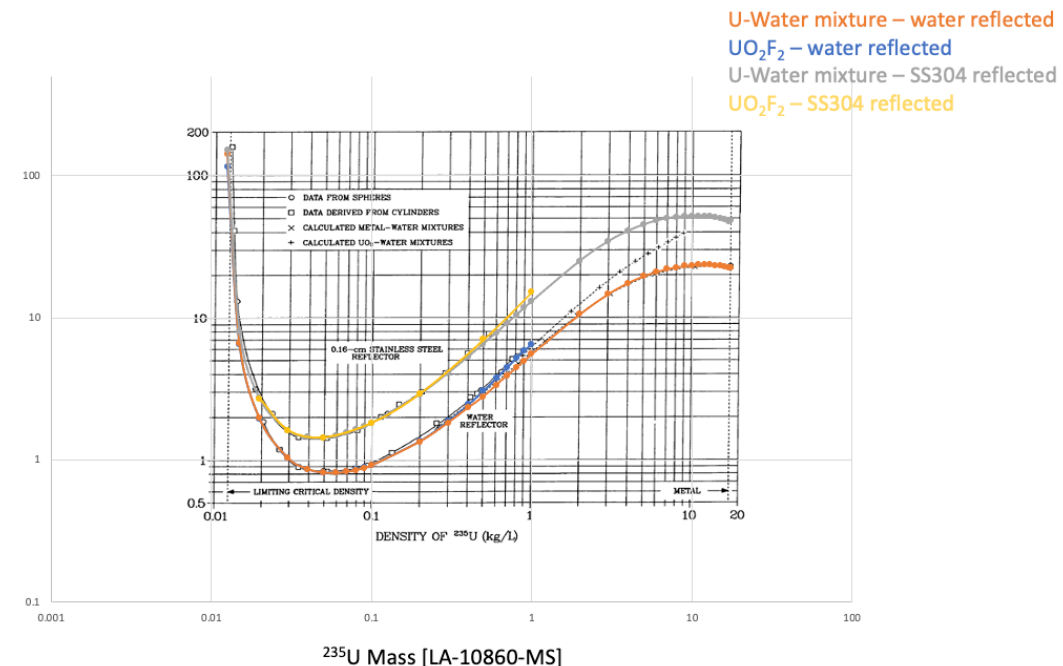
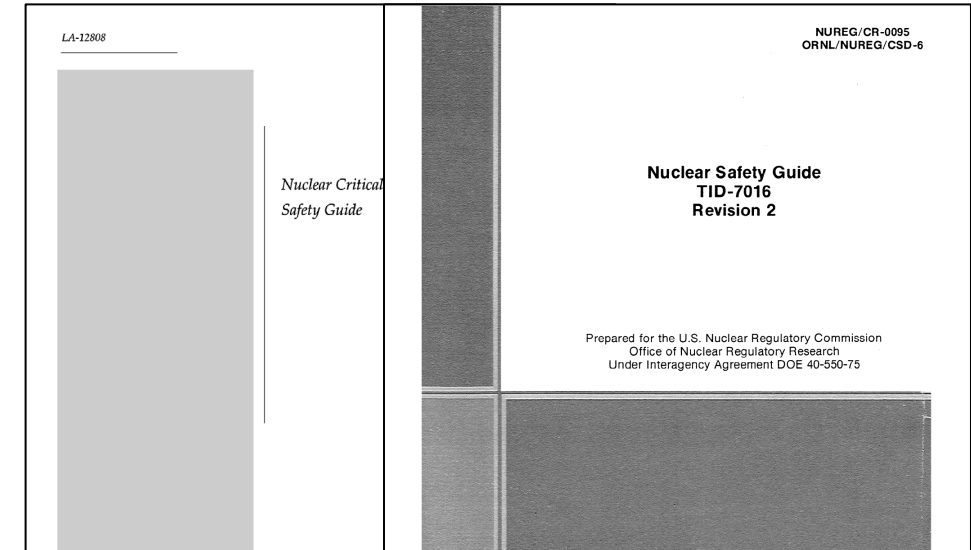
- **Status:** Complete
- Document completed in FY2022 – ORNL external review completed in April 2023
- Website complement completed and provided to LLNL for an addition to NCSET module #9 for Hand Calculations*
- Addition of new example problems in progress for typical NCS applications (single-unit and array problems)
- Solid angle method chapter has been revised due to variability of applicability
- Web-based sample problem complement completed in FY2023
 - All data needed to complete a problem will be available
 - HTML format—to be linked to NCSP website (NCSET modules) and linked to the NCSP training course
 - Graduate student work delayed by COVID-19 and transition to a new purchase order system
- NCSD topical paper submitted
- Follow-on papers on hand calculations to be published by authors



* Issues with implementation on NCSP website

ORNL TE1 1—Revision of the LA-12808 Nuclear Criticality Safety Guide

- In progress using carryover funding – delayed
- Contents
 - New subcritical limits
 - Updated critical mass curves for ^{233}U , ^{235}U , and ^{239}Pu
 - Standards-driven outline
 - Use of modern references and experiences
 - Focus on the importance of conduct of operations and how this can impact process analysis



ORNL TE14—Nuclear Criticality Safety Training and Pipeline Development (university proposal)

- Walid Metwally will provide a detailed presentation on this ORNL task
- Goal – speed up T&Q process at DOE sites
 - All DOE sites should benefit from this program
- Phase 1 – Program development
 - Outline the certificate program
 - Lecture material development
 - Record lectures
 - Material review
 - Website development
 - Exercise development
- Phase 2 – Hands-on training development
 - Recruiting
 - Course delivery
 - Student travel for hands-on training at Sandia, NCERC or the ORNL subcritical assembly



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