

Reactor Safety Curriculum Center of Excellence

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Program: Nuclear Reactor
Safety Training and
Workforce Development
Program

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ABSTRACT:

The Tennessee Valley stretches across seven states (Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee, and Virginia) and is a national leader in nuclear energy research, development, and deployment, hosting over 229 nuclear-related companies in the State of Tennessee alone¹. According to E4 Carolinas the nuclear industry in the Tennessee Valley region provides over 40,000 jobs and nearly \$10 billion in yearly economic impact². These companies will contribute to continued growth in workforce demand. For example, the Tennessee Valley Authority (TVA) operates three multi-unit nuclear plants: Browns Ferry, near Athens, Alabama, Sequoyah, in Soddy-Daisy, Tennessee, and Watts Bar, near Spring City, Tennessee, and is moving forward with plans for the construction and operation of a fleet of Small Modular Reactors (SMR). It is necessary to make sure nuclear reactor safety training has the highest focus and priority within the entire nuclear workforce. **The objective of this Topic Area 2 proposal is to meet nuclear reactor safety educational and workforce development goals through establishing curriculum that directly leads to industry recognized credentials in nuclear reactor safety.**

Nuclear reactor safety is central to the goals of the nuclear industry. Local industry, including the TVA and United Cleanup Oak Ridge (UCOR), have a pressing demand for workforce development to ensure the successful execution of their projects. These workforce needs encompass engineering disciplines such as Nuclear, Mechanical, Electrical, Chemical, Biomedical, Civil, and Industrial Engineering, as well as areas beyond engineering. The reactor safety workforce needs of the Tennessee nuclear industry also include those met by the community colleges, colleges of applied technology, labor unions, and even K-12. As another example of a relevant collaboration that meets the need of a local industry partner, Kairos Power has agreed to collaborate with UTK to train operators for their Hermes reactor³. Other notable companies investing in the nuclear sector in the Tennessee also include TRISOX and Orano — the latter of which recently announced the largest private investment in the history of Tennessee⁴. The curriculum development proposed under this project would prepare workforce for robust, safe operation of nuclear power facilities.

This proposal focuses on fostering opportunities to design and implement training pathways, curricula, and faculty development programs at universities and community colleges to support nuclear reactor safety training. We propose an integrated plan to implement the developed training curriculum in partnership with established stakeholders, ensuring it aligns with workforce demands and supports the long-term sustainability of the program.

U.S. Department of Energy

A recent study by the Tennessee Nuclear Energy Advisory Council⁵ highlights key workforce needs in nuclear energy, particularly in safety and licensing. These areas are a primary focus of our consortium. Our initiative targets **Topic Area 2: Training Needs and Curriculum Development**. We aim to develop specialized training programs and curricula at universities, community colleges, and for the trades to support reactor safety initiatives. Additionally, we plan to establish sustainable, long-term partnerships with utilities, industry stakeholders, state and local governments, K-12 schools (both formal and informal), and labor organizations. Building a strong technical workforce with the requisite reactor safety knowledge requires a cohesive pipeline that spans from kindergarten through to PhD-level education and upskilling/reskilling the current workforce. For a robust nuclear reactor safety workforce, it's crucial to integrate nuclear knowledge into the curricula at all educational stages—elementary and middle schools, high schools, technical academies, community colleges, universities, and industrial apprenticeship programs.

- ¹ East Tennessee Economic Council, “Nuclear Industry Hub.” <<https://www.eteconline.org/nuclear-industry-hub/>> Retrieved January 6, 2025.
- ² E4 Carolinas, “The Economic Impact of the Nuclear Industry In the Southeast United States.” <<https://www.senuclear.org/Reports>> Retrieved January 6, 2025.
- ³ “UT Launches Partnership with Kairos Power.” April 24, 2024. <<https://ne.utk.edu/ut-partnership-kairos-power/>> Retrieved December 26, 2024.
- ⁴ Department of Energy, “Oak Ridge Multibillion Dollar Nuclear Project: Largest Investment in Tennessee History.” September 10, 2024. <<https://www.energy.gov/em/articles/oak-ridge-multibillion-dollar-nuclear-project-largest-investment-tennessee-history>> Retrieved January 6, 2025.
- ⁵ Tennessee Nuclear Energy Advisory Council, “Final Report and Recommendations for Governor Bill Lee, Lt. Governor Randy McNally and Speaker Cameron Sexton.” October 31, 2024. <https://www.tn.gov/content/dam/tn/environment/energy/documents/tneac/tneac_final-report-and-recommendations.pdf> Retrieved December 26, 2024.