



core was slightly reconfigured in order to resume operation. A new basket with fewer holes (37 instead of 55) was fabricated. In this case, only 32 of the holes would contain Pu slugs, and the five remaining would be filled with steel cans, each with a small hole in the bottom and top so the mercury could flow slowly, minimizing disruption of the coolant flow pattern within the cage." The reactor was started back up in September 1950.

Roughly two years later, there was a second failure. On December 24, 1952, alpha activity was detected in the mercury coolant. This meant that there was plutonium in the coolant. It was determined that one of the fuel rods had experienced cladding failure. Ultimately, the decision was made to shut down the reactor for the final time, as testing objectives had been fulfilled. Disassembly of the reactor proceeded with much planning and caution, as the mercury coolant now had alpha radiation from the ruptured plutonium fuel rod.

Clementine was extremely important in

providing real-time experience operating and controlling a fast neutron reactor. The reactor also helped provide data that indicated that mercury was a less-than-desirable choice of coolant due to its poor heat transfer characteristics. According to Merle Bunker's "Early Reactors—From Fermi's Water Boiler to Novel Power Prototypes," which appeared in the winter/spring 1983 issue of *Los Alamos Science*, "During the last year that Clementine was operated, the total neutron cross sections of 41 elements were measured with an accuracy of +10 percent over a neutron energy range of 3 to 13 million electron volts." Due to these achievements, Clementine holds an important place in the history of nuclear technological development. ☒

*Jeremy Hampshire is an ANS member whose avocation is writing about nuclear science and technology's history. His experience includes time as a lead nuclear quality assurance auditor and a senior nuclear technical advisor.*

## FOUNDING DIRECTOR OF NUCLEAR ENGINEERING

The College of Engineering at Tennessee Technological University (TTU) invites applications for the Founding Director of Nuclear Engineering position at the rank of Associate or Full Professor, pending approval of the program by the Tennessee Higher Education Commission (THEC). This is a very exciting time for Tennessee Tech as the university launches a Bachelor of Science in Nuclear Engineering (BSNE) within its College of Engineering, Department of Mechanical Engineering, to facilitate workforce development in nuclear engineering and close the impending workforce gap, particularly as the state of Tennessee establishes a nuclear development and manufacturing ecosystem to lead the way for the nation's energy advancements.



The pending BSNE program at Tennessee Tech builds upon Tech's long history of success with accredited undergraduate engineering programs. The College of Engineering is the second largest undergraduate engineering college in Tennessee, with a total enrollment of nearly 2,900 students in Fall 2023 and produces nearly a quarter of Tennessee's engineering workforce. The college offers bachelor's, master's, and doctoral degrees in chemical engineering, civil engineering, computer engineering, computer science, electrical engineering, and mechanical engineering, as well as a bachelor's in engineering technology. The mechanical engineering department grants the college's largest number of undergraduate degrees, with an average undergraduate enrollment of over 700 students.

This new BSNE program builds on the department's success with experience-based engineering programs such as its vehicle engineering and aerospace concentration and leverages several specialized resources in the college, including the Clay N. Hixson Student Success Center, Center for Manufacturing Research (CMR), Center for Energy Systems Research (CESR), and Center for Cybersecurity Research and Outreach (CEROC). It will support the growth requirements for Tennessee Valley Authority (TVA), Oak Ridge National Laboratory (ORNL), Consolidated Nuclear Security (CNS), Y-12 National Security Complex, and other agencies. Graduates of the program will benefit from the increased depth and breadth of the program made possible by the availability of next-generation technology, as well as emerging areas in embedded security, end cycle nuclear reclamation and reprocessing, mathematical modeling, and electronic controls as the industry moves toward increased demand for safe nuclear energy.

The candidate will provide academic and administrative leadership for the new program, promote excellence in research and teaching, encourage the pursuit of external funding, and foster a collegial atmosphere that supports equity and inclusion, consistent with state and institutional expectations, as well as Tennessee Tech's mission.

**Required Qualifications:** An earned doctorate from an accredited institution in nuclear engineering or a closely related field by the start date of employment. The ability to perform the essential functions. The ability to communicate effectively and to develop and maintain an effective working relationship with faculty, students, administrators, staff, and public.

**Preferred Qualifications:** In addition to the doctorate degree, a bachelor's degree in nuclear engineering from an accredited institution is preferred. Prior teaching and/or industrial experience. Demonstrated awareness of the national trends in nuclear engineering education, as well as experience and familiarity with ABET accreditation.

**Application Procedure:** Applicants are required to electronically submit all of the following through <https://jobs.tntech.edu/postings/16896>.

Questions can be directed to Dr. Mohan Rao, Chair, Mechanical Engineering Department, Box 5014, Tennessee Technological University, Cookeville, TN 38505 (mrao@tntech.edu, 931-372-3254). TTU will only hire U.S. citizens and aliens lawfully authorized to work in the U.S. All new employees will be required to complete an employer's verification form, I-9, no later than three (3) days from the date of hire.

Nominations and applications will be accepted until the position is filled. Tennessee Tech is an Equal Opportunity/Affirmative Action employer.