2024 Nuclear Engineering Student Delegation

Washington, D.C. September 14th - 20th

The Delegation applauds the passage of the ADVANCE Act for modernizing the Nuclear Regulatory Commission, accelerating the deployment of advanced nuclear, and reaffirming U.S. nuclear leadership.

The Delegation supports continued education and workforce development through:

- Strengthening the U.S. Department of Energy's Office of Workforce Development for Teachers and Scientists and expanding the educational pathways emphasized in H.R.8129, *American Nuclear Workforce Act*, and in H.R.6888, *Clean Energy Workforce Act* (Section 2), inclusive of trade/technical schools, community colleges, and credential programs.
- Appropriating funding from the CHIPS and Science Act of 2022 (Subtitle L) for the development of university research infrastructure, similar to the University Nuclear Research Infrastructure Revitalization Grant.
- Amending H.R.2938, *International Nuclear Energy Act of 2023,* to include educational institutions and students in the "whole-of-government strategy for nuclear cooperation and nuclear exports."

The Delegation supports continued investment in nuclear infrastructure through:

- Preserving programs like the Production Tax Credit and Title 17 of the DOE's LPO, which protect the existing nuclear fleet.
- Eliminating IRS Investment Tax Credit normalization rules from regulated utilities, thus enabling them to fully realize benefits up front and invest in new nuclear power plants.
- Adopting H.R.5803, *Grid Resiliency Tax Credit*, which provides a 30% tax credit for investments in new or upgraded electric power transmission projects.
- Supporting public-private risk sharing mechanisms that enable new nuclear reactor designs to move from "first-of-a-kind" to "Nth-of-a-kind" economics.
- Robust funding and modernization of research and test reactors (RTRs), especially at the university level with the Nuclear Energy University Program (NEUP) Infrastructure Grants.

The Delegation supports enhancement of the domestic uranium supply chain and exploration of solutions for used fuel management through:

- Implementing programs to accelerate the domestic availability of HALEU, outlined in Section 3131, the *Nuclear Fuel Security Act,* of the National Defense Authorization Act.
- Funding the EPA to develop a generic standard for future authorized high-level nuclear waste disposal facilities.
- Amending the *Nuclear Waste Policy Act of 1982* (42 U.S.C. 10101) to remove the requirement of Yucca Mountain as the first repository and allow the DOE to conduct site-specific activities prior to the selection of an alternative repository site.

The Delegation supports advanced reactor deployment and emerging technologies that complement nuclear power through:

- Appropriating the necessary funds for the prize structure in Section 202 of ADVANCE Act for the support of licensing advanced reactors.
- Research into the regulated, ethical, and responsible use of AI to advance nuclear science and nonproliferation, facilitated through programs such as 15 U.S.C. 9461, *DOE Artificial Intelligence Research Program*.
- The civilian use of nuclear technology for non-power activities through the implementation of H.R.6303, *Strengthening American Nuclear Competitiveness Act.*

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Emma Houston (Chair)	University of Tennessee, Knoxville
Natalie Cannon (Vice Co-Chair)	Georgia Institute of Technology
Mitchell Mika (Vice Co-Chair)	University of Florida
Hayden Bland	North Carolina State University
Liz Bramer	Indiana University Southeast
Sarah Cole	Boise State University
Thomas DeGuire	Texas A&M University
Santiago Fajardo	Iowa State University
Christopher Forsyth	Massachusetts Institute of Technology
Ethan Krammer	University of New Mexico
Julia Marshall	University of Wisconsin - Madison
Grant Mills	University of California, Berkeley
John Mobley IV	University of Michigan
Auden Oliveri	Reed College
Andrew Panter	University of Michigan
Nathan Ryan	University of Illinois Urbana-Champaign
Anna Schafer	Georgia Institute of Technology
Morgan Smith	Purdue University

About the NESD

In 1994, the first Nuclear Engineering Student Delegation (NESD) convened in Washington, D.C. to reinstate funding for research reactors. Today, the Delegation continues to express the views of students on nuclear science, policy, and education issues. Each year, the Delegation comprises a diverse group of students representing various disciplines within the nuclear sciences.

For further information on the 2024 NESD or the policy recommendations in this document, please contact Emma Houston at ehoust10@vols.utk.edu or visit the NESD website at http://www.nesd.org.

Growing the Nuclear Workforce

The U.S. Department of Energy's (DOE) report, Pathways to Commercial Liftoff: Advanced Nuclear, estimates that full-scale industrialization of advanced nuclear power will require an expansion of the current workforce by roughly 375,000. The Delegation supports workforce development through the U.S. Department of Energy's Office of Workforce Development for Teachers and Scientists existing programs, which provide funding for university students, faculty, and K-12 STEM classes. In the spirit of H.R.8129, *American Nuclear Workforce Act of 2024*, and H.R.6888, *Clean Energy Workforce Act* (Section 2), the Delegation encourages engaging with all forms of education—inclusive of trade/technical schools, community colleges, and credential programs.

The Delegation also advocates for the expansion of funding awarded for higher education and academic research. This includes but is not limited to the University Nuclear Leadership Program, DOE Computational Science Graduate Fellowships, and National Nuclear Security Administration Graduate Fellowships captured in the FY 2024 DOE budget. Other avenues of student support include funding for the deployment and maintenance of university research facilities, which serve a broader research community. To ensure both continued operation and applicable upgrades foundational for the next generation research and development, funds authorized for university research infrastructure through the CHIPS and Science Act of 2022 (Subtitle L) must be appropriated by Congress.

To ensure U.S. nuclear leadership on the international stage, support for capacity-building efforts with allies and partner nations should be pursued in the spirit of H.R.3486, *Recoup American Nuclear Global Leadership Act of 2023*. These endeavors will contribute to the knowledge management outlined by the International Atomic Energy Agency, which anticipates the global workforce expanding to over four million within the next 25 years. The Delegation supports H.R.2938, *International Nuclear Energy Act of 2023* and advocates for its expansion to include streamlining and modernizing export control measures for our educational institutions and students (e.g., shared laboratory resources, multi-institution consortia).

Building and Maintaining Nuclear Infrastructure

Between 2013 and 2021, 12 nuclear reactors shut down due to financial struggles, leading to a loss of 9,436 MW of clean electricity. To protect financially at-risk plants, the Production Tax Credit incentivizes the continued production of clean electricity by crediting $15/MWh of clean electricity. Additionally, the Energy Infrastructure Reinvestment category of Title 17 offers loans to legacy plants looking to uprate, maintain, or restart. Both of these programs are successful at supporting the existing fleet and, therefore, should be continued by Congress.

Following the recent completion of Vogtle 3 and 4, Congress should take action to maintain the momentum for new nuclear deployment. In order to provide regulated utilities with greater financial flexibility for building new nuclear power plants, Congress should consider tax policy changes to exempt these utilities from the IRS normalization rules that limit the effectiveness of the Investment Tax Credit (ITC). Additionally, we support programs designed to share cost overrun risks between the federal government and private industry for the first several deployments of new reactor designs, thus enabling these novel technologies to reach their full potential to compete in the marketplace.

Improvements to nuclear reactor infrastructure can only be fully realized if they are accompanied by improvements to the nation's power grid. Congress should adopt the provisions of the Grid Resiliency Tax Credit (H.R.5803), which provides a tax credit equal to 30% of the qualifying investment made into new or upgraded power line transmission projects.

The DOE should prioritize continued robust funding for research and test reactors (RTRs), especially the 24 operating university research reactors. Programs such as the DOE Nuclear Energy University Program (NEUP) Infrastructure Grants provide crucial support for maintaining and upgrading essential RTR infrastructure. We encourage the expansion of these programs to ensure these facilities remain operational and at the forefront of scientific research. The Delegation commends the NRC for the recent issuance of a new university research

reactor construction permit at Abilene Christian University. The Delegation strongly advises against the imminent closure of the Rensselaer Polytechnic Institute Research Reactor, one of the last remaining civilian, zero-power reactors. The loss of this uniquely beneficial nuclear facility would significantly diminish the nation's capacity for critical research and development in nuclear science.

Expanding the Nuclear Fuel Cycle

Establishing a reliable nuclear fuel supply chain for existing and advanced nuclear reactors is a critical component of U.S. energy security. The Delegation applauds the passage of the Nuclear Fuel Security Act within H.R.2670, *National Defense Authorization Act*, allocating $2.7 million toward expanding key programs for low enriched uranium (LEU) and high assay low enriched uranium (HALEU).

Spent nuclear fuel contains strategic isotopes that can be recycled into new fuel or used for medical treatments. The Delegation supports the development of a milestone-based approach as described in H.R.8674, *Milestones for Advanced Nuclear Fuel Act,* to explore the feasibility of fuel recycling in the United States.

Around 30 countries are considering constructing their first nuclear power plant. In order to maintain U.S. leadership in the international nuclear sphere, promote the adoption of nonproliferation and safety norms in embarking civil nuclear nations, and spread clean energy technology, the Delegation supports the adoption of legislation which seeks to promote the export of U.S.-designed civil nuclear technology to other countries such as H.R.2938, *International Nuclear Energy Act of 2023*.

Congress should fund the Environmental Protection Agency (EPA) to develop a generic, technology-neutral protection standard that would apply to future authorized high-level nuclear waste disposal facilities. This is the first in a series of developments recommended by the DOE's Blue Ribbon Commission on America's Nuclear Future to successfully manage the back-end of the nuclear fuel cycle.

As amended, the *Nuclear Waste Policy Act of 1982* (42 U.S.C. 10101) requires that the first repository for used nuclear fuel must be the Yucca Mountain site; we find this prescriptive approach limiting to the growth of key sectors responsible for nuclear material management. As a result, the Delegation supports modifications to the Act that would remove the requirement that Yucca Mountain be the first repository site and allow DOE to engage in site-specific activities prior to repository selection.

Developing Emerging Technologies

The Delegation applauds the passage of the ADVANCE Act, and advocates for subsequent appropriations for the prize structure, which would incentivize licensing first-of-a-kind reactors. The Delegation also supports the efforts to reduce regulatory and licensing costs in H.R.6326, *The Advanced Reactor Fee Reduction Act*, and the expansion of tax credits in the Inflation Reduction Act to apply to individual reactors at multi-reactor plants (26 U.S.C. 45U).

The Delegation supports nuclear technologies and their diverse applications to medical treatment, space, industrial heating, and desalination. The Delegation recognizes the emergence of other technologies, including AI and digital twins, that have the potential to impact the deployment of nuclear technology. We support research into ethical and regulated use of AI, facilitated through programs such as the *DOE Artificial Intelligence Research Program* (15 U.S.C. 9461), to ensure the responsible use of AI in nuclear science and nonproliferation.

Advanced reactor technologies have unique security needs as the United States works with international partners. We support bipartisan efforts in H.R.995, *Global Nuclear Energy Assessment and Cooperation Act*, to streamline the process of civil nuclear exports while acknowledging the need for the implementation of safeguards and security by-design for advanced reactors.