2022 Nuclear Engineering Student Delegation

Washington, D.C. September 19th - 23rd

The Delegation supports continued investment in nuclear workforce development through:

- Continued allocation and appropriation of Nuclear Energy University Program funding.
- Specific allocations for underrepresented demographics and emerging academics as part of the assistance outlined in the H.R. 4819 (*National Nuclear University Research Infrastructure Reinvestment Act of 2021*).
- Expanding American technological leadership by addressing education disparities and deficiencies through H.R. 210./S.1374 (*Rural STEM Education Research Act).*

The Delegation supports new methods in addressing nuclear waste management through:

- Collaborative management of waste through consent-based siting for used nuclear fuel repository development.
- Reducing the volume of stored waste by repurposing used nuclear fuel for applications such as fuel for advanced reactors, as incentivized in H.R.6618 (*Advanced Nuclear Reactor Prize Act*).

The Delegation supports the development of advanced reactors in the US and abroad by:

- Funding testing capabilities to support the commercialization of advanced reactors.
- Fully appropriating the Department of Energy's Advanced Reactors Demonstration Program.
- Agreeing with the positions outlined in H.Res.1311 (*Expressing the sense of the House of Representatives that the United States should support the expansion of domestic nuclear energy and advanced nuclear technology as a viable source of power in order to promote United States nuclear energy leadership and global energy independence).*

The Delegation recommends outlining the path forward to new nuclear reactor construction by:

- Realigning the nuclear energy regulatory process to work with emerging and future reactor designs, as recommended in H.R.1746 (*Strengthening American Nuclear Competitiveness Act*), H.R.1578 (*Nuclear Licensing Efficiency Act*), and allocation of non-application funding
- Expanding U.S. energy infrastructure and exportation, outlined in S2373 (*American Nuclear Infrastructure Act of 2021*) and H.R.1748 (*Strengthening American Nuclear Competitiveness Act*).
- Centralizing U.S. policy interests through a transition from fossil fuels to nuclear power that accommodates affected communities.

2022 Nuclear Engineering Student Delegation

Brent Hollrah (Chair)	Texas A&M University
Amanda Bachmann (Co-vice chair)	University of Illinois Urbana-Champaign
Kaylee Cunningham (Co-vice chair)	Massachusetts Institute of Technology
Rebecca Baker	Pennsylvania State University
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Zachariah Jones	Texas A&M University
Madeline Lockhart	North Carolina State University
Mitch Mika	University of Florida
Vincent Paglioni	University of Maryland, College Park
Nataly Panczyk	University of Illinois Urbana-Champaign
Hannah Patenaude	University of Nevada, Las Vegas
Maxwell VanLandschoot	Reed College

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 from the nation's most prestigious nuclear engineering programs, representing various disciplines within the nuclear sciences.

For further information on the 2022 NESD or the policy recommendations in this document, please contact Brent Hollrah at bhollra@tamu.edu or visit the NESD website at http://www.nesd.org.

Expanding Education Opportunities for Science and Technology

Research shows that nuclear science education and informed public awareness are critical to a successful, publicly accepted nuclear infrastructure. Federal involvement is essential to reaching this goal. The Delegation supports H.R.4819 (National Nuclear University Research Infrastructure Reinvestment Act of 2021) in full and encourages specific funding allocated to women and racial minorities at higher education institutions. The Delegation also supports increasing federal funding to promote education relevant to skilled trades in order to develop a diverse, capable generation of workers that bolsters the declining nuclear workforce. The Delegation encourages awarding reserved nuclear research grants to junior university faculty, acknowledging that supporting the next generation of researchers will promote diversity within the field and reinforce academic standards. Additionally, the Delegation encourages the continuation of the Nuclear Energy University Program, which demonstrates the positive impact of federal education investment and provides a tested framework for providing federal support for nuclear science and engineering education at all levels.

The Delegation applauds the recent passage of the *CHIPS and Science Act of 2022*, specifically the investment in STEM education and continued funding of university research reactors. To extend the impact of the *CHIPS and Science Act*, the Delegation recommends establishing federal guidelines for K-12 education regarding energy science and urges continued STEM education development by passing H.R.210/S.1374 (*Rural STEM Education Research Act)*. Increased general awareness of nuclear science through public education further benefits the Department of Energy's consent-based siting initiative, which requires informed community consent to site used nuclear fuel.

Nuclear Waste: Addressing Old Problems with New Solutions

The U.S. should approach the ongoing issue of nuclear waste management in new ways to promote stakeholder' engagement and repurpose used nuclear fuel (UNF). The Delegation supports consent-based siting in identifying UNF repository locations, specifically introduced in H.R.1524/S.541 (*Nuclear Waste Informed Consent Act*). However, a permanent disposal facility for UNF is a vital component of the nuclear fuel cycle and has been in a political stalemate. As a result, the industry currently stores UNF on-site at nuclear power plants at taxpayers' expense, bypassing opportunities for community consent. Currently, the main barriers to a repository are public support and politicization. To move forward with developing a UNF repository, the Delegation supports the modernization of H.R.3809 (*Nuclear Waste Policy Act of 1982*) to remove Yucca Mountain as the only location for a centralized geological repository. To support this, the Delegation recommends action allowing the Department of Energy to define a site-independent geological repository standard and create a generalized waste procedure moving forward.

The Delegation also encourages the utilization of UNF in applications such as advanced reactor fuel and medical isotope production to the long-term storage requirements. Initiatives for the repurposing of UNF are discussed in H.R.6618 (*Advanced Nuclear Reactor Prize Act*), which incentivizes the use of UNF as fuel for advanced reactors. The Delegation recognizes and appreciates the commitment of the Department of Energy to implement a potential UNF management strategy. There are many pathways to address this issue; the U.S. deserves a solution.

Advanced Reactor Technologies

As H.R.1311 describes, there are many benefits associated with nuclear energy including the creation of sustainable jobs, $60 billion annually contributed to the U.S. GDP, and producing clean, baseload electricity to complement renewable sources. Advanced reactor technologies serve additional markets by facilitating the generation of process heat, hydrogen, medical isotopes, and potable water. Some advanced reactor designs can be powered by UNF, helping address concerns over storage at

existing reactor sites. Additionally, the construction of advanced reactor designs will use highly modular construction processes to reduce investment costs and risks.

The Delegation supports the authorization and appropriation of funds to expand current domestic testing capabilities for developing advanced reactors. Currently, many of the testing capabilities required for advanced reactor designs are only available through foreign competitors. There is a strong demand domestically and among allies to promote domestic essential testing capabilities. Potential new testing capabilities should be operated domestically while still leveraging beneficial international partnerships.

The Delegation supports the continued appropriation of authorized funds for the Advanced Reactor Demonstration Project (ARDP) from the Department of Energy Office of Clean Energy Demonstrations. ARDP pursues the development and commercialization of ten diverse nuclear reactor designs, including two demonstration projects of technologically mature designs by the end of the decade. There is a global race to develop these technologies, with global competitors deploying next generation reactor designs in recent years. Maintaining our nuclear energy capabilities to be beyond those of global competitors is essential to maintain U.S. leadership on the global stage. Additionally, ARDP provides valuable experience in the construction of advanced reactors that will facilitate the future deployment of U.S.-designed advanced reactors domestically and abroad.

The Delegation also supports the continued development of Project PELE and possible follow-on DOD mobile reactors. The small size and mobility of small modular reactors makes them uniquely able to meet expeditionary military energy needs and to respond to domestic distressed power grids. This project also stands as a clear example of a successful development and regulatory framework to rapidly take an advanced reactor from concept to fruition, acting as a pathfinder for commercial adoption of SMRs.

A Path Forward for a Just and Competitive Nuclear Energy Industry

The U.S. nuclear regulatory process has failed to evolve with technological and economic changes. This has resulted in significant disparity between the number of new reactors constructed in the U.S. and abroad, as well as the lack of a clear regulatory pathway for advanced reactors. To address the inefficiencies in the regulatory process, the Delegation supports the passage of H.R.1746 (The Advanced Nuclear Deployment Act) and H.R.1578 (Nuclear Licensing Efficiency Act).The delegation recommends internal, innovation-driven regulation reform; specifically, allocation of non-fee funds to provide the Nuclear Regulatory Commission the resources necessary to successfully implement the changes outlined in H.R. 1746 and H.R. 1578.

To confront deficiencies and support reliable U.S. energy infrastructure, the Delegation also supports the passage of S.2373 (American Nuclear Infrastructure Act of 2021) and H.R.1748 (Strengthening American Nuclear Competitiveness Act) which reinforce the safe expansion and exportation of U.S. nuclear technologies. These bills would once again establish U.S. leadership in nuclear technology, economically support American industries and communities, and help to address global energy insecurities.

In the pursuit of centralizing U.S. interests into coherent policy, the Delegation further promotes the transition of current fossil fuel plants to nuclear plants. This transition would include support for communities that were previously reliant on fossil fuels through retraining programs and the revitalization of former coal power plants. This process would ensure that such communities are not abandoned in the wake of decarbonization, but continue to thrive economically and socially.