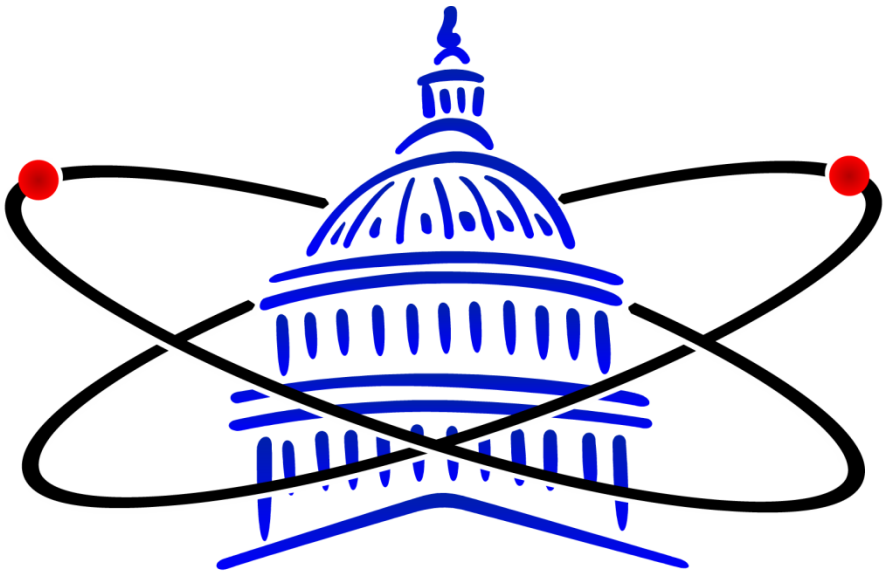

2012 NUCLEAR ENGINEERING STUDENT DELEGATION

WASHINGTON, D.C. JULY 22ND – 27TH

WWW.NESD.ORG

POLICY STATEMENT

Mark Norsworthy (Chair)	University of Michigan
Matthew Gidden (Co-Vice Chair)	University of Wisconsin-Madison
Shaheen Dewji (Co-Vice Chair)	Georgia Institute of Technology
Oluwatomi Akindele	Texas A&M University
Samuel Brinton	Massachusetts Institute of Technology
Andrew Cartas	University of Florida
Lily Crabtree	University of Tennessee
Wesley Deason	Oregon State University
Savannah Fitzwater	Colorado School of Mines
Douglas Fynan	University of Michigan
Shadi Ghrayeb	Pennsylvania State University
Mahima Gupta	University of Wisconsin-Madison
Mark Reed	Massachusetts Institute of Technology
Eric Terpening	North Carolina State University
Nicholas Thompson	Rensselaer Polytechnic Institute

Executive Summary

- The federal government is the single largest employer of nuclear engineering graduates. The federal government is legislatively mandated by the Atomic Energy Act of 1946 to sustain research and development in the discipline of nuclear science and engineering.

- The Integrated University Program (IUP) is the only source of funding specifically targeted at nuclear science and technology students, and maintaining its FY2012 funding level is vital to the continuation of nuclear education programs. **The House of Representatives has appropriated $5M for the Department of Energy Office of Nuclear Energy (DOE-NE) and $15M for the U.S. Nuclear Regulatory Commission (NRC) in its bill, H.R. 5325. The Delegation strongly urges the Senate to do the same.**

- To maintain its role as a leader in nuclear innovation and expertise, the U.S. must invest in its intellectual infrastructure by addressing the current generation gap in the domestic workforce. To conduct innovative research and educate the next generation of nuclear scientists and engineers, U.S. universities require investment in new equipment and current research infrastructure. **Federal support through the Nuclear Energy University Partnership (NEUP) satisfies this goal and should be maintained at its current level.**

- Federal investment is crucial to ensure development of innovative applications of nuclear science and technology, including industrial, medical and scientific domains. Government support is necessary to maintain global leadership in the field of nuclear science and technology. The world will continue to benefit from strong U.S. leadership advocating the safe, clean, and peaceful application of nuclear technology.

- United States leadership in nuclear engineering is essential for domestic energy supply and security, creation of high-value domestic jobs, meeting climate and air pollution objectives, and giving the United States a voice in nuclear security and nonproliferation issues on the international stage.

About the NESD

In 1994, the first Nuclear Engineering Student Delegation (NESD) to Washington, D.C. convened to reinstate funding for research reactors. Today, the Delegation continues to express the views of the student population on nuclear science, policy, and education. 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. The students independently organize and run this trip to Washington, D.C. The Delegation does not represent any organization or university; the views expressed in this policy document are strictly those of the delegates.

For further information, please contact Mark Norsworthy at marknors@umich.edu or visit the NESD website at www.nesd.org.

2012 NESD Policy Statement

Integrated University Program

The Integrated University Program (IUP) provides a critical funding mechanism for nuclear science and technology education. Additionally, federal funding for nuclear science and technology programs is mandated by the Atomic Energy Act of 1946 (Sec.8A). The IUP was established in the Energy and Water Appropriations Act of 2009 due to the "Committee's concern for lack of stable support"[1] for such research. Although the IUP was authorized $450M over 10 years to achieve this legislative goal,[2] neither the Department of Energy Office of Nuclear Energy (DOE-NE) nor the U.S. Nuclear Regulatory Commission (NRC) has requested funding for the IUP in FY2013. The Delegation endorses former American Nuclear Society president Eric Loewen's testimony advocating the reinstatement of IUP funding at FY2012 levels ($15M for the NRC, $5M for the DOE-NE).[3] At present, the House has provided such funding in its appropriations bill while the Senate's current bill leaving committee has not.

The IUP provides unique and much-needed funding for nuclear faculty development. While enrollment at universities is steadily increasing, faculty positions remain in high demand. State legislatures are unable or unwilling to provide the appropriate assistance, limiting funding for such expansions solely to the IUP. The continued growth of the nation's nuclear science faculty is critical for maintaining global leadership in the field of nuclear science and technology. The NRC Faculty Development Grant Program, funded by IUP, exemplifies the type of funding that encourages junior faculty to become established at universities while offering an incentive for universities to hire nuclear engineering instructors to meet this demand.

The federal government is the single largest employer of graduating nuclear engineers.[4] It is the responsibility of the Administration to provide the nation with an educated nuclear science workforce. The IUP is the sole source of funding specifically targeted at nuclear science and technology students. However, the Administration has argued that the IUP is a "less efficient means to promote [its] STEM objectives than other programs." **The Delegation disagrees and contends that the IUP is the only vehicle currently capable of fulfilling the Administration's responsibility to support nuclear science and technology education.**

Recommendation: The Delegation recommends that the IUP be reinstated at or above its FY2012 level.

Domestic Nuclear Workforce and Infrastructure

Investment in the human capital pipeline is essential for the U.S. to remain competitive in the global nuclear industry. Moreover, a disproportionate number of the existing domestic nuclear workforce is approaching retirement age, which will increase demand for new nuclear experts in the immediate future. The U.S. must invest in its intellectual infrastructure and preserve expertise relating to regulation and nonproliferation in order to maintain its role as a leader in the nuclear sector thus promoting U.S. safety and security cultures domestically and abroad.

This workforce comprises nuclear engineers, nuclear and radiochemists, health and medical physicists, nuclear technicians, and skilled labor in a variety of sectors including, but not limited to:

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[1] "Integrated University Program", Ingrid Milton, DOE-NE. August 14, 2009.
[2] Energy and Water Development and Related Agencies Appropriations Act of 2009, Title III Section 313.
[3] Eric Loewen, written testimony to the U.S. House Appropriations Subcommittee on Energy and Water Development. March 30, 2012.
[4] "Nuclear Engineering Enrollments and Degrees Survey, 2009 Data," Oak Ridge Institute for Science and Education.

- Federal government (DOE & National Laboratories, DoD, NNSA, DHS, NRC, NASA)
- Commercial nuclear power industry
- University and academic institutions
- Medical facilities (medical isotope production, radiation therapy & imaging)

To conduct innovative research and educate the next generation of nuclear scientists and engineers, U.S. universities require investments in new equipment and current research infrastructure. Research reactors, accelerators, hot cells and irradiation facilities are valuable resources that give students hands-on training that cannot be replicated by classroom instruction or simulations. DOE-NE's Nuclear Energy University Partnership (NEUP) initiative has been effective as a means of providing university environments with financial support through grants for infrastructure, as well as research and development projects. Infrastructure investments through the use of Infrastructure Research and Development grants ($13.2M in FY 2010) were awarded to 39 universities in 27 states and should continue to invest in core competencies and infrastructure. The NEUP has historically corresponded to 20% of the DOE-NE research budget.

Recommendation: The Delegation recommends sustained federal funding of DOE-NE to maintain U.S. intellectual and physical infrastructure for current and future generations of students and researchers.

Impact of Nuclear Technology Innovation

Nuclear technology spans industrial, medical, and scientific applications. The U.S. government, with its historical legacy in nuclear technology, has an enduring interest to innovate with respect to fuel cycle, non-proliferation, environmental, and safety challenges. These remain domestic and global issues.

Nuclear energy is the only source of baseload electricity that is scalable, zero-emission, and economically competitive with conventional fossil fuel generation. Additionally, nuclear technology has industrial applications, such as well logging in the oil and gas industry. New innovative reactor designs have the potential ability to recycle used fuel while creating power. Investing in nuclear technology and education has a significant economic impact.

Investment in domestic nuclear technology beyond electricity generation has impacts that range from global energy and security issues to enriching the lives of individual American citizens. For example, approximately twenty million medical procedures in the U.S. annually rely on medical isotopes created in specialized nuclear facilities. As the U.S. relies primarily on imports of these isotopes from abroad, investment in domestic nuclear engineering expertise and technology is essential for domestic production, alleviating the reliance on this market shortage.

Nuclear science and technology research and education holds the key for the scientific understanding our universe, from the parts of atoms discovered in the depths of particle accelerators to the celestial bodies traveled to by nuclear powered space vehicles. For the U.S. to remain a leader in this sector, investment in education and infrastructure will facilitate the advances required not only to remain globally competitive, but to maintain its global legacy as an innovator.

Recommendation: The U.S. federal government should invest in innovation in nuclear technology to increase U.S. competitiveness, retain leadership in the sector, and ensure its safe, clean, and peaceful application.