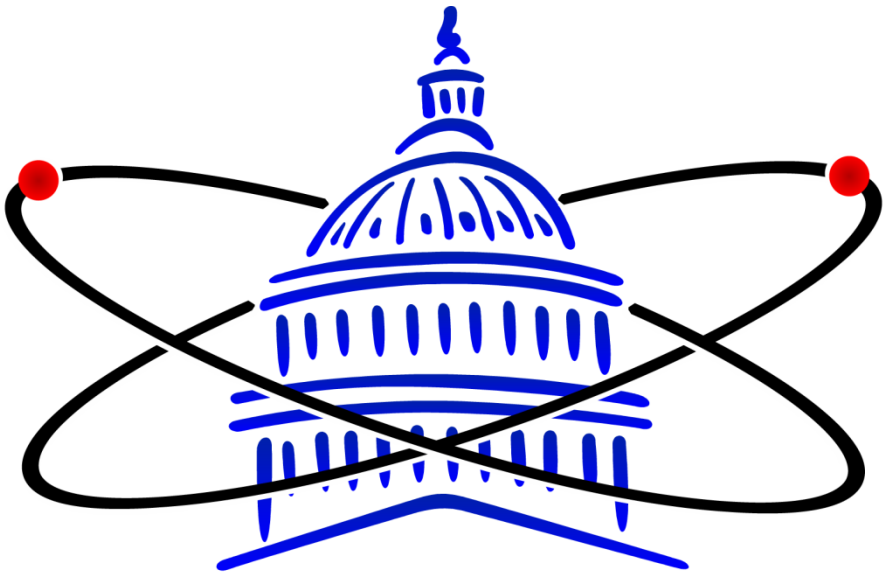

2010 NUCLEAR ENGINEERING STUDENT DELEGATION
WASHINGTON, D.C. JULY 24TH – 29TH

POLICY STATEMENT

Michael Meholic, Pennsylvania State University (Chair)
Lenka Kollar, Purdue University (Co-Vice Chair)
Rachel Slaybaugh, University of Wisconsin – Madison (Co-Vice Chair)
Jacob Dobisesky, Massachusetts Institute of Technology
Matthew Fields, Purdue University
David Genevich, University of Michigan
Isaac Matthews, Massachusetts Institute of Technology
Mark Norsworthy, Massachusetts Institute of Technology
Kevin Robb, University of Wisconsin - Madison
William Sames, Texas A&M University
Nicholas Touran, University of Michigan
Rebecca Ward, University of Texas – Austin

EXECUTIVE SUMMARY

- The 2010 Nuclear Engineering Student Delegation recommends maintaining federal support levels for university programs and current research efforts. We emphasize the benefits of increasing the flexibility of award solicitations to encourage basic science and interdisciplinary research alongside existing mission-driven projects.

- Additional nuclear engineering faculty are needed across the United States. This should be addressed by maintaining funding for the NRC Faculty Development program and by creating a program to facilitate joint appointments between universities and national laboratories.

- Federal funding levels must match those of previous years in order to maintain university research reactors and research facilities. Investments in infrastructure upgrades, such as digital instrumentation and controls, are required.

- International opportunities should be created to engage U.S. nuclear engineering students in research and technology areas that are not being thoroughly investigated in the United States. Support and encouragement for international internships will help cultivate a workforce that can participate in the international arena.

- A long-term federal commitment to nuclear development is needed. United States leadership 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.

2010 NESD POLICY STATEMENT

Sixteen years ago, 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.

The U.S. nuclear industry plays a vital part in a wide array of areas including 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. Nuclear engineering education is the crucial first step in ensuring the United States has an exemplary and well-trained nuclear workforce.

For further information, please contact Michael Meholic at mjm596@psu.edu or visit the NESD website at http://www.nesd.org/.

University Programs

Due to the strong national interest in and support for nuclear power, federal funding for nuclear science and technology education is at an all-time high. In FY2010, $53M was distributed to nuclear engineering university programs and students in the forms of grants, scholarships, and fellowships, with $38M coming through the Department of Energy (DOE) Nuclear Energy University Programs (NEUP) and $15M coming through the Nuclear Regulatory Commission (NRC). The universities are very pleased with the levels of support provided by these and other agencies as they further enable their abilities to conduct both novel and fundamental research as well as to attract and retain top-quality students.

At a minimum, it is imperative that current funding levels be maintained to allow continued progress, particularly in light of continuing increases in nuclear science and engineering program enrollments. Rather than awarding funds exclusively to mission-driven research, the delegation recommends that these programs distribute a portion of the awards towards research with more flexible goals, including basic science and interdisciplinary studies. Nuclear engineering is interdisciplinary by nature, with applications and yet-unsolved technical challenges in areas as diverse as materials science, medicine, and space propulsion. It is in these intersections that truly novel research often happens, and funding awards should encourage such endeavors.

Faculty Workforce Development

The quality and number of graduates is intrinsically limited by the availability of qualified faculty. While student enrollment has increased rapidly in recent years, the number of faculty entering the field has not kept pace, leading to an unacceptably high number of students for each faculty member. Given the current trends in student enrollment, major universities have expressed concern over the number of proficient faculty members in nuclear engineering available for hire. This problem is compounded by an aging workforce, which has created a generation gap within nuclear engineering faculty.

In an effort to address this issue, programs like the Faculty Development Grants were created. These grants, administered through the NRC Nuclear Education Grant Awards, distributed approximately $6.3M in support of junior faculty members in FY2010. **The delegation commends this program and recommends that the grants not only be continued, but funds should also be reallocated so that the program can be expanded**.

Programs to foster collaborative relationships between universities and national laboratories, such as one offering joint appointments between these institutions, should be designed as an additional strategy to solve this problem. The joint appointments would benefit both universities and laboratories by providing new faculty members the opportunity to establish contacts at laboratories. Further, the university would benefit from the expertise of laboratory collaborators. Such joint appointments would facilitate knowledge transfer between experts in the field.

University Research Facilities

Nuclear engineering programs have a variety of research facilities available which, among others, includes research reactors, innovative test facilities, accelerators, hot cells, and irradiation facilities. These are valuable tools that give students hands-on training that cannot be replicated by classroom instruction or simulations alone. The facilities are truly unique and would be difficult to replace. Research reactors in particular provide a concrete understanding of fundamental concepts and serve as unparalleled educational tools for students and the public alike.

There are 26 operating university research reactors in the United States. In recent years, the bulk of government funding was used to replace highly enriched fuel with fuel of lower enrichment in support of international nonproliferation goals. This mission is nearly complete, allowing for other pressing needs to be addressed. These needs include general infrastructure improvements as well as upgrading instrumentation and controls (I&C) from analog to digital, consistent with needs of new commercial plants. Industry-university partnerships supporting these needs should be facilitated by the government in order to teach students and train reactor operators. This can be done through cost matching programs and NRC regulatory support.

In addition to providing invaluable education for engineering students, research facilities offer the opportunity to communicate with the public about nuclear science and technology.

Conducting outreach events at these facilities makes the public more comfortable with nuclear science and technology and allows for open and honest information sharing. Federal funding was previously available for such outreach programs and has been removed in recent years. This important use of such facilities yields high return on a small investment and should be reinstated.

In FY2009 DOE-NE appropriated $6.1M for research reactor infrastructure. The current appropriation is $10M, including some costs for converting university research reactors from high to low fuel enrichment. The FY2011 request has been reduced to only $4.7M. **Federal funding levels must at least match those of previous years in order to maintain existing research facilities. The Delegation recommends new funding for general infrastructure improvements (including digital instrumentation and control), facility outreach support, and general staffing needs.**

International Collaboration

International university partnerships and research opportunities should be supported to broaden and enrich U.S. nuclear science and engineering research. Knowledge transfers gained through international exchange programs will greatly contribute to the intellectual capital needed for next generation nuclear development and planning. Creating and sustaining such a channel for nuclear knowledge transfers are imperative to U.S. national security in an age of a rapidly expanding global nuclear community. Further, public-private partnerships will be critical to the sustainability of the proposed international collaborations and their intended benefits. **The delegation applauds the addition of funding for DOE International Nuclear Energy Cooperation and recommends that some of this funding be used for student opportunities.**

International safeguards and nonproliferation programs are crucial for safe and secure growth in nuclear energy both domestically and internationally. Continued efforts to raise awareness of existing opportunities for internships and research in these areas will help ensure that U.S. students gain expertise necessary for careers in international safeguards and nonproliferation. **Creating opportunities for student internships at international organizations, such as the International Atomic Energy Agency (IAEA), will help create a workforce with awareness of international issues and nonproliferation efforts.** Encouraging students to apply for international safeguards research internships at national laboratories will inspire students to pursue careers in nonproliferation and later apply for jobs at the IAEA and other international organizations. This will give the United States a stronger international presence and influence in the nonproliferation arena.

Nuclear Energy Policy

The nuclear industry plays a vital role in U.S. society, and it is highly influenced by government decisions. The delegation feels the following issues warrant detailed attention:

- Stable and consistent federal funding of nuclear engineering programs is needed.
- Nuclear energy should be classified as clean energy, acting as a renewable emissions-equivalent.
- The nation needs to implement a comprehensive, long-term strategy to handle used nuclear fuel and a well thought-out, sustainable nuclear fuel cycle.
- There is concern that the United States is losing relevance on the international nuclear stage. The United States can remedy this by reestablishing their technical edge, signing 123 agreements with major and upcoming nuclear players, and staying engaged in security and nonproliferation efforts.
- Support for federal incentives for new nuclear construction is needed.
- Facilitation of the development and licensing of innovative reactor concepts, including small modular reactors, is essential.

Supporting nuclear engineering programs establishes the foundation that will ensure the United States is on the forefront of nuclear science and technology. Such leadership 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. The delegation recommends that Congress support university programs, faculty development, nuclear research facilities, international engagement, and nuclear energy policy. Such support should come from a variety of federal agencies, all of which have a stake in these interests.