

2011 NUCLEAR ENGINEERING STUDENT DELEGATION

WASHINGTON, D.C. JULY 10TH – 15TH

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POLICY STATEMENT

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Executive Summary

- The Integrated University Program (IUP) is a cornerstone for educating America's future nuclear engineering workforce and is currently zeroed out by the Administration. This void cannot be filled by the commercial nuclear industry since the Federal Government is the single largest employer of nuclear engineering graduates. **The Delegation strongly recommends restoring this funding for FY11 and continuing for FY12 and FY13.**
- The Nuclear Engineering University Program (NEUP) provides significant benefits to nuclear engineering education and should be maintained at its current funding level.
- Continued funding for the NRC Faculty Development Grant Program is needed because this program is crucial to the support of nuclear engineering education as university enrollments continue to grow.
- University research facilities and research reactors in the United States provide unique capabilities that are essential to nuclear engineering education and scientific inquiry; continued federal support through NEUP is essential for the operation of these facilities.
- 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.

2011 NESD Policy Statement

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 Lenka Kollar at kollar@purdue.edu or visit the NESD website at www.nesd.org.

Integrated University Program

The Integrated University Program (IUP) is a congressionally mandated program to build nuclear education infrastructure and train the future workforce that will ensure that the United States remains a leader in nuclear engineering. **The Administration has zeroed out funding for the IUP in its FY11 budget request.**

The IUP is a joint program between the Department of Energy's Office of Nuclear Energy, contributing \$5 million, and the Nuclear Regulatory Commission and the National Nuclear Security Administration, contributing \$15 million each. This allocation is used to fund two major endeavors: (1) Student scholarships and fellowships, and (2) New faculty development. For the past two years, IUP has provided \$7.9 million to students from across the country in the forms of over 161 scholarships and 108 fellowships. **IUP funding is now in jeopardy, and its irreplaceable loss would create a grave deficiency in the nation's ability to develop the required intellectual infrastructure to sustain the domestic nuclear workforce for government agencies and the nuclear energy infrastructure.**

President Obama stated in his 2010 State of the Union speech that greater energy independence entails "building a new generation of safe, clean nuclear power plants in this country." In order to enact a 2007 congressional mandate, the IUP was formed as a complement to the Nuclear Energy University Partnership (NEUP). The NEUP has a proposed FY11 budget of \$61.8 million. This corresponds to 20% of the Department of Energy Office of Nuclear Energy budget. The NEUP has been effective as a means of providing university environments with financial support needed to research cutting edge nuclear problems by providing not only scholarships and fellowships from the IUP, but also infrastructure and significant research and development projects.

The Delegation strongly recommends restoring IUP funding for FY11 and continuing support for both IUP and NEUP for FY12 and FY13.

Faculty and Workforce Development

The current domestic nuclear workforce has suffered critical shortages coupled with concerns for the development and training of new workers. By 2012, the Clean and Safe Energy Coalition (CASEnergy Coalition) estimates that 47% of the nuclear utility workforce will be lost; 35% to retirement and 12% to miscellaneous workforce attrition—a loss of approximately 25,900 employees. The American Physical Society (APS) attributes this to a more than thirty-year failed demand for new civilian nuclear energy facilities which has resulted in significant reductions in undergraduate interests in nuclear science and engineering, university nuclear engineering departments (66 in the 1970's to 30 today), and the number of university research and training reactors (63 in the 1970's to 32 today). The nuclear industry is currently working with and should continue to work with minority and women groups and universities to create nuclear education programs and jobs.

This workforce comprises nuclear engineers, nuclear and radiochemists, health and medical physicists, nuclear technicians, and professionals in numerous other fields and related disciplines employing their skills in a variety of sectors including the commercial nuclear power industry, academia, hospitals, national laboratories, the National Institutes for Health, the Department of Homeland Security, the Department of Defense, the Intelligence Community, the Department of Energy, the National Nuclear Security Administration, and the Nuclear Regulatory Commission. Together, these fields play critical roles in our domestic nuclear infrastructure, security, healthcare, industrial processing, as well as occupational health and safety; each of these presents significantly more dramatic challenges than it has in previous years.

There is currently a shortage of qualified faculty among the domestic nuclear engineering programs as student enrollment increases. Universities vitally need federal funding to support the necessary growth in their faculty to match the growing demand for nuclear engineers. The NRC Faculty Development Grant Program has provided funding for young professors to become established at Universities and offers an incentive for universities to hire nuclear engineering faculty.

The Delegation recommends continued support for the NRC Faculty Development Grant Program.

University Research Facilities

Nuclear engineering programs have a variety of research facilities available that include 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. In addition, these facilities enable advanced materials research, isotope production, semiconductor doping, geological and archaeological research, neutron radiography, and a variety of other scientific uses. In order for universities to conduct cutting-edge research and educate the next generation of nuclear scientists and engineers, the best equipment and infrastructure are paramount.

According to the Blue Ribbon Commission on America's Nuclear Future, "there remain approximately 27 research and training reactors on university campuses and most nuclear engineering programs have, at minimum, fundamental radiation detection and measurement laboratories. The recent introduction of the NEUP has enabled stronger and continuing investments in core competencies and infrastructure." The U.S. Department of Energy Office of Nuclear Energy (DOE-NE) awarded \$13.2 million in infrastructure grants to 39 U.S. universities in FY 2010 through its NEUP initiative. This funding provided support for research facilities in 27 states.

The Delegation recommends sustained federal funding through NEUP to maintain and improve U.S. research facilities for current and future generations of students and researchers. This investment will also provide research capacity for meeting key national scientific priorities.

Nuclear Energy Policy

The 2011 Great East Japan Earthquake was devastating in terms of both loss of life and economic ruin. The damaged Fukushima Daiichi Nuclear Power Plant, an unfortunate consequence of the natural disaster, captured worldwide attention for many weeks. The Delegation commends the U.S. Administration and Congress for not making hasty decisions with long-term energy policies, as it should be grounded in sound science after all of the facts from the accident are known.

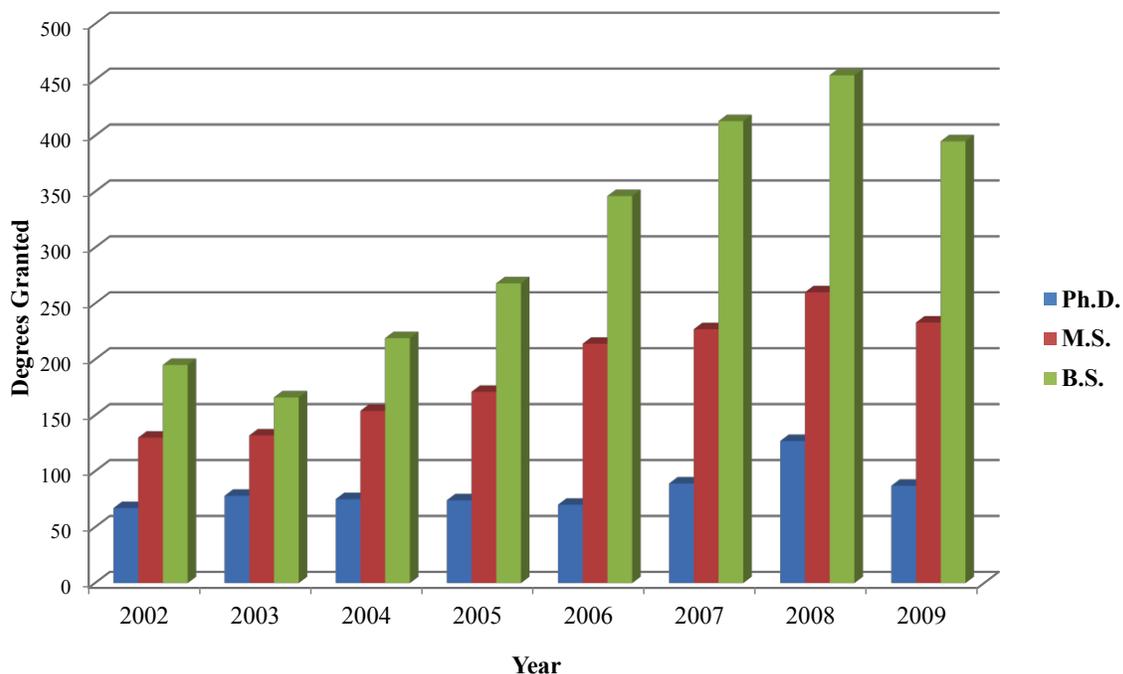
The U.S. Nuclear Regulatory Commission (NRC) provides independent oversight, evolving and adapting to new scenarios. The NRC is currently conducting a comprehensive review of the events at the Fukushima Daiichi plant and making regulatory changes as necessary. The U.S. nuclear industry has a history of learning from past accidents and is also currently taking the initiative to compile lessons learned from Fukushima. All this should serve to reinforce the need for a steady flow of nuclear engineers through U.S. universities – not only to design and build the next generation of reactors, but also to maintain and manage the current fleet.

In order to meet growing energy demands, a diverse energy portfolio is necessary. Since nuclear energy is a viable clean-air energy capable of supporting a large base load, it must play a vital role in United States' energy policy. Nuclear energy is heavily influenced by government decisions, and it is imperative that the United States government exercise discretion in the wake of current economic concerns and in response to the consequences ensuing from the natural disaster in Japan. The United States needs to continue to support new nuclear construction through federal incentives, which will create high value jobs for United States workers. Equally important is the need to maintain a pipeline of nuclear engineers who can advance U.S. 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.

Nuclear Engineering Quick Facts

- “A **single** uranium fuel pellet the size of a fingertip contains as much energy as 17,000 cubic feet of natural gas, 1,780 pounds of coal or 149 gallons of oil.”
- Nuclear energy is 19.6% of the US energy portfolio, and **75%** of the US clean energy portfolio.
- There are 104 commercial reactors in 31 states.
- According to a survey released June 17, 2011 by Bisconti Research Inc. and Quest Global Research Group, “**8 of 10 Residents** near U.S. nuclear power plants **favor the use of nuclear energy**” and “**83%** give them a **high safety rating.**”
- According to the same survey, 62% of the US public accept new reactors at the nearest plant, 67% favor use of nuclear energy, 71 % want to keep the option to build nuclear power plants, and 60% want favor definitely building nuclear plants in the future.
- **The Federal Government is the single largest employer of nuclear engineering graduates.**



Nuclear Engineering Degrees, 2002-2009*

*Three programs were discontinued/out-of-scope after 2002 and not included in the 2003 survey. These three programs reported a total of 17 B.S. degrees in 2002.

Source: “*Nuclear Engineering Enrollments and Degrees Survey, 2009 Data*”, Oak Ridge Institute for Science and Education.