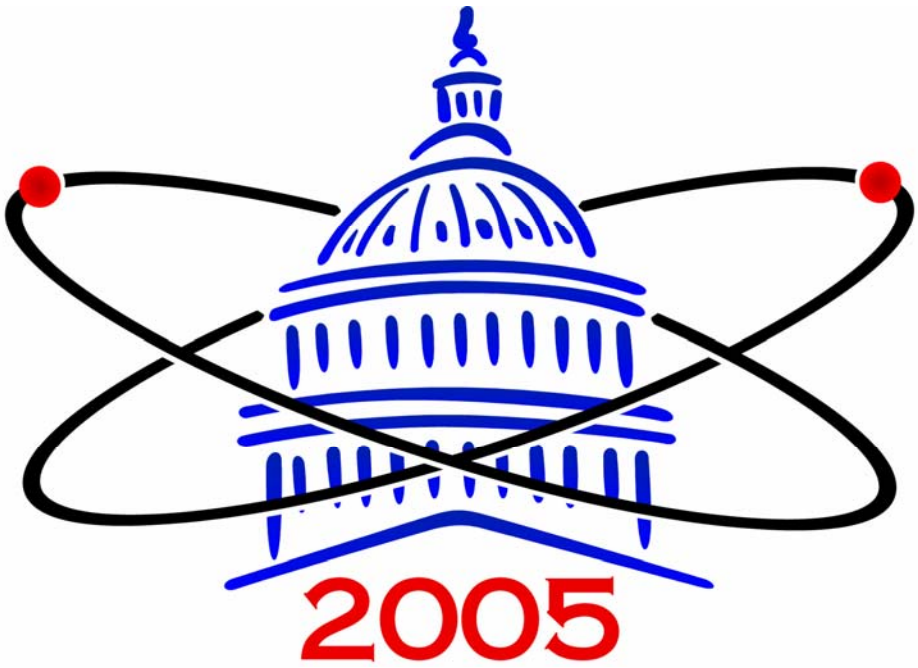

Nuclear Engineering Student Delegation

Washington, D.C. July 24-27, 2005

Policy Statements

Rian Bahran, Rensselaer Polytechnic Institute (Chair)
Paul Kollath-Romano, Rensselaer Polytechnic Institute (Co-Chair)
Katherine Gray, Oregon State University
Jason Hollern, The Ohio State University
Wayne Lytle, University of Illinois at Urbana-Champaign
Adam Nelson, Pennsylvania State University
Whitney Raas, Massachusetts Institute of Technology
Jill Rydalch, Idaho State University
Leah Spradley, Vanderbilt University
Krystina Tack, Oregon State University

Eleven years ago, the first Nuclear Engineering Student Delegation to Washington D.C. was formed to reinstate funding for research reactors. Today, the Delegation to Washington D.C. continues to express the views of the student population on nuclear science, policy, and education. Every year, the Delegation is made up of 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 annual 3-day trip to Washington D.C. and meet with the policymakers, public figures and the government officials whose decisions directly influence and shape the issues facing the nuclear community. The Delegation is not representing any Organization or University, as the attending students are expressing views that they themselves support.

The 2005 Nuclear Engineering Student Delegation has come to Washington, D.C. to convey our views on nuclear science, policy, and education. We represent some of the nation's finest universities, and span several diverse disciplines within the nuclear sciences. As students, we find ourselves discovering a field that holds promise for a bright future.

We, the 2005 Nuclear Engineering Student Delegation, feel strongly that nuclear research and technology are essential to the present and future welfare of the United States.

In particular, we applaud the continued support for programs in nuclear research and education. Furthermore, we strongly believe that advanced nuclear technology applications should be pursued in the near future and supported through appropriate policy decisions.

There is an ever growing interest and enthusiasm for the nuclear sciences in our peers, and we ask you to support the following programs that promise to benefit both students and society. We welcome your feedback and look forward to any opportunity to further express our views regarding these important issues.

- **Support of Yucca Mountain as a High Level Waste Management System**

  Data indicates that nuclear waste evokes fear and concern in many members of the public. The Nuclear Engineering Student Delegation supports the need for a better understanding of public concerns and a way to assure the public that the waste can be managed safely. If national policy reflects a sound understanding of science, then the public must either understand the science or trust those who do possess an understanding. Achieving public perception that a repository will provide adequate protection requires effective communication between scientists and the public.

  Scientists are proving the robustness of the repository through the application of a Performance Assessment. The DOE's Total System Performance Assessment is a mathematical model containing thousands of random variables that model the long-term behavior of engineered and geologic barriers in a nuclear waste repository.

  Government and the scientific community cannot expect the public to easily understand and trust such complex models. The Delegation supports research programs that help identify methods of communicating results of complex Performance Assessments to the public so that they may have faith in the results.

  Studies show that the nuclear power program in France is popular and remarkably non-controversial. Still, there was a tremendous amount of opposition when the country tried to find a site for a permanent waste repository. Regions that had lobbied to become power plant sites were opposed to hosting a waste repository, possibly due to a lack of perceived benefit. The country improved public perception by shifting the policy from permanent disposal to ongoing management. Instead of burying the waste permanently, it will be stocked in underground laboratories in a way that keeps it accessible at some time in the future. Stocking and monitoring waste involves a strong commitment of future responsibility. It also allows for future advances in technology that reduce or eliminate the toxicity of the waste.

  Estimates for the closure of Yucca Mountain include scenarios for no retrieval action, exercise of retrieval option, and an extended pre-closure monitoring period. The requirements reflect criteria for an extended monitoring of the repository that would extend the pre-closure period to as long as 300 years after the last

waste package is emplaced. Maintenance of ongoing research and surveillance will aid in assuring the public that the repository barriers are behaving as predicted and that the waste is not migrating. The Delegation supports an alternative that leaves future generations a maximum choice of options for nuclear waste management. A management approach, as opposed to a disposal approach, emphasizes the ability to reclaim the waste if appropriate, implement separations and transmutation if advantageous, observe the performance of tunnels and engineered barriers, and deal with unanticipated situations.

- **Support for Research and Development of Fuel Reprocessing Technologies**

  An underground waste repository will not be able to hold all of the spent fuel that currently exists and will be created in the coming years in our country. It is imperative that an alternative method for dealing with spent nuclear fuel, namely fuel reprocessing, be developed in the future.

  We agree with the decision of the House Committee on Science, Subcommittee on Energy, that while nuclear reprocessing remains an option for the future of nuclear power, it would not be economical for the United States to begin reprocessing on a large scale at this time. However, we feel that there is a need for research on advancements in reprocessing technologies that would allow the United States to utilize reprocessing if it were to become economical.

- **Increased Funding for Education and Research in the Nuclear Sciences**

  The Delegation applauds the request for increased funding of the Generation IV nuclear energy systems, nuclear hydrogen, and advanced fuel cycle initiatives by the Office of Nuclear Energy, Science, and Technology under the Department of Energy. These initiatives are vital to the advancement of new technologies within the nuclear industry and are in accord with the goals of the Nuclear Power 2010 program as well as the Next Generation Nuclear Power Plant program.

  We believe that the basis for the funding of the University Reactor Infrastructure and Education Assistance program under the Department of Energy's Office of Nuclear Energy, Science, and Technology should take into account data on enrollment and the number of bachelors degrees conferred each year in nuclear science disciplines. Recent studies have shown that undergraduate enrollment in nuclear engineering has been on the rise as much as 25 percent per year over the last half decade and as such, the number of grants, fellowships, and scholarships established under the University Reactor Infrastructure and Education Assistance program should accurately reflect these changes.

- **Incentives for Emission-Free Energy Generation**

  We support the Renewable Portfolio Standard in the Energy Policy Act of 2005; however we feel that a better option would be a Non-Emitting Technology Portfolio Standard. This standard would give credit for all non-emitting electricity generation including nuclear, hydro, integrated gasification combined-cycle (IGCC) with carbon sequestration, and renewables. We feel that incentives should be given for non-emitting technologies with extra incentives for renewables.

  We believe it is important not to overlook the non-emitting technologies that currently provide approximately 28 percent of our nation's energy, especially nuclear, because it is a baseload supply of power. Nuclear energy is also beneficial because it is not dependent on characteristics of a particular geographic region as hydro, solar, and wind power are, for example. In addition, we support consideration of a tax for those forms of electricity generation that emit carbon.

- **Support for the Funding of Nuclear Medicine Programs**

  The President's FY06 budgetary reduction for the Department of Energy Biological and Environmental Research (BER) Medical Application and Measurement Sciences Program poses a serious threat to the ongoing advancement of research that directly feeds molecular and nuclear medicine. The Medical Applications and Measurement Science Program funds hypothesis-driven research in basic physics and chemistry, which is a precursor to nuclear/molecular imaging and therapies. Without the funds from this DOE program, nuclear medicine as it is known today would not exist. The Anger Camera, (the first

gamma camera), was developed with DOE funding at Lawrence Berkeley Laboratories. Cancer diagnosis, staging and therapy assessment have been significantly enhanced by the introduction of Positron Emission Tomography (PET) that was also developed with these same funds at Washington University in St. Louis.

The reduction of funding for the DOE's Medical Application and Measurement Sciences Program would be a giant step away from what nuclear science could be—a way to enhance and prolong life for all people. The FY06 Budget initially was reduced to $13 million from its previous $37 million in 2005. The funding was reinstated ($35 million) in both the House and Senate versions of the budget, but the wording to secure funds for *this* research was not utilized in the Senate version. It is vital that these funds be correctly appropriated, and thus the House version should be adopted when the budget goes to committee.

- **Increased Funding for Non-Proliferation Programs**

Protecting our homeland from radiological attack is a prime priority for the United States. We, as a nation, are working hard to train our first responders and provide them with the tools necessary to detect, mitigate, and recover from a radiological incident. This, however, is not our first line of defense. Our primary priority is to keep the radiological materials out of the hands of terrorists. There are several federal programs that are devoted to the dismantlement and safe protection of these materials in the United States and overseas. One of these foreign programs is the Nunn-Lugar Cooperative Threat Reduction Program. This was first introduced in late 1991 by Senators Richard Lugar (R-IN) and Sam Nunn (D-GA) to safeguard and destroy weapons of mass destruction. To date, the program has dismantled and destroyed 6,312 nuclear warheads and 537 ICBMs. It is also devoted to finding meaningful peaceful employment for over 58,000 former weapons scientists.

Another important program run by the Department of Energy is the National Nuclear Security Administration's NA-21. This program has two parts: Global Nuclear Materials Threat Reduction and Global Radiological Threat Reduction. With increases in funding, these programs will be able to expand operations, increase personnel, recover more radiological materials, and continue to destroy harmful radioisotopes. With the expansion of these programs, radiological materials will be made inaccessible to terrorists. Nunn-Lugar and Global Threat Reduction are first lines of defense against radiological attack, and continued funding will insure their success.

- **Support for Non-Consolidated National Laboratories**

Recently, a DOE task force has submitted recommendations for changes to our nation's nuclear weapons infrastructure and stockpile. Included in the report is the creation of a new national laboratory with the sole purpose of warhead design, consolidating the jobs done at Los Alamos National Laboratory (LANL), Lawrence Livermore National Laboratory (LLNL), and Sandia National Laboratories (SNL). The Delegation opposes the recommendations of the task force. For years, one of the main goals of having multiple weapons laboratories was to ensure that the labs were consistently competing with each other and producing the best product available. The scientists at these laboratories also thrive in an environment based upon interchange of scientific ideas and not in an environment where cost plays a major role in the decisions made, as is what is ideologically built in the report.

- **Endorsement of Public Education in Nuclear Sciences and Technology**

The ability to make well-informed political and societal decisions is the basis for furthering the development of technology in the United States. However, when it comes to nuclear-related topics, many people are lacking the basic knowledge needed to make informed decisions and to form well-founded opinions. The public opinion on nuclear energy is, in many cases, based off of media sentiment that reflects inaccurate or biased information against the nuclear power industry. One way to boost the nuclear power industry and alleviate many of the misunderstandings that lead to the delay in the development of nuclear power plants is through education of the public.

With curricula for schools established at the state level, federal action is limited. However, increasing federal funding to secondary schools who integrate nuclear topics into their curricula would lend to a more informed public. Information through well researched and non-biased sources will reduce the obstacles facing the nuclear power industry to produce an ecologically friendly source of power.

- **Opposition to the Transfer of Nuclear Technology to Non-Signatories of the NPT**

  The Bush Administration has recently proposed to alter the long-standing U.S. policy of refusing to sell nuclear-related technology to countries that have not signed the Nuclear Non-Proliferation Treaty (NPT) by supporting the sale of civilian nuclear technology to India. This agreement would require India to place civilian nuclear sites under international safeguards, submit to inspections under the International Atomic Energy Agency's (IAEA) Additional Protocol, and pledge to support non-proliferation measures by refraining from selling nuclear arms technology to other non-nuclear weapons states. However, India is not currently a signatory to, and under this agreement would not be required to sign, the NPT, which would directly contradict the U.S. Non-Proliferation Act.

  While recognizing that bringing India's civilian nuclear sites under IAEA safeguards is a worthy goal, the Delegation opposes such a change in U.S. policy towards non-signatories of the NPT. By transferring nuclear technology to India, the U.S. will lose credibility on additional non-proliferation issues such as the debate over the North Korean and Iranian nuclear programs, strengthening the NPT, promoting the Proliferation Security Initiative, and other important international non-proliferation efforts. In addition, sale of significant civilian nuclear power to India has the potential to disrupt improving relations between India and Pakistan and may possibly harm U.S. – Chinese relations at a time when the help of the Chinese is desired to curb North Korean nuclear ambitions.

  The Delegation supports civilian nuclear technology transfers, under appropriate circumstances, to signatories of the NPT, but does not encourage the sale of nuclear technology to non-signatories, including India. However, we do encourage provisions to persuade India to submit civilian nuclear sites to IAEA inspections.

For any further information regarding any of these issues, please contact Rian Bahran at bahran@nesd.org. Thank you for your consideration.