2014 NUCLEAR ENGINEERING STUDENT DELEGATION

WASHINGTON, D.C. JULY 6TH – 11TH

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POLICY STATEMENT

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Executive Summary

- The federal government is the single largest employer of nuclear engineering graduates and has a vested interest in maintaining high quality professionals in nuclear science and technology.

- The Integrated University Program (IUP) is the only source of funding specifically targeted at nuclear science and technology students, and maintaining the IUP at or above the FY2014 funding level is vital to maintaining a strong nuclear workforce.

- To conduct innovative research and educate the next generation of nuclear scientists and engineers, U.S. universities require continued investment in existing equipment and modern research infrastructure.

- U.S. nonproliferation policy and trade agreements are vital to the security of the nation and the domestic growth of the industry. The Delegation supports a flexible approach to 123 Agreements for nuclear exports, renewal of the Export-Import Bank charter, and providing additional training to students in nonproliferation and safeguards.

- The Delegation recommends enactment of the main principles of the NWAA: establishing a consent-based siting process for interim storage facilities and geologic repositories and allowing access for an administering agency to the NWF. In the short term, the Delegation supports moving forward on a consolidated interim storage facility.

- The Delegation recommends equal application of emissions regulations across all energy sources. We strongly recommend that the Congress appropriate funds for SMR development and through deployment.

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.

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2014 NESD Policy Statement

Investing in Education

The Integrated University Program (IUP) is an initiative that supports nuclear science and engineering through student scholarships, fellowships, early faculty grants, and infrastructure improvements. It was established in the Energy and Water Appropriations Act of 2009 due to the "Committee's concern for lack of stable support" for intellectual capital necessary to operate nuclear facilities, perform research, and train nuclear scientists and engineers as mandated by the Atomic Energy Act of 1946. IUP provides the sole funding source specifically targeted at nuclear science and technology students and their education. Additionally, sustained long term funding for fission reactors and fusion experiments is crucial for preserving US expertise in nuclear science and engineering. According to ORISE [1], a breakdown of 2013 Nuclear Engineering graduates who were hired reveals 30% of BS, 44% of MS, and 46% of PhD graduates were hired by the government or government contractors. This clearly demonstrates that the U.S. Federal government has a vested interest in supporting the next generation of nuclear students, and gets a return on their investment.

The FY15 budget proposes a consolidation of STEM funding programs including IUP [2]. Nuclear science and technologies programs tend to be highly specialized and applied. As a result, the Department of Energy Office of Nuclear Energy (DOE-NE), the U.S. Nuclear Regulatory Commission (NRC), and the National Nuclear Security Administration (NNSA) are best suited to oversee and distribute funding for their specific missions through the IUP. Consolidating IUP may lead to the specific needs of nuclear science and technology programs being unfulfilled.

Recommendation: The Delegation recommends that funding for IUP is maintained at or above the FY2014 level. The Delegation does not recommend the consolidation of the IUP as part of the larger STEM consolidation effort.

Nuclear Exports and Nonproliferation

As the originators of nuclear technology, we Americans have both an obligation and a vested interest to continue leading the world in its responsible management. The Delegation does not encourage the proliferation of enriching and reprocessing (ENR) technologies, but we see need for versatile nuclear export agreements ("123") that allow exportation without forcing countries to forswear ENR technologies. Flexible agreements allow for greater American penetration into international markets and maintains domestic nuclear expertise. Recent efforts by the U.S. government to evaluate nuclear technology exportation on a case-by-case basis instead of requiring forswearing of ENR is promising. The U.S. Department of Commerce values these markets to be worth $740 billion over the next ten years [3]. An increased American share in these markets will create jobs and economic prosperity.

Nuclear technology exports are aided by the U.S. Export-Import Bank, which puts the U.S. on equal footing with other nuclear exporting nations that offer competitive financing. The Export-Import Bank is successfully operating and collected profits of $1.06 billion for the U.S. Treasury in 2013 [4]. Continued support and renewal of the Export-Import Bank charter is essential to maintaining the United States as a global leader in nuclear technology.

The United States has a national security interest in financially supporting and providing technical experts to the International Atomic Energy Agency (IAEA). Currently, many American nuclear engineers graduate without experience in nonproliferation and safeguards, which has resulted in a decrease in U.S. representation at the IAEA.

Recommendation: The U.S. should continue a flexible approach to 123 Agreements for nuclear exports, renew the Export-Import Bank charter, and provide additional training to students in nonproliferation and safeguards.

Used Nuclear Fuel

Currently, there is no system in place for long-term disposition of used nuclear fuel. In 1982, the Nuclear Waste Policy Act (NWPA) established the Nuclear Waste Fund (NWF) and mandated federal responsibility to develop a geological repository for high-level radioactive waste and used nuclear fuel (UNF) from civilian nuclear facilities. Approximately $750 million in annual fees from the NWF has created a balance of over $28 billion [5]. Since 1998, utilities have sued the federal government to recover costs from on-site dry cask storage. These lawsuits have totaled $3.7 billion as of December 2013 and are expected rise to $21 billion by 2020 [6].

The lack of political action for developing a repository has resulted in the U.S. Court of Appeals overruling the Waste Confidence Rule. The NRC is writing a Generic Environmental Impact Statement to address the Court's issues and create a new rule, but the outcome of the Court's decision is still pending. During this legal challenge, issuance of new reactor licenses has been halted until a decision is made on the Waste Confidence Rule.

Resolution of these matters would increase job potential and allow for growth in the nuclear industry. The Nuclear Waste Administration Act (NWAA) helps to solve this problem by creating a dedicated agency whose sole responsibility would be to handle disposition of UNF while having have full autonomy over future contributions to the NWF. It is in the interest of the federal government to enact a long-term storage solution because of the future economic impacts.

The Delegation recommends enactment of the main principles of the NWAA: establishing a consent-based siting process for interim storage facilities and geologic repositories, and allowing access for an administering agency to the NWF. In the short term, the Delegation supports the DOE recommendation of the construction of an interim storage facility using the NWF.

Energy, Emissions, and SMRs

Nuclear energy is artificially placed at an economic disadvantage because of preferential technology-based subsidies despite being well suited to meet current and future emissions-based standards. For example, these subsidies enable situations where wind generators can sell electricity at a negative price and still be profitable [7]. On an equal playing field, nuclear energy can meet the challenges posed in the Environmental Protection Agency's new Clean Power Plan effectively and economically. Additionally, each nuclear energy facility creates hundreds of jobs for middle class Americans with a competitive average salary of $60,000 [8].

Small Modular Reactors (SMR) provide a promising, low-economic-risk option for installation of new nuclear capacity to achieve emissions targets, create energy portfolio diversity, and secure national superiority in the technology. Therefore, we encourage continued appropriation of funds directed towards licensing SMR designs. Department of Defense or DOE facilities are attractive locations to build SMRs that ensure energy security for vital national security facilities. It is in the country's best economic and national security interest to take a more active role in building a first-of-a-kind SMR to stay competitive and establish ourselves as the global leader in this emerging technology.

The Delegation recommends equal application of emissions regulations across all energy sources. We strongly recommend that the Congress appropriate funds for SMR development through deployment.

[1] *Nuclear Engineering Enrollments and Degrees Survey*, 2013 Data, Number 72, Oak Ridge Institute for Science and Education

[2] *Budget of the United States Government*, Fiscal Year 2015: Cuts, Consolidations, and Savings.

[3] *The Energy Industry in the United States*, Select USA, http://selectusa.commerce.gov/industry-snapshots/energy-industry-united-states

[4] *Annual Report 2013*, Export-Import Bank of the United States, http://www.exim.gov/about/library/reports/annualreports/2013/highlights.html

[5] *Nuclear Waste Fund Fee Adequacy Assessment Report, January 2013*, U.S. Department of Energy

[6] *Disposal of High-Level Nuclear Waste*, GAO, http://www.gao.gov/key_issues/disposal_of_highlevel_nuclear_waste/issue_summary

[7] *Negative Wholesale Electricity Prices Occur in RTOs*, EIA http://www.eia.gov/todayinenergy/detail.cfm?id=6730

[8] *Nuclear Energy's Economic Benefits - Current and Future, White Paper*, Nuclear Energy Institute, April 2014. http://www.nei.org/CorporateSite/media/filefolder/Policy/Papers/jobs.pdf?ext=.pdf