Addressing the Need for Policy Education of the Next Generation of Nuclear Engineers and Scientists

Presentation to the American Nuclear Society Annual Meeting, Panel Discussion

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Federation of American Scientists

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Responsibilities of Nuclear Engineers and Scientists

• Because of the dual-use nature of nuclear technologies, engineers and scientists have ethical obligations concerning safety and security.

• Founding mission of the Federation of American Scientists (FAS) was to reduce nuclear dangers and to educate policymakers and the informed public—still guides FAS’s present day work.
• Who has control and who should have control of nuclear technologies? First major issue for FAS.
• In 1946, creation of AEC gave control to civilians.
Every Nuclear Engineer and Scientist is an Action Hero

• Our goal is to ensure that the next generation of nuclear engineers and scientists have the training they need for their chosen professions and the requisite knowledge in nuclear safety, nuclear security, and nonproliferation.

• What should be covered in the curriculum?

• Concerns that the required engineering curriculum might not allow one more required course.
FAS Task Force on Naval Nuclear Propulsion

- Formed in 2014 a task force of about a dozen experts who have diverse expertise and who are mostly outside DC policy circles (involved several research universities and the Naval Academy)
- Assigned aspects of the research agenda to particular task force members and their graduate students to write working papers, available at FAS.org
- One working paper resulted in a peer-reviewed journal article
- Briefings in Washington, DC
- This project would not have been covered by U.S. government support. The MacArthur Foundation funded it.
Our Study’s Research Questions

• What nuclear policy relevant courses are being taught at the graduate student level at the more than two dozen U.S. universities with nuclear science and engineering programs?

• Which programs have little or no nuclear policy relevant courses? And how can they develop such courses? Train-the-trainers workshops?

• Which programs have research opportunities for graduate students in nonproliferation or nuclear security projects?

• What is the funding availability for U.S. and foreign graduate students? How to address any gaps?
Our Study’s Tasks

• Preliminary research: literature review of about a dozen major universities

• Summer intern (2016) Steven Horowitz (TAMU) talked with and emailed numerous professors and other experts—prepared draft report

• Commissioned half dozen short papers by professors and graduate students

• April 21st event in Washington, DC

• June 13th event at ANS Annual Meeting

• Write report and ask for expert feedback

• Complete final report and distribute it by end of July/early August 2017
FAS convened on April 21, 2017 an intergenerational event in Washington, DC, featuring three experienced practitioners and three graduate students to discuss their work in nuclear safety and security.

Dr. Richard Meserve, Dr. Rodney Wilson, Dr. John Holdren, Hannah Gardiner (U. of FL), Yanuar Ady Setiawan (TAMU), Stephen O.A. Dahunsi (U. of Tenn.)
FAS Task Force on Verification of Naval Nuclear Materials convened an NGO event at the NPT PrepCom on May 3, 2017, at the Vienna International Centre.

Two panels featuring senior officials and experts and two graduate students: Andrew Reddie (political science, UC, Berkeley) and Sebastien Philippe (nuclear engineering, Princeton) with student rapporteurs Janani Mohan (Berkeley) and Henrietta Toivanen (Claremont College).
• Learning what has worked well and fostering collaborations among universities
• Continuation and possible expansion of consortia, funded by DOE/NNSA
• Private foundation and corporate support for gap areas—e.g., students not eligible for consortia programs and issues not wanting to be covered by government
• Required course(s) or sessions within courses on nuclear policy for engineers—need to address accreditation issues
• Development and publication of a course textbook
• Train-the-trainers workshops
Thank you for your attention!

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We value your advice. We would appreciate any comments or questions you may have.

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