THIRD WAY

BLOG *Published April 16, 2024 • 6 minute read*

US Leadership: Training the Future Global Nuclear Workforce

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Takeaways

- A major factor affecting our competitiveness in overseas nuclear energy markets is our ability to engage those markets early, establish interpersonal ties, and train and assist other countries to develop their nuclear workforces, regulatory structures, and other critical institutional frameworks.
- Doing so can help us lead in shaping international norms in safety, security, and nonproliferation (and not China or Russia) and thus, directly advance our national security interests.
- To meet this challenge, we must robustly fund federal programs that support international capacity building and training, and better integrate these efforts with domestic training and educational resources in the US.

At COP28, countries around the world pledged to triple global nuclear capacity by 2050, underscoring the importance of nuclear energy to our climate, commercial, and national security interests. It is clear that the international community is moving forward on deploying nuclear energy, and we either answer this call or get left behind.

Reaching this goal is a massive undertaking, but failing to rise to the challenge would threaten crucial national priorities, including global security.

Tripling world nuclear capacity will require a coordinated effort across nations to build and deploy advanced nuclear projects at the necessary scale. One important component of a coordinated approach is supporting countries who may be deploying US advanced nuclear systems in developing a trained workforce.

The Importance of International Workforce Development

For a country new to nuclear energy, a first step in preparing to deploy nuclear technology would be to start developing a knowledgeable workforce. This workforce would include technical, legal, regulatory, and other relevant expertise. The United States should seek an emerging host country to establish a set of values for using nuclear technology that are aligned with ours.

Nuclear power programs in Japan and Korea were developed with significant assistance from the United States and today operate with similar norms as the United States and other western countries. Importantly, the US established personal relationships and trust with key decision makers in those countries that lasted decades.

Where do those values get planted? In training programs. How are those values nurtured and grown? In the personal relationships that are built during those training programs.

The United States will be more competitive internationally and successful in establishing markets for advanced nuclear energy by training personnel from the host country—through such efforts, we can ensure US nuclear technology and US norms are preferred by international partners. These programs help us establish safety norms, security norms, foundations for operational excellence, and most importantly, personal relationships and trust.

These efforts jointly counteract and decrease the influence of autocratic regimes like Russia and China by making US technology the preferred technology globally. As an example, the Russian state nuclear corporation, Rosatom, has created a one-stop approach, the “Build-Own-Operate (BOO)” model, where Russia takes all of the financial and operational risks in building the plant but, in turn, operate the plant and receive a fixed price on the sale of electricity. In many cases, the relationship building starts with a personnel-training

agreement. [1] The US can counter this BOO model by creating opportunities for countries to buy US-designed products, supported by programs to train their indigenous experts.

Training and Educational Programs in the United States

Who would be responsible for developing training programs and fostering the personal relationships that arise from them? What special skills do we have in the US that we are under-deploying? There are a large number of programs that range from K-12 education through university programs. There are technician training and operational accreditation programs. There are unique training platforms available in our national laboratory system. There are training programs supporting the US Navy that efficiently train people to operate nuclear reactor power systems. Some of these programs include:

- American Nuclear Society K-12 Programs,
- University and Community College System,
- National Laboratory System,
- Naval Reactors Program,
- INPO Accredited Training Programs (NANT),
- United Association Training and Certification Programs,
- Operating Reactor Training Programs

While these programs offer valuable opportunities, they are limited in scope. As a result, any country interested in US training programs would struggle to find a starting point.

Policy Implications and Recommendations

So what new policies are needed?

Federal programs that provide civil nuclear partners with capacity building support and assistance in the development of regulatory and other institutional frameworks are vital. Helpful actions could include:

- Providing strong funding for programs such as the Foundational Infrastructure for Responsible Use of Small Modular Reactor Technology (FIRST) at the Department of State, which is intended to deepen bilateral relationships on civil nuclear and support other countries with capacity building efforts. One major step towards this end: pass the International Nuclear Energy Act, which would provide authorities to the State Department to more robustly execute these programs.

- Expanding the US Trade and Development Agency's (USTDA) programmatic budget so it has greater capacity to engage with prospective nuclear markets and extend nuclear-related grants to other countries on feasibility studies, regulatory gap analyses, etc.

- Passing the Senate's ADVANCE Act and its partner in the House, the Atomic Energy Advancement Act, which would take NRC international activities off the fee base and generally enhance the agency's capability to engage internationally.

Next, create better linkages between the components of the US system and make them available as part of the US approach to ensure US technology is preferred internationally. This deployment is desired to maximize influence of the US and its allies and minimize Russian and Chinese influence. For example:

- Funding regional training and recruiting consortia. This would provide an easily recognizable entity that could provide training while also providing better domestic visibility and attracting students from the US.

- Creating scholarship and fellowship programs to make US programs more affordable for overseas students—developing personal relationships is critical to the educational process, and we must embed overseas students with US students to nucleate decadal professional relationships.
- Creating online training delivery platforms for degrees and credentials that will maximize training while minimizing cost.
- Developing a "circular curriculum" that brings cohorts back together for advanced training opportunities.
- Creating curricula about deployment broadly and not just technology (the OECD NEA NEST SMR program and the Idaho National Laboratory Frontiers Program, supported by the Emerging Markets Analysis Program are both exemplars) to help countries think holistically about nuclear deployment.

Conclusion

The US and its international allies and partners must coordinate efforts to deploy nuclear power in partner countries by fostering close relationships built on shared values. Those common values are planted and can be grown through educational and training programs to create a talented nuclear workforce. These workforce development efforts will be critical to meeting our global nuclear deployment goals, strengthening our competitiveness in emerging international markets, and ultimately supporting US energy, climate, foreign policy, and national security interests.

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ENDNOTES

1. Kacper Szulecki & Indra Overland, "Russian nuclear energy diplomacy and its implications for energy security in the context of the war in Ukraine," Nature Energy | Volume 8 | April 2023 | 413–421