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Lessons Learned from Industry Engagement in Export Controls

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EXECUTIVE SUMMARY

There are several U.S. government-sponsored programs with significant experience engaging with foreign government and industry partners to support capacity-building in export controls. This work seeks to answer the question: How can the outreach experience of the U.S. government-sponsored export control capacity-building programs (ECCBP) inform best practices for engaging with advanced reactor vendors in the domain of international nuclear safeguards? To answer this question, we interviewed export control subject matter experts with experience working for the U.S. ECCBPs – the Bureau of Industry and Security (BIS), the Export Control and Related Border Security (EXBS) program, and the International Nonproliferation Export Control Program (INECP) – and developed a set of recommendations for industry engagement based on the collective experience of interviewees. These recommendations are:

1. Reach the largest audience. U.S. ECCBPs can maximize benefits and minimize outreach costs by "training the trainer" and hosting events that are relevant to the largest audience possible.
2. Emphasize carrots and sticks. Outreach events should highlight the benefits of compliance and the possible consequences of noncompliance with export control systems or international nuclear safeguards.
3. Engage in ongoing outreach. Though most outreach occurs during large events, maintaining open lines of communication and providing assistance or resources between events will maximize the effectiveness of capacity-building efforts.

Despite legal differences between export controls and international nuclear safeguards, these recommendations could inform the direction of future engagements between U.S. international safeguards capacity-building programs (INSGCBP) and advanced reactor vendors. The set of recommendations gleaned from export control SMEs serve as a starting point for discussions about how engagements in export controls and international safeguards may differ; whether large-audience outreach in the international safeguards domain would be similarly effective; and what challenges in engagements with reactor vendors will U.S. INSGCBPs face that have not been present in previous export control engagements.

ACRONYMS AND DEFINITIONS

Abbreviation	Definition
BIS	Bureau of Industry and Security
DOE	United States Department of Energy
ECCBP	export control capacity-building program
EXBS	Export Control and Related Border Security Program
INECP	International Nonproliferation Export Control Program
INSGCBP	international nuclear safeguards capacity-building program
NNSA	National Nuclear Security Administration
PNNL	Pacific Northwest National Laboratory
SME	subject-matter expert
USG	United States Government

1. INTRODUCTION

Export control systems are designed to prevent and detect the illicit movement of strategic goods, or items that can be used for military purposes, including dual-use goods which can be used for civilian or military applications. There are several departments and programs within the U.S. Government (USG) that engage with foreign partners, both governments and industries, to help develop and strengthen their export control systems. In this work, we seek to understand how industry engagement happens in the export control domain so that we may apply the lessons learned from such engagements to future engagements with U.S. advanced nuclear reactor vendors in the field of international nuclear safeguards. Engaging U.S. industry partners in international nuclear safeguards poses two unique challenges: 1) many advanced reactor vendors have little to no experience with international safeguards and therefore may not be familiar with international safeguards obligations, and 2) U.S. reactor vendors have no legal requirements related to international nuclear safeguards, but many international buyers and U.S. operators identified on the U.S. Eligible Facilities List under its Voluntary Offer Agreement with the International Atomic Energy Agency (IAEA) will.

In this report, we begin with a discussion of how industry outreach takes place in the export control domain by USG-sponsored ECCBPs. This discussion is informed by a series of interviews conducted with national laboratory staff with experience working for these programs. Then, we discuss the recommendations gleaned from these interviews. We briefly highlight the inherent differences between export control outreach and international safeguards outreach and conclude with a discussion of lessons learned for future industry engagement in international nuclear safeguards based on recommendations from export controls.

2. INDUSTRY OUTREACH IN EXPORT CONTROLS

2.1. USG Export Control Capacity-Building Programs

Industry outreach in export controls is led by three offices and programs within the USG. First, the U.S. Department of Commerce's Bureau of Industry and Security (BIS) performs export control outreach on behalf of the USG through training events, conferences, and targeted capacity-building tailored to customer needs. Second, the U.S. Department of State manages the Export Control and Related Border Security (EXBS) program to help partner governments strengthen their national strategic trade control systems. EXBS provides training and assistance in areas like development of laws and regulations, licensing, enforcement, government-industry cooperation, and interagency and international cooperation (U.S. Department of State n.d.). Third, the National Nuclear Security Administration (NNSA) under the U.S. Department of Energy (DOE) manages a partner program to EXBS, the International Nonproliferation Export Control Program (INECP). INECP provides its global partners with WMD-related export control training and technical assistance to strengthen its partners' ability to identify export-related risks and address implementation gaps in export control systems. Together, BIS, EXBS, and INECP strive to strengthen the global export control system to prevent the illicit transfer of strategic and dual-use commodities.

Industry outreach is often a collaborative effort between the ECCBPs and the government of the state of interest. BIS, EXBS, and INECP take a "train the trainer" approach by working with foreign governments to identify a state's needs related to its export control system. Before an individual company can comply with export regulations, that company's host state must first have a robust strategic trade control system with regulations, licensing requirements, and an enforcement system. Most BIS, EXBS, and INECP outreach involves meeting with foreign governments to improve these systems, identify the sensitive industries or sectors of the state, and develop training materials for those groups. Then, the USG ECCBPs help the foreign government organize training events tailored to their needs.

The discussion that follows is based on a series of interviews conducted with six SMEs from the U.S. national laboratories and DOE/NNSA with prior or current experience as training implementers with BIS, EXBS, and INECP. These interviews were conducted anonymously to allow interviewees to speak candidly about their experiences with foreign partners. Interviews took place between August and October of 2022. Findings in the following section, "Industry Outreach Methods," were informed by a combination of literature reviews and the experiences of interviewees. The subsequent section, "Motives to Participate in Industry Outreach," was informed entirely by interviewee experience.

2.2. Industry Outreach Methods

Industry outreach is tailored to the needs of the state based on the state's industries and sectors, international export agreements, or shipping partners. ECCBPs work with foreign governments to identify the challenges they face and organize training events to address them. Industry outreach often occurs in conference or workshop settings in which many companies from an industry are invited to learn about export controls, risks, and violations. Although attendance is voluntary, companies have incentives to attend as they are responsible for following export requirements of their host country and their trade partners.

Previous work in this area sought to understand industry's interest in a self-regulation approach, or an approach in which individual industries or companies proactively identify and mitigate export risks across their supply chain to prevent illicit transfers of dual-use goods (Hund and Elkhamri, Industry Self-Regulation as a Means to Promote Nonproliferation 2005). Self-regulation differs from an internal compliance program (ICP) implemented by an individual company because self-regulation encapsulates industry-wide approaches for contributing to nonproliferation while an ICP is narrowly focused on ensuring a company follows its internally-established rules to comply with export regulations (Hund and Seward 2008). Hund and her team at Pacific Northwest National Laboratory (PNNL) interviewed representatives of dual-use industries, trade associations, and non-governmental organizations to understand their export-related challenges and interest in a self-regulation approach. Interviewees cited challenges like the use of front companies as middlemen between the supplier and the end user and a lack of knowledge of export controls resulting in violations (Hund and Seward 2008). While some companies were interested in the self-regulation concept, others did not see a functional difference between self-regulation and an ICP.

Nearly a decade later, PNNL's self-regulation team participated in a wider variety of activities related to self-regulation to engage with industry. Some such activities included attending the Wiesbaden 1540 meeting alongside a wide variety of industry representatives, using Japanese company data to track which have some self-regulation system in place, participating in a panel at the American Nuclear Society conference, and publishing an article in the *Bulletin of the Atomic Scientists* (Hund and Weise 2016). The team also developed a set of indicators companies can adopt to demonstrate commitment to supply chain security and implemented these indicators at PNNL to "walk the talk" (Hund 2016).

The self-regulation team's changes in outreach approaches – from individual interviews and consultations to attending conferences, publishing work, and leading by example – coincides with a priority shift by the USG to focus on reaching larger audiences and broader capacity-building. In the mid-2000s, ECCBPs began expanding to provide licensing and other training to a growing number of countries. At the time, "assistance providers [the ECCBPs] had very little experience upon which to base the development of export enforcement training" (Perry 2019). With a growing body of experience to draw from, the ECCBPs have sought to allocate their limited resources most efficiently to maximize impact and reduce proliferation risks.

To this end, BIS, EXBS, and INECP engage in a variety of outreach activities to assist their partners. BIS offers seminars, industry group meetings and conferences, and meetings with foreign governments. In 2020, BIS "participated in more than 147 outreach activities" including meetings, conferences, trade shows, and individualized outreach visits (Bureau of Industry and Security 2020). BIS also publishes "Don't Let This Happen to You!", an annual report that highlights export violations committed by or through U.S. companies and the penalties they incurred. EXBS also engages in a variety of outreach activities, including providing direct assistance through tailored export training curricula, hosting international and regional conferences and training workshops, and collaborating with other agencies to provide assistance and information exchanges (U.S. Department of State 2011). INECP engages in direct bilateral consultations with partner governments, hosts hands-on training courses on specific topics like commodity identification, and hosts conferences and workshops that target entire industries and sectors (National Nuclear Security Administration 2018, U.S. Department of Energy 2008).

Since 2012, BIS, EXBS, and INECP have collaboratively hosted the annual Joint Industry Outreach Seminar on Strategic Trade Management. The seminar invites representatives from government, industry, and academia from many countries to participate in conversations about export controls, internal compliance programs, enforcement, and other relevant topics. The 2022 Joint Industry Outreach event took place in late September in Singapore as Southeast Asia is a region of focus for all three organizations.

Direct outreach from BIS, EXBS, INECP, or any of the DOE national laboratories to specific companies is uncommon. Instead, as described previously, companies are invited to attend training events and conferences hosted by these programs to learn more about export controls. This is due to the capacity-building focus of the programs. The programs are implemented with the intent of empowering partner governments and reaching as many relevant parties as possible effectively. They do so by 1) providing assistance and resources to partner governments which then allow those governments to offer direct industry outreach and by 2) holding training events that are broad enough to attract a large audience but specific enough to provide useful information for attendees. For example, a chemical sector-based approach allows the programs to reach companies broadly involved in chemical production or shipment and tailor an event to focus on export regulations related to chemicals.

Though industry outreach is managed primarily by BIS, EXBS, and INECP, the DOE national laboratories play an important supporting role by identifying states that could benefit from outreach and by developing training materials. Many laboratory staff members working on export controls previously worked at the Department of Commerce or State and bring that experience into their work at the labs. Many also work directly with BIS, EXBS, or INECP to identify a partner's needs and implementation gaps, tailor training materials for a specific customer, deliver material during outreach events, or consult with foreign governments.

2.3. Motives to Participate in Outreach Events

2.3.1. Carrots

Foreign governments and industries are obligated to adhere to export regulations, and there are carrots (positive incentives) and sticks (threat of negative consequences) associated with export control systems. Governments are motivated to develop and maintain an export control system to enjoy the benefits of doing so. At the highest level, developing an export control system demonstrates a state's commitment to global security and nonproliferation as the goal of export controls is to prevent the illicit movement of strategic goods. On a more granular level, governments are motivated to develop an export control system that complies with trade partners' export regulations to increase their state's exports. International trade can spur economic development and attract foreign direct investment.

Companies and industries within a state have a wider range of "carrots" motivating them to comply with export regulations and participate in export outreach events. To export certain strategic commodities, companies must comply with their state's export regulations and those of their trade partners. Outreach events are designed to teach companies about domestic and international export controls relevant for their industries, and understanding the regulations is the first step toward complying with them. In addition, attending export outreach events demonstrates a company's

efforts to comply with export regulations. Some states give companies that have attended outreach events expedited access to government licensing officials as a reward for their attendance. These efforts also contribute to building a company's export-compliant reputation which may attract investors or international trade partners. Companies like Westinghouse and General Electric often attend outreach events to explain what compliance looks like and emphasize that they will only do business with export control-compliant companies.

2.3.2. Sticks

Foreign governments are motivated to develop export control systems and adhere to export regulations of their international trade partners to avoid the negative consequences, or the "sticks," associated with not doing so. Governments want to avoid sanctions or other trade restrictions resulting from violating trade partners' export regulations. Industries and companies that violate export regulations are likely to suffer reputational damage and risk driving away investors or trade partners. The BIS's "Don't Let This Happen to You!" report takes advantage of companies' fear of reputational damage by naming and shaming those that violate export controls. Another "stick" driving a company to comply with export controls is the penalties and fines associated with export violations. Companies cannot use ignorance of the regulations as a defense for violating them; therefore, it is in their best interest to learn about export controls, and outreach events provide the opportunity to do so.

3. RECOMMENDATIONS FROM EXPORT CONTROL SUBJECT MATTER EXPERTS

Discussions with export control SMEs have informed the following set of recommendations for effective industry engagements:

1. **Reach the Largest Audience**
   BIS, EXBS, and INECP maximize benefits and minimize costs of outreach by focusing on government capacity-building and holding events that are relevant to large audiences. By targeting governments for many outreach activities, the programs are "training the trainer" and enabling governments to perform their own outreach without external assistance. Fostering self-sufficiency in partner governments is more cost-effective than engaging in one-on-one outreach with individual foreign companies. Second, the programs host outreach events focusing on topics relevant to specific industries (e.g., equipment manufacturing, metal production, etc.) or sectors (e.g., chemical or biological sectors). These events are broad enough to attract an audience of organizations across government, industry, and academia but specific enough to an industry or sector to provide relevant and useful export control information.

2. **Emphasize Carrots and Sticks**
   Outreach events highlight the benefits to companies of export compliance and the costs of noncompliance. Benefits could include attracting investors, participating in international trade, protecting intellectual property, and contributing to global security and nonproliferation. Costs could include penalties or fines for export violations, reputational damage, denial or revocation of export licenses, and loss of future international trade opportunities.

3. **Engage in Ongoing Outreach**
   It is important that the ECCBPs maintain relationships with their partners over time and not just during events. The U.S. programs accomplish this in several ways. First, the programs establish multiple channels of communication to provide ongoing outreach to partners. One such channel is to designate a U.S. program point of contact for communications about ongoing cooperation. Second, when appropriate, the U.S. programs provide training materials and other resources to their partners to use for export control system development and domestic outreach. Last, outreach is not limited just to events. Instead, outreach happens over the course of months to years as the U.S. programs cooperate with their partners to identify gaps, implement solutions, and empower domestic companies to follow export control laws. The U.S. programs achieve this through regular meetings and communication with their partners.

4. CONTRASTING EXPORT CONTROLS AND INTERNATIONAL NUCLEAR SAFEGUARDS

While the lessons learned from export control engagements could shape engagements with nuclear reactor vendors in the domain of international nuclear safeguards in the future, there are some key differences between export controls and international safeguards that impact the applicability of these lessons for safeguards. These differences include differing legal requirements and engaging partners outside of traditional safeguards stakeholders.

Export control systems mandate that industries adhere to all relevant domestic and international export regulations prior to exporting controlled goods. Export regulations are enforced by the state's criminal justice system, and violations are punishable with fines and other penalties. To avoid such penalties, it may be in a company's best interest to take advantage of opportunities like government-sponsored export outreach events to learn about export controls.

In contrast, legally, the burden of applying international safeguards to a new reactor falls on the buyer rather than the vendor. Because the U.S. is a Non-Proliferation Treaty-designated nuclear weapons state that has concluded a Voluntary Offer Agreement with the IAEA, only those facilities on the U.S.'s "Eligible Facilities List" may be subject to IAEA safeguards (International Atomic Energy Agency 1981). However, vendors will find benefit in implementing international safeguards in new reactor designs despite the lack of legal requirements for safeguards for two reasons. First, because any U.S. reactor may be placed on the Eligible Facilities List, it is possible that vendors will be required to implement international safeguards on their reactors and should therefore understand their obligations. Second, while reactors may not be placed under international safeguards in the U.S., they will be required to be placed under international safeguards when exported to other countries.

Many of the reactor vendors currently working on advanced reactors are new to the field of nuclear technology. Companies like Westinghouse and General Electric have been designing and deploying nuclear reactors globally for decades and have teams devoted to international safeguards implementation. Vendors new to the field, however, may not be familiar with international safeguards requirements. Compounding this issue is the fact that advanced reactor vendors are developing brand new reactors for which an establish international safeguards approach does not exist, which could lengthen the design process to develop such an approach. Vendors unaware of international safeguards requirements may be resistant to participate in engagements for international safeguards if they do not understand the importance of them.

Recommendation 1: Safeguards engagements with new reactor vendors should try to reach large audiences while grouping vendors by design maturity or level of familiarity with international safeguards. Despite the legal and audience-related differences between export controls and international safeguards, the experiences of staff members that have participated in export control engagements could inform the direction of future engagements with advanced reactor vendors in international safeguards. A 2021 report published by PNNL highlights the need for engagements with reactor vendors to be tailored based on design maturity since international safeguards considerations vary at different stages of R&D (Gray, et al. 2021). At the earliest stages of the design process, many advanced reactor vendors – especially those new to nuclear – may not even be aware of international safeguards requirements. Engagements would therefore be most effective if designed around safeguards-by-design, or incorporating safeguards into a reactor from

the beginning of the design process. However, because it might not always be possible to engage with vendors who have not already begun the design process, another effective way to engage in outreach would be to target and group vendors by design maturity or vendors' level of familiarity with international safeguards. This method of outreach could imitate the way that the U.S. programs engaged in export control outreach seek to reach the largest audience while ensuring that information shared during such engagements is relevant to all attendees.

Recommendation 2: INSGCBPs should emphasize the carrots and sticks when engaging with reactor vendors by focusing on the international marketability of a new reactor. Although reactors deployed in the U.S. may have limited or no international safeguards requirements, reactors deployed in most states outside of the U.S. will have such requirements. Vendors with international market ambitions have incentives to consider safeguards early in the design process to reduce development costs and delays resulting from redesign due to international safeguards design elements implemented late in the design, build, and commissioning phases. In addition to reactor marketability, a vendor whose reactor meets international safeguards requirements may enjoy reputational benefits from adhering to international safeguards requirements and supporting nonproliferation. On the other hand, "sticks" associated with international safeguards could include increased project costs due to development delays and a loss of competitive advantage due to not having a safeguards-ready product.

Recommendation 3: Model ongoing outreach with reactor vendors after the ongoing outreach taking place in the export control domain. Ongoing outreach could involve establishing multiple channels of communication, delivering training materials or other international safeguards-related resources to partners, and maintaining relationships with vendors outside of large events. One difference between export control and international safeguards engagements that Gray and colleagues highlight is that vendors are likely to be concerned about protecting proprietary information during discussions about implementing safeguards (Gray, et al. 2021). Many vendors will likely rely on nondisclosure agreements (NDA) to protect their intellectual property when engaging with U.S.-based INSGCBPs such as the International Nuclear Safeguards Engagement Program (INSEP). A desire to protect proprietary information may limit discussions about implementation of international safeguards during large-audience events. Concerns about protecting intellectual property could deter vendors from engaging with INSGCBPs directly or on specific issues. Whether through NDAs or other means, it will be important to consider how to maintain ongoing and fruitful relationships with vendors while protecting their proprietary information.

5. CONCLUSION

As more nuclear newcomers enter the market with advanced reactor designs, it will be increasingly important for U.S. INSGCBPs to identify opportunities and establish methods to engage with new vendors on international nuclear safeguards. Despite differences between export controls and international safeguards, the recommendations from export control SMEs about best practices for engaging with industry partners can be applied to future engagement with advanced reactor vendors. Future efforts in this area could draw on the experience of safeguards SMEs that have collaborated with reactor vendors in the past to identify aspects of export control outreach that are applicable to international safeguards outreach and the aspects that may not be applicable. This work could identify such differences and inform how safeguards outreach can be tailored to best meet the specific needs of engagement partners.

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