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Engaging Industry in Supporting Self Regulation

August 2016

G Hund
RA Weise

U.S. DEPARTMENT OF ENERGY

Prepared for the U.S. Department of Energy
under Contract DE-AC05-76RL01830

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Pacific Northwest National Laboratory
Richland, Washington 99352

Contents

1.0 Overview

The Pacific Northwest National Laboratory (PNNL) Self Regulation team conducted several activities this year to engage industry. The list includes:

1. Attending Wiesbaden 1540 meeting in November 2015
2. Reviewing and providing comments on Botticelli principles throughout the year
3. Tracking Japanese companies' self regulation focus (contract with Pritham Tanno)
4. Managing data associated with industry submittals under 10 CFR Part 810 authorizations
5. Conducting industry interviews (covered under another deliverable)
6. Participating on American Nuclear Society panel – 2016 Advances in Nuclear Nonproliferation Technology and Policy Conference (September)
7. Publishing an article in the *Bulletin of the Atomic Scientists* about the role of industry and finance in nonproliferation.

1.1 Wiesbaden

Gretchen Hund attended the Wiesbaden 1540 meeting that included a wide array of industry representatives. One panel focused on industry compliance practices. An industry representative mentioned the challenges of buying a company that has a different culture than your own. Reputational risk is the most important consideration. This company conducts industry-to-industry engagement by doing bench marking. Another company mentioned the need to set up supply chains such that the parent company or lead has strategic discussions with its suppliers about the importance of compliance. Another industry participant discussed how complex the global supply chain is for his business: electronic transfers are often more difficult than the movement of goods, and the location of computer servers can be an issue. One representative from the finance industry discussed his role in compliance. He feels there needs to be a "vigilance" requirement that is practiced to ensure that illicit transactions are not funded. Another industry representative cited intangible technology as being a big area of focus for his firm, and asked for better regulatory predictability. He sees cloud services becoming increasingly prevalent and challenging to manage. Another industry participant represented the Botticelli Project. He mentioned the Commandments that serve as best practices for members and the Botticelli Internal Compliance Program (ICP) self-assessment guide. He wants Botticelli to be recognized as a useful organization and is working to promote it.

1.2 Botticelli

Rachel Weise prepared a set of specific comments to Sandro Zero concerning the Botticelli 10 Commandments. We offered to provide non-legal counsel and were interested in remaining apprised of their activities but felt that some of the guidelines went too far and were not going to be supported by government. We have remained in touch with Mr. Zero.

1.3 Japanese Companies

Pritham Tanno continued to track Japanese companies to determine which ones have some type of industry self-regulation approach in managing their operations. The review included 254 companies from the automotive, electronic, defense, machine tool, chemical, and trading sectors. Most of these have some form of ICPs, a requirement for being recognized for compliance by certain Japanese governmental and non-governmental organizations. Thirty-one companies (12 percent) were highlighted because they advertised ICP activities in clear and specific language on their public company websites about their commitment to nonproliferation activities through stringent export control. These highlighted companies mention their responsibility to support international export control and nonproliferation activities. The full report is available in Appendix A.

1.4 Data Management -- Part 810 Authorizations

The team is working with National Nuclear Security Administration (NNSA) contractor Margaret Harding to identify a path forward to manage NNSA's problem that it is "swimming in data," concerning the historical and future submittals of reports by industry in support of their authorization requests. This is an ongoing project that will be coordinated with other entities supporting NNSA to ensure that approaches are complementary. The team felt that efficient data extraction processes could be used for:

1. Reports to Congress
2. Nuclear Suppliers Group support
3. Enforcement
4. Improvements on the Part 810 (particularly the new e-810) process itself

1.5 American Nuclear Society Panel

Gretchen Hund will participate in a panel at a topical American Nuclear Society conference—Advances in Nuclear Nonproliferation Technology and Policy—being held in Santa Fe in September. The panel will discuss the importance of controlling transfers of relevant materials, equipment, and technology to nuclear nonproliferation. Historic attempts to acquire or develop nuclear weapons have included international procurement of goods and services. The responsibility to block such procurements is shared by industry, government, researchers, academics, financiers, brokers, and insurers. This panel will consider "supply chain security"—the concept of controlling and securing sensitive goods and information not only while in an organization's possession and when delivered to a customer, but also when transferred to suppliers as well as subsidiaries. This session will address:

- The potential threat of procurement of nuclear fuel cycle dual-use commodities and technology
- Nuclear industry's role in positively impacting strategic trade and nonproliferation through a dedicated focus on enterprise compliance and supply chain security
- Ensuring effective supply chain security within a research environment to manage nuclear technology exchanges.

The anticipated outcome from the session is to build a foundation for further exploration of key export control and broader supply chain security issues that impact the nuclear industry and its engineers, scientists, academics and policy makers.

The panel will be moderated by Margaret Harding, DOE/NNSA consultant. Panelists will include:

- **Kevin Whattam**, PNNL, will provide an overview of the general illicit procurement threat and background on U.S. strategic trade control activities addressing the threat.
- **Bill Puff**, HSI E2C2 or other enforcement agency, will present examples of nuclear technology/commodities procurement networks.
- **Gretchen Hund**, PNNL, will discuss industry self-regulation concept; "gold standard."
- **Shannon Barna**, GE, will discuss secure trade flows with a focus on ICPs.
- University Compliance Officer will discussing the role of export control/compliance in a research environment.

1.6 Bulletin of the Atomic Scientists Article

Rachel Weise and Gretchen Hund published an article in the September issue of the *Bulletin of the Atomic Scientists.* The article is entitled "Financial incentives for reducing proliferation risks." The article is provided in Appendix B.

Appendix A

Methodology for Review of Internal Compliance Programs in Japanese Industry

KT Research Services

July 5, 2016

Methodology for Review of Internal Compliance Programs in Japanese Industry

Overview

KT Research Services conducted a survey of the internal compliance programs in Japanese industry. This review included 254 companies from the automotive, electronic, defense, machine tool, chemical, and trading sectors, most of which have some form of internal compliance programs (ICPs), which is required to be listed by certain Japanese governmental and non-governmental organizations. Thirty-one companies were highlighted because they advertised ICP activities in clear and specific language on their company websites, including public statements about their commitment to nonproliferation activities through stringent internal export control. This analysis was conducted over the Internet.

Sources

This survey relied on publically available information from governmental, non-governmental, and commercial sources on-line. The primary sources are:

- The Japanese Ministry of Economy, Technology and Industry (METI): METI maintains a public listing of "names of companies that have voluntarily established ICPs, conducted self-audits, and registered with METI for the purpose of implementing appropriate security export controls."[1] As of April 2016, 607 companies have been published on this list. Companies stay on the list for one year, can be renewed annually, and new companies are added quarterly.

- The Center for Information on Security Trade Controls (CISTEC): CISTEC is a Tokyo based non-governmental organization that supports Japanese industry partners on issues related to export controls and coordinates with governmental entities, such as METI. "CISTEC aims to contribute to world peace by supporting rational and effective security export control and by serving as a 'linkage channel' among industry, government and academia on security export control." [2] CISTEC provides fee-based consultation for companies, assists with the development of internal compliance programs, offers training seminars, and holds international export control seminars for Asian countries. CISTEC maintains a list of associate member, which includes 427 companies.

- The Japanese Customs Authorized Economic Operator (AEO) program: AEO is run by the Japanese Customs and is a program where companies, both importers and exporters, can be certified as an AEO for complying with certain security standards and would additionally "enjoy specific benefits such as a positive reputation as a more compliant and security-oriented company, favorable consideration in Customs enforcement proceedings and better relations with Customs."[3] As of April 2016, 87 companies have been certified as AEOs.[4]

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[1] http://www.meti.go.jp/policy/anpo/securityexportcontrol4.html
[2] http://www.cistec.or.jp/english/about/introE2.html#annaie2
[3] https://tax.thomsonreuters.com/blog/onesource/japan-aeo-program-authorized-economic-operator/
[4] http://www.customs.go.jp/kyotsu/aeo/export/e_tokyo/e_tokyo.pdf

- The Japan Chemical Fibers Association and the Japan Machine Tool Builder Association: Both associations maintain member directories that were consulted because they are industries of interest.

- Global Defense Contractors: Listings of top global defense contractors were used to identify additional companies active in the defense-related business.[1]

Methodology

To begin with, the five lists mentioned above were compared to find overlap, and to identify those companies most likely to have strong ICPs in place. The METI and CISTEC lists combined to result in a dataset of 201 companies that were on both lists, excluding non-Japanese subsidiaries, such as GE Healthcare of Japan. Forty-one companies on the Customs list were also on the combined METI and CISTEC list, and were included in the review. Twelve additional companies, identified through business associations or defense contractor listing, and on either the METI or CISTEC list but not the combined list, were also included. For example, Kureha Corporation is a member of the Japan Chemical Fibers Association but was not listed in the combined METI and CISTEC dataset because it is not on the CISTEC list. It was included in the final dataset because it belongs to an industry of interest.[2] This resulted in a final group of 254 companies presumed to have ICPs in place in industries that deal in products of nonproliferation interest.

Table 1: Sources of Dataset

Source Lists	Original Number of Companies Listed	Number of Companies Analyzed
METI	607	
CISTEC	427	
AEO	87	
METI and CISTEC overlap		201
METI, CISTEC, AEO overlap		41
Business association or defense		12
Total Reviewed		254

In the end, only approximately half of the companies from each source was included in the review because the remaining companies have not be registered on multiple lists and, as such, represent a second tier of interest. Some companies that were not reviewed are presumed to have some form of ICPs in place, but have not taken the steps to be registered with multiple governmental and nongovernmental organizations in Japan. Registering with multiple organizations, and implementing the various requirements of each organization, can be seen as a critical step in taking responsibility for internal compliance with export control obligations.

[1] http://www.jcfa.gr.jp/english/3-members.html, http://www.jmtba.or.jp/english/members-directory/list-of-members/, http://www.globalsecurity.org/military/world/japan/industry.htm
[2] http://www.jcfa.gr.jp/english/3-members.html,

Results

The categories of industry reviewed are listed in Table 2. The companies in this dataset are from a diverse cross-section of Japanese industry and seem to be a mixture of large names such as Canon, Sony, Toshiba, and smaller firms like Advantest. Approximately half are from the electronics sector, machine tools, and trading houses combined.[1] The electronics sectors include companies in consumer electronics and electronic testing equipment and represents 25% of the total number of companies reviewed. The machine tool industry and trading houses comprised 12% and 11% of the total reviewed, respectively.

In the next step, a review was conducted of Corporate Sustainability Reports (CSR) or other corporate governance and compliance information on a company's website for information on export control activities. Most companies maintain a section of their website for corporate responsibility activities such as efforts to protect the environment, engage with local communities, and ensure employee health and safety. Some included export control or secure trade control activities under this section or in the risk management section. This information was highlighted and included in the database. A basic Internet search was conducted for other information of interest and was included where applicable.

Table 2: Industry and Priorities

Industry	Number of Companies	Priority per Industry[2]	Priority Percent[3]
Aerospace	2		
Automotive	14	2	14%
Carbon Fiber	8	1	13%
Chemical	21	1	5%
Defense	7	2	29%
Electric engineering	10	1	10%
Electric Manufacturing	14	5	36%
Electronics	64	10	16%
Engineering	10	1	10%
Heavy Equipment Manufacturing	3		
Information Technology	9		
Machine tools	30	3	10%
Machinery	10		
Materials Processing	3		
Metals	6		
Other	5		
Telecommunications	9		
Trade	29	5	17%

[1] Japanese trading houses are Japanese companies that trade in a wide range of products, with extremely diversified business lines, unlike other trading companies which often specialize in specific product lines. There are seven major trading houses in Japan and they are among the highest-paying employers in Japan. (https://en.wikipedia.org/wiki/Sogo_shosha)

[2] Priority per Industry -- companies identified in the review as having clear and specific language on export control efforts and have been highlighted within their industrial sector.

[3] Priority Percent – the percent of companies identified as priority based on industrial sector.

Grand Total	**254**	**31**	**12%**

The review of CSRs show that there is a wide range of activities each company undertakes to address their responsibilities relative to export control, and that only a small portion makes a public statement about their activities. Thirty-one companies, 12% of the total, were identified as priority based on their clearly defined, publically stated efforts on export control compliance activities. These priority companies mention their responsibility towards supporting international export control and nonproliferation activities in varying degrees of strong language.

Appendix B

Financial Incentives for Reducing Proliferation Risks

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Financial incentives for reducing proliferation risks

Rachel A. Weise & Gretchen E. Hund

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OTHER FEATURES

Financial incentives for reducing proliferation risks

Rachel A. Weise and Gretchen E. Hund

ABSTRACT
Two influential market groups can take action to reduce the risk that nuclear dual-use technologies end up in the wrong hands. Financial institutions, such as banks and insurance companies, and large manufacturers that integrate dual-use technologies into more complex goods both can encourage other companies to adopt stricter compliance programs to reduce the risks of nuclear proliferation. The authors describe ways to create financial incentives for risk reduction along the whole nuclear supply chain.

KEYWORDS
Antiproliferation; dual-use technologies; export control; financial institutions; integrators; internal compliance programs; risk management; supply chains

A subsidiary of the American company Schlumberger Limited pled guilty in March 2015 to violating Iran sanctions and was fined more than $230 million; the subsidiary failed to adequately train its staff on sanctions policies and compliance procedures, which resulted in penalties to the parent company as well as to the subsidiary (US Department of Justice 2015b). A Turkish national, Reza Zarrab, facilitated hundreds of millions of dollars of transactions between 2010 and 2015 for sanctioned Iranian entities using an international network of front companies to deceive banks and companies about the Iranian beneficiaries of the transactions (US Department of Justice 2016b). And Erdal Kuyumcu, a US citizen and the CEO of an international metallurgical company, was arrested in March 2016 for allegedly exporting a specialized metallic powder with nuclear applications to Iran without a license – listing Turkey as the final destination, but then shipping the powder on to Iran (US Department of Justice 2016a). While these three recent incidents are seemingly unrelated, they all illustrate that, for better or for worse, globalization of manufacturing and finance has changed the nature of nuclear proliferation.

Before 1991, nuclear nonproliferation efforts focused almost exclusively on limiting the spread of materials and equipment specifically designed for nuclear use – reactors, centrifuges, and fissile material. Governments did not closely scrutinize or control dual-use items – those with both nuclear and nonnuclear applications, such as carbon fiber and anti-corrosive valves. When the world discovered in 1991 that Iraq had been developing a relatively sophisticated nuclear weapons program by importing dual-use items, the international community responded by increasing controls on such technologies (International Atomic Energy Agency 2015, 4). Despite ongoing efforts to control dual-use items, including components of weapons-of-mass-destruction delivery systems, illicit trafficking continues to undermine international security.

While some manufacturers of nuclear dual-use items are aware of the proliferation risks associated with their goods, and implement internal compliance programs[1] to reduce those risks, a distressing number of dual-use manufacturers do not (Hobbs and Young 2015, 1). Manufacturers are generally aware of the export restrictions on their goods, but they often do not connect their work with nuclear proliferation and weapons delivery systems, nor do they consider themselves part of the nuclear supply chain. Therefore, though manufacturers meet regulatory requirements, dual-use items still end up in the wrong hands.[2] Raising awareness among dual-use manufacturers about the proliferation risks associated with their businesses is crucial, but the sheer number and diversity of dual-use manufacturers makes outreach by government agencies difficult. For example, in research that has not yet been published, researchers at Pacific Northwest National Laboratory found that there are likely thousands of manufacturers of sensitive dual-use technologies in the United States alone, spanning diverse industry groups ranging from steel production to precision electronics to chemical manufacturing.[3]

Two groups of market participants could be instrumental in reaching dual-use manufacturers and persuading them to improve their compliance processes. Larger companies called "integrators" comprise the first group: They integrate dual-use products into more complex goods or use dual-use products to manufacture other goods. Financial institutions – banks and insurance companies that bankroll and underwrite businesses – form

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the second group. By leveraging the financial influence of large integrators, banks, and insurance companies, it may be possible to raise small- and medium-sized manufacturers' awareness about the risks associated with dual-use items, and to encourage them to adopt compliance programs that include antiproliferation policies, thus reducing proliferation risks.

Both financial institutions and integrators may be financially rewarded for their proactive compliance efforts, particularly if such policies influence the purchasing and investing behavior of customers and shareholders.[4] Integrators and financial institutions represent choke points through which nearly all manufacturers must pass, making them logical partners for outreach to manufacturers – and crucial force multipliers in antiproliferation efforts.[5]

Integrators' influence over the supply chain

Integrators tend to be larger companies than those manufacturing dual-use products, and often have at least some public brand recognition. Because of this, companies such as Boeing, Rolls Royce, and General Electric are well positioned to influence their supply chains: A change in a big company's purchasing behavior could change the nature of the whole supply chain. Concern about maintaining brand reputation and reporting to shareholders and/or to boards of directors may also make integrators more likely than smaller, less-well-known manufacturing companies to go beyond minimum compliance requirements. For this reason, convincing a limited number of integrators of the value of adopting strong internal compliance programs and antiproliferation measures is a simpler and likely more fruitful process than convincing thousands of diverse dual-use manufacturers of the value of doing so.

Two ways in which integrators could influence the behavior of dual-use suppliers are by implementing a preferential sourcing policy, and by training suppliers on best practices. Under a preferential sourcing policy, integrators would commit to purchasing from suppliers that implement certain compliance and antiproliferation practices. Because suppliers would have to adopt better compliance processes in order to do business with integrators, preferential sourcing policies could reduce proliferation risks throughout the supply chain. The larger the market share of dual-use goods purchased by the integrator, the more inclined suppliers would be to meet preferential sourcing requirements.

With the second option, integrators would train their suppliers on best practices for compliance, likely based on the integrators' own compliance processes. Such compliance trainings are valuable because dual-use manufacturers are frequently smaller companies with limited resources for developing compliance programs.[6] Integrators typically have more resources to dedicate to compliance than smaller companies, and could assist their suppliers in implementing internal compliance programs, as noted by representatives from large integrators (for example, Cuddy 2015; Hund 2015). An integrator could offer compliance training either in conjunction with preferential sourcing or on its own. Adopting both policies would speed implementation of internal compliance programs, but even training programs alone would help raise awareness about proliferation risk management.

Even if large integrators do not represent 100% of a dual-use supplier's business, preferential sourcing and compliance training can potentially improve the compliance screening for all of a supplier's business. For example, imagine that a small dual-use manufacturer called DU Widget Maker sells 40% of its dual-use items to a large integrator, General Integrator, which has a preferential sourcing policy requiring all suppliers to implement compliance programs for controlled items. Technically, DU Widget Maker only needs to apply the heightened compliance processes to 40% of its items. But it is more efficient for DU Widget Maker to apply the same internal controls to all of its items, rather than having two different compliance procedures or giving up 40% of its current business. Thus, DU Widget Maker is likely to start treating all of its dual-use items with the same level of control as those required for the items sold to General Integrator (von Engelhardt and Maurer 2012, 5). This is even more likely to be true if DU Widget Maker has limited compliance resources, with perhaps just one or two employees responsible for export compliance. (For a real-world example of a market subsection influencing the supply of a whole market, consider that US car manufacturers design all of their cars to meet California's heightened fuel efficiency standards, even though only a small percentage of their cars are destined for California.)

The benefits of improved compliance

Of course, integrators are unlikely to adopt heightened compliance programs without some financial benefit for doing so (Olson and Finlay 2013, 29). Fortunately, improved compliance may be financially rewarding for both integrators and suppliers. The first and most obvious benefit of going beyond minimum compliance requirements is a reduced risk of incurring fines and penalties for trade violations (Hund et al. 2015). Penalties for knowingly violating trade restrictions in

the United States – if a company, employee, or individual actor knew or should have known that the export was illegal – can include prison time and/or millions of dollars in fines.[7] In the face of inadvertent violations, fines and penalties may be reduced where "the party has an effective export compliance program and its overall export compliance efforts have been of high quality" (15 C.F.R. § 766. 2015). Thus, the value of compliance programs is built into the US federal sentencing guidelines for export and sanction violations.

The second benefit of enhanced compliance is that it reduces the risk of supply chain stoppage or slowdown. If a supplier has difficulty obtaining an export license, it can slow or stop production along the whole supply chain. For example, a trade compliance attorney, speaking on the condition of anonymity, explained how export license holdups forced a foreign manufacturing client to build a costly new warehouse to store items intended for overseas customers (Anonymous 2015, trade attorney, personal communication). Likewise, if an integrator finds that a supplier's compliance is subpar, under a preferential sourcing policy the integrators will likely need to replace that supplier, which can take time (Hund et al. 2015). Such supply chain disruptions can be costly. For this reason, an integrator will only seek to replace the supplier when it believes that the cost of its supplier's noncompliance is greater than the cost of replacing that supplier; otherwise, an integrator might just look the other way. Thus, in instances when the cost of replacing the supplier is higher than the cost of noncompliance, integrator representatives suggested that it may be preferable for integrators to offer training programs to their suppliers, rather than having a rigid preferential sourcing policy that might encourage the integrator to ignore or cover up bad behavior (Anonymous 2015, integrator representative, personal communication).

Third, improved compliance efforts can improve efficiency. At least one nuclear dual-use supplier found that improving its compliance processes beyond the minimum regulatory requirements made its shipping more efficient and its business more cost-effective, even though the adopted processes were costly (Anonymous 2014, nuclear dual-use supplier, personal communication). Admittedly, one company's improved efficiency is not proof positive that compliance improves efficiency. However, other industry representatives confirmed that it is more efficient for companies to address compliance up front, rather than after an incident (Hund et al. 2015, 2). Moreover, another trade compliance expert explained that the more established a compliance program is, the lower the compliance costs per unit because the compliance department becomes more adept at implementing compliance procedures (Anonymous 2015, trade attorney, personal communication).

Finally, those who excel at compliance may have a competitive advantage over their peers. Companies with strong compliance programs can use their reputation and reduced business risks to appeal to customers and financiers. Suppliers that excel at compliance are likely more appealing to integrators (particularly ones with preferential sourcing policies), and integrators with excellent compliance could differentiate themselves in the market by appealing to customers sensitive to proliferation risks (for example, see Murphy 2014).

Companies have suffered reputational harm in the past for export control violations. For example, in 1987 the United States learned that a Japanese subsidiary of Toshiba Corporation had been involved in the illegal transfer to the Soviet Union of technology that significantly impacted US national security interests (Omnibus Trade and Competitiveness Act of 1988). The revelation resulted in US Congressmen smashing a Toshiba radio on the steps of the Capitol (Tolchin 1988) and proposed legislation that would have permanently banned imports of Toshiba products to the United States (Morehead 1988). Toshiba Corporation as a whole suffered a significant reputational blow in its largest export market, though the parent company was apparently uninvolved and unaware of the wrongful acts of its subsidiary (Shaw 2016). As a result of this reputational blow and resulting impact on its bottom line, Toshiba engaged in an extensive and costly public relations campaign in the US media, apologizing for the behavior of its subsidiary and promising it would not happen again (Shaw 2016).

The Toshiba incident demonstrates not only how the actions of a subsidiary can color perceptions of an entire brand, but also how consumer products can be associated with bad practices in manufacturing and sales of defense and nuclear-related items. As consumer awareness about the proliferation risks associated with certain manufactured goods and production processes increases through the efforts of nonprofit organizations and companies marketing their own responsible practices, leading the way in compliance efforts could become increasingly important for maintaining a competitive advantage.[8]

The far-reaching influence of financial institutions

While the policies of integrators can improve the behavior of some dual-use manufacturers, not all dual-use manufacturers work with integrators. Financial institutions can reach market participants that integrators may miss. Almost every dual-use supplier and

integrator will need financing or insurance at some point in its business cycle. Businesses may need capital for start-up costs, loans for expansion, loan guarantees for exports or imports, or insurance for their business activities, investments, and capital. Thus, financial institutions interact with nearly all supply chain participants, including the diverse group of dual-use manufacturers. If financial institutions considered compliance risks when evaluating potential clients, particularly those in the nuclear weapons and delivery supply chain, those clients would be more likely to improve their compliance and risk management.

There are two ways that financial institutions can incorporate compliance risks into their financing and pricing decisions. The first is a quantitative risk assessment of compliance risks, which would involve significant data collection and statistical analysis. The analysis would need to determine the risks of nuclear incidents and associated costs, the amount of probabilistic risk reduction that results from adopting a certain compliance or antiproliferation activity, and the resulting rate reduction that the bank or insurance company can offer to a customer who adopts the aforementioned compliance activity. Given the difficulty in assigning probability to nuclear incidents, quantitative incorporation of compliance risks may be difficult and expensive at this time, though not impossible (Olson 2014, 122).

The second way to incorporate compliance risks into financial or insurance decision-making is qualitative. With a qualitative risk assessment, compliance risk or a lack thereof would not necessarily impact pricing for finance or insurance products, but would instead be a general factor to consider when deciding whether to underwrite a loan or insurance policy for a given customer. An insurance underwriter, for example, would conduct his or her due diligence and risk assessment for a loan as usual, and then assess the loan applicant's compliance procedures. If the assessment revealed red flags – such as a company seeking financing to export anti-corrosive valves to ports associated with illegal transshipments to North Korea – the underwriter could decide to provide that loan based on the totality of the loan application, deny the loan, or conduct enhanced due diligence (United Nations Security Council 2014). Evaluating compliance risks qualitatively – as a type of proliferation "smell test" – is simpler, though less precise, than quantitative risk assessment.

Simplicity makes the qualitative method more likely to be adopted in the near term. Some companies are already doing so. For example, Lloyd's of London (2014) has identified a number of red flags that its clients and underwriters can use to avoid engaging in transactions that may violate sanctions against North Korea. According to a trade compliance attorney, other companies qualitatively consider compliance risks by conducting extensive due diligence before mergers and acquisitions, including a review of the target acquisition's compliance liabilities (Anonymous 2015, personal communication). Additionally, at least a handful of banks have requested increased transparency into customers' compliance activities before approving loans (Hund et al. 2015, 4). Despite its lack of precision, the qualitative method can help both finance and insurance companies reduce their risk exposure while rewarding those who excel at compliance and encouraging underperformers to improve compliance practices.

Why should financial institutions care?

Financial institutions are in the business of assessing risk in general, which means they should have the capability to evaluate the proliferation and compliance risks of their customers, including manufacturers and integrators. When a business has implemented strong internal compliance processes, that business is less risky. It is less likely to default on a loan, less likely to suffer certain types of insurable losses,[9] and less likely to cause reputational harm to the bank or financial institution for supporting a company that intentionally or unintentionally contributes to nuclear proliferation.[10] If companies with compliance programs are less risky than companies without such programs, then insuring or lending money to exceptionally compliant companies is, by nature, less risky than doing business with similar companies with inadequate internal compliance programs. Therefore, it makes financial sense for banks and insurance companies to consider such risks in their decision-making. This conclusion is supported by anecdotal evidence from interviews with insurers that the value to be gained by incorporating proliferation risks into financial decision-making is greater than the costs of assessing those risks. However, more research is necessary to verify the reliability of this anecdotal evidence.

Rewarding businesses and thwarting bad actors

By considering compliance risks when selecting suppliers or when making financial decisions, integrators and financial institutions stand to reduce their business risks, and potentially improve their bottom line. Fortunately, the more integrators, suppliers, banks,

auditors, and insurance companies that begin touting exceptional compliance programs as a competitive advantage, the more shareholders and consumers will begin demanding improved compliance. Large integrators and financial institutions have the name recognition and resources to launch marketing campaigns directed at their customers about the importance of compliance procedures in reducing proliferation risks. While this has not yet occurred on a large scale in the nuclear supply chain, in other sectors market leaders have advertised certain benefits of their production and business practices over their competitors. One such example is Swiss Re, the world's largest reinsurance company, which refuses to insure, reinsure, or invest in companies involved with the production of biological, chemical, or nuclear weapons as part of its corporate responsibility platform (Swiss Re 2012).[11]

Like Swiss Re, a single visible company – an integrator, bank, or insurer – could act as a catalyst in raising awareness about proliferation through publicized adoption of antiproliferation policies and marketing campaigns, encouraging competitors to take action as well. The resulting increase in consumer demand for antiproliferation goods and financial services could financially reward those businesses that incorporate antiproliferation practices into their supply chains (Kurzrok and Hund 2013, 33). While an international organization or governments could eventually certify companies as antiproliferation companies, initially companies would most likely be self-identifying, with or without formal certification processes, similar to the start of the organic food or sustainable seafood movements (for example, Marine Stewardship Council 2016). In the meantime, uneven adoption of compliance procedures among dual-use manufacturers is an opportunity. The important question is: Who will seize this opportunity, businesses or proliferators?

Notes

1. We refer to "compliance" and "compliance programs" to convey the set of activities that companies can undertake to reduce export control and trade risks. However, we recognize that merely having a compliance program or being "compliant" may be only a box-checking standard that does not adequately address proliferation risks. For an example of a compliance program that goes "beyond compliance" and incorporates antiproliferation principles into corporate culture to create a supply chain security culture, see Hund (2015). See also Kurzrok and Hund (2013).
2. The US Government Accountability Office was able to obtain and export nuclear dual-use items using "bogus front company[ies] and fictitious identities" (Kutz 2009). Additionally, the fact that the FBI Counterproliferation Center had more than 1,500 pending cases involving illegal export in 2012 suggests illegal exports are relatively frequent (Mueller 2012).
3. This estimate includes manufacturers in the United States making dual-use items controlled under the Missile Technology Control Regime, the Australia Group, and/or the Nuclear Suppliers Group.
4. Many of the findings described here are based on numerous interviews and meetings with representatives from industry and financial institutions. Due to the sensitive nature of trade compliance, meetings were held under the Chatham House Rule, and many interviewees only spoke on the condition of anonymity. For summaries of meetings held under the Chatham House Rule, see Hund, Kurzrok, and Quint (2014) and Hund (2015).
5. It is worth noting that we use the term "antiproliferation," adopted by Project Alpha at King's College London to encompass measures that the private sector can take to prevent proliferation (Stewart 2012). While "nonproliferation efforts" are often thought to be the responsibilities of governments, "antiproliferation" refers to actions the private sector can take, with or without government involvement. Furthermore, "antiproliferation" is preferred in the context of this article because it parallels "anti-money laundering" language, which is more familiar and accessible to those in financial institutions than the relatively lofty and abstract concept of "nonproliferation."
6. Industry representatives and compliance attorneys noted that integrators may prefer to use outside legal counsel to train suppliers, instead of directly training suppliers themselves, to reduce integrators' legal liability in the event that a trainee violated trade regulations (Hund et al. 2015). Integrators may also consider requiring waivers of liability from suppliers before commencing training.
7. For example, the US Department of Justice fined Epsilon Electronics Inc. $4 million for selling goods that it knew or had reason to know were intended for use in Iran (Szubin 2014). In another case, a Taiwanese businessman was sentenced to two years in prison for exporting items to North Korea for its nuclear weapons program (US Department of Justice 2015a).
8. Like the campaign to stop sales of blood diamonds and efforts to ensure dolphin-safe tuna, consumer concern about production processes can dictate which products consumers will buy, encouraging producers to adopt the desired production processes. Defense and nuclear industry participants at the 2015 International Seminar on Due Diligence, Risk Assessment, and Supply Chain Management further emphasized the importance of maintaining a reputation for compliance (Hund et al. 2015).
9. For example, compliance procedures may reduce the risk of lost shipments/inventory that would be covered under maritime insurance. Pacific Northwest National Laboratory is currently conducting more research on which insurance products would best promote excellent compliance practices.

10. For example, financiers of nuclear power plants consider a host of factors that may impact their reputation, including proliferation risks and sustainability efforts (Murphy 2014).
11. In 2013, the Swiss government passed the Federal Act on War Materials – which prohibits Swiss companies from supporting the production of chemical, biological, and nuclear weapons – four years after Swiss Re voluntarily adopted its weapons-conscious corporate sustainability policy (Federal Act on War Material 514.51 2013).

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