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The Power of Integrators, Financiers, and Insurers to Reduce Proliferation Risks

Nuclear Dual-Use Goods

May 2015

RA Weise
GE Hund

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Prepared for
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Pacific Northwest National Laboratory
Richland, Washington 99352

Executive Summary

Globalization of manufacturing supply chains has changed the nature of nuclear proliferation. Before 1991, nonproliferation efforts focused almost exclusively on limiting the spread of materials and equipment specifically designed for nuclear use – reactors, centrifuges, and fissile material. Dual-use items, those items with both nuclear and non-nuclear applications, were not closely scrutinized or controlled. However, in 1991 the international community discovered that Iraq had developed a fairly sophisticated nuclear weapons program by importing dual-use items; this discovery spurred the international community to increase controls on dual-use technologies.¹ Despite these international efforts, dual-use items are still a challenge for those seeking to limit proliferation.

While some manufacturers of nuclear dual-use items are aware of the proliferation risks associated with their goods and implement internal compliance programs (ICPs) to reduce those risks, a distressing number of dual-use manufacturers do not. Manufacturers are aware of the export restrictions on their goods, but these manufacturers do not associate their work with nuclear proliferation and do not consider themselves to be part of the nuclear supply chain. Therefore, though manufacturers generally meet regulatory requirements, dual-use items are still illegally exported.² Raising awareness among dual-use manufacturers about the proliferation risks associated with their business activities is crucial, but the sheer number and diversity of dual-use manufacturers makes outreach difficult.³

Despite the differences amongst dual-use manufacturers, there are two common traits that may make outreach more effective. First, many dual-use manufacturers sell at least some of their products to larger companies (“integrators”) that integrate those products into more complex goods or use those products to manufacture other goods. Second, essentially all dual-use manufacturers require financing, insurance, or both at some point in their course of business. By leveraging the buying power of large integrators and the financial power of banks and insurance companies, it may be possible to raise manufacturers’ awareness about the risks associated with dual-use items, encourage them to adopt ICPs that include anti-proliferation policies, and thus reduce proliferation risks.

Given large integrators’ substantial purchasing power,⁴ dual-use manufacturers in integrators’ supply chains would likely improve their compliance programs⁵ if integrators made doing so a

¹ See International Atomic Energy Agency, INFCIRC/539/Rev.6, 22 Jan. 2015, 4.

² See e.g., Gregory Kutz, *Military and Dual-Use Technology: Covert Testing Shows Continuing Vulnerabilities of Domestic Sales for Illegal Export*, United States Government Accountability Office, June 4, 2009 (showing examples of how GAO was able to obtain and export nuclear dual-use items using “bogus front compan[ies] and fictitious identities”), available at <http://www.gao.gov/assets/130/122654.pdf>; see also Robert S. Mueller, III, *Preventing Illegal Exports and Protecting National Security in Today’s Global Marketplace*, Prepared Comments for U.S. Department of Commerce, BIS Annual Update Conference on Export Controls and Policy, Washington, DC, July 18, 2012 (noting that the FBI Counterproliferation Center has more than 1,500 pending cases involving illegal export), available at <http://www.fbi.gov/news/speeches/preventing-illegal-exports-and-protecting-national-security-in-todays-global-marketplace>.

³ PNNL background research indicates that there are approximately 3,000 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 PNNL was unable to find data indicating what percentage of dual-use manufacturers sell their items to integrators, or what percentage of sales from a given company is sold to integrators. This paper assumes that a significant number of dual-use manufacturers sell a significant percentage of their dual-use items to integrators. PNNL hopes to conduct research to corroborate and quantify this assumption in the near future.

⁵ This paper will refer to “compliance” and “ICPs” to convey the set of activities that companies can undertake to reduce export control and trade risks. However, this paper recognizes that merely having an ICP or being “compliant” may be a minimum box-checking standard that does not adequately address proliferation risks. For an

requirement or preference for doing business. Preferential sourcing policies of large integrators would ensure that the commitment to compliance, including anti-proliferation efforts, is reflected throughout the supply chain. Integrators could also train or assist their suppliers in compliance best practices. Both integrators and dual-use manufacturers could profit from such arrangements, for example, by avoiding costly fines and penalties, reducing risk of supply chain stoppages or slow-downs, increasing efficiency, and by giving compliance leaders a reputational competitive advantage over their peers.¹

The benefits of excelling at compliance are similarly encouraging some financiers and insurers to pay more attention to compliance efforts and could prompt financiers and insurers to consider developing products for compliance high-performers, be they integrators or smaller manufacturers. For example, some banks request increased transparency into customers' compliance activities, factoring compliance into loan approval decisions. Banks and insurance companies could also offer reduced premiums or interest rates for companies that implement strong ICPs.

A single visible company – integrator, bank or insurer – can play a critical role in raising awareness about proliferation risks associated with manufactured goods through publicized adoption of anti-proliferation policies and marketing campaigns. For example, banks or insurance companies could issue public statements saying they will consider a company's ICP and proliferation risks in their financial decision-making, while integrators could adopt preferential sourcing policies. Increased awareness of these policies would lead to consumer demand for products made with anti-proliferation procedures and to financial rewards for companies leading the way. The uneven adoption of ICPs across dual-use industries represents an opportunity to improve compliance, increase profitability, and reduce proliferation risks.

This paper argues that integrators and finance and insurance industries can use their market power to encourage dual-use suppliers to improve their compliance efforts. Section II describes how integrators could adopt preferential sourcing policies or train their suppliers on compliance, how compliance improvements benefit both integrators and suppliers, and uses defense industry integrators as examples of how integrators can exert positive influence over their supply chains. Section III describes how financiers and insurers can consider compliance risks when making decisions about whether to insure or finance dual-use manufacturers and discusses the potential benefits from doing so. Section IV sums up the arguments from Section II and III. Section V lays out next steps, including more research that needs to be conducted.

example of an ICP that goes “beyond compliance” and incorporates anti-proliferation principles into corporate culture to create a supply chain security culture, see Gretchen Hund, *Walk the Talk: How PNNL is Developing a Supply Chain Security Culture*, Presentation at the Export Control Coordinators Organization, 27th Annual ECCO Training, Arlington, VA, March 17, 2015, available at <http://ecco.lanl.gov/History/2015/Gretchen%20Hund%20Presentation.pdf>; see also Andrew Kurzrok & Gretchen Hund, *Beyond compliance: Integrating nonproliferation into corporate sustainability*, Bulletin of the Atomic Scientists 69(3), May/June 2013.

¹ Participants at the *International Seminar on Due Diligence, Risk Assessment, and Supply Chain Management: Combatting Nuclear Proliferation*, March 12 & 13, 2015, Vienna, Austria [hereinafter “*International Seminar*”] (repeatedly confirming that there is a competitive advantage for excelling at regulatory compliance).

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1.0 Introduction

Globalization of manufacturing supply chains has changed the nature of nuclear proliferation. Before 1991, nonproliferation efforts focused almost exclusively on limiting the spread of materials and equipment specifically designed for nuclear use – reactors, centrifuges, and fissile material. Dual-use items, those items with both nuclear and non-nuclear applications, were not closely scrutinized or controlled. However, in 1991 the international community discovered that Iraq had developed a fairly sophisticated nuclear weapons program by importing dual-use items; this discovery spurred the international community to increase controls on dual-use technologies.¹ Despite these international efforts, dual-use items are still a challenge for those seeking to limit proliferation.

While some manufacturers of nuclear dual-use items are aware of the proliferation risks associated with their goods and implement internal compliance programs (ICPs) to reduce those risks, a distressing number of dual-use manufacturers do not. Manufacturers are aware of the export restrictions on their goods, but these manufacturers do not associate their work with nuclear proliferation and do not consider themselves to be part of the nuclear supply chain. Therefore, though manufacturers generally meet regulatory requirements, dual-use items are still illegally exported.² Raising awareness among dual-use manufacturers about the proliferation risks associated with their business activities is crucial, but the sheer number and diversity of dual-use manufacturers makes outreach difficult.³

Despite the differences amongst dual-use manufacturers, there are two common traits that may make outreach more effective. First, many dual-use manufacturers sell at least some of their products to larger companies (“integrators”) that integrate those products into more complex goods or use those products to manufacture other goods. Second, essentially all dual-use manufacturers require financing, insurance, or both at some point in their course of business. By leveraging the buying power of large integrators and the financial power of banks and insurance companies, it may be possible to raise manufacturers’ awareness about the risks associated with dual-use items, encourage them to adopt ICPs that include anti-proliferation policies, and thus reduce proliferation risks.

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requirement or preference for doing business. Preferential sourcing policies of large integrators would ensure that the commitment to compliance, including anti-proliferation efforts, is reflected throughout the supply chain. Integrators could also train or assist their suppliers in compliance best practices. Both integrators and dual-use manufacturers could profit from such arrangements, for example, by avoiding costly fines and penalties, reducing risk of supply chain stoppages or slow-downs, increasing efficiency, and by giving compliance leaders a reputational competitive advantage over their peers.⁶

The benefits of excelling at compliance are similarly encouraging some financiers and insurers to pay more attention to compliance efforts and could prompt financiers and insurers to consider developing products for compliance high-performers, be they integrators or smaller manufacturers. For example, some banks request increased transparency into customers' compliance activities, factoring compliance into loan approval decisions. Banks and insurance companies could also offer reduced premiums or interest rates for companies that implement strong ICPs.

A single visible company – integrator, bank or insurer – can play a critical role in raising awareness about proliferation risks associated with manufactured goods through publicized adoption of anti-proliferation policies and marketing campaigns. For example, banks or insurance companies could issue public statements saying they will consider a company's ICP and proliferation risks in their financial decision-making, while integrators could adopt preferential sourcing policies. Increased awareness of these policies would lead to consumer demand for products made with anti-proliferation procedures and to financial rewards for companies leading the way. The uneven adoption of ICPs across dual-use industries represents an opportunity to improve compliance, increase profitability, and reduce proliferation risks.

This paper argues that integrators and finance and insurance industries can use their market power to encourage dual-use suppliers to improve their compliance efforts. Section II describes how integrators could adopt preferential sourcing policies or train their suppliers on compliance, how compliance improvements benefit both integrators and suppliers, and uses defense industry integrators as examples of how integrators can exert positive influence over their supply chains. Section III describes how financiers and insurers can consider compliance risks when making decisions about whether to insure or finance dual-use manufacturers and discusses the potential benefits from doing so. Section IV sums up the arguments from Section II and III. Section V lays out next steps, including more research that needs to be conducted.

2.0 Integrators can Improve Awareness and Compliance Efforts Amongst Dual-Use Suppliers.

Integrators are large companies that use a variety of components from different manufacturers to make a more complex final product. Integrators often have brand recognition and reputational value, while the manufacturers supplying the subcomponents for their goods may have less brand recognition and fewer reputational concerns. This is likely because many nuclear dual-use items are manufactured by businesses that only sell to a handful of other businesses, not to the general public.⁷

Supply Chain Security Culture, Presentation at the Export Control Coordinators Organization, 27th Annual ECCO Training, Arlington, VA, March 17, 2015, *available at* <http://ecco.lanl.gov/History/2015/Gretchen%20Hund%20Presentation.pdf>; *see also* Andrew Kurzrok & Gretchen Hund, *Beyond compliance: Integrating nonproliferation into corporate sustainability*, *Bulletin of the Atomic Scientists* 69(3), May/June 2013.

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⁷ See Footnote 4.

If dual-use manufacturers mostly sell to a smaller number of integrators, then changing the integrators' purchasing behavior can potentially change the whole nature of the supply chain. Convincing a limited number of integrators of the value of strong ICPs and anti-proliferation procedures is a simpler process than convincing thousands of diverse dual-use manufacturers of the value of adopting an ICP. The power that large integrators have over their supply chains makes them crucial force multipliers in combating nuclear proliferation.

2.1 Integrators can promote dual-use manufacturers' use of ICPs.

This section introduces two policies that integrators could adopt to encourage their dual-use suppliers to increase compliance efforts. Section II(b) looks at the potential benefits resulting from improved compliance, and Section II(c) uses examples from the defense industry to demonstrate the power integrators have over their supply chains.

The first option is a preferential sourcing policy, in which integrators commit to purchasing their items from suppliers that implement certain compliance and anti-proliferation practices. Because suppliers would have to adopt better compliance processes in order to do business with integrators, preferential sourcing policies reduce risks along the whole supply chain. The larger the market share purchased by the integrator, the more likely the suppliers would seek to meet the preferential sourcing requirements.

Another option is for integrators to offer best practice guidance or training to their suppliers. Often dual-use manufacturers are smaller companies with limited resources for developing compliance programs. Integrators typically have more resources to dedicate to compliance and could assist their suppliers in implementing ICPs.⁸ An integrator could offer compliance training, without having a preferential sourcing policy, or could do both in tandem. Adopting both policies would speed implementation of ICPs, but training programs alone would still help raise awareness about proliferation risks.

Even if large integrators do not represent 100 percent of a dual-use supplier's business, both preferential sourcing and ICP training still can potentially impact 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 percent of its dual-use items to a large integrator, General Integrator, which has a preferential sourcing policy requiring all suppliers to implement ICPs for sensitive items. Technically, DU Widget Maker only needs to apply the ICP to 40 percent 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. Thus, DU Widget Maker is likely to start treating all of its dual-use items with the same level of controls as those required for the items sold to General Integrator.⁹ This is even more likely to be true where DU Widget Maker has limited compliance resources, perhaps with just one or two employees forming the compliance department. This is similar to car manufacturers building all of their cars to meet California's heightened fuel efficiency standards, even though only a percentage of their cars are destined for California.

⁸ Integrator representatives at the *International Seminar*.

⁹ See Sebastian v. Engelhardt & Stephen M. Maurer, *Industry self-governance and national security: On the private control of dual use technologies*, Public policy working paper GSpp12-005, UC Berkeley Goldman School, December 2012, 16 (explaining why an industry as a whole will adopt the standards set by large buyers even if suppliers would prefer a lower standard).

2.2 Improved compliance efforts benefit both integrators and suppliers.

Not only does adopting strong ICPs reduce proliferation risks associated with dual-use items, but improved compliance may be financially rewarding for both integrators and suppliers. First, and somewhat obviously, going beyond minimum compliance requirements reduces the risk of incurring fines and penalties for trade violations.¹⁰ Penalties for trade violations where the actor knew or should have known that the export was illegal can include prison time or millions of dollars in fines.¹¹ However, fines and penalties for inadvertent violations may be reduced where, “the party has an effective export compliance program and its overall export compliance efforts have been of high quality.”¹² Thus, the value of compliance programs is built into the sentencing guidelines for export and sanction violations.

Second, reducing compliance risks also reduces risks of supply chain stoppage or slow-down. If a supplier has difficulty obtaining an export license, it can slow or stop production along the whole supply chain.¹³ Likewise, if an integrator finds that a supplier’s compliance is subpar, it will need to replace that supplier if it has a preferential sourcing program,¹⁴ which can take time. Such supply chain disruptions can be costly. But, 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 costs of replacing the supplier is higher than the cost of noncompliance, 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.

Third, improved compliance efforts can improve efficiency. At least one dual-use supplier with whom PNNL has spoken found that improving its compliance processes beyond regulatory requirements made its shipping more efficient and its business more cost-effective, though the adopted processes were costly. Admittedly, one company’s improved efficiency is not dispositive proof that compliance improves efficiency. However, a trade compliance attorney with whom PNNL spoke confirmed that it is more efficient for companies to address compliance up front, rather than after an incident. The more established an ICP is, the lower the compliance costs per unit because the compliance department gets more efficient.¹⁵

Finally, those who excel at compliance may have a competitive advantage over their peers. Companies with strong ICPs can use their excellent compliance 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 can

¹⁰ Industry representative at the *International Seminar* (indicating that after his company was heavily fined it made substantial compliance investments to avoid future fines).

¹¹ For example, Epsilon Electronics Inc. was fined \$4 million for selling goods that it knew or had reason to know were intended for use in Iran. See http://www.treasury.gov/resource-center/sanctions/CivPen/Documents/20140721_epsilon_penalty.pdf. A Taiwanese businessman was sentenced to twenty-four months in prison for exporting items to North Korea for its nuclear weapons program. See <http://www.justice.gov/opa/pr/taiwan-businessman-sentenced-24-months-conspiring-violate-us-laws-preventing-proliferation>.

¹² 15 CFR § 766, Supplement No. 1 to Part 766—Guidance on Charging and Penalty Determinations in Settlement of Administrative Enforcement Cases.

¹³ Telephone interview with trade compliance attorney wishing to remain anonymous, January 13, 2015 (discussing how a company had to build a new storage warehouse to hold items intended for export because the company was unable to obtain licenses quickly).

¹⁴ Industry participant at the *International Seminar*.

¹⁵ Telephone interview with trade compliance attorney wishing to remain anonymous, January 13, 2015.

differentiate themselves in the market by appealing to customers sensitive to proliferation risks.¹⁶ As consumer awareness about proliferation risks associated with certain manufactured goods and production processes increases through the efforts of organizations like PNNL and companies marketing their own responsible practices, leading the way in compliance efforts may become increasingly important for maintaining a competitive advantage.¹⁷

2.3 Integrators in the defense industry illustrate the influence of integrators over their supply chains.

The U.S. defense industry is an excellent example of the influence that large integrators have over the compliance and production processes of their suppliers. Large defense contractors are one type of integrator; they are companies that purchase subcomponents for their items from smaller suppliers that may or may not contract directly with the U.S. Government.

All U.S. defense contractors are legally required to meet certain compliance standards; the U.S. Government requires that all Department of Defense solicitations and contracts contain an export control clause, in accordance with federal regulations.¹⁸ These regulations stipulate that for items controlled under the Export Administration Regulations¹⁹ (EAR) or the International Traffic in Arms Regulations²⁰ (ITAR) contractors must comply with all applicable export laws.²¹ Moreover, the regulations require contractors to include an export control clause in all subcontracts, often referred to as the “flow-down” clause.²² The “flow-down” requirement almost operates like a preferential sourcing requirement, whereby government contractors must only contract with suppliers who at least contractually agree to implement export control processes. The financial incentive to participate in the defense market makes it worthwhile for companies to adopt compliance programs and meet the minimum compliance requirements.

Competition for the government’s business actually results in companies holding out their compliance programs as a competitive advantage over other contractors that just meet the minimum legal requirements. Many of the large defense contractors make their compliance and ethical obligations part of their public image. For example, large defense contractor Raytheon has an ethics code, readily available on its website, that includes a section on export control compliance.²³ Similarly, Lockheed Martin’s ethics training program is on its website, and includes a section on export control and trade restrictions that all employees must complete.²⁴ Lockheed goes even further though, and has drafted a supplier code of

¹⁶ See e.g., Paul Murphy, *Reputational Risk Consideration in the Cross-Border Financing of Nuclear Power Projects*, Who’s Who Legal Energy, no date given (arguing that reputational risk associated with a nuclear power project (NPP) “is a threshold issue that can determine whether or not an NPP is financeable”); see also Section II.c for examples from the defense industry.

¹⁷ 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. The concern about the importance of maintaining a reputation for compliance was reiterated by defense and nuclear industry participants at the *International Seminar*.

¹⁸ DFARS § 252.225-7048 Export-Controlled Items (see 78 Fed. Reg. 36,108) (codified at 48 C.F.R. § 204.73).

¹⁹ 15 C.F.R. §§ 730-774.

²⁰ 22 C.F.R. §§ 120-130.

²¹ See 75 Fed. Reg. 18,029 (Apr. 8, 2010).

²² *Id.*

²³ Available at http://www.raytheon.com/ourcompany/rtnwcm/groups/public/documents/content/rtn_ethics-code.pdf.

²⁴ Available at http://lockheedmartin.com/us/who-we-are/ethics/global_integrity.html#.

conduct that it expects its suppliers to meet, which includes export and trade control requirements.²⁵ While the Lockheed Martin website does not indicate a refusal to contract with companies who do not uphold the supplier code of conduct, it offers a voluntary program to mentor its suppliers “to share best practices, resources, and experiences, all with the aim of creating a more robust ethics program throughout the supply chain.”²⁶

Lockheed’s mentoring program demonstrates the value that Lockheed places on compliance in its supply chain.²⁷ Some integrators are willing to implement costly compliance and ethics training programs, well beyond what is required by law, in order to reduce risks and maintain a competitive advantage over other government contractors. Their suppliers, in turn, are willing to invest in compliance in order to remain attractive business partners for integrators. Regulations, fines, and penalties motivate companies to meet their minimum legal requirements, but it is the competitive advantage that integrators get from excelling at compliance that makes integrators go to great lengths to develop and publicize their rigorous compliance programs. While the compliance programs of the defense industry do not prevent every illicit export, these programs nonetheless have been recognized as important in limiting the spread of sensitive goods and technologies.²⁸ The defense industry demonstrates both how integrators can influence the behaviors of their suppliers and of the possible financial benefits of going beyond regulatory compliance requirements.

3.0 Finance and Insurance can Promote Awareness and Adoption of Compliance Efforts throughout Supply Chains.

While a significant portion of suppliers sell some of their manufactured items to integrators, 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, banks and insurance companies have potentially greater influence on the behavior of supply chain participants than integrators, considering banks’ and insurers’ ability to reach the diverse group of dual-use manufacturers.

3.1 Financiers and insurers could promote supply chain security by incorporating compliance risks into their decision-making.

Financiers and insurance companies are in the business of assessing risk, which means they should have the capability to evaluate the proliferation and compliance risks of their customers, including

²⁵ Available at http://www.lockheedmartin.com/content/dam/lockheed/data/corporate/documents/suppliers/LM_Supplier_Code_of_Conduct.pdf.

²⁶ Available at <http://lockheedmartin.com/us/suppliers/ethics.html>.

²⁷ Lockheed implemented its mentoring program in 2012. It had a number of export control violations prior to 2012 with the most recent one occurring in 2008. In Consent Agreements with the Department of State, Lockheed was required to use portions of the fines against it to implement remedial compliance efforts. See Consent Agreement between the U.S. Department of States and Lockheed Martin Corporation, July 24, 2008. Given the length of time between this violation and the mentoring program being established, it is not clear that the program was a direct result of the Consent Agreement. See <http://www.lockheedmartin.com/us/suppliers/ethics.html>.

²⁸ For example, the Boeing Company had a series of export control violations resulting in multiple settlements with the U.S. government. Boeing was required to implement company-wide compliance protocols to reduce risks of trade violations. See Consent Agreement between US Department of State and The Boeing Company, March 28, 2006. Since implementing these changes, Boeing has not been charged with any export violations suggesting that Boeing’s more-comprehensive compliance measures are working.

manufacturers and integrators. Where a business has implemented strong ICPs, that business is less risky.²⁹ This means the business is less likely to default on a loan, less likely to suffer certain types of insurable losses,³⁰ 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. Given the potential impact that compliance risks can have on banks or insurance companies, banks and insurance companies may want to consider paying more attention to compliance risks. Doing so would not only reduce risk exposure for banks and insurance companies, but it would create incentives for companies to improve their ICPs and anti-proliferation policies.

There are two different ways that financial or insurance institutions can incorporate compliance risks into their financing and pricing decisions. The first way is quantitative. Quantitative risk assessment of compliance risks would involve significant data collection and statistical analysis. The analysis would need to determine risks of nuclear incidents and associated costs, the amount of probabilistic risk reduction that results from adopting a certain compliance or anti-proliferation activity, and the resulting rate reduction that the finance/insurance company can offer for a customer adopting the aforementioned compliance activity. Given the difficulty in assigning probability for various nuclear or compliance incidents, and the low-risk/high-cost probability associated with such events, quantitative incorporation of compliance risks may be difficult and expensive at this time.³¹

The second way to incorporate compliance risk into finance or insurance decisions is qualitative. Compliance risk, or 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. For example, an underwriter would conduct his or her due diligence and risk assessment for a loan as usual and then assess the loan applicant's compliance procedures and look for any proliferation red flags. If there were red flags, for example, like a company seeking financing to export anti-corrosive valves to Dalian, China,³² the underwriter could simply make a yes or no decision on whether to provide that loan based on the totality of the loan application. Using compliance risks qualitatively, like a proliferation "smell test," is simpler, though less precise, than using compliance risks quantitatively. Its 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 has identified a number of red flags that their clients and underwriters can use to help them avoid engaging in transactions that may violate sanctions against the Democratic People's Republic of Korea.³³ 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.³⁴ Additionally, a few banks have requested increased transparency into customers' compliance activities before approving loans.³⁵ Despite its lack of precision, qualitatively considering compliance risks would help both finance and insurance companies reduce their risk exposure while rewarding those who excel at compliance.

²⁹ *E.g.*, less likely to suffer reputational harm that could hurt the business's bottom line and ability to pay back loans or less likely to pay costly fines and penalties. Such operational risks can impact profitability, and thus can affect credit-worthiness or insurability.

³⁰ For example, compliance procedures may reduce risk of lost shipments/inventory that would be covered under marine or hull insurance. PNNL is currently conducting more research on what insurance products would best promote excellent compliance products.

³¹ While measuring such risks would be difficult, it would not be impossible. Insurance companies and banks frequently quantify the probability and costs of hard-to-quantify events.

³² Based on a UN Report about the Democratic People's Republic of Korea's WMD activities, Lloyd's of London identified some red flags for their clients to use to identify transactions that may violate sanctions on the DPRK. *See* <http://www.lloyds.com/the-market/communications/regulatory-communications-homepage/regulatory-communications/regulatory-news-articles/2014/11/assessing-the-risk-of-doing-business-with-north-korea-and-its-business-partners>.

³³ *Id.*

³⁴ Trade attorney at the *International Seminar*.

³⁵ *See id.*

3.2 Finance and insurance companies stand to benefit from considering compliance risks in their financial decisions.

Consideration of compliance may actually result in financial benefits for insurance and finance institutions. This paper has demonstrated in Section II.b that companies with ICPs are less risky than those without. Thus, based on this argument, one can also assert that lending money to or insuring exceptionally compliant companies is, by nature, less risky than doing business with similar companies with inadequate ICPs. 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 cost of assessing proliferation risks is less than the value that could be gained by incorporating proliferation risks in financial decisions. PNNL plans to conduct further research to verify that this anecdotal evidence is reliable.

It is common practice for banks or insurance companies to raise interest rates or premiums for businesses that are riskier than average. Banks and insurance companies also lower finance and insurance costs for lower risk customers in some circumstances. Two examples are safe driver discounts for car insurance and reduced interest rates for having a co-signor with excellent credit.³⁶ But research conducted to date³⁷ shows that the correlated concept of lowering interest rates or premiums for reduced compliance or proliferation risks has not been adopted in the nuclear dual-use market.

Where insurance and financial companies can better assess and price risks, they are better positioned to make a profit rather than suffer a loss. Finance and industry representatives have expressed an interest in further incorporating compliance risks in financial decision-making, believing it would benefit banks, insurance, industry, and also third-party auditors.³⁸ This burgeoning support from market participants is encouraging, suggesting that lack of awareness about supply chain security is the cause of inadequate controls, not apathy.

4.0 Conclusion

The uneven awareness amongst dual-use manufacturers of the proliferation risks associated with their goods represents an opportunity to both improve compliance and increase profitability. Integrators can use their buying power to encourage dual-use manufacturers to adopt stronger compliance and anti-proliferation measures. Likewise, banks and insurance companies can use their financial strength to promote strong compliance practices amongst their integrator and dual-use manufacturing customers. By considering compliance risks when selecting suppliers or when making financial decisions, integrators, financiers and insurers all stand to reduce their business risks and improve profitability.

Fortunately, the more integrators, suppliers, banks, auditors, and insurance companies that begin touting exceptional compliance programs as a competitive advantage, the more the consumers will begin demanding improved compliance. Large integrators and financial institutions have the name recognition and resources to launch marketing campaigns directed at the public about the importance of compliance procedures in reducing proliferation risks. Thus, a single visible company -- integrator, bank or insurer -- can play a critical role in raising awareness about proliferation through publicized adoption of anti-proliferation policies and marketing campaigns. The resulting increase in consumer demand for anti-

³⁶ While the risk pools for car insurance or for mortgages vary dramatically from the risk pools that may be considered for compliance issues, the general concept of reducing premiums for reduced risk customers still applies.

³⁷ PNNL is still conducting research on underwriting practices and considerations in the insurance and financial markets.

³⁸ Anonymous participants at the *International Seminar*.

proliferation goods and financial services can financially reward those businesses that incorporate anti-proliferation practices into their supply chains.³⁹

5.0 Next Steps

After discussing the concepts in this paper with government and industry representatives in Vienna in March 2015, PNNL has identified possible next steps for this topic. It is necessary to continue outreach to integrators, financial institutions, and insurance companies to promote adoption of anti-proliferation compliance policies. More research on a few related topics described below would make such outreach more effective and would offer clearer financial justifications for adoption of anti-proliferation policies.

One such research area is the identification of red flags for a finance or insurance institution to qualitatively consider as part of their underwriting decisions. Other organizations are working in this area and PNNL would look to build on this work while identifying and collaborating with organizations contributing to this research.

Another possible research area is the creation of a quantitative model to assess compliance and proliferation risks. PNNL has excellent data analytics capability, though acquiring the data for this model may be resource-intensive. Before investing resources in this model, it may be best to see if such a model would be useful for and well-received by finance and insurance companies.

PNNL will continue reaching out to insurance and finance representatives to gather more evidence about how proliferation risks may be incorporated into their decision-making and to determine what type of anti-proliferation products they might offer. Questions that PNNL needs to further study include: (1) how and to what extent is compliance considered by finance and insurance underwriters; (2) do the costs of noncompliance outweigh the costs of incorporating means to measure proliferation risks; (3) can compliance and proliferation risks be incorporated in marine or hull insurance; and (4) what insurance policies would best promote adoption of anti-proliferation efforts.

Another area of research would study the quantitative relationship between integrators and suppliers of dual-use items to help those actors assess the financial value of adopting compliance. The study would look at what percentage of a manufacturer's dual-use components go to a large integrator, what percentage of the integrator's dual-use supply is made up by a single supplier, and what percentage of all manufactured components do dual-use components comprise for a given supplier? Answering these questions would help to assess the impact that preferential sourcing policies might have on both integrators and suppliers.

The team will also continue to look for opportunities to build awareness of the importance of supply chain security and about the role of integrators and financial institutions in helping dual-use companies adopt strong anti-proliferation policies. Important social change rarely happens from the top-down, but is set in motion by demands from the general population for change. The more the team can engage a variety of consumers and market participants, the greater the chances the team can move the ball forward and reduce the risk of nuclear proliferation.

³⁹ Andrew Kurzrok & Gretchen Hund, *Beyond compliance: Integrating nonproliferation into corporate sustainability*, Bulletin of the Atomic Scientists 69(3), May/June 2013, 32.



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