



THE

MONITOR

THE UNIVERSITY OF GEORGIA CENTER FOR INTERNATIONAL TRADE AND SECURITY

FROM THE EDITOR...

Strategic Trade Control in an Age of Terror

Export controls remain a critical element of the larger nonproliferation regime. Yet they tend to be overlooked relative to other nonproliferation tools. The security of fissile materials and nuclear weapons in the former Soviet Union commands greater attention in the public and policy communities, if only because the menace of nuclear-armed terrorists is so readily understood. Few would dispute the importance of physical protection measures. Experience has shown, however, that proliferators most often attempt to advance their unconventional weapons programs by purchasing dual-use items off the shelf. Sub-state groups could likewise seek to buy rather than steal the components they need to carry out acts of terror. Hence the

importance of export controls.

Major challenges face the nonproliferation community. How can export controls be adapted to a threat milieu in which terrorism outweighs more traditional concerns? How can supplier countries better coordinate their export controls in the face of globalization and other emerging realities? How can companies trading in controlled items better monitor end-users of their wares? How can multilateral norms, agreements, and standards be refreshed and strengthened?

There has been no shortage of talk about these matters, but action has been sparse. Last April the UN Security Council unanimously approved a resolution, UNSCR 1540, that directed UN member states to enact rigorous export controls. Despite the mandatory nature of UNSCR 1540, which was passed under Chapter VII of the UN Charter, it has already become apparent that some, perhaps many, member states will fail to meet their obligations. Resources are one hurdle: The resolution is in effect an unfunded mandate handed down by the Security Council. The Group of Eight industrial democracies, meanwhile, has not yet made good on its pledge to extend assistance to countries that need to bolster their export controls. Nor have efforts to reform the Nuclear Suppliers Group and the other export control regimes from within borne much fruit.

Progress, in short, has been fitful across the board. The disappointments in this area can be traced largely to a dearth of leadership. This issue of *The Monitor* ventures some new ideas in hopes of helping break the export control impasse. At the level of high politics, our

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What Will It Take to Revise the Export Administration Act of 1979?

Knowledge, Commitment, Leadership, and Cooperation

Senator Michael B. Enzi *Republican of Wyoming*

Knowledge

In today's world, we know these basic truths: The United States must work with our international allies to win the war on terror and confront those who threaten the security of our homeland; our intelligence forces must be relied upon to effectively gather and share information that will protect our troops and citizens abroad and at home; the U.S. military and the federal government should continue to develop critical partnerships with private companies to produce and deliver militarily critical and dual-use technologies; and the U.S. Congress should put in place a modern export control system that improves national security, not threatens it.

The U.S. export control system is a complex assemblage of regulations and agencies. The Departments of State, Commerce, Energy, Treasury, Defense, and Homeland Security and the intelligence community all carry out key functions with respect to controlling the export of items that are either defense, commercial, or dual-use in nature. The Office of Defense Trade Controls within the Department of State administers the International Traffic in Arms Regulations and maintains the Munitions List, which identifies items controlled for defense purposes. The Nuclear Regulatory Commission controls certain fissile and nuclear materials, especially items that may contribute to weapons of mass destruction. The Department of Commerce, Bureau of Industry and Security, administers the Export Administration Regulations, which provide the regulatory framework for controlling dual-use items listed on the Commerce Control List. Other departments like the Departments of Defense and Homeland Security play critical decisionmaking roles at both the interagency licensing level and when it comes to operations and enforcement.

The U.S. Congress established the legal foundation for controlling dual-use exports (i.e., exports that may be used for both civilian and military purposes) under the Export Administration Act (EAA) of 1979. Alarming, the Export Administration Act was allowed to expire, first on August 20, 1994 and then again, after a short reauthorization in 2000, on August 20, 2001. The law remains expired today. Sans legal authority under the EAA, the president has used his authority under the International Emergency Economic Powers Act (IEEPA) (Executive Order 12924) to continue controlling the export of dual-use items. IEEPA, however, is a poor instrument for controlling exports indefinitely in place of an up-to-date Export Administration Act.

IEEPA applies minimal penalties to exporters of unlicensed technologies and puts the confidential business records of the business community at risk of exposure. Under IEEPA, fines for export control violations are seen simply as another cost of doing business. For example, it would cost a company more to purchase a half-page advertisement in the *Washington Post* or to fly its chief executive officer to China on a corporate jet than to knowingly violate our export control laws. These ineffective penalties do not adequately deter bad actors from engaging in criminal behavior. Although controlling dual-use exports under IEEPA is not a new dilemma, it has become a more serious and urgent problem in recent years given the war on terror. Without a strong export control system, the United States does not have the ability to convince other countries, even our strongest allies, to improve their export control regimes. That's why Congress must take steps now to pass a new law that will reauthorize the Export Administration Act of 1979.

Commitment

The Export Administration Act was first drafted and passed by the United States Congress in 1949, the same year the United States helped form the North Atlantic Treaty Organization, the Soviet Union tested its first atomic bomb, and the People's Republic of China was founded. Thirty years later, Congress revised the EAA to reflect the political and economic realities of 1979, namely the Cold War and the tremendous inflation happening domestically and worldwide. Twenty years later, in 1999, Congress again recognized the need to reform the Cold War relic known as the Export Administration Act of 1979.

The Senate Committee on Banking and its Subcommittee on International Trade and Finance held seven different hearings on export controls in 1999 and 2000. I was the chairman of the Subcommittee during that time and worked tirelessly with my colleagues in both the House and Senate; high-tech and industry groups; the Departments of State, Defense, and Commerce; the intelligence community; and other executive agencies to produce a comprehensive collection of thoughts and ideas on how best to modernize our antiquated export control system. We developed a set of principles based on transparency, accountability, deterrence, enforcement, and multilateral cooperation that helped guide

the drafting of S.1712 and its successor, S.149, the Export Administration Act of 2001.

S.149, the Export Administration Act of 2001, passed the Senate on September 6, 2001 by a vote of 85-14. S.149 was a comprehensive bill that would have provided a modernized framework for controlling dual-use exports. It would have strengthened our national security efforts by enhancing enforcement powers, targeting end-use checks in the most sensitive regions, and significantly increasing penalties for violators. The bill took into account the realities of today's global economy, recognizing that items available from foreign sources or in mass-market quantities could not always be effectively controlled and that to try to do so would be counterproductive. S.149 also addressed the importance of strengthening our multilateral export control regimes, a critical component for international cooperation, and tightening the controls on items that may contribute to acts of international terrorism.

The tragic events of September 11, 2001 underscored the need for a strong and responsive export control system that would keep dangerous items out of the hands of terrorists and terrorist countries. S.149, which passed just five days before the United States was attacked in New York, Washington, DC and Pennsylvania by al Qaeda, identified deterring acts of international terrorism as a key theme. The bill would have prevented the sale of controlled items to state sponsors of terrorism and other countries of concern and mandated that items not be decontrolled if they were subject to one

of the international nonproliferation arrangements, which continue to cover nuclear, biological, chemical, and missile-related goods and technologies today. The bill also contained an ultimate terrorism trump: a provision that would have authorized the U.S. government to impose export controls, under any circumstances, on the sale of items contributing to the proliferation of weapons of mass destruction.

S.149 was a strong bill that required risk-based analysis of proposed exports and emphasized transparency and accountability. The bill garnered vocal support from the president, his national security advisor, the secretaries of defense and state, and the rest of the national security team.

Unfortunately, progress on S.149 was brought to a screeching halt in 2001 and 2002 when two of the House committees holding jurisdiction (i.e., International Relations and Armed Services) attached over 30 amendments to the original bill in two separate House markups. The modified House bill would have put in place a stringent, yet unpredictable and ineffective, licensing process for all dual-use exports. Furthermore, it would have threatened the long-term sustainability of America's defense and high-tech sectors. Unlike S.149, the House bill failed to recognize the symbiosis between the U.S. military and the private companies that produce cutting-edge technologies for military and civilian uses. As noted in the *Final Report of the Defense Science Board Task Force on Globalization and Security*, "the Department of Defense is relying increasingly on the US commercial advanced technology sector to push the technological envelope....If US high-tech exports are restricted in any significant manner, it could well have a stifling effect on the US military's rate of technological advancement." Yet proponents of the modified House bill would have established a slow-moving and cumbersome process that would have needlessly harmed U.S. industry.

The answer today—as it was two years ago—to effectively controlling the flow of dual-use goods and technology is not to kill the American high-tech sector. Instead, it is to provide the president and his administration with the legal authority they need to focus U.S. export controls on dangerous chokepoint technologies going to countries and actors of concern. Although S.149 was a well-drafted bill that would have put in place an effective and enhanced framework for controlling exports, I believe we should build upon the lessons we have learned since drafting the first bill in 1999 and in light of the drastic changes taking place post-9/11. I believe the time is right to pass a bill that will provide critically important updates, improvements, and enhancements to current law.

Leadership

Introducing and passing a bill in the 109th Congress that renews the Export Administration Act is a goal of mine for next year. I have been meeting again with industry and business groups, my colleagues in both the House and Senate, and the administration to develop a new guiding set of principles that will meet the needs of today's exporting industry and

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our national security officials. Although I will continue to promote comprehensive reform to the underlying statute, I support developing a new legislative package that is more streamlined, less complex, and more in tune with what is happening in today's political climate.

The overarching concept of any new bill should be the same as in recent years: to build higher fences around the most sensitive of items and hold those accountable who break the law. Given the current strain on our defense and non-defense-related budgets, we do not have the resources to waste money on ineffective export control measures and overly burdensome license approval procedures.

I believe there are a number of key provisions that must be addressed in a renewal bill, including penalties, enforcement, protecting the confidentiality of businesses, repealing the MTOPS (million theoretical operations per second) measurement, and building and strengthening our participation in multilateral export control regimes.

Multilateral export control regimes play a vital role in our efforts to control exports of sensitive dual-use goods and technology. I will continue to push for improvements to U.S. law that will help carry out the recommendations made by the Study Group on Enhancing Multilateral Export Controls for U.S. National Security, which I co-chaired with Senator Jeff Bingaman and Representatives Christopher Cox and Howard Berman in 2000. The mission of the Study Group was to develop practical recommendations for more effective multilateral controls of militarily relevant technologies. I believe we can draft legislation, modeled on S.149, that will provide clear statements of policy regarding U.S. and foreign participation in any export control regime, including but not limited to the Australia Group, the Missile Technology Control Regime, the Nuclear Suppliers Group, and the Wassenaar Arrangement, and outline the standards we expect our partners within the regimes to uphold. Such legislation will enable the president to approach our international partners and allies with a solid understanding of what Congress expects out of America's participation in each of the multilateral export control regimes. Further, it will apprise the international community of what we, as a country, expect out of the regimes' other participants.

Congress must pass a new bill that acknowledges the value of multilateral cooperation and encourages the United States to provide leadership in training, information sharing, and enforcement assistance to members and non-member countries within the regimes. Incorporating these themes into new legislation is especially important given our recent support of United Nations Security Council resolution 1540. UNSCR 1540, which passed in April after the president called for UN action last fall, states that all UN members "shall...establish, develop, review and maintain appropriate effective national export and trans-shipment controls over such items, including appropriate laws and regulations to control export, transit, trans-shipment and re-export." As the administration begins urging other countries to implement UNSCR 1540, it is very important that the United States itself have enacted export control legislation.

Cooperation

I believe it will take real cooperation to draft and pass a bill reauthorizing the 1979 Export Administration Act. A critical step will be engaging the chairman of the Senate Banking Committee, who was the lone opponent of S.149 when the Senate Banking Committee reported S.149 out of committee in 2001. Because the Senate Banking Committee has sole jurisdiction over the Export Administration Act in the Senate, I will need the chairman's support before we can make any real progress. It is important to also note that the chairmen of the House Committees on International Relations and Armed Services effectively blocked passage of S.149 when it was last debated in the House. If we hope to see real reform in the near future, my colleagues in both chambers will need to work with me to develop strong bipartisan, bicameral legislation.

Drafting and passing a bill to reauthorize the expired Export Administration Act of 1979 will also take the cooperation of the many agencies and departments that carry out either the licensing processes or the enforcement and administrative procedures. The Departments of Commerce, State, and Homeland Security, among others, must continue working to improve their information-sharing capabilities and the interoperability of networks and databases. The recent 9/11 Commission report and the passage by Congress of the most far-reaching reform in decades to America's 15 intelligence agencies only highlights the critical nature of timely and thorough intelligence reports. Export controls are a frontline defense in fighting terrorism, but without good information about license applicants and end-users, the integrity of the entire system will fall into question. As the Department of Homeland Security continues to work out its kinks and the intelligence community begins its massive reform, we need to ensure that the interagency process, which steers the licensing decisions for dual-use exports and helps guide policy decisions, has access to critical information and remains effective and responsive to changing world dynamics.

In closing, I believe that—without a new and improved Export Administration Act—we endanger not only our ability to control dangerous dual-use items, but our ability to work with our international friends to deter acts of international terrorism and the proliferation of weapons of mass destruction. The EAA must be reauthorized as we continue to build relationships with our foreign partners in terrorist hotbeds like Iraq and in relatively new democracies like Russia. We need to put into place a strong system that will keep sensitive items out of the hands of the terrorists and put them into the hands of citizens who are fighting every day for freedom and democracy. We cannot continue to operate under the International Emergency Economic Powers Act. I am confident that Congress can and will pass a bill reauthorizing the Export Administration Act of 1979 in 2005.

UNSCR 1540: Universalizing Export Control Standards?

Scott Jones *Director, Export Control Program, Center for International Trade and Security*

On April 28, 2004, the United Nations Security Council passed resolution 1540 on the nonproliferation of weapons of mass destruction (WMD). Inchoate form, the idea behind the resolution first appeared in an address to the UN General Assembly in 2003 by President George W. Bush, who declared that the United States planned to seek a resolution from the Security Council to “criminalize” the proliferation of WMD by non-state actors. After considerable political wrangling, the resolution emerged with a battery of legal obligations, a committee to supervise its implementation, and soft requirements for member states to report progress toward implementing its provisions.

The resolution was explicitly designed to address the “gap” in current nonproliferation treaties and arrangements, as well as deficiencies in national legislation. The gap refers to “non-state” actors, which is the term of art for terrorist groups.¹ The current nonproliferation architecture is predicated upon the nation-state as the primary agent of proliferation. Terrorist groups, whose recent interest in WMD has accentuated the non-state factor, are not captured by accords such as the Nuclear Non-Proliferation Treaty (NPT) or the Chemical Weapons Convention (CWC).

Beyond UNSCR 1540’s calls for “appropriate effective measures to account for and secure” WMD-related items in production, use, storage, or transport and to “maintain appropriate effective physical protection measures” for said items, the resolution is an export control edict, passed under Chapter VII of the UN Charter. In this respect, the real gap addressed by the resolution is the absence of a truly universal standard for export controls.

The current *de facto* universal standard for export controls is shared amongst the multilateral export control arrangements: the Australia Group, the Nuclear Suppliers Group, the Missile Technology Control Regime, and the Wassenaar Arrangement. As they are exclusionary organizations, their respective guidelines have limited currency. When strategic technologies were produced by and traded amongst a smaller number of states, export controls were effectively applied by and between these supplier states. With the growth in the number of suppliers of and global trade in strategic technologies, regime non-members with weak export controls have increasingly been able to compromise international export control efforts. Absent common standards, export control development would either be politicized or narrowly adopted.

UNSCR 1540 identifies the key elements of effective export controls. Specifically, the resolution calls on member states to enact effective laws to control WMD-

related transfers. Leaving aside the ambiguities inherent in “effective,” the resolution outlines a legal basis that addresses brokering (paragraph 2c), transit, transshipment, and re-export controls (paragraph 2d), and sufficient penalties for violations (paragraph 2d). Because the resolution is legally binding, all UN member states must adopt such a legal basis, albeit in a manner that conforms to “their national procedures.”

As a means of executing provisions of the legal basis, member states are called upon to “develop and maintain appropriate effective border controls and law enforcement efforts to detect, deter, prevent and combat, including through international cooperation when necessary, the illicit trafficking and brokering in such items in accordance with their national legal authorities and legislation and consistent with international law.”² In other words, member states must develop an enforcement capacity to police exports and transfers of sensitive items.

To ensure compliance with the “effective” laws the resolution calls upon states to adopt, another neglected gap is also addressed. Apart from direct theft of strategic goods and technologies (e.g., fissile material), proliferants generally attempt to acquire the makings of WMD through otherwise routine commercial transactions. That is, they attempt to purchase sensitive items from producers.³ To this end, the resolution calls upon states to “develop appropriate ways to work with and inform *industry* and the public regarding their obligations under such laws” (emphasis added).

In summary, UNSCR 1540 identifies the necessary elements of effective national export controls: a legal basis, enforcement capacity, and industry-government relations. Although many governments viewed the resolution’s universal scope with the skepticism typically accorded Security Council resolutions, it was unanimously adopted.⁴ Nevertheless, as with similar resolutions, the means and therefore likelihood of implementation are problematic for reasons of scale, resources, and commitment.

Apart from the member states of the multilateral export control regimes, export controls are not a matter of course. Even within the regimes, moreover, export control development is highly variable.⁵ Compliance with UNSCR 1540 by all 191 UN members will be complicated further by resource limitations and political commitment.⁶

To help offset these limitations, resolution 1540 invites states with resources and experience to spare to offer assistance to other “States lacking the legal and regulatory infrastructure, implementation experience and/or resources”

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Consolidating the Gains in Multilateral Export Control Efforts

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International efforts to prevent the proliferation of weapons of mass destruction (WMD) and related technologies include formal treaties and conventions, as well as informal agreements. The international treaties, which include the International Atomic Energy Agency Statute, the Nuclear Non-Proliferation Treaty, the Biological Weapons Convention, and the Chemical Weapons Convention, require their signatories to undertake not only to desist from acquiring or developing WMD themselves, but also to refrain from helping other states or non-state actors acquire, develop, or produce WMD. Yet the mere existence of such commitments and treaties has not been able to foil efforts by some states, and possibly a few non-state actors, to acquire WMD.

As a result, several informal multilateral regimes/agreements have been established to coordinate policies among major suppliers of WMD-relevant technologies. These regimes include the Australia Group (AG), the Nuclear Suppliers Group (NSG), the Missile Technology Control Regime (MTCR), and the Wassenaar Arrangement (WA). They aim to enforce the commitments of the formal treaties in a setting that is unencumbered by the prolonged political and legal wrangling, common among treaty members, over the modalities of regulating dual-use (that is, WMD-relevant) trade.

It is important to remember, however, that despite the restrictions imposed by treaties and informal regimes, and even after the first Gulf War, states like Iraq, Iran, Libya, and North Korea were able to procure sensitive technology, materials, and know-how through semi-commercial channels.¹ They did this by using already-existing networks of scientists, technologists, ideologues, and businessmen who had been cooperating for decades in the WMD procurement efforts of various countries. They operated through real or shell companies, brokerage firms with shady antecedents, and insignificant and/or overlooked warehousing facilities around the world.²

Much of the proliferation took place by exploiting loopholes in the existing national export control systems of major supplier states such as Germany, the Netherlands, Belgium, Switzerland, the United Kingdom, and France,³ whose policies, in turn, had been shaped by the guidelines of the multilateral agreements/regimes (NSG, MTCR, AG, and WA). These regimes therefore appear to have been tested to their logical limits and capabilities by patient proliferators, and to have been found wanting.

These developments together underscore the need to focus on the long-term nuts-and-bolts issues in preventing proliferation, whether from primary or secondary sources,

and on strengthening the implementation side of the multilateral nonproliferation regimes.

A Bold Agenda for the Regimes

The multilateral regimes are now under pressure to reform themselves and respond to the new challenges of globalization, secondary proliferation, and terrorism. A team of researchers from the Center for International Trade and Security (CITS) has been examining the rules and functions of the regimes, as well as their efforts regarding technology controls, for several years. Our research suggests that the regimes, established during the Cold War, have not changed much even though the technological, political, economic, and security environment in which they operate has changed drastically.⁴ Thus far, the regimes have sought to respond to environmental changes via incremental reforms aimed at tightening the nuts-and-bolts of individual regimes.

We believe, however, that given the urgency of the task of curbing WMD proliferation, the regime-principals have to take a proactive stance and show themselves willing to rethink the structures and rules of the export control regimes. In order to assure efficient and effective controls over dual-use technology, several significant reforms will be necessary:

- The gains achieved by individual regimes ought to be consolidated by combining the four separate regimes.
- The rules of the new, combined regime ought to be clear, coherent, and concise.
- National discretion to interpret the regime's guidelines ought to be reduced.
- Members should respond collectively to violations of the regime's guidelines by fellow members.
- There should be graduated membership categories.

These measures would reduce redundancy and the associated costs on the one hand, while on the other allowing existing members to explicitly renew their commitment to nonproliferation export controls.

Rationale: New Realities for States and High-technology Industries

Globalization of high-technology industry means that technology-generation and innovation now involve teams of scientists and engineers working across national boundaries. Much of such innovation takes place in the private sector, and within companies that are multinational not just in terms

of their location but also in their workforce, management, ownership, and target markets. Regime members have to define their rules and regulations more clearly and coherently, keeping in mind the need to balance nonproliferation requirements with the operative realities of high-technology commerce. At a time when businesses are streamlining their operations to innovate, produce, and export faster, it would be counterintuitive for the regimes to attempt to regulate these activities without first streamlining their own regulations and consolidating their own structures.

The private sector in developed economies has replaced the state as the locus of technological innovation and market expansion, especially in the field of dual-use technologies. The markets for civilian uses of these technologies are global in scope, immensely lucrative, and legitimate under the rubric of economic liberalism. Controlling them on the basis of fuzzy and/or unilateral foreign-policy considerations elicits huge protests from domestic industries. Regime members have to establish and enforce common standards of export licensing, to ensure that national commercial considerations do not triumph over collective decisions, that free riding by some members is curtailed, and that industry has a level playing field across increasingly integrated markets.

With shrinking defense budgets at home, defense manufacturers are looking abroad for new markets. There is more competition for new markets among suppliers of high technology, while the economic and security interests of member states overlap to a decreasing degree. This does not bode well for the regimes' cohesion and unity of purpose. The rift within the Wassenaar Arrangement between exporters of conventional weapons and exporters of dual-use technologies, for instance, has stymied reforms in the past.

States such as North Korea, Iran, Pakistan, Malaysia, South Africa, and the United Arab Emirates have become alternative destinations for proliferation networks.⁵ Whether these states proliferate as a matter of deliberate policy or as a result of unauthorized collusion among significant domestic actors, they continue to pose a challenge to the regimes as secondary suppliers. The regimes have to develop a unified, coherent strategy for dealing with such states and for sharing information within the entire membership if they are to counter the acquisition strategies deployed by state and non-state actors in these states.

Similarly, states such as China, India, and Israel have emerged not only as possible secondary suppliers but as increasingly attractive markets for technology-embedded capital investment and as partners for collaborative development of certain technologies. The regimes might find it increasingly difficult to allow cooperation in one technology-sector and deny it in other technology-sectors, since many dual-use technologies are fungible across sectors.

Rationale: Outdated Realities of Regime Rules

Each of the regimes has a consensus voting rule. As a consequence, all members have to agree in order to allow any changes to definitions, control lists, or membership rules. This worked well when the regimes were composed

mainly of advanced industrial states that shared a common security and economic outlook, and when members saw the benefits of abiding by self-defined nonproliferation norms. The regimes, in essence, were established as groups of like-minded suppliers of WMD-relevant technologies. Over time, however, membership has expanded to include states that do not necessarily share this common vision. Many members of the regimes are not suppliers, are not like-minded, or do not have the domestic consensus necessary to abide by all the regime guidelines.⁶ In such a situation, decisions to update control lists or guidelines can be, and often are, stymied by the intransigence of even a single member.

Each regime also allows its members to use national discretion in implementing regime decisions via national legislation and procedures. Again, such an approach, which essentially makes the regimes "gentlemen's agreements," worked well in constraining free riding when there were fewer and more homogenous members, and when the lure of foreign markets for dual-use technologies was not so great. Now that globalization has created more markets in states outside the comfort zone of the regimes, members increasingly use their national discretion to interpret the regimes' guidelines in ways that favor their domestic industries and manufacturers.⁷ In order to ensure greater harmonization in export control procedures and policies among the regime members, the ambit of national discretion within the regimes has to be narrowly and specifically defined. And doing so individually within each of the regimes might well leave loopholes or create logical inconsistencies that could be exploited by interested parties within or outside the regimes.

The regimes have no mechanism for establishing that a member has committed a violation. They essentially rely on individual members to rebuke and/or pressure the violating member through bilateral channels. In some cases, violations have elicited no more than protests and demarches from fellow members. Such measures typically have little impact, as the offending member perceives such determinations to be subjective, malicious, or simply in violation of the national-discretion provision of the concerned regime. A new unified regime could enact objective criteria to determine when a violation has occurred and establish a procedure for delivering a collective reprimand to the violating member. This would represent a major improvement on the practice of relying on individual members or sub-groups to lodge informal protests.

A Unified Multilateral Export Control Regime⁸

The multiyear research program at CITS has yielded the following recommendations about the structure of the proposed unified regime:

1. It should include each of the existing regimes. The regimes would play the role of Permanent Technical Working Groups, working under the overall direction of the Plenary Conferences and an Executive Committee.

2. There should be a new category of “adherents.” This category would be for states that generally abide by the regime’s guidelines. Adherents would gain access to some of the information maintained by the regime but have no role in decisionmaking.⁹
3. There should be clear standards governing export control policy and process. Members would have to demonstrate and uphold these standards, while prospective members would have to demonstrate the capacity and willingness to meet these standards before they were inducted as full members.¹⁰
4. There should be a Secretariat that would play the role of information clearinghouse and provide export control training and assistance to members and adherents.¹¹
5. Some decisions should be made on the basis of qualified majority voting among members. Others would require consensus.¹²
6. Members should have less leeway to dilute the standards of the regime. They would, however, be free to adopt stricter guidelines unilaterally should they wish to do so.¹³
7. The regime should use one integrated information-sharing system and database rather than maintain four separate ones. A common system would allow members to share information about a range of issues, including proliferation threats, acquisition trends among proliferators, national export control systems, and licensing decisions by member states.¹⁴

Moving from the Present toward the Future

The call for wholesale reform of the multilateral regimes no doubt appears unrealistic to those who have experienced the endless objections, pessimism, and delay that characterize efforts at institutional reform involving bureaucracies at the national and international levels. Vested interests and/or sheer inertia pervade the actors that are most intimately involved in managing the regimes. Arguments for bold reform, therefore, are unlikely to gain traction within the policy community unless the political leadership in the member states examines and adopts these ideas.¹⁵

Our research suggests that few policymakers around the world, including those who are routinely asked to vote/legislate on such issues, grasp the details of export control in general, and multilateral export control regimes in particular. A key reason for this lack of understanding is the existence of four regimes that do essentially the same things in the same ways. The current system is confusing to the casual observer, moreover, because those who are most familiar with the export control regimes tend to highlight minute differences among the regimes, making them seem more exotic or esoteric than they really are.

The challenge of mobilizing political leadership in member states behind such reforms, therefore, is twofold.

Those policymakers who have an interest in regulating the trade in technology must examine our proposals and assess them on their merits, while the nongovernmental community must work to educate and inform other relevant policymakers about the need to reform the regimes. Our proposals for regime reorganization should be taken up at the political level first, with industry leaders and career government officials recruited later to provide input on specific topics. In the end, only visionary political leadership in the countries that have long been at the forefront of export control innovation will be able to place this kind of sweeping reform on the international nonproliferation agenda. ■

¹ For instance, “Iran acquired a long list of items, including high-strength aluminum, maraging steel, electron beam welders, balancing machines, vacuum pumps, computer-numerically controlled machine tools, and flow-forming machines for both aluminum and maraging steel. Many of these items were obtained in Europe, especially from Germany and Switzerland.” David Albright and Corey Hinderstein, “The Centrifuge Connection,” *Bulletin of the Atomic Scientists* 60 (March/April 2004): pp. 61-66.

² Case studies on Iraqi and Pakistani procurement efforts are available at the ISIS website, <<http://www.exportcontrols.org/glossary.html>>.

³ For a recent report on proliferation from these states since the 1980s, see Craig S. Smith, “Nuclear Black Market Had Roots in Europe,” *International Herald Tribune*, February 21, 2004, p. 1; “German Scientist Charged over Equipment for Pakistan’s Nuclear Program,” BBC Monitoring International Reports, February 18, 2004; Michael Hirsh and Sarah Schafer, “Black Market Nukes,” MSNBC Website, <<http://www.msnbc.msn.com/id/4270904/>>; and Jacob Blackford, “Asher Karni Case Shows Weakness in Nuclear Export Controls,” ISIS Analysis, September 8, 2004, <<http://www.isis-online.org/publications/southafrica/asherkarni.html>>.

⁴ Michael Beck, Seema Gahlaut, Cassidy Craft, and Scott Jones, *Strengthening Multilateral Export Controls: A Nonproliferation Priority* (Athens, GA: University of Georgia Center for International Trade and Security, September 2002), <http://www.uga.edu/cits/documents/pdf/ regime_report.pdf>.

⁵ Among these states, only South Africa is a member of the NSG, yet its export controls do not seem to be as strong as one would assume given its membership in this regime. See Jacob Blackford, “Asher Karni Case Shows Weakness in Nuclear Export Controls,” ISIS Analysis, September 8, 2004, <<http://www.isis-online.org/publications/southafrica/asherkarni.html#south%20africa>>.

⁶ For more on this issue, see Seema Gahlaut and Victor Zaboriskiy, “Do Multilateral Regimes Have the Members They Really Need?” *Comparative Strategy* 23 (January-March 2004): pp. 73-91.

⁷ For instance, Russia has upheld its right to engage in nuclear cooperation with India and Iran, while France and the United Kingdom have exported conventional weapons to India. More recently, the United States appears to have pushed for China’s membership in the NSG partly in order to enable its nuclear industry to take advantage of the growing Chinese nuclear energy market.

⁸ For details on these recommendations, see *Strengthening International Export Controls: Roadmap to a New Regime*, CITS Report, forthcoming fall 2004.

⁹ This could include states that either do not wish to bear the burden of full membership or cannot be granted full membership because of their unique circumstances.

¹⁰ Members’ compliance with these standards would have to be assessed periodically, either by the regime itself or by nongovernmental organizations, to ensure greater objectivity and less politicization.

¹¹ The Secretariat’s administrative and analytical functions would ensure institutional memory for the regimes and ensure a means to provide outreach to members and non-members.

¹² Majority rules could vary from an absolute majority to two-thirds or three-fourths, depending on the issue.

¹³ This would ensure that decisions to strengthen the regime would not be stymied by a few dissenting members. If the majority did not agree to a

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The Certified Enterprise: A Response to Changing Export Controls

Dominique P. Lamoureux¹ *General Secretary, Thales International*

In recent months a number of European contractors have been examining innovative ideas about the future of export controls on sensitive goods. Their aim is to simplify technology transfer and international cooperation while at the same time improving compliance with the rules of ethical practice in international trade.

The basic concept behind the discussions is that of the “certified enterprise.” The principle of certification is already used in a number of fields. It represents an approach that will likely develop further in the future. But can this concept be applied to sales of defense equipment or dual-use goods? In a word: Yes. This ambitious, forward-looking idea would gain legitimacy from the fact that it would be part of a comprehensive, integrated system adapted to the new geopolitical and geo-economic environment.

Background

The starting point for discussion of certification is that current export control legislation appears to be woefully inadequate to cope with the new threats arising in a radically changing geopolitical environment. First, this legislation is outdated. It was framed in large part in the years following World War II and thus was heavily influenced by issues peculiar to the Cold War. Now, however, Western states are facing new types of globally organized crime that generate a greater need for security and control. Second, technology is developing rapidly, giving rise to new threats such as cybercrime. Third, the trend toward globalization involves exchanges of people, knowledge, goods, and capital, all within an increasingly multinational corporate environment. Our proposals also concern small firms with a substantial involvement in international trade.

Current legislation regulating the trade in technology and other goods, then, is unsuited to the realities of a globalized world. In a globalized world, export control clearly needs to be international, coordinated, and multilateral. At present, a large number of different regulations exist, while national practices are poorly coordinated and even contradictory. Some legislation, such as that of the United States, is even extraterritorial and unilateral. Globalization in the business world “deterritorializes” players’ responsibilities, yet current regulations remain largely territorial.

Indeed, it could even be argued that current export control legislation defeats its very purpose. Current procedures are counterproductive in that they are at once unable to ensure greater security and unable to facilitate normal, legitimate trade. The intrinsic design of these rules, consequently, could make it impossible to achieve the ultimate aim of ensuring the security and development of the Western nations. The proliferation of increasingly complex,

difficult-to-understand procedures increases the risk of diversion and noncompliance. This is the state of affairs that lies behind the certified enterprise proposal.

The Certified Enterprise Concept

A new paradigm of corporate social responsibility is now emerging. This paradigm has engendered many international initiatives intended to foster an ethical approach to world trade, over and above national legislation. Examples include the Organization for Economic Cooperation and Development’s “Guidelines for Multinational Enterprises,” the European Union’s “Green Book on Corporate Social Responsibility,” the United States’ “Federal Sentencing Guidelines” concept, the International Organization for Standardization’s (ISO) proposed standard for corporate social responsibility, and the UN secretary general’s proposed “Global Compact.” The latter is billed as a plan to “involve business in upgrading environmental, labor and human rights conditions, and to bring the benefits of globalization to more people worldwide.” Major companies and small firms alike increasingly share this vision. As these enterprises have become aware of the new competitive advantage to be gained from these commitments, and of the importance of perceived social responsibility to their international positioning, they have sought with increasing rigor to implement this vision.

The certified enterprise concept is part of a comprehensive, integrated system with three dimensions. First, a company makes a unilateral commitment to adopt a socially responsible attitude. Second, it accepts a commitment that is legally binding in those countries where the company and its subsidiaries operate. Third, it introduces internal control programs in all of its entities.

Social responsibility commitments may cover a variety of concepts, but they must remain objective. One such commitment could be a pledge to comply with the criteria of the European Union’s “Code of Conduct,” which requires adherents to validate all exports. Another might be a promise to perform due diligence, ensuring that no international body has found a prospective customer guilty of serious infringements of human rights. Similarly, companies may promise to enact effective procedures to combat organized crime, bribery, money-laundering, and tax havens.

Internal control programs mandate among other things the appointment of specific officers, staff awareness campaigns and training, rigorous procedures for identifying high-risk customers and detecting possible diversions, and strict audit processes. To be effective and strictly applied, these programs should be integrated as far as possible with the company’s existing procedures, especially its ISO procedures.

These three commitments, enshrined in the company's management principles, would be certified by an independent auditing body. Clearly, certification could only be granted if the enterprise fulfilled all of the criteria listed above. The administration of each country could carry out inspections of the enterprises within its national jurisdiction to verify that all the principles were actually being applied. The certification of a given enterprise would be recognized by all countries that agreed to the certified enterprise concept.

Conditions for Introduction

A broad proposal of this sort can only be developed in a gradual, pragmatic manner. Some progress has indeed already been made. For example, the European Union countries have agreed to create an area in which the free movement of dual-use goods is authorized. Unfortunately, this area is restricted to 25 countries. Real, highly practical progress was made on another front when six EU countries (Great Britain, France, Italy, Sweden, Spain, and Germany) signed a Letter of Intent and the associated Framework Agreement to coordinate their export control policies. Each signatory to the Framework Agreement can issue a Global Project License authorizing multiple exports of defense-related goods and technology to other Framework Agreement signatories. However, a Global Project License is restricted to a particular project.

One may dream of a fully harmonized, worldwide system founded on a single list of sensitive goods and a single, agreed list of controlled destinations or end-users, administered within a single international framework. Unfortunately, despite the progress made in the European context, the dream of a universal system for certifying enterprises is not likely to come true in the foreseeable future.

Given the urgency of the situation, it is nevertheless important to move ahead now. It seems more realistic to begin the process of certification in phases, according to the sensitivity of the goods and technologies. This process would bring together those states that share similar approaches to end-user control. This "club" would admit new members over time as these aspirants to membership developed and deepened their consultations with current members.

In such a sensitive area, it is important to begin by taking national sovereignty concerns and divergences in foreign policy into consideration as fully as possible. For that reason, before a fully harmonized system could exist among club members, each country would be asked to declare its "differentials" or "deltas" from club policy on certain technologies and goods, as well as on restricted or embargoed end-users. These differentials in foreign policy or the recognized criticality of a good would allow the club to construct an end-user/technology matrix depicting the policies of each member state.

There might be no difference of opinion among club members about certain end-users of dual-use goods or conventional weapons. On the other hand, a member country might inform contractors that, unlike its partners, it intended to refuse exports of ballistic-missile technology to a

particular end-user. Or all member countries might agree to block exports of all military goods to a particular end-user, with one country choosing to block not only military but civilian goods.

In this exercise, the aim would be to reduce the various countries' stated differentials to a minimum, since each certified enterprise would undertake to abide by the differentials and to ask a given country for permission before re-exporting a good from that country outside the club.

Effects of Certification

Certification would allow the free circulation of goods, technologies, and people within certified enterprises and all their subsidiaries throughout the world. The system would also ensure free circulation between certified enterprises, thereby facilitating technological cooperation, no matter where an industrial site might be located. Specific, simplified licenses might even be designed. Certified enterprises could obtain these licenses to operate within particular geographic zones.

Furthermore, a company awarded a commercial contract would only have to apply to its own national administration for a license to export finished equipment outside the club, even if that equipment contained components, subassemblies, or technologies originating in other partner countries.

Some states may be tempted to reject a comprehensive control mechanism of this sort on the grounds that it would erode their sovereignty. However, closer analysis reveals that this concept actually gives each country greater control, even outside its borders, since a policy decision by Country X would also apply to all the foreign subsidiaries of firms based on its national territory. Furthermore, this approach would bolster the likelihood of effective sanctions in case of noncompliance by a particular firm, since the commitments made by certified enterprises would be legally binding. All certified enterprises would also agree to integrate each country's differentials on sensitive technologies into their business operations. In terms of effectiveness, then, the system would guarantee a high degree of state control over exports, supported by strict, internationally agreed procedures.

For companies, a system of certification would apply identical controls to their subsidiaries throughout the world. Simplified requirements would allow them to cut back on bureaucracy, reduce the likelihood of inadvertent (and potentially costly) violations of export control law, and thereby boost their competitiveness. Rather than persisting with what is basically a case-by-case system with ex post operation, the certification concept would be in line with the internal control and self-regulation approaches already used in many other areas of international business life.

This approach would encourage business and industry to assume their fair share of corporate responsibility for the major security issues that justify export controls on sensitive technologies. The certified enterprise concept hinges on partnership, trust, and dialogue between government and business. It is the only effective way to build an export control

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Automatic Identification of Proliferation-Sensitive Equipment Using RFID¹

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Automatic identification (or auto ID) is a general term given to a host of technologies that help machines identify objects. One such technology, Radio Frequency Identification (RFID), which is becoming increasingly common, has the potential to solve a vexing export control problem: the difficulty of intercepting and identifying illicitly trafficked, proliferation-sensitive dual-use equipment.² This paper outlines the problem, explores RFID technology and its current applications and limitations, and then considers how RFID technology could contribute to the problem's solution.

What's the Problem?

Export control systems attempt to disrupt efforts by proliferators to traffic in specialized, dual-use materials and equipment needed for the production of nuclear materials, nuclear weapons, and other weapons of mass destruction (WMD). While most export control efforts are directed toward preventing illicit trade, countering the illicit trade that occurs in spite of these efforts depends strongly upon the ability to detect, identify, and interdict shipments of export controlled items.

The multilateral export control regimes specify controls for an enormous range of dual-use materials, components, and equipment used in WMD programs. Even if a particular item is recognized as potentially controlled, the control specifications are often technically complex, making quick determination of the item's control status difficult or impossible. Because most of the items of concern are dual-use in nature, they are seen in legitimate trade flow and don't necessarily look exotic. As a result, unlike more traditional forms of contraband, dual-use equipment tends to be smuggled in plain view. Especially in light of the enormous volume of global trade and the (relatively) minute volume of illicit procurement for nuclear weapons programs, distinguishing illicit shipments of these commodities from legitimate ones is very difficult. Customs personnel simply do not have the time, expertise, or resources to inspect all shipments of potentially controlled items, and selecting a subset to investigate is quite difficult.³

In an ideal world, such items could be rapidly and definitively identified without human intervention, without opening or even slowing their containers, and without impeding legitimate commerce. All shipping documents, declarations, and export licenses would be instantly and automatically available. RFID has the potential to move us toward that kind of world.

What Is RFID?

Technologically...the excitement of RFID is due to its contactless communication, low cost of tags, batteryless operation and long life. On the business side, the excitement of RFID is due to its ability to keep track of any product from cradle to grave as it moves through the various stages of its supply chain.⁴

RFID uses radio waves to transfer information between fixed or handheld transceivers (also known as interrogators or readers) and transponders (or tags) attached to the tracked item. The tags are generally small microchip transponders capable of responding to a specific outside query from a reader by transmitting back a unique identification code. Tags can be active (requiring a battery) or passive (meaning that they draw their power from the radio-frequency (RF) signal sent from the reader). They can be "read-only" or "read/write," and they can operate at various frequencies. Finally, tags range in size from millimeters to that of a credit card. To make sense of this, Table 1 (page 12) summarizes the main types of RFID systems, together with their advantages and limitations.⁵

While functionally similar to barcode reading technology, RFID offers several significant advantages over barcodes. RFID is independent of line-of-sight requirements and fully automatic (requiring no human intervention), works at distances of tens of meters, works well in hostile environments (such as dirt, moisture, and poor visibility), and works fast, with data captured in milliseconds, meaning that moving objects can be tracked.⁶ Together, these attributes create some intriguing possibilities for RFID systems. Like shopping carts passing through RFID-enabled checkout aisles in grocery stores, with all of their contents scanned at once, shipping containers would not need to be opened (or even slowed down) to interrogate their contents.

This is more feasible than it may initially sound. Investment in and commitment to RFID technologies is already widespread. Two very significant mandates, from Wal-Mart and the Department of Defense (DoD), are driving accelerated RFID adoption. Both now mandate that their suppliers incorporate RFID into their systems. Specifically, Wal-Mart has mandated that its top 100 suppliers achieve pallet- and case-level tagging by January 2005, while DoD will require all of its suppliers to use passive RFID tags on all case, pallet, and item packaging, also by January 2005.⁷

These mandates have far-reaching implications up and across the supply chain, affecting retailers, freight and logistics operations, and manufacturing plants. Demands for RFID-tagged inventory from retailers like Wal-Mart (for

their own inventory and warehouse management or “smart-shelf” applications) compel suppliers to tag pallets, cases, or individual items bound for those retailers. This also results in RFID readers’ and tags’ being ubiquitously integrated into trucks, railcars, warehouses, conveyors, forklifts, and portals. For example, Old Dominion, a multiregional motor carrier specializing in transporting consumer goods, capital goods, and textiles, has been deploying an automated, RFID-based system around the country. RFID tags applied to all of the 2,600 trucks in the Old Dominion fleet allow real-time processing of the contents of a shipment whenever a truck arrives at a service center.⁸ In another example, the Port of Singapore spent \$93 million in 1993 on various development projects, including the installation of thousands of RFID transponders in the shipyard’s asphalt to create a multidimensional grid for a container positioning system.⁹ Manufacturers such as Ford and Boeing are even doing component-level tagging, a process in which individual parts are tagged and tracked throughout the manufacturing process. Just as retailers pass tagging mandates to their suppliers, so too do manufacturers pass tagging mandates to their component suppliers. Once this infrastructure is in place, and the associated fixed costs incurred, the marginal cost of tagging additional items or shipments is quite low.

Thus, much of the fixed cost for the necessary infrastructure has already been paid. Tag costs are lower than ever (at around 30 to 50 cents per tag and still dropping¹⁰), and many manufacturers are already accustomed to tagging their goods. While it still may be a few years before every bottle of shampoo or other consumer good has its own tag, it is certainly feasible, cost-effective, and relatively routine already to tag expensive pieces of capital equipment, like those controlled by the multilateral export control regimes. The use of RFID is already becoming ubiquitous in manufacturing, shipping, logistics, and supply-chain management. It stands

to reason that the regulation of such activities should take advantage of the same technology. Indeed, RFID technology is already being used in several container security initiatives to track and monitor the locations, contents, and integrity of containers. So why not use it for export controls, too?

How Can RFID Solve the Problem?

Two fundamental strategies for applying RFID to export control enforcement could be used, either individually or in parallel: (1) Controlled items could be tagged to facilitate their detection and identification, and/or (2) uncontrolled items could be tagged to expedite their processing and clearance, freeing resources to concentrate on the controlled items. This second strategy is akin to the original application of RFID technology in “identification friend or foe” (IFF) systems for military aircraft.¹¹ With these systems, unidentified aircraft could be interrogated, and aircraft with the correct transponders and codes could respond to identify themselves as friendly or provide other information about their mission and characteristics.

For export controlled items, manufacturers could tag the items at the point of manufacture and/or the point of shipment, either by adding a dedicated RFID tag or by adding export control/customs information to their existing tags. Customs houses, ports, and border checkpoints could be equipped (or could potentially leverage their existing RFID infrastructure) to interrogate the tags. These tags could carry a rich data set including product information (manufacturer, model number, and serial number), shipping information (bill of lading, shipper’s export declaration, or even an auditable scan history), and export control information (harmonized tariff numbers, export control categorization numbers (ECCN), and perhaps even the export license itself in the form of an encrypted key issued with the license).

The logical place to embed a RFID tag on a machine is in the manufacturer’s nameplate. Such nameplates are already standard fare on industrial and electronic equipment. The electronic nameplate concept is not new. As early as 1977, RCA developed a RFID-based electronic license plate for motor vehicles.¹²

Of course, there is more to regulating the trade in controlled equipment than intercepting shipments from manufacturers to end-users. RFID tags could help in other ways, too. Many licensed transfers of such equipment carry approval conditions, such as post-

Table 1 – Summary of RFID Tag Attributes

Tag attribute	Significance
Power source <ul style="list-style-type: none"> • Active • Passive 	<ul style="list-style-type: none"> • Passive tags last forever but have limited range, while active tags have limited lifetime batteries but potentially unlimited ranges. • Passive tags are very cheap, about 30 cents per tag and still dropping fast, while active tags cost a few dollars per tag or more.
Memory type <ul style="list-style-type: none"> • Read-only • Read/write 	<ul style="list-style-type: none"> • Read-only tags are coded at the time of manufacture and are tamper-proof. • Read/write tags allow information to be added as products and shipments move through supply and logistics processes. For security, read/write tags typically use encryption standards.
Frequency <ul style="list-style-type: none"> • Low frequency (LF) • High frequency (HF) • Ultra-high frequency (UHF) 	<ul style="list-style-type: none"> • LF and HF tags have typical ranges of several inches, while UHF tags can typically be read at a distance of 12 feet. • UHF tags can handle “tag collision” better, allowing a larger number of tags to be read at once. • Higher-frequency tag signals do not penetrate liquids or metals as well as the lower frequency signals do. • Dual-frequency tags are possible.

shipment or post-installation verification, that are difficult to fulfill.¹³ RFID tags on the equipment could facilitate these verification inspections by making it much easier and quicker for personnel with handheld interrogators to determine that the equipment actually resides where it should.

In addition, the RFID tags could also potentially help to detect “secondary movements” or retransfers, which occur when goods are diverted or simply resold. Since passive tags will last for the life of the equipment, the envisioned RFID infrastructure at major ports and transshipment points would detect and identify these subsequent transfers as readily as it would the original export.

While RFID is a proven and established technology, it is important to be aware of several issues that could affect its usefulness relative to the problem of identifying export controlled commodities. These issues include operating range, standards, security, and buy-in. Many of these issues have already been touched upon, but the following few paragraphs summarize and elaborate on each of them.

Range: The range of a passive tag is a function of the amount of power supplied to it, the frequency, the size and shape of its antenna, and any interference from metal objects or other RF devices. For item-level tagging, it will be important that the tag transmit with sufficient power to penetrate the packaging. In general, low-frequency tags are read from a range of a foot or less. High-frequency tags are read from about 3 feet away, and ultra-high-frequency tags are read from 10 to 20 feet. Where longer ranges are needed, such as for tracking railway cars, active tags boost the range to 300 feet or more. In fact, active tags could be read reliably at a range of 300 yards in DoD tests.¹⁴

Standards: Frequency bands and encoding schemes are not yet standardized, meaning that all applications of RFID to date have used proprietary standards. International standards have been adopted for some very specific applications, such as tracking animals, and many other standards initiatives are underway. The International Organization for Standardization (ISO) is working on standards for tracking goods in the supply chain using high-frequency tags (ISO 18000-3) and ultra-high-frequency tags (ISO 18000-6). EPC Global, a joint venture set up to commercialize Electronic Product Code (EPC) technologies, has its own standards process, which was used to create barcode standards. EPC Global intends to submit EPC protocols to ISO so that they can become international standards.¹⁵

EPC Global has been criticized for being too slow to publish its standard. One reason cited for the delay is making sure the tag standard will work outside of the retail, consumer-product area, recognizing that others will want to piggyback their needs on the tag. This standard-setting process is underway now. If part of that standard is to include a harmonized tariff number, an ECCN, or some other designation relevant for export control commodity detection and identification, then that requirement needs to be set forth very quickly.

Security: A study¹⁶ in 2000 looked at a number of possible security measures, including passwords for accessing tag memory, a challenge/response authentication mechanism, and logical or physical locking of the memory. The conclusion of the study was that data encryption with a private key presents the most formidable mechanism for enhancing the security of RFID devices. While tags could possibly be removed or destroyed, the current efficacy of encryption makes it unlikely that individuals wishing to circumvent the RFID system could access the transponders electronically to modify the encoded data. It would be difficult if not impossible to fake the signature of an encrypted original tag with an imposter device.

Buy-in: Promoting compliance with the implantation of RFID tags within nameplates of controlled equipment could be done as an extension of current “internal compliance programs.” The implantation of tags in uncontrolled equipment could be motivated by the benefits of expedited customs processing. While it may not be possible to tag everything, those items without tags would be treated as they are today, perhaps receiving more scrutiny thanks to the resources freed by the tagged items.

Conclusion

The use of radio-frequency identification tags is becoming cheap and ubiquitous. They are already being used extensively for inventory tracking, supply-chain management, container location tracking, and other applications, so the requisite infrastructure of antennas, scanners, and computer systems either already exists or is rapidly being built. Significant mandates from Wal-Mart and the Department of Defense are further accelerating the adoption of this technology, affecting more than 30,000 companies. This presents an opportunity to solve one of the most vexing nonproliferation challenges: monitoring the movements of controlled equipment. If precision machine tools and other high-value equipment critical for WMD programs could be tagged with RFID transponders at the point of manufacture, their movements (including retransfers) could be automatically recorded and tracked through ports, warehouses, rail yards, and other transportation nodes.

To enlist the cooperation of manufacturers, logistics providers, regulators, and customs authorities, such a system would hinge on multilateral coordination among nuclear suppliers. The feasibility of the concept should be studied in detail to enable informed consideration of such an initiative. ■

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Strategic Trade . . . from page 1

contributors variously suggest how the United States and other governments can keep abreast of the threat, assess the chances that the promise of UNSCR 1540 will be fulfilled, and recommend superimposing a grand new export control regime on the current patchwork of multilateral export control institutions. On the functional level, they promote the idea of “certified” industry compliance programs, under which governments would enlist the help of private actors in the effort to squelch illicit trade, and explore the use of radio-frequency transponders to track dual-use goods within the world trade system. Some of these proposals are fairly radical. None can be realized absent farsighted, courageous political leadership.

Senator Mike Enzi (R-WY) leads off by urging Congress to “put in place a modern export control system that improves national security, not threatens it.” Sen. Enzi notes that the Export Administration Act of 1979, the guiding framework for U.S. export controls, has been moribund for a decade (except for a brief spell in 2000-2001). Absent effective law in this area, successive presidents have used their authority under the International Emergency Economic Powers Act (IEEPA) to impose oversight on the flow of dual-use goods. The IEEPA is no substitute for an updated Export Administration Act, however, largely because of its leniency vis-à-vis offenders. Sen. Enzi contends that bipartisan commitment and cooperation in Congress, augmented by leadership in the executive and legislative branches, will be required to bring U.S. export controls in line with new realities. Else the U.S. administration will find itself in the unwieldy position of pressing other governments to comply with the terms of UN Security Council resolution 1540, which directs UN member states to enact stringent export and transshipment controls, when the United States itself has fallen short in this area. Sen. Enzi professes confidence that Congress will reauthorize the Export Administration Act in 2005.

Scott Jones of the Center for International Trade and Security offers a snapshot of the UN Security Council’s efforts to propagate a universal standard for export controls. This effort found expression in Security Council resolution 1540, approved unanimously last spring. The resolution, observes Dr. Jones, was intended to close a gap in the existing array of nonproliferation institutions that could be exploited by terrorist groups. Generally speaking, these groups attempt to obtain the makings of weapons of mass destruction not by theft or other dramatic means but through lawful commercial transactions. A uniform export control standard would help frustrate their efforts. On the positive side, UNSCR 1540, passed under Chapter VII of the UN Charter, is binding on all UN member states. On the negative side, notes the author, the resolution represents an unfunded mandate that is certain to be viewed with suspicion by many governments. Like the multilateral export control regimes, then, the UNSCR 1540 regime could be depicted as a “suppliers’ cartel” intent on keeping advanced technology from developing countries. Even so, Dr. Jones welcomes the

resolution, which “provides a critical template upon which to build a truly international consensus on the form, if not scope, of export controls.”

Seema Gahlaut, also of the Center for International Trade and Security, reviews the reasons behind the lackluster performance of the four multilateral export control regimes. Dr. Gahlaut begins by observing that states have managed to obtain dual-use goods through normal commercial channels, advancing their weapons programs in plain sight. Non-state actors such as al Qaeda and its brethren could conceivably do the same. Indeed, the export control regimes shaped the approach to export control used by states from which proliferation has taken place. The author traces the failings of these regimes, first, to the increasingly globalized economy. Economic change has outpaced the regimes’ efforts to adapt. She also points to a second factor, the current regimes’ reliance on consensus voting, which allows even a single regime member to frustrate reform. Third, the export control regimes operate on the principle of national discretion, which gives governments the latitude to interpret their commitments out of existence if they see fit. Dr. Gahlaut urges the international community to work toward a grand multilateral export control regime that cuts down on these deficiencies while tapping the strengths of the existing regimes. Simplifying export controls would also make the system more intelligible to political leaders and their constituents, buttressing support for this element of nonproliferation.

Dominique Lamoureux, general secretary of Thales International, explores the concept of “certified enterprises.” He portrays this concept as a way to encourage “business and industry to assume their fair share of corporate responsibility for the major security issues that justify export controls on sensitive technologies.” Certification would take three forms: Companies would (1) profess a responsible attitude toward export control, (2) accept legally binding commitments, and (3) enact internal compliance programs. In return for these vows of good behavior, certified enterprises would receive the benefits of simplified export regulations, allowing them to reduce administrative costs and legal liability. Mr. Lamoureux urges governments to start the process moving by forming a “club” of like-minded nations with similar approaches to export control. Goods, services, and people from certified enterprises would flow freely among the members of this club. The prospect of gaining a competitive edge would provide sufficient inducement for firms to seek certification. He appeals to the self-interest of private firms, then, framing certification as a practice that would at once clamp down on the illicit traffic in weapons-related materiel and augment the competitiveness of certified enterprises.

Pete Heine of the U.S. Department of Energy’s Argonne National Laboratory offers a glimpse into how technology can be used to regulate the flow of dual-use goods and technology. Radio Frequency Identification (RFID) transponders, derived from the same technology used in barcode devices in retail outlets, can be mounted on dual-use

goods at surprisingly low cost. Not only the U.S. Department of Defense but private companies such as Wal-Mart have spurred the development of RFID technology by requiring their suppliers to install radio-frequency transponders on merchandise. The marginal cost of an RFID tag runs as low as 30 cents once firms absorb the fixed cost of handheld transceivers and other infrastructure. RFID-equipped customs and border personnel can remotely identify and approve dual-use goods in transit through seaports, airfields, and other transportation nodes. They can also detect diversions or re-exports of goods and technology, even after these items have been delivered to their original end-users and post-shipment checks have been conducted. This proven technology, says Mr. Heine, offers the dual benefit of bolstering the efficacy of export controls and eliminating many of the cumbersome inspections that currently impede the flow of lawful trade.

We hope this issue of *The Monitor* will inspire leaders to act. ■

■ UNSCR 1540 ... from page 5

to “fulfill the provisions of the resolution.”⁷ In other words, UNSCR 1540 is an unfunded mandate. At present the United States is, for all intents and purposes, the only provider of significant export control assistance.⁸ Extending its export control assistance programs beyond the approximately 45 countries with which it already cooperates would demand financial support orders of magnitude beyond its current operating budget.⁹ The Group of Eight (G-8) industrial democracies, as part of its Global Partnership agenda, has called for similar support for export control assistance.¹⁰ Actual support for the G-8 Global Partnership has flagged, however, since its inception in 2002.

Lastly, the international perception of trade controls suggests that the 1540 regime will be immediately unpopular. For several years, the multilateral export control regimes have been viewed as “supplier cartels” engineered to keep high technology out of the hands of developing countries. Furthermore, heavily trade-dependent countries and regions, such as Asia, regard trade controls as antithetical to their economic development.

While the implementation of UNSCR 1540 faces considerable obstacles, even to its partial realization, the resolution provides a critical template upon which to build a truly international consensus on the form, if not the scope, of export controls. While ostensibly created to address the non-state-actor gap, UNSCR 1540 also concentrates on state-based proliferation programs. For example, U.S. Assistant Secretary of State for Nonproliferation John S. Wolf has argued, “I would submit that the resolution also looks at state-state transactions, as well as state-non-state transactions. There’s a whole universe of state-state, state-non-state, non-state-non-state, non-state-state [transactions], and all of those need to be covered by comprehensive export controls and rigorous enforcement.”¹¹ Such a comprehensive approach is

necessary to ensure a proper balance between global trade and nonproliferation. ■

¹ The resolution defines a non-state actor as an “individual or entity, not acting under the lawful authority of any State in conducting activities which come within the scope of this resolution.”

² UNSCR 1540 was designed to accommodate the Proliferation Security Initiative. See Jofi Joseph, “The Proliferation Security Initiative: Can Interdiction Stop Proliferation?” *Arms Control Today* 34 (June 2004); *The Monitor: International Perspectives on Nonproliferation* 10 (spring 2004).

³ The A. Q. Khan network revealed the extent to which commercial networks were engaged in illicit trade. In addition, studies of WMD acquisition efforts by terrorist groups indicate that these groups, too, are relying on trade rather than theft. On this last point, see Gavin Cameron, “Multitrack Microproliferation: Lessons from Aum Shinrikyo and Al Qaeda,” *Studies in Conflict and Terrorism* 22 (October-December 1999).

⁴ Despite its seemingly unobjectionable purpose, however, the U.S.-initiated resolution required several months of debate and revisions before winning approval. See Wade Boese, “Security Council Unanimously Adopts Resolution on Denying Terrorists WMD,” *Arms Control Today* 34 (May 2004).

⁵ Michael Beck, Cassidy Craft, Seema Gahlaut, and Scott Jones, *Strengthening Multilateral Export Controls: A Nonproliferation Priority* (Athens, GA: University of Georgia Center for International Trade and Security, 2003), <http://www.uga.edu/cits/documents/pdf/regime_report.pdf>.

⁶ There are 191 members of the United Nations. Although this number represents almost all of the countries in the world, there is still one country (the Vatican City) that is independent and has chosen not to become a member of the United Nations.

⁷ Operative paragraph 7.

⁸ Some European states and Japan do provide export control assistance to less developed countries, albeit on a fraction of the scale provided by the United States.

⁹ The U.S. Export Control and Related Border Security Assistance (EXBS) Program, which provides essential technical and material assistance to recipient countries to help them carry out these nonproliferation efforts, is budgeted at approximately \$40 million for FY04.

¹⁰ For a fuller treatment of the G-8 and its role in nonproliferation, see *The Monitor: International Perspectives on Nonproliferation* 10 (summer 2004).

¹¹ Wade Boese, “The Bush Administration’s Non-proliferation Policy: An Interview with Assistant Secretary of State John S. Wolf,” *Arms Control Today* 34 (June 2004).

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system suited to the economic and geopolitical challenges of the 21st century. ■

¹ As General Secretary of Thales International, Dominique Lamoureux actively contributes to the enforcement of Thales’ corporate policy mandating comprehensive compliance with international trade regulations and ethics. He is involved in the development of Thales’ international strategy in terms of structures, procedures, and practices. Mr. Lamoureux’s role with industrial organizations includes several positions with leadership responsibility for the export of sensitive technology. Since 1989 he has been president of the trade group for French industrial exporters of strategic products (SIEPS) and chairman of the export controls working group of the Union of Industrial and Employers Confederations of Europe (UNICE). He also chairs the Commission for International Trade Regulations of the French Defense Industry Council (CIDEF), of which he has been a member since its creation. He is a member of the European Defense Industry Group’s arms control working party (EDIG) and of the Transatlantic Business Dialogue (TABD), where he is European Issue Manager for several strategic issues. He has been awarded the French Order of the Legion of Honor and National Order of Merit.

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² Controlled dual-use materials and equipment are specified on the control lists of the Nuclear Suppliers Group, the Missile Technology Control Regime, and the Australia Group.

³ The process of screening data in manifests, bills of lading, shippers' declarations, and other sources to target suspect shipments for examination is strongly analogous to the problem of the "signal-to-noise ratio" (SNR), with data related to illicit procurements representing a faint "signal" in a high-noise environment. Targeting profiles work by assigning points for characteristic indicators or signatures of illicit shipments, such as first-time exporters or freight forwarders, nonexistent consignees, shipments to post-office boxes, unusual routings, or vague commodity descriptions. When the profile score exceeds some threshold, the shipment is targeted for inspection. The tradeoff when setting that threshold is between confidence and spurious detections (false positives). In a low-SNR environment, even a small change in the detection threshold can result in an explosion of false positives, which would demand excessive inspection resources and unacceptably interfere with commerce. If SNR is low enough, it may be impossible to achieve an acceptable level of confidence without incurring an unacceptable level of false positives. See Pete Heine et al., "Countering Illicit Trade in Nuclear-Related Commodities: Targeting and Commodity Identification to Improve Export Control Enforcement," Paper Presented at the 45th Annual Meeting of the Institute for Nuclear Materials Management, Phoenix, AZ, July 2004.

⁴ Rajit Gadh, "RFID: Getting from Mandates to a Wireless Internet of Artifacts," *Computerworld*, October 4, 2004.

⁵ AIM Global, "RFID Frequently Asked Questions," AIM Global Website, <http://www.aimglobal.org/technologies/rfid/rfid_faqs.asp>.

⁶ Accenture, "Radio Frequency Identification (RFID) White Paper," 2001.

⁷ Don St. John, "Taking Inventory of RFID," *TechWeb*, Oct 30, 2003, <http://www.techweb.com/tech/ebiz/20031030_ebiz>.

⁸ Intermec Technologies Corporation, "Old Dominion Freight Lines Saves Both with Intermec Mobile and Wireless Technology," April 1, 2003.

⁹ Texas Instruments, "Port of Singapore Case Study," Texas Instruments Website, <http://www.ti.com/tiris/docs/applications/supply/logsup_port.shtml>.

¹⁰ Diane Marie Ward, "5-Cent Tag Unlikely in 4 Years," *RFID Journal*, August 26, 2004.

¹¹ Jerry Landt, "Shrouds of Time: The History of RFID," 2001, AIM Global Website, <http://www.aimglobal.org/technologies/rfid/resources/shrouds_of_time.pdf>.

¹² Ibid.

¹³ U.S. General Accounting Office, "Export Controls: Post-Shipment Verification Provides Limited Assurance That Dual-Use Items Are Being Properly Used," GAO-04-357 (Washington, DC: Government Publishing Office, January 2004).

¹⁴ Alorie Gilbert, "US Military Invests in 'Active' RFID," CNET News.com, March 23, 2004.

¹⁵ Matt Hines, "RFID Standards Race May Set Early Market Leaders," CNET News.com, May 19, 2004.

¹⁶ Alain Berthon and Michael Guillory, "Security in RFID," SG1 Meetings in Somerset and Nice, July 27, 2000, <<http://www.nepc.sanc.org.sg/html/techReport/N327.doc>>.

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particular proposal aimed at strengthening the regime, individual members could opt to uphold the proposal unilaterally, without forcing it on others. In other words, members would be free to do more, but not less, than the regime required. Nor would they be permitted to reduce the rules below the minimum acceptable level.

¹⁴ This would include information about licenses granted as well as denials, thereby ensuring transparency among suppliers and reducing the likelihood of inadvertent exports.

¹⁵ The speed with which the Proliferation Security Initiative was formulated and implemented provides a perfect example of what can be achieved on security issues in multinational forums when political leaders are determined and engaged.



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