



CENTER FOR INTERNATIONAL SECURITY AND COOPERATION

**Enhancing Implementation of
U.N. Security Council Resolution 1540**

Allen S. Weiner, Chaim Braun, Michael May & Roger Speed

**Center for International Security and Cooperation
Freeman Spogli Institute for International Studies
Stanford University**

September 2007



Stanford University's Center for International Security and cooperation, part of the Freeman Spogli Institute for International Studies, is a multidisciplinary community dedicated to research and training in the field of international security. The center brings together scholars, policymakers, scientists, area specialists, members of the business community, and other experts to examine a wide range of international security issues. The center's mission has remained largely the same since its founding in 1983: to produce outstanding policy-relevant research on international security problems; to teach and train the next generation of international security specialists; and to influence public policy through public outreach, track-two diplomacy, and policy advising.

The opinions expressed here are those of the authors and do not represent positions of the center, its supporters, or Stanford University.

**Enhancing Implementation of
U.N. Security Council Resolution 1540**

**Report of the
Center on International Security and Cooperation (CISAC)
Freeman Spogli Institute for International Studies
Stanford University**

**by
Allen S. Weiner, Chaim Braun, Michael May & Roger Speed
September 2007**

Synopsis

The threat of the use of weapons of mass destruction by terrorist groups is perhaps the gravest threat confronting the international security system. In 2004, the United Nations Security Council, acting under Chapter VII, adopted Security Council Resolution 1540 (“UNSCR 1540”). UNSCR 1540 calls on U.N. member states to enact legislation and to take effective measures to prevent non-state actors, and terrorist groups in particular, from obtaining weapons of mass destruction. UNSCR 1540 also obligated states to report on measures they have taken to fulfill the substantive requirements of the resolution. In addition, UNSCR 1540 established an *ad hoc* committee (“the 1540 Committee”) to receive states’ reports and in turn to report to the Security Council on implementation of the resolution. In 2006, the 1540 Committee’s initial two-year mandate was renewed for another two years.

UNSCR 1540, as administered by the 1540 Committee, has largely been effective in encouraging states to provide detailed descriptions of the domestic legal authorities and administrative structures they have in place to address the threat of WMD proliferation. Additional progress can and should be made by the Security Council and the 1540 Committee, however, to ensure that the maximum nonproliferation and security benefits that might be produced by UNSCR 1540 are achieved. Our recommendations fall into the following categories:

1. **Implementation:** We recommend that the 1540 Committee should move beyond assessing whether states have in place the formal legal authorities needed to carry out their responsibilities under UNSCR 1540. The Committee should assess what steps states are actually taking to implement those authorities. We have developed an extensive set of questions about **implementation indicators**. These questions would solicit information about how vigorously each country is implementing its 1540 obligations in practice, as well as on paper. As such, these questions can be used to assist in objectively assessing states’ implementation records.
2. **Adaptation:** Although the UNSCR 1540 reporting process has produced a considerable body of important information, there is a risk of “reporting fatigue”

setting in. Future information gathering should be tailored to the particular proliferation threats posed by or within particular countries. We have identified categories of **adaptation indicators** the 1540 Committee can consider in pursuing differentiated information gathering strategies that would be tailored to the needs and situations of individual states.

3. **International cooperation and assistance:** The 1540 Committee can expand ways in which it assists states in strengthening their nonproliferation capacities. For instance, the Committee, which has considerable expertise regarding nonproliferation, should begin giving tailored and specific recommendations to states about legislative improvements they should make in view of their particular circumstances. Beyond this, however, the 1540 Committee – given its limited mandate and resources – will have to rely on outside entities, including states, international organizations, private sector entities, and nongovernmental organizations (NGOs), to better realize the goals of UNSCR 1540. We accordingly discuss ways of expanding outreach programs and better coordinating the programs carried out by various international organizations with the work of the 1540 Committee. A **UNSCR 1540 Coordination Committee should be established** under the leadership of the 1540 Committee to coordinate the efforts of international and regional organizations. The 1540 Committee should develop memoranda of understanding (MOUs) with other international organizations governing the scope and modes of cooperation.
4. **Information sharing and assessment:** The 1540 Committee relies on voluntary self-reporting by states. This is by itself significant, in that it provides a basis for assessing needs and holding states accountable to complying with their own laws. We recommend some supplemental **information-exchange** strategies, including authorizing the Committee: (1) to receive on a voluntary and confidential basis sensitive information beyond that which states are mandated to provide; (2) to receive information from international or regional organizations, NGOs, businesses, non-state groups, or individuals; and (3) in appropriate cases, to disseminate confidential information on a restricted basis. In cases involving particularly sensitive information that could be the subject of bilateral assistance or cooperation, the Committee should encourage states to share information directly with one another, rather than with the Committee itself.
5. **Organizational implications:** The structure and limited mandate of the 1540 Committee is not well-suited for long-term oversight of state compliance with the obligations of UNSCR 1540. We offer suggestions on **better organizational approaches** to discharging the responsibilities that have been assumed by the 1540 Committee, including: (1) a longer term/indefinite mandate; (2) increased funding; (3) a long-term staff of independent and professional experts; (4) broader authority with respect to information exchange, including discretion to request information from states on a tailored, country-by-country basis, in view of all available information; and (5) greater authority to facilitate compliance, including a voluntary fund the 1540 Committee could use to help finance efforts by states to comply with the requirements of UNSCR 1540.

Section 1: Introduction¹

With the increasing specter of terrorism facing the international community and the challenges posed by continued proliferation of weapons of mass destruction (“WMDs”), the member states of the United Nations decided in 2004 to act in an effort to prevent terrorist groups from obtaining WMDs.

The result was United Nations Security Council Resolution 1540 (“UNSCR 1540”), which, as described in greater detail below, calls on U.N. member states to enact legislation and to take effective measures to prevent non-state actors, and terrorist groups in particular, from obtaining WMDs.² UNSCR 1540 also established an *ad hoc* Committee of the Security Council (“the 1540 Committee”) to oversee implementation of UNSCR 1540.³ While the 1540 Committee has made strides forward in collecting information and aiding states, there is still more that could be done.

This report reflects the results of a study conducted by the Center on International Security and Cooperation (CISAC) at the Freeman Spogli Institute for International Studies at Stanford University on ways to enhance implementation of UNSCR 1540. Some of the recommendations in this report could be adopted and given effect by the 1540 Committee itself as it carries out its mandate. (The Committee’s initial two-year mandate was extended until April 2008 in United Nations Security Council Resolution 1673 (2006).) Other proposals are more far-reaching, and involve other steps that the international community in general, and the Security Council in particular, might pursue in furtherance of an enhanced effort to prevent non-state actors from acquiring WMDs.

Section 2 of this report sets out important **background information**. Section 2.1 reviews in greater depth both UNSCR 1540 and the functions and achievements of the 1540 Committee. Section 2.2 then outlines some of the technical aspects of WMD proliferation and identifies what terrorist groups might need to acquire a WMD.

Section 3 addresses the need for more careful evaluation of how states implement their legal nonproliferation authorities and suggests a series of **implementation indicators** that can be used by the 1540 Committee or others to gain a deeper understanding of state compliance with UNSCR 1540.

Section 4 discusses the importance of having the Committee develop a differentiated and tailored approach to additional information gathering. The section

¹ We are grateful for funding provided by the Norwegian Foreign Ministry, the Los Alamos National Laboratory, and the Ploughshares Fund. We are also grateful for significant contributions from Tonya Putnam and Alisa Carrigan, for helpful comments we received on an earlier version of recommendations from participants at a Workshop held at Stanford on July 20 – 21, 2006, and for outstanding research assistance by Nisha Prabhu.

² For the full text of UNSCR 1540, see U.N. Doc. S/RES/1540 (28 April 2004), available at [http://disarmament2.un.org/Committee1540/Res1540\(E\).pdf](http://disarmament2.un.org/Committee1540/Res1540(E).pdf).

³ The 1540 Committee website can be found at <http://disarmament2.un.org/Committee1540/>.

includes a series of objective **adaptation indicators** that can be used to prioritize and tailor future information requests.

Section 5 discusses **international cooperation and assistance** and examines the role of various international and regional organizations, as well as private sector actors, in helping to implement the UNSCR 1540 mandate.

Section 6, after noting that **information sharing** and **assessment** of state performance at this stage is limited to self-reporting by states, suggests some supplemental or enhanced information-exchange strategies to enable the 1540 Committee to more effectively conduct its work.

Section 7 addresses the **organizational challenges** facing the 1540 Committee and discusses organizational approaches that would better enable the Committee to carry out the responsibilities assigned to it under UNSCR 1540.

The Appendix summarizes information included in the reports submitted by a select group of 37 states pursuant to UNSCR 1540 related to the **implementation indicator** questions discussed in Section 3.

Section 2: Background

Section 2.1: UNSCR 1540 and the 1540 Committee

On 28 April 2004, the United Nations Security Council adopted UNSCR 1540, which was aimed largely at preventing the spread of WMDs to non-state actors, and specifically, to terrorist groups. The resolution is also aimed at ensuring that states have in place measures to ensure that non-state actors do not engage in proliferation-related activities, including state-to-state proliferation.

Although UNSCR 1540 generally obligates states to take effective measures “to prevent the proliferation of” WMDs and their means of delivery, the resolution is principally focused on the problem of non-state actors. The resolution was motivated on the one hand by the growing awareness of the international security threats posed by non-state actors, such as the terrorist attacks of 11 September 2001 and the discovery of A.Q. Khan’s nuclear smuggling network, and on the other hand by the various voluntary anti-smuggling and interdiction activities of various *ad hoc* state coalitions.⁴ UNSCR 1540 is based on the following conclusions:

⁴ For more information on the A.Q. Khan nuclear smuggling network, *see, e.g.*, Sharon Squassoni, *Closing Pandora’s Box: Pakistan’s Role in Nuclear Proliferation*, Arms Control Today, April 2004, available at http://www.armscontrol.org/act/2004_04/Squassoni.asp. For additional discussion of recent counterproliferation efforts by state coalitions to combat WMD proliferation, *see* Section 5.4.2, *infra*.

- Different terrorist groups were trying to acquire WMDs and their means of delivery;
- Possession of such WMD capabilities by terrorist groups poses an unacceptable danger for peace and security of the international community; and
- Means to thwart and prevent such terrorist activities should be expanded, systematized, and made binding on the entire community of nations (rather than being carried out on a voluntary basis by states or *ad hoc* groups of states).

In adopting UNSCR 1540, the Security Council acted pursuant to its Chapter VII powers to adopt legally binding measures on all U.N. member states to confront threats to international peace and security. UNSCR 1540 obligates all U.N. member states to:

- Refrain from providing any form of support to terrorist organizations attempting to acquire WMDs;
- Adopt and enforce domestic legislation prohibiting terrorist organizations from acquiring WMDs and prohibiting assistance to such WMD acquisition efforts;
- Establish effective accounting and physical security measures for WMD-related materials;
- Establish export controls and border controls and other law enforcement measures to prevent the unlawful export of WMD-related equipment, goods, technologies, and means of delivery to terrorist groups;
- Establish outreach programs targeted at the manufacturing and exporting communities; and
- Submit reports to the *ad hoc* committee established by the resolution on steps they have taken or intend to take to implement the resolution.

The 1540 Committee's initial mandate was for a two-year period ending in April 2006. During that period, the Committee sought country reports on how member states were implementing all aspects of UNSCR 1540. The 1540 Committee provided some initial general guidelines to states regarding the reports, which states were required to submit by October 2004.⁵ The Committee developed a matrix based on the language of UNSCR 1540; it used the matrix to evaluate the national reports it received. The Committee also summarized data in the initial national reports according to the matrix. As of 30 May 2006, 129 member states plus the European Union had provided responses.⁶ This represents roughly two-thirds of the membership at the United Nations. When the 1540 Committee's initial mandate ended, 62 member states had not provided responses.⁷

⁵ See 1540 Committee, Guidelines for the preparation of national reports pursuant to resolution 1540 (2004), <http://disarmament2.un.org/Committee1540/napprepare.html>.

⁶ Briefing by Chairman of Security Council Committee established pursuant to resolution 1540 (2004) to the Security Council (30 May 2006), available at disarmament2.un.org/Committee1540/doc/statement.chair.SC.30may06.doc.

⁷ See Report of the Security Council Committee established pursuant to resolution 1540 (2004), U.N. Doc. S/2006/257 (25 April 2006), available at

Based on its evaluation of the initial country reports, the Committee developed an additional questionnaire aimed at eliciting more targeted responses from states about legislation and programs focused on proliferation to terrorist organizations, as opposed to state-to-state transfers. As of 17 August 2007, 87 countries had provided responses to the Committee's additional questionnaire, and some countries had provided additional information beyond even the scope of the questionnaire.⁸

The Committee submitted its report to the Security Council on implementation of UNSCR 1540 in April 2006.⁹ The report included the results of the Committee's evaluation of all the information it had received from states, including their responses to the additional matrix questionnaire.

In April 2006, the Security Council renewed the Committee's mandate in U.N. Security Council Resolution 1673, which extended activities related to implementation of UNSCR 1540 for two additional years. In the renewal resolution, the Security Council stated that the Committee's goal should be to "intensify its efforts to promote full implementation by all states of Resolution 1540" through the "compilation of information on the status of states' implementation of all aspects of Resolution 1540," as well as through "outreach, dialogue, assistance and cooperation."¹⁰ To help carry out its mandate, the 1540 Committee has developed periodic work plans which lay out its expected scope of activities for the period in question. The current work program covers the period from 1 October 2006 to 30 September 2007.¹¹

On 19 May 2006, the Committee published on its web site a database containing national nonproliferation legislation and regulatory directives provided by 124 member states and the European Union.¹² Information provided by member states is reported without annotation or comments. The Committee has said that it intends to update this database on a regular basis to include reports from additional states and further information from states that have already submitted reports. However, as of 17 August 2007, no updated material has been added to this database.

<http://daccessdds.un.org/doc/UNDOC/GEN/N06/293/00/PDF/N0629300.pdf?OpenElement> [hereinafter 1540 Committee Report].

⁸ Submitted country reports and responses to the additional questionnaire are available on the 1540 Committee's website, <http://disarmament2.un.org/Committee1540/report.html>.

⁹ 1540 Committee Report, *supra* note 7.

¹⁰ UNSCR 1673, U.N. Doc. S/RES/1673 (27 April 2006), available at <http://daccessdds.un.org/doc/UNDOC/GEN/N06/331/10/PDF/N0633110.pdf?OpenElement>.

¹¹ See Programme of Work of the Security Council Committee established pursuant to resolution 1540 (2005), available at [http://disarmament2.un.org/Committee1540/doc/programmeofwork01Oct2006\(E\).doc](http://disarmament2.un.org/Committee1540/doc/programmeofwork01Oct2006(E).doc) [hereinafter 1540 Committee Work Program].

¹² The legislative database is accessible through the 1540 Committee website, <http://disarmament2.un.org/Committee1540/legalDB.html>.

The countries that have yet to submit status reports are primary candidates for a concerted U.N. outreach program, although in some cases the states concerned may not present a significant WMD terrorism proliferation risk. Despite the premium placed by the Security Council and the 1540 Committee on improving the reporting rate, as of 17 August 2007 a total of 136 states had submitted reports, meaning that only 7 additional states reported in the nearly 15 months between May 2006 and August 2007.

Section 2.2: Technical Background on WMD Proliferation Threats

In evaluating measures adopted by states to implement UNSCR 1540, it is important to bear in mind the nature of the WMD proliferation threat in the context of WMD acquisition efforts by non-state actors. The path a terrorist group might follow to obtain WMDs is likely to be quite different from that pursued by states, and thus procedures, regulations, and controls designed to prevent proliferation by states may not be appropriate – or even viable – in all cases for stopping non-state actors.

Broadly speaking, terrorists require the same three things that states do in order to construct a weapon: material, equipment, and expertise. However, the means of manufacturing or procuring all three differ greatly for non-state groups. Expertise is perhaps the most critical – without someone who knows what he or she is doing, components cannot be manufactured or bought with confidence that they are reliable. Nor can they be assembled correctly into a working weapon. And yet, under the current nonproliferation regime, expertise is also the most difficult to control, because tracking the movement of knowledge (be it books, blueprints, internet publications, or scientists themselves) is a difficult proposition in a rapidly globalizing world.

Intelligence services and police agencies can attempt to keep track of experts who might seek to sell their services, as A.Q. Khan did, or who might attempt to give assistance because of ideological sympathies. However, intelligence agencies must be able to coordinate their information gathering, and states need to share pertinent information with each other and with oversight bodies, like the IAEA and the 1540 Committee, with much greater speed and regularity. Given the almost reflexive reluctance of intelligence agencies to share information outside highly restricted channels, this is something that is too rarely done under the current nonproliferation regime.

Though acquiring the necessary expertise can prove problematic for terrorist groups, they must also obtain the necessary equipment and materials to make a weapon. This section briefly summarizes the general nature of various WMD threats and the requirements for materials and equipment, as well as the kinds of state and industrial practices that might limit the threat.

Section 2.2.1: Nuclear Weapons

To construct a nuclear weapon, generally either plutonium or enriched uranium must be used. Natural uranium contains only about 0.72 percent of the fissile isotope U-235. To make a uranium weapon, the material must be enriched to much higher levels of U-235. Plutonium does not occur naturally, but can be formed in nuclear reactors and extracted from the highly radioactive spent fuel by chemical separation. Enriched uranium is produced at an enrichment facility – generally either a gaseous diffusion plant or a facility employing thousands of gas centrifuges. Both the diffusion and centrifuge methods are large industrial processes, and terrorists or non-state groups are unlikely to have the resources to be able to separate plutonium from fuel rods or to enrich uranium. Thus, they must rely on obtaining material that has already been separated or enriched.

The smallest amount of fissile material needed for a sustained nuclear chain reaction is called a “critical mass.” To produce a very rapid self-sustaining chain reaction that will result in a nuclear explosion, a “supercritical” mass of fissile material is required. This can be obtained by bringing two subcritical masses together or compressing a subcritical mass of fissile material. Terrorists are most likely to rely on a “crude design” to create such a supercritical mass:

“A crude design is one in which either of the methods successfully demonstrated in 1945 – the gun type and the implosion type – is applied. In the gun type, a subcritical piece of fissile material (the projectile) is fired rapidly into another subcritical piece (the target) such that the final assembly is supercritical without a change in the density of the material. In the implosion type, a near-critical piece of fissile material is compressed by a converging shock wave resulting from the detonation of a surrounding layer of high explosive and becomes supercritical because of its increase in density.”¹³

The technical challenge is to perform these operations (assembly or compression) very quickly before the energy released by the initial fission blows the weapon apart and stops the chain reaction.

Highly enriched uranium (HEU)

The amount of material required to make a bomb will vary considerably with the design of the weapon and the nature of the material. For a uranium bomb, the more highly enriched the uranium is, the less material required. For example, the critical mass of a bare sphere of uranium (when there is no neutron reflector present) is 52 kg of 94% U-235 and 800 kg of 20% U-235.¹⁴ With a neutron reflector such as natural uranium, iron, or graphite surrounding the nuclear material, the critical mass can be reduced by half or more.

¹³ Carson Mark, et al., *Can Terrorists Build Nuclear Weapons?*, Nuclear Control Institute (1987), available at <http://www.nci.org/k-m/makecab.htm>.

¹⁴ *Id.*

In terms of proliferation, the level of enrichment considered to be of concern is set (somewhat arbitrarily) at 20% and greater. Such material is called highly enriched uranium (HEU). Material with less than 20% U-235 is called low-enriched uranium (LEU). Because of the large amount of material required (hundreds of kilograms), it is generally considered to be impractical to build a weapon with LEU. Thus, it is generally not considered a proliferation concern.

The simplest way for a terrorist group to construct a nuclear weapon would be to use HEU in a gun-type device. This was the type of weapon dropped on Hiroshima (“Little Boy”). Because of the simplicity and high reliability of the design, the United States had enough confidence to deploy the weapon without first testing it. An implosion device might also be used, but would involve considerably more technological risk. That said, the A.Q. Khan network has provided Libya, and possibly Iran and North Korea, with a design of a workable HEU implosion weapon, which was actually tested by China in 1964.¹⁵ Thus, basic knowledge of this design might already have been disseminated. Furthermore, while a crude implosion device would require about 25 kg of very highly enriched uranium, a gun device would require considerably more material (since the uranium would be uncompressed).¹⁶

The United States and Russia possess hundreds of tons of military HEU.¹⁷ Presumably the other seven nuclear states also have military stockpiles of HEU or plutonium that must be safeguarded. It is important to note that there are also non-military uses for HEU. HEU is used in civilian research reactors around the world, though many of these reactors are in the process of converting their feedstock into low-enriched uranium that cannot be used to construct a nuclear weapon. “Over 130 research reactors continue to operate with HEU in over 40 countries around the world . . . with an estimated 20 tons of HEU in the research reactor fuel cycle worldwide, enough for hundreds of nuclear weapons.”¹⁸ Many of these reactors are in academic or industrial settings where the security of the material is of concern. In general, there is a troubling lack of accountancy or inventory of world supplies of HEU – very little is known about which countries possess critical amounts of HEU.

¹⁵ See Joby Warrick & Peter Slevin, *Libyan Arms Designs Traced Back to China; Pakistanis Resold Chinese-Provided Plans*, *The Washington Post*, 15 February 2004, at A1.

¹⁶ *Id.* The Little Boy device contained about 64 kg of 80% enriched uranium and produced a yield of about 13 kilotons. HEU as a Weapons Material: Briefing by the Norwegian Project Secretariat, International Symposium on Minimisation of HEU in the Civil Nuclear Sector (June 2006), available at http://www.nti.org/e_research/official_docs/norway/HEU_as_Weapons_Material.pdf.

¹⁷ See Nuclear Threat Initiative (NTI) Research Library, *Securing the Bomb: Introduction: Reducing Excess Stockpiles*, http://www.nti.org/e_research/cnwm/reducing/index.asp.

¹⁸ NTI Research Library, *Securing Nuclear Warheads and Materials: Converting Research Reactors*, http://www.nti.org/e_research/cnwm/securing/convert.asp.

Civilian plutonium

Plutonium is created in nuclear reactors when the uranium reactor fuel is bombarded with neutrons from the chain reaction. The most useful isotope of plutonium for making nuclear weapons is Pu-239, which is created when U-238 adsorbs a neutron and then quickly decays to Pu-239. However, the longer the reactor fuel is exposed to neutrons, the more likely that other less desirable isotopes (Pu-238, Pu-240, and Pu-241) will also accumulate. These isotopes produce excessive numbers of neutrons, dangerous radiation, and heat, which could cause serious problems for a weapons designer.

To produce “weapons-grade” plutonium, which is typically about 93% Pu-239, the reactor rods are exposed for only a relatively short period of time (usually in a reactor dedicated to this purpose). Any unblended weapons-grade plutonium would be quite suitable for a nuclear weapon, although using it would involve creating a more sophisticated implosion-type weapon, since a gun-type device using plutonium would most likely fizzle. (Plutonium produces several thousand times more spontaneously-emitted neutrons than uranium. As the two pieces of the “gun” are brought together, these neutrons will cause the chain reaction to start before the pieces can be brought completely together to form a supercritical mass, resulting in a zero or very low yield.) In a typical civilian power reactor, however, the rods are exposed to neutrons for a much longer period, producing “reactor-grade” plutonium with many more of the undesirable isotopes of plutonium.

Several countries possess large stockpiles of reactor-grade plutonium for use in civilian nuclear power reactors. The plutonium, which is reprocessed from nuclear fuel rods, is combined with LEU to form a mixed-oxide (MOX) fuel. It is estimated that about 225 metric tons of plutonium are stored in civilian stockpiles in France, Britain, Russia, Japan, India, Belgium, Germany, Switzerland, and the United States.¹⁹ And all of these countries, with the exception of Belgium, Germany, and the United States, continue to produce more plutonium for their reactors. Generally, this civilian plutonium is reactor-grade, meaning it could be difficult, though not impossible²⁰, for a state, let alone a terrorist group, to produce a weapon (because of the excessive heat, radiation, and neutrons).

There is a strong movement in several countries toward using weapons-grade plutonium to produce MOX fuel, thus providing more reactor fuel and simultaneously “disposing” of weapons-grade nuclear materials. Plutonium blended with uranium to create MOX fuel would have to be separated again, which could present a difficult technical challenge for a terrorist group, depending of course on their resources and expertise. Of course, not all of the plutonium will be destroyed in the reactor and additional plutonium would be created from the uranium. But the plutonium would be

¹⁹ Frank von Hippel, International Panel on Fissile Materials, *Managing Spent Fuel in the United States: The Illogic of Reprocessing 10* (2007), available at http://www.fissilematerials.org/ipfm/site_down/ipfmresearchreport03.pdf.

²⁰ See Mark et al., *supra* note 13.

trapped in the radioactive fuel rods (and relatively safe from terrorists), as long as they are not reprocessed. If the rods were reprocessed, the plutonium would then be in the form of (somewhat less useful) reactor-grade material rather than weapons grade.

Conclusion regarding nuclear weapons

To prevent nuclear terrorism, terrorists must be prevented from obtaining nuclear weapons or the materials necessary to construct such weapons – especially the requisite HEU or plutonium. Thus, efforts should focus on accounting for, physically securing, or eliminating military and civilian HEU and separated plutonium in the 40 or so countries that possess these materials. Developing and sharing best practices that move beyond the IAEA security standards should be the highest priority; means of doing this are discussed in the sections on implementation indicators and cooperation with international nonproliferation organizations.

The usual approaches to prevent proliferation to a state, such as export controls on necessary tools, machines, and materials, are probably of limited utility in the case of terrorists. If a group has obtained enough fissile material, the equipment needed to produce a weapon is generally non-specialized and commercially available in most industrialized states. On the other hand, carefully monitoring the purchase of sensitive dual-use components, like high explosives, neutron sources, and timing devices, could be a useful adjunct to police and intelligence work in identifying potential terrorist threats.

Section 2.2.2: Radiological Dispersal Devices (RDDs)

If terrorists could obtain quantities of radioactive isotopes (such as Cesium-137, Strontium-90, or Cobalt-60), they could use conventional high explosives to disperse those materials over a wide area. While such a radiological dispersal device (RDD) would not produce many immediate deaths from the radiation – and thus may not technically be a weapon of mass destruction – it would likely create widespread panic among the public and possibly enormous economic costs stemming from radiological clean up, suspension of economic activities, evacuation of homes and businesses, and potential depression or loss of property values. (These weapons are accordingly sometimes referred to as “weapons of mass disruption.”) There are many civilian sources of radiological materials, including medical and industrial facilities. At this point, the majority of these sources are not well-registered or -protected, and so radioactive materials could be stolen fairly easily. A related problem is that of the “orphan sources” of radioactive materials used for various industrial or agricultural purposes and then abandoned with almost no records kept. If such sources could be identified and retrieved by terrorist groups they could be used for RDD production.

To help address this problem, the IAEA has adopted a “Code of Conduct on the Safety and Security of Radioactive Sources.”²¹ This is a voluntary code, but many

²¹ International Atomic Energy Agency (IAEA), Code of Conduct on the Safety and Security of Radioactive Sources (2004), available at http://www-pub.iaea.org/MTCD/publications/PDF/Code-2004_web.pdf.

countries have elected to comply with the standards in the code. In addition, in 2005, the IAEA published practical guidance for how to comply with the code, particularly in the area of exports and imports.²² The IAEA has also initiated an “orphan sources” program aimed at supporting states in registering and controlling such sources.²³

Section 2.2.3: Biological Weapons (BW)

The classical biological weapons (BW) threat agents are those microorganisms (bacteria or viruses) that cause diseases like anthrax, brucellosis, cholera, glanders, plague, tularemia, Q fever, smallpox, Venezuelan equine encephalitis, viral hemorrhagic fevers (e.g., Marburg and ebola), and botulism.²⁴ Most bioterrorism threat agents (except smallpox) can be isolated from natural sources such as diseased animals, patients, or even contaminated soil in the case of anthrax spores. However, isolating particularly virulent strains of some of these agents can be complicated. An alternative source for threat agents might be theft from the many research facilities or culture collections that exist in the world.

Once the seed material is obtained, the equipment and materials necessary to safely grow the microorganisms are widely available from commercial suppliers and are usually “dual use” in that they can be used for purposes other than developing BW agents. Once a sufficient supply of material is grown, it is necessary to weaponize the material, putting it in a form that can be stored and then dispersed as an aerosol cloud of microscopic particles, ranging in size from one to five microns (a size that will stick in a person’s lungs). Finally, the terrorists would need some method of dispersing the material over a wide area. This is not a simple task for a number of reasons, not least of which is the fragility of most biological agents.

Of course, the terrorists will need skilled people to carry out all of these tasks (such as biochemists, microbiologists, engineers, aerosol and containment specialists, lab technicians, etc.). These people need not have specific backgrounds in a bio-weapons program, since most of the information necessary to make a weapon is available in the open literature (including internet sources).

The problem of preventing the acquisition of BW is compounded by the fact that biotechnology is information intensive, not capital intensive. Thus, a relatively small

²² IAEA, *Guidance on the Import and Export of Radioactive Sources* (2005), available at http://www-pub.iaea.org/MTCD/publications/PDF/Imp-Exp_web.pdf.

²³ See IAEA News Center, *Safe Homes for “Orphan” Sources: IAEA Helps Track & Control Abandoned Radioactive Sources*, 20 February 2004, <http://www.iaea.org/NewsCenter/Features/RadSources/orphaned20040219.html>.

²⁴ For a short summary of the problem, see National Academy of Sciences and Department of Homeland Security, *Biological Attack: Human Pathogens, Biotoxins, and Agricultural Threats*, available at [http://www.nae.edu/NAE/pubundcom.nsf/weblinks/CGOZ-6C2MCR/\\$file/Biological%20Attack%2006.pdf](http://www.nae.edu/NAE/pubundcom.nsf/weblinks/CGOZ-6C2MCR/$file/Biological%20Attack%2006.pdf).

group of technically competent people with perhaps modest resources could, in principle, create deadly biological weapons. Whether they could overcome all the practical problems in producing such weapons is less clear, but prudence requires vigilance against this possibility.

Because controlling biological materials and the relevant weapons-building equipment is so difficult, the primary thrust of a program to combat bioterrorism should be on intelligence and developing a harmonized international regime of best biosecurity practices. These practices should include strengthening security at sensitive facilities; better registry of pathogen production, storage, and shipments; placing controls on who has access to dangerous pathogens; and developing stronger export controls on biological materials.

Section 2.2.4: Chemical Weapons (CW)

There are a wide variety of chemical agents that can also be used as weapons. Chemical warfare agents can be manufactured quite simply – using well established methods that have been published in the open scientific literature. Most chemical weapons (CW) agents are made from intermediate chemicals known as precursors, some of which are dual-use.

“World War I-era CW agents, such as chlorine, phosgene, hydrogen cyanide, and sulfur mustard, are relatively easy to manufacture. At least nine methods for the synthesis of sulfur mustard have been published. In contrast, the production of nerve agents such as sarin and VX involves the use of high temperatures and corrosive and dangerous chemicals, requiring expertise in synthetic organic chemistry.”²⁵

Nevertheless, even nerve agents can be manufactured by small, well-financed groups, as demonstrated by the Aum Shinrikyo terrorist cult in their 1995 sarin gas attack on the Tokyo subway system.

If a terrorist group is able to manufacture a chemical agent, the group must also weaponize it and find a means to effectively deliver the agent. To inflict mass casualties, terrorists would probably need to spread the agents in the form of a concentrated aerosol or spray. There are strong technical challenges to both the weaponization and delivery of chemical weapons that would be difficult for a terrorist group lacking expertise to overcome.

As in the case of biological weapons, the equipment necessary to manufacture a small batch of chemical weapons may be widely available, although if purchased by individuals rather than front companies suspicions could be raised. And in most countries, the domestic sale and purchase of precursor chemicals is not controlled at all.

²⁵ NTI, *CW Terrorism Tutorial: Production and Use of Chemical Weapons*, http://www.nti.org/h_learnmore/cwtutorial/chapter04_02.html.

Because the chemical market is so large, it may be impractical to implement effective controls.

Besides improving intelligence, it would probably be most useful to develop best practices for critical chemical industry enterprises. These could involve matters such as risk assessments, site security, supply chain security, transport security, and computer and information security. Such practices could also raise industry awareness about the need to “know your customer” and about behaviors – such as the purchase of large quantities of key CW precursor chemicals – that should arouse suspicion and lead the firms from which such materials are sought to notify law enforcement officials.

Section 3: Implementation Indicators

The matrix and questionnaire developed by the 1540 Committee to solicit data from states, discussed in Section 2.1, was reasonably effective at eliciting detailed information about state-level legislation that had been passed (or was planned) and other legal or regulatory measures in place that met the requirements of the UNSCR 1540. But the matrix and questionnaire focused essentially on the existence of institutional *legal structures* and *legal authorities*. It did not solicit information on how actively and assiduously each country was *implementing* its domestic controls system so as to prevent the spread of WMDs to non-state actors. Thus, while a country may have what it claims to be effective institutions, legislation, and programs to deal with the threat of proliferation to terrorists, even the additional questionnaire provides little basis for evaluating how legislation and programs operate in practice.

For the 1540 Committee or U.N. member states to evaluate actual practices and implementation of UNSCR 1540, both the Committee and states need more, and more detailed, information than has been submitted to date. We recommend that the Committee compile a more detailed list of questions that would solicit information about how vigorously each country is *implementing* its 1540 obligations in practice, as well as on paper. Accordingly, we have developed a set of **implementation indicators** to provide an objective basis for assessing each state’s record of performance in working to prevent non-state actors from acquiring WMDs. The implementation indicator questions set out below offer a means of eliciting information that would assist the 1540 Committee and other states in fulfilling the objectives of Resolution 1540.

While some states may be reluctant to provide answers to some of the implementation indicator questions, we believe these indicators (or a similar list) would provide not only critical information to the 1540 Committee, but would also assist states in identifying additional steps they might take pursuant to their domestic legal authorities to address the WMD terrorism threat. Information on how states actually implement the UNSCR 1540 could be obtained in one of four ways, or a combination thereof: first, by allowing states to continue self-reporting to the Committee; second, through voluntary interstate cooperation and sharing of information and control technologies; third, by looking for “best practice” examples among member states; and fourth, by gleaning

information from other U.N. organizations to which states report on specific control programs that are relevant to the implementation of Resolution 1540.

For present purposes, the implementation indicators that follow are structured in the form of questions the 1540 Committee might ask states. The indicators are organized in the following categories: (1) general indicators; (2) accounting and physical protection indicators; (3) export control indicators; and (4) outreach program indicators. The Appendix to this Report summarizes information included in the UNSCR 1540 reports submitted by a select group of 37 states that responds to the **implementation indicator** questions discussed this section.

Section 3.1: General Indicators

Although many states may have had robust nonproliferation laws and measures in place prior to the adoption of UNSCR 1540, the Security Council's decision to enact the resolution reflects a judgment that additional efforts must be made to confront the threat of WMD proliferation. A number of general indicators examine whether states are strengthening their legal or institutional structures or taking **additional or incremental measures** to meet the obligations of UNSCR 1540:

- 1.1.1. Have any new laws or directives been enacted since UNSCR 1540 was adopted on 28 April 2004, or do countries rely only on laws/institutions that predate UNSCR 1540?
- 1.1.2. Do states expressly indicate whether they believe that they are already fulfilling the requirements of UNSCR 1540 without the adoption of new measures?
- 1.1.3. Do states describe any modifications they intend to take to strengthen/complete their legal or institutional structures, specifically with regard to WMD terrorism threats?

Other general indicators are aimed at gathering information about the **overall systemic approach** taken by states to implementing nonproliferation policies:

- 1.2.1. What resources are given to agencies (e.g., structure, size, manpower, budgets, and percentage of national budgets) devoted to preventing proliferation of WMD, including export and border control functions and law enforcement resources devoted to investigating/prosecuting activities prohibited by UNSCR 1540?
- 1.2.2. Has the state indicated that it has taken (or plans to take) measures specifically aimed at the threat of terrorist groups or *non-state actors* seeking to acquire WMD (in contrast to measures aimed at preventing other *states* from developing a WMD program)?
- 1.2.3. Is there a conscious, well-designed process of risk assessment to help allocate resources in countering terrorist threats?

Additional general indicators seek information about efforts to build an effective, **integrated intelligence and law enforcement capability** focused on WMD terrorism threats:

- 1.3.1. Does the state maintain a record of measures taken to enforce WMD nonproliferation-related legal provisions, including reports of investigations and prosecutions?
- 1.3.2. Has the state developed specialized intelligence capabilities to detect non-state actors operating in its territory that seek to develop/acquire WMD-related items (either for export or for construction of weapons on the state's territory)?
- 1.3.3. Interaction between intelligence and law enforcement:
 - 1.3.3.1. Can intelligence services share information with law enforcement agencies? Is there capacity to share such information at the field level?
 - 1.3.3.2. Can law enforcement agencies act upon information received from intelligence services?
 - 1.3.3.3. Have intelligence-law enforcement information-sharing procedures ever been employed with respect to WMD-related terrorism cases?
- 1.3.4. Does the state have the capacity to conduct legally-authorized electronic intercepts or wiretaps? Has it ever been used in connection with WMD-related terrorism cases?
- 1.3.5. Does the state have law enforcement and intelligence relationships with other states that enable it to warn other states or receive warnings from other states regarding WMD-terrorism risks? Have there been intelligence exchanges in practice? Have there been any such exchanges specifically regarding WMD-related terrorism cases?

Section 3.2: Indicators Regarding Effective Accounting and Physical Protection Measures for WMD-related Materials

General:

- 2.1.1. Does the state conduct audits and inspections of civilian nuclear, chemical, or biological facilities, or does it rely on self-reporting by entities that control designated items?

Accounting:

- 2.2.1. Has an inventory of all civilian HEU and plutonium located in the state been completed and reported?
- 2.2.2. Are the same (nuclear-, biological-, or chemical-related) items that are subject to export control laws also subject to a domestic/internal accountability regime? If not, what items, if any, are subject to accountability requirements?

- 2.2.3. What are the state's practices regarding the storage/disposal of radiological sources? Does the state adhere to the "IAEA Code of Conduct on the Safety and Security of Radioactive Sources"?

Physical protection and security measures:

- 2.3.1. Nuclear: Is there a physical protection system for all facilities containing HEU or plutonium? Are risk assessments at each critical facility made on an ongoing basis? Have "best practices" been adopted in securing all dangerous nuclear materials?
- 2.3.2. Biological: Is there a legally binding registry of, and control over access to, all dangerous pathogens? Has the government adopted and published "best practices" bio-security measures to be followed by industry?²⁶
- 2.3.3. Chemical: Are domestic and international sales of "precursor" chemicals (used to manufacture chemical weapons) to individuals and firms controlled? Have best practices for critical chemical industry enterprises (involving such matters as risk assessments, site security, supply chain security, transport security, and computer and information security) been adopted?
- 2.3.4. Are the same items that are subject to export control laws also subject to a physical protection regime? If not, how are items of concern designated for physical protection and control?
- 2.3.5. Are there cases of regulators demanding that facilities take remedial measures to enhance security arrangements, or denials/revocations of licenses for facilities with inadequate security arrangements?
- 2.3.6. Does the state test physical protection measures at critical nuclear, biological, and chemical facilities through unannounced exercises or other "red team" activities?

Section 3.3: Indicators Regarding Export and Transshipment Controls to Prevent the Export of WMD-related Equipment, Goods, Technologies, and Means of Delivery to Terrorist Groups

- 3.1. Has the country adopted an export control "best practices" regime²⁷ covering:

²⁶ As an example of biological "best practices," the Australian government has adopted a set of biosecurity best practices – in addition to applicable legal requirements – as a guideline for industry behavior. The Australian "checklist" indicates that firms should undertake risk assessment studies for facilities housing biological agents, remain vigilant about suspicious or unusual export orders, local purchase orders, or approaches by others seeking education and training services in areas considered to be a security concern. The checklist also provides contact information for the government authorities to whose attention any suspicious incidents should be brought. See Checklist of Biosecurity Measures, Australian Department of Foreign Affairs and Trade, available at http://www.dfat.gov.au/security/downloads/checklist_biosec_measures.pdf.

²⁷ Various states have adopted detailed export control best practices that can be used as models; the website www.exportcontrol.org is a good source for these best practices.

- 3.1.1. Licensing procedures and practices?
- 3.1.2. Enforcement, investigation, and prosecution?
- 3.1.3. Industry outreach?

The following are examples of some questions that might indicate whether a state is implementing an effective best practices regime:

- 3.2.1. What criteria do licensing authorities use to determine whether to approve or deny licenses? Are these criteria established by regulation? By policy? By practice? On an ad hoc/discretionary basis?
- 3.2.2. Has the state denied export licenses for controlled items? Have they been denied for substantive reasons related to proliferation concerns, or only for formal/technical reasons? What is the ratio of license denials to approvals?
- 3.2.3. Does the state keep record of “informal denials” of export licensing requests, i.e., indications provided to potential exporters before an export license request is formally submitted that such a request is likely to be denied? Does the state report such events to other states?
- 3.2.4. What is the state’s record of enforcement of its export control provisions? What is the record of investigations and prosecutions of export control violations?
- 3.2.5. Do licensing regulations set different licensing standards to different end-use countries/projects? Are any countries, entities, persons, or end-uses identified as being of particular proliferation concern warranting higher scrutiny?
- 3.2.6. Are exports/transfers by national agencies or country-owned or country-controlled entities subject to review by export control authorities?
- 3.2.7. Does the state apply its export control licensing regulations, including any catch-all clause, to re-exports by foreign enterprises?
- 3.2.8. Does the state computerize and automate the export licensing process and make it user friendly on both the regulatory and export applicant side? Does the state publish all regulations and control lists and application forms on-line? Does the state automate information transfer from application forms to centralized export control-related databases?
- 3.2.9. Does the state require exporters to designate specific corporate officials to be held personally and legally responsible for any improper proliferation-related exports by their corporations? If so, how many corporations engaged in exporting commodities or technologies have designated such officials?
- 3.2.10. Does the state have the operational capability for post-delivery inspection and verification of authorized exports? Does the state rely on inspections and verification activities by the exporters themselves? Or on investigations by the Foreign Ministry’s embassies and/or by the intelligence services? Or on direct verification queries to the government of the importing state? How many such inspection and verification activities were conducted over the last two years?

- 3.2.11. In the context of multilateral export control regimes or otherwise, does the state exchange information with other states regarding exports (including license denials and approvals/transfers of dual use items) or regarding countries/end-uses of concern? If so, how many such exchanges have taken place over the last two years?
- 3.2.12. When a state receives export licensing information from other states, does it apply “no undercut” provisions by refusing to license any export for which another state has denied an export license due to proliferation concerns? Does it do so as a matter of policy, or as a formal regulatory matter?
- 3.2.13. Has the state held consultations with any other state that has undercut its denial of export license application by approving the export of substantially the same items/technology to the same end user?

Section 3.4: Indicators Regarding Border Controls to Prevent the Export of WMD-related Equipment, Goods, Technologies, and Means of Delivery to Terrorist Groups

- 4.1. Legal authorities:
 - 4.1.1. Does the state have the domestic legal authority to inspect both the import and export of goods?
 - 4.1.2. Does the state have domestic legal authority to inspect foreign flag ships/aircrafts in its ports/territorial waters/airspace?
 - 4.1.3. Are customs agents/border guards legally empowered to impound/seize goods on their own authority, or are judicial seizure orders required? Can customs agents and/or border guards seize export items?
 - 4.1.4. For states with significant transshipments, do they have the legal capacity to inspect goods in transit? How frequently and thoroughly are such shipments inspected?
- 4.2. Does the state have a record of enforcement of provisions to counter illicit trafficking in WMD-related items, i.e., investigations, prosecutions, interdictions, etc.
- 4.3. How frequently and thoroughly are shipments (incoming or outgoing) inspected?
- 4.4. Have suspicious shipments been impounded or seized? Have they ever been impounded/seized for WMD-related concerns?
- 4.5. Does the state publicize cases of enforcement actions against and penalties imposed on organizations or individuals in order to deter such attempts?
 - 4.5.1. How many such enforcement and penalty cases against export control violators have been publicized?
- 4.6. Does the state facilitate communications about exports or imports of concern between regulatory organizations (export control authority), enforcement agencies (police, customs agents, and border guards), and intelligence services?

- 4.7. Is information about controlled items readily available to border control officers in the field?
- 4.8. Does the state define communication protocols and provide equipment for rapid communications (phone, fax, computer) between border control crossing points and the technical experts advising the central export control organization regarding equipment specifications, design data, and potential for modification of dual-use items, in order to enable local inspectors to determine the purpose of suspect, technically complex items to be imported or exported?
- 4.9. Does the state train border control inspectors to identify and interdict trade in illicit WMD-related items, identify the use of front companies and/or use of forged end-use certificates? Has this training been extended to components level of dual-use items?
- 4.10. Does the state possess technology to enable it to detect contraband WMD-related goods, e.g., radiation detectors and non-intrusive technology that allow container shipments to be inspected?
- 4.11. Has the state received training from foreign countries or outside organizations for its customs service/border guards? How many training exercises been conducted over the last two years?
- 4.12. Does the state test its customs and border services through unannounced exercises or other “red team” activities?
- 4.13. Does the state participate in arrangements like the Container Security Initiative?
- 4.14. Does the state participate in any cooperative agreements/arrangements to allow interdiction and inspection of foreign flag vessels?

Section 3.5: Indicators Regarding Outreach Programs

- 5.1. Has the state developed and communicated a description of its strategy for cooperating with the private sector (e.g., exporters, private research facilities, private operators of civilian nuclear, chemical, and biological facilities) in the development of effective and affordable implementing regulations regarding accountability, security, and export/import procedures?
- 5.2. Does the state develop a regularized schedule of information-sharing exchanges with industry regarding suspect end-users or destinations, or does it use a case-by-case approach?
- 5.3. Does the state fund industry outreach programs aimed at small and medium-sized corporations operating on regional or provincial levels with limited compliance resources? What is the ratio of medium-sized corporations compared to large national companies included in the industry outreach programs?
- 5.4. Is there special attention given to multinational companies (since they may be able to affect, positively or negatively, the transport of goods, services, and funds worldwide)?

Section 4: Adaptation Indicators

To date, the 1540 Committee has essentially set identical information reporting requirements for all states. It has, for instance, sought the information requested in the Committee's matrix from all U.N. member states. For some states, reporting has been burdensome, and as we have noted, a substantial number of states have not submitted the reports required by UNSCR 1540 at all.

In Section 3, we have identified a series of "implementation indicators" about which the 1540 Committee could seek additional information. However, we do not necessarily believe that the 1540 Committee should seek all of the information that could be requested through the implementation indicator questions for all states. First, as a general matter, we are aware of the risk of "reporting fatigue." If states come to view the 1540 Committee as a source of perpetual and burdensome information reporting requirements, they may begin to respond on a perfunctory basis, at best. At worst, they may cease to provide information at all.

Second, states differ in many ways in terms of the WMD proliferation risks they present, and not all control measures are equally justified or appropriate in different cases. It thus may not be important for the 1540 Committee to seek information about all implementation indicators for every state. Accordingly, we recommend that additional information gathering should be tailored to the particular proliferation threats posed by particular countries. We have identified three possible categories of **adaptation indicators** the 1540 Committee can consider in pursuing differentiated information-gathering strategies that are tailored to the needs and situations of individual states:

1. The physical opportunities that exist within the state for non-state actors to acquire or develop WMD. These opportunities include the state's nuclear infrastructure as well as the chemical and biological infrastructures, which are usually much more widespread. On the nuclear side, material storage sites, weapons sites, relevant research establishments, and licensed industrial or medical facilities provide such opportunities. These opportunities are most often found in developed countries, where much of the apparatus for control also exists. On the other hand, countries where such infrastructures do not exist or are sparse should be spared the burden of detailed reporting about control or implementation measures, particularly if the countries in question possess little or no radioactive or chemical/biological precursor materials.
2. The exposure of individual states to the international movement of goods and people. This includes most states in today's world, but the conditions and possible control measures at the world's various borders vary greatly. Some borders of interest are sparsely inhabited and numbers of crossings are small, but local inhabitants generally are aware of most crossings, especially if they are repeated. Other border crossings must handle millions of crossings a year. Measures to control the flow of nuclear materials, for example, must be tailored to the situation. Those measures include, for instance, container certification and

- continued container monitoring, essentially international endeavors; security measures such as radiographic imaging and radiation detection at major ports of embarkation and debarkation; and continuous information monitoring and data fusion. They also include measures envisaged in the Proliferation Security Initiative to interdict and inspect ships at sea and eventually other means of transport. Those control measures are also unevenly needed across different states.
3. The existence of terrorist actors or activities within the state, and the capabilities and purposes of the terrorist organizations that do exist. Because of the variable and often contested views about whether or not a particular group is a “terrorist” organization, we propose beginning at least initially by prioritizing risks in this regard based on the presence in a country of individuals or organizations listed by the Al-Qaida and Taliban Sanctions Committee initially established by U.N. Security Council Resolution 1267. Attention should be paid to what is known regarding the number of individuals suspected of participation in terrorist activities, as well as the number of organizations suspected of supporting or abetting terrorist activities within the state.

These adaptation criteria highlight the WMD proliferation risks that may exist in a particular country. It may be, however, that a state with high degree of WMD proliferation risk – e.g., a state with highly developed nuclear, biological, and chemical industries where individuals and goods move liberally – might also have developed extensive control measures to safeguard the control and trade in WMD-related materials. This is arguably the situation that pertains with respect to the United States and many European Union states. The information provided to the 1540 Committee to date should provide a basis for determining how robust a state’s non- and counter-proliferation practices are. In prioritizing supplemental information-gathering requests, the 1540 Committee should balance the proliferation risks against the evidence of existing robust non- and counter-proliferation measures. The Committee should seek supplemental information about implementation first where states present high proliferation risks and do not appear to have advanced non- and counter-proliferation measures regimes in place.

Finally, in deciding what supplemental information requests to make, the 1540 Committee should take into account, in addition to the adaptation criteria set forth above, any other information available to the Committee about states’ implementation of their nonproliferation obligations. (We make recommendations regarding supplemental information exchange in Section 6.)

While most Security Council resolutions such as UNSCR 1540 do not differentiate among states, in order to maximize the effectiveness of the resources available, it is important for the 1540 Committee to seek to gather supplemental information on a differentiated and tailored basis.

Section 5: International Cooperation and Assistance

Because of the limited mandate and size of the 1540 Committee, it can play only a modest role in enhancing implementation of nonproliferation measures in U.N. member states. Achieving the goals of UNSCR 1540 thus requires engagement with other members of the international community through enhanced state-to-state cooperation and through cooperation with regional organizations, international agencies, private corporations, and non-governmental organizations (NGOs). It is in the interest of the 1540 Committee to cooperate with other international organizations and agencies for several reasons: they already perform functions relevant to the role of the 1540 Committee; they possess useful information related to the implementation of the resolution; and they could provide assistance to member states in their efforts to meet the requirements of the resolution. Indeed, UNSCR 1540 itself stresses the importance of such outreach programs.

The 1540 Committee also addressed the need for outreach programs and the reliance on international organizations in the report issued at the conclusion of its initial two-year term in April 2006. The Committee emphasized voluntary activities by states within a region, as well as external assistance provided by other states, international organizations, or the Committee itself. The Committee encouraged groups of states facing similar implementation or reporting challenges to work together to overcome such difficulties. It further encouraged states within a region or with similar national priorities to share lessons learned among one another. The Committee encouraged states to make use of offers of assistance by international organizations to enhance their domestic capabilities. The Committee further recommended substantial widening of its own regional outreach activities in response to requests from groups of states for support in implementing their obligations under the UNSCR 1540.

The 1540 Committee recommended improving cooperation with existing international treaty organizations, and using meetings organized by such organizations to address state obligations under UNSCR 1540. The Committee also called on representatives of international organizations to participate in various meetings, workshops or seminars related to the implementation of UNSCR 1540.

Despite the attention given to cooperation with international organizations, the specific recommendations made by the 1540 Committee regarding enhanced cooperation were quite modest. The remainder of this section examines ways of expanding the scope of outreach programs and better coordinating the programs carried out by various agencies with the work of the 1540 Committee. Such coordination can avoid duplication of effort and allow the 1540 Committee to enhance the effectiveness of its outreach programs by relying on activities already carried out by other international treaty organizations that are aimed at similar general results. This section also highlights the potential role of private sector organizations in furthering the goals of UNSCR 1540 by working directly with the 1540 Committee or with other regional or international treaty organizations.

Section 5.1: State-to-State Cooperation

State-to-state cooperation is the most simple and direct means of providing support in implementing UNSCR 1540. The main advantage of this process is that it involves the least amount of bureaucratic red tape, administrative costs, and communication channels. Assistance can be provided confidentially and on the basis of established bilateral relationships. Personnel training and legislative support can be most intensive and useful, and follow-on support could also be available to ensure correct implementation and application of the aid supplied. Examples of such state-to-state cooperation abound in the country reports submitted by states to the 1540 Committee and published on the Committee's web page. States that have reported on the provision of assistance include the United States, the United Kingdom, France, Germany, and the European Union (EU). States reporting having requested support include members of regional groups such as the Organization of Caribbean States, as well as various individual countries.

The disadvantage of state-to-state cooperation is that assistance is provided sporadically, without common standards. In some cases, states are unwilling to provide assistance to states with the greatest needs because of underlying political relationships. There is in general a lack of uniformity in the amount and level of assistance provided through state-to-state channels.

The 1540 Committee has assumed a function of serving as a clearinghouse for coordinating requests and offers of technical assistance.²⁸ It should expand this function. The Committee should develop lists of states seeking support and states willing to provide assistance. These lists should be made available to all states, which then may pursue the provision of assistance as they see fit. The Committee should also utilize its expertise to broker contacts between the most compatible recipient state and prospective donor country. The Committee might also form its own judgment as to the value and usefulness of various donor programs and the actual needs of states requesting support, and use its own internal evaluations to guide it in matching donor and recipient countries. The Committee could also gather feedback from recipient states as to the usefulness of various aid packages offered to the donor states, so they might better tailor their aid offers to maximize effectiveness. Similar information could be passed by the Committee in the reverse direction, i.e., conveying to recipient states impressions on how they might best implement the aid received.

Section 5.2: The 1540 Committee

The 1540 Committee now serves as a clearinghouse for legislative provisions. It can go beyond merely posting various national legislative regimes on its website and can begin to provide technical assistance to states about how to strengthen their domestic legislative provisions. We recommend that the Committee, which has expertise in this area, begin giving tailored and specific guidance to states about legislative improvements

²⁸ See 1540 Committee Work Program, *supra* note 11, at 4-5.

that make sense in light of the particular circumstances of the country in question. The Committee might use the adaptation indicators proposed in Section 4 or similar criteria in determining which states to approach first in this regard.

The 1540 Committee could also fulfill a useful role by requesting information regarding various implementation measures such as the ones noted in Section 3, or such others as the Committee may decide. The Committee could also facilitate information exchange among states regarding implementation measures. The adaptation indicators could be used to help develop a prioritized list of states from which supplemental information might be requested.

Section 5.3: Regional Organizations

There are a number of regional organizations that can enhance implementation of UNSCR 1540 by coordinating implementation of specific programs within the relevant region. Such organizations can support member states in preparing the detailed reporting requirements of the 1540 Committee and its sister institutions – the Al-Qaida and Taliban Sanctions Committee (initially established pursuant to U.N. Security Council Resolution 1267) and the Counter Terrorism Committee (CTC) (established pursuant to U.N. Security Council Resolution 1363).²⁹ Such organizations might also develop programs to provide technical legal support, export control personnel training, and performance reviews and evaluations. They might also establish systems for voluntary data exchanges (bilateral or multilateral) on export application denials and suspected end-use certificates. The regional organizations could also serve as fora for information sharing with the 1540 Committee, and for joint regional activities such as best practices comparisons or joint training exercises.

We consider the roles of two types of regional organizations: first, existing organizations that might be prevailed upon to execute additional functions related to the mission of the 1540 Committee; and second, special-purpose technical organizations operating within one region or topic relevant to UNSCR 1540 that might expand their activities to other world regions where such activities are at embryonic stages.

Section 5.3.1: Existing Regional Organizations

There are a large number of regional organizations that might assume some UNSCR 1540-related tasks as additional functions. Examples of such regional organizations include Asia-Pacific Economic Cooperation (APEC), the Association of Southeast Asian Nations (ASEAN), the ASEAN Regional Forum (ARF), and the Shanghai Cooperation Organization (SCO) in Asia; the African Union (AU) in Africa; the Organization of American States (OAS) in the Western Hemisphere; the European

²⁹ A related question concerns the duplication of reporting requirements set by the 1540 Committee and the Al-Qaida and Taliban Sanctions Committee and the Counter Terrorism Committee. The 1540 Committee may wish to coordinate its information requests with these other two committees to avoid subjecting states to redundant reporting requirements. In the long run, a single integrated report covering the areas of responsibility of all three Committees might be jointly developed.

Union (EU) and its associated organizations in Europe; and the GUAM Organization for Democracy and Economic Development and the Arab League in the greater Middle East and Southeastern Europe region. Under the right conditions, these organizations might be willing to undertake additional tasks like supporting states in establishing improved export control systems, training export control inspectors and border guards, enhancing electronic data management systems related to export and border controls, developing legislation related to the prevention of WMD terrorism, and fulfilling reporting requirements for the 1540 Committee. While such capabilities might not currently reside within some of the above-mentioned organizations, the requisite capabilities could be developed if the countries within the region support and fund such new missions, in coordination with the 1540 Committee.

Relying on existing regional organizations, rather than attempting to form new organizations, has several advantages. It is usually more cost effective and easier in political and administrative terms to expand the functions of existing organizations than to create a new special-purpose organization. In addition, members of regional organizations have greater cultural, linguistic, and sometimes political affinities towards each other, and their representatives are usually familiar with each other and have established working relationships. It should thus be feasible to create in such a regional organization an additional department or function to provide UNSCR 1540-related services or assistance that member states are interested in obtaining.

Adding UNSCR 1540-related functions to the scope of activities of regional organizations will raise administrative issues. There will be issues regarding whether participation in such functions should be voluntary or mandatory for members of the organizations. Questions about funding and the relationship of regional organizations to the 1540 Committee and the Security Council may also arise. We do not believe there is a single template that can address all of these issues. The important point is to establish some regional function within an existing organization and let it grow and expand in time, without necessarily seeking to establish the perfect UNSCR 1540-related organizational activity from the start.

Section 5.3.2: Special-Purpose Technical Organizations

There are various regional special-purpose technical organizations whose functions overlap with some of the activities called for in UNSCR 1540. Examples of such organizations include, in Europe, EURATOM (the regional supply agency which fulfills safeguards functions for the IAEA) and WENRA (the European nuclear regulators organization). In South America, the ABACC group performs mutual nuclear safeguards functions in Brazil and in Argentina.

Such organizations might cooperate with the 1540 Committee to facilitate implementation of UNSCR 1540 in the relevant region. For example, nuclear export control, personnel training, and database management could be overseen by EURATOM or WENRA in Europe. At later stages, such organizations might provide 1540-related services to other regions in cooperation with the 1540 Committee and could even

eventually create new branch organizations in other geographic regions. Such new departments might, in time, expand on their own and become independent new organizations fulfilling functions, among others, related to UNSCR 1540.

Section 5.3.3: Conclusions Regarding Regional Organizations

Regional organizations must evolve over time to assume UNSCR 1540-related functions based on their existing structures. These additional activities may initially be limited in participation to few states and narrow in scope. Once established, however, regional organizations' UNSCR 1540-related activities can be expected to expand laterally and in depth. One way of encouraging such expansion is to create a **UNSCR 1540 Coordination Committee**, under the leadership of the 1540 Committee. In such a coordination group, regional organizations can exchange ideas about new approaches and possibly offer one another technical assistance for training and learning purposes. The existence of such a coordinating group would also provide a more effective means for the 1540 Committee to prioritize its own outreach activities than the current *ad hoc* approaches.

Section 5.4: International Agencies

Various international agencies already fulfill some functions related to the WMD nonproliferation objectives of UNSCR 1540 under their current mandates. Some of these are organizations with relatively large membership created by international treaty; others are voluntary nonproliferation export control regimes with more limited membership. The 1540 Committee should establish formal working relationships with such other international organizations or regimes, which could be done by having them participate in the UNSCR 1540 Coordination Committee referred to in Section 5.3.3. The 1540 Committee could coordinate with those agencies to seek their assistance in carrying out functions in furtherance of UNSCR 1540.

The advantage of this approach is that it relies on existing international agencies with experience and technical capacity to perform important WMD nonproliferation functions. Although these organizations only carry out these functions for their member states, it would thus be relatively easy – at least in legal terms – to extend their ability to provide such functions to any U.N. member state. Nevertheless, some international organizations involved in nonproliferation matters might not wish to coordinate with the 1540 Committee, and would rather deal directly with the U.N. Security Council itself. More importantly, no agency would undertake additional missions without additional funding, and perhaps additional personnel to carry out the additional tasks. This might require coordination between the 1540 Committee, the other international agencies involved, and the Security Council. This in turn is likely to require the development of memoranda of understanding (MOUs) between the 1540 Committee and other international organizations establishing and detailing modes and procedures for cooperation.

In Section 7, we recommend that the Security Council establish a voluntary fund to which states can contribute to promote implementation of UNSCR 1540. Among the purposes for such funds could be used would be to finance enhanced 1540-related activities conducted by existing international organizations.

Section 5.4.1: International Treaty Organizations

International treaty organizations with extensive membership include the International Atomic Energy Agency (IAEA), the Organization for the Prohibition of Chemical Weapons (OPCW), the International Maritime Organization (IMO), and the International Criminal Police Organization (INTERPOL).

The IAEA has developed an Illicit Trafficking Database (ITDB) to improve member states' understanding of nuclear-related smuggling risks and trends.³⁰ The ITDB is a collection of information from participating states regarding incidents of illicit trafficking and unauthorized activities involving nuclear and other radioactive material. Based on information released by the IAEA's Office of Nuclear Security in September 2007, the ITDB has confirmed 275 incidents involving unauthorized possession of nuclear materials and related criminal activities that occurred between January 1993 and December 2006.³¹ Fourteen such incidents occurred in 2006.³² Most of these incidents (55%) have involved nuclear materials; 45% involved radioactive sources.³³ Additionally, 332 incidents involving the theft or loss of nuclear or other radioactive materials (85 events occurred in 2006), and 398 incidents involving other unauthorized activities, such as the unauthorized disposal of radioactive materials or the discovery of "orphan sources" (51 instances occurred in 2006), have been reported in the ITDB over the same period.³⁴ The ITDB also includes analyses of trafficking events aimed at identifying common trends and patterns and reports such assessments to participating states. Such a database and analyses should be made available to all U.N. member states rather than to the more limited membership of the IAEA, through an arrangement between either the 1540 Committee or the Security Council, on one hand, and the and the IAEA, on the other.

The IAEA also currently operates the International Physical Protection Advisory Services (IPPAS), which provides audit and peer review functions related to the physical

³⁰ See IAEA Office of Nuclear Security, Illicit Trafficking Database (ITDB) Fact Sheet for 2006, available at http://www.iaea.org/NewsCenter/Features/RadSources/PDF/fact_figures2006.pdf.

³¹ *Id.*

³² *Id.*

³³ *Id.*

³⁴ *Id.*

protection of nuclear material.³⁵ Both of the above functions relate specifically to the requirements of UNSCR 1540. The IAEA should make IPPAS audit and peer review functions available to all U.N. member states, subject to arrangements with the 1540 Committee or the Security Council. While virtually all countries with nuclear material, including non-NPT states such as India, Pakistan, and Israel, are members of the IAEA or deal directly with it,³⁶ the number of IPPAS missions the IAEA can undertake at any year is quite limited. The IAEA working together with the 1540 Committee can encourage more states to request such IPPAS missions, and prioritize the order of these missions to countries most in need of such support activities.

Under the Chemical Weapons Convention (CWC), the OPCW oversees the regulation of an agreed list of toxic chemicals or precursors that have potential use in the development of chemical weapons. The 1540 Committee could use the Schedules of Chemicals annexed to the CWC as a model list of chemicals to be controlled by even non-CWC parties. The OPCW, which has gained experience in conducting various voluntary or mandated inspections, could also provide the 1540 Committee or member states with technical assistance on best practices for safeguarding chemical materials. The OPCW could also support U.N. member states in enhancing the capabilities of their export and border control agencies in preventing illicit manufacture and export of chemical weapons and their precursor materials.

The 1540 Committee could also encourage states to adhere to the WMD nonproliferation instruments developed by the IMO. The most relevant convention in this regard is the 2005 Protocol to the 1988 Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation (SUA). The 2005 Protocol, among other things, requires state parties to make it an offense to transport on board a ship any biological, chemical or nuclear (“BCN”) weapons, or any special fissionable material or material especially designed for the production of fissionable material, knowing that it is intended to be used in a nuclear explosive activity. The 2005 Protocol also requires states to make it an offense to transport on board a ship any equipment, materials, or related technologies that significantly contribute to the design, manufacture, or delivery of a BCN weapon. This Protocol provides a model for even states that are not a party to the SUA Convention to adopt. The 1540 Committee could also encourage states that are not parties to the SUA Convention to enact legislation empowering them to assert jurisdiction over persons found in their territories suspected of having committed an offense as defined in the 2005 Protocol aboard the flag vessels of other states.

Section 5.4.2: Voluntary Export Control Regimes

Examples of voluntary multilateral export control regimes with limited membership and with a “secretariat” of relatively limited authority include the Nuclear

³⁵ For more on IPPAS and the peer review process, *see* IAEA, Guidelines for IAEA International Physical Protection Advisory Service (1999), <http://www.iaea.org/OurWork/SS/Protection/guideline.html>.

³⁶ North Korea, which joined the IAEA in 1974, withdrew its membership in June 1994.

Suppliers Group (NSG), the Australia Group, the Missile Technology Control Regime (MTCR), and the Wassenaar Arrangement.³⁷ The NSG deals with the export of dual-use nuclear equipment, the Australia Group deals with chemical and biological weapons-related goods and technologies, the MTCR deals with missile technology, and the Wassenaar Arrangement deals with the export of conventional weapons and related goods and technologies. These regimes are not based on treaties, but are voluntary associations of potential suppliers of the relevant goods and technologies that have made political commitments to coordinate their export control policies in furtherance of nonproliferation goals.

Cooperation of the multilateral control agencies with the 1540 Committee might have synergistic benefits to both. The 1540 Committee could rely on the professional capabilities and resources of national experts identified through the export control regimes in coordinating training, teaching, legal assistance, report writing, and information-sharing functions. The control lists developed by the export control regimes could also serve as model control lists that even states that do not participate in the regimes could adopt. The multilateral control agencies would benefit if the 1540 Committee promoted efforts by non-regime members to control goods and technologies covered by the regime. UNSCR 1540 could be used in an effort to universalize the control lists and licensing practices of the export control regimes without requiring the regimes to expand to include members they may not be prepared to embrace.

Three specific examples of special purpose, proactive, voluntary programs to counter WMD proliferation attempts are the Proliferation Security Initiative (PSI), the Container Security Initiative (CSI), and the Megaports Initiative.³⁸ All three are international cooperative efforts, initiated by the United States, to prevent or interdict the shipment of WMD-related goods and technologies. PSI is not an international organization, as such, but a cooperative set of international activities carried out by states exercising their own domestic legal powers. A loose structure of this type may have limited “shelf life” and is vulnerable to the charge of being a “coalition of the willing” aimed at specific “countries of concern.” UNSCR 1540 can provide broader international legitimacy for activities such as PSI aimed at preventing the illicit traffic in WMD-related materials. Indeed, some states, in their 1540 reports, have mentioned their participation

³⁷ Each of these organizations maintains an informative website. See Nuclear Suppliers Group, <http://www.nuclearsuppliersgroup.org/>; the Australia Group, <http://www.australiagroup.net/en/index.html>; Missile Technology Control Regime, <http://www.mtcr.info/english/index.html>; the Wassenaar Arrangement, <http://www.wassenaar.org/>.

³⁸ For additional information on PSI, see United States Department of State, Bureau of Nonproliferation, The Proliferation Security Initiative (28 July 2004), <http://www.state.gov/t/isn/rls/other/34726.htm>. For more on CSI, see United States Customs and Border Protection, Department of Homeland Security, CSI: Container Security Initiative, http://www.cbp.gov/xp/cgov/border_security/international_activities/csi/. The National Nuclear Security Administration (NNSA), a semi-autonomous agency within the United States Department of Energy, administers the Megaports Initiative; background on the Initiative is available on the NNSA website, at http://www.nnsa.doe.gov/megaports_initiative.htm. The Megaports Initiative also has its own website, which is available at <http://interdict-intl.pnl.gov/>.

in PSI or CSI activities. This could in turn induce more states to participate in such activities.

Section 5.5: Private Sector Cooperation

Private sector nongovernmental organizations (NGOs) and for-profit corporations that are directly involved in international commerce and in international efforts to interdict WMD-terrorism may have real-world exposure to issues affecting the implementation of UNSCR 1540 that could prove beneficial to the 1540 Committee. At this time the Committee is limited to formal communications from states and from international agencies as its information sources. There exists, however, a wealth of information on activities related to traffic in WMD goods and technologies and what it takes to interdict such trade in private sector corporations and NGOs which is not formally accessible to the 1540 Committee. The Committee should develop a framework for cooperation and information exchanges with various private sector organizations.

Such entities might also be able to support the nonproliferation goals of UNSCR 1540 through means other than the provision of information. In some cases, private corporations or NGOs might be able to provide technical assistance or training to strengthen the nonproliferation capacities of target countries. We accordingly recommend that the Committee develop a framework for enlisting private sector cooperation.

There are four groupings of private sector organizations with which the 1540 Committee could interact: large multinational corporations; smaller business entities; NGOs; and technical industry associations.

Section 5.5.1: Large Multinational Corporations

Large multinational corporations – given their size, personnel talent, financial resources, involvement in business activities, and information on various ongoing and prospective transactions – may be well positioned to provide support to states in implementing the requirements of UNSCR 1540. Examples of such corporations might include: General Electric (GE), Toshiba, and AREVA in the nuclear area; DuPont, Exxon-Mobil, Royal Dutch Shell, and BASF in the chemicals area; Glaxco-Smith Kline, Aventis, Pfizer, and Merck in the biological area, and SAIC, Fluor, and Bechtel in the services sector.

Whether they are seen as potential sources of information or as providers of technical assistance, such large corporations are usually motivated by a complex set of incentives including long-term survival, being a good global citizen, and strategic positioning. The profit motive may be important but by no means the overriding factor in decision making for such entities. The 1540 Committee might need to take into account these complex motivations in order to secure the cooperation of such corporations.

In developing a framework for seeking the cooperation of large multinational corporations, the 1540 Committee should factor into account the need to:

- Protect states' interests. The Committee should not recommend corporate assistance activities that might give the corporation unfair access to state resources (such as the chance to bid on future government contracts), or that might position the corporations to take unfair business advantage of other, particularly local, private sector corporations.
- Protect national security. The Committee should not recommend corporate assistance activities that might reveal national security interests or information to private sector business interests.
- Incentivize the corporations. Corporations must be presented with incentives (not necessarily just financial) that will motivate them to provide the support requested by the 1540 Committee. Acting in the interests of international peace and security and being recognized as good global citizens could represent important motivations if properly presented.
- Balance values. The Committee should assess the value of the assistance to be provided against the value of the incentives package offered to secure that support. A set of guidelines for appropriate cost-benefit ratios should be developed.

Section 5.5.2: Smaller Business Entities

Small- and medium-sized corporations can play an important role in the WMD-proliferation process. Examples include the international network of illicit equipment suppliers that served the A.Q. Khan proliferation ring and the chemical corporations that supported the chemical weapons development activities of the Aum Shirikyo terrorist group in Japan. Given the past record we can assume that small company suppliers driven primarily by profit motives would be ready to support future terrorist groups or sub-state organizations seeking to acquire WMDs.

It is unlikely that small business entities of the type mentioned above will generally be available to provide assistance of a type that will be of interest to the 1540 Committee. There may, however, be specialized consulting firms that develop precisely to provide training of the type seen in many nonproliferation assistance programs. The 1540 Committee should retain rosters of such companies which it might share with states seeking assistance, although it may not be in a position to verify the competence of any particular firm.

It is also possible that the 1540 Committee will receive information about the illicit activities of small business entities. If the Committee is made aware by one state or international organization or agency of such activities in a third state, it might pass on that information to the relevant authorities in that state for their appropriate control action. Similarly, if a state informs the 1540 Committee of the suspect activities of a particular business entity operating within its borders, the Committee might confidentially inform other states which could be affected by the activities of the suspect

entity. In either case the 1540 Committee could fulfill a useful role in confidentially exchanging information among the states concerned.

Section 5.5.3: Non-Governmental Organizations (NGOs)

Nongovernmental organizations (NGOs) could prove to be valuable sources of information for the 1540 Committee. Such NGOs could help the Committee track state compliance with the requirements of Resolution 1540, report on egregious situations of non-compliance brought to their attention, and act as catalysts to encourage state compliance in specific situations through the provision of financial or material seed support.

The 1540 Committee might wish to devise guidelines for cooperation with NGOs. Because NGOs may be subject to harassment or prosecution in authoritarian states, for instance, it would be important to ensure that the 1540 Committee can receive information on a confidential basis. Also, because of the ease with which NGOs can be established and the lack of transparency in many cases about who supports and funds their work, the 1540 Committee might wish to establish mechanisms to check on the qualifications of the organizations involved and on the professionalism of their staff members.

Section 5.5.4: Technical Industry Associations

Special-purpose technical industry associations, operating mostly on a regional basis, could serve as useful examples for regional cooperation on UNSCR 1540-related matters that the Committee might wish to foster. Such voluntary industry associations provide useful services to their members based on members' self-interest. Examples of such voluntary self-help regional or international organizations include UNIPEDE – the EU high-voltage electric transmission network organization – and WANO – the World Association of Nuclear Operators in nuclear plant safety operations.

In particular, WANO could serve as a model for the type of international industry association we have in mind. WANO is comprised of four regional sub-organizations operating in the Western Hemisphere, Asia, Europe, and the former Soviet Union. In each region most of the nuclear electric corporations participate in the activities of the regional center, as it is in their own interest to do so. All regional centers exchange information and compare performance evaluations on a common basis, using a set of internationally agreed upon standards. WANO, through its regional centers, provides services to its member electric utilities in the areas of personnel training and qualifications, establishing and tracking individual plant performance based on common standards, and conducting confidential individual plant performance assessments for use by plant management and for review by the regional organization. All activities are performed by regional electric utilities personnel on loan to WANO either to conduct specific evaluations or for a long-term basis. Nuclear electric utilities value the services performed by WANO as they provide objective measures on how well they perform and alert management if a trend of deteriorating performance emerges. Given this benefit,

nuclear utilities are willing to share the costs of operating the association and abiding by its professional evaluations.

A private sector industry association such as WANO could serve as a model for regional cooperation with respect to the WMD nonproliferation activities covered by UNSCR 1540. It is admittedly easier to secure the cooperation of private sector corporations with relatively narrow and shared interests than it might be to secure the cooperation of states driven by diverse political, economic, and national security considerations. Yet the approach, based on the enlightened self-interest of the participants, is a powerful motivator, if the 1540 Committee could harness it for its own purposes in implementing UNSCR 1540. Thus, the 1540 Committee could encourage the formation of regional organizations of state export control agencies to perform training, “lessons learned,” and performance evaluation functions. Similarly, the 1540 Committee could support efforts by governmental agencies to strengthen outreach activities aimed at industry associations.

Section 5.6: Conclusions Regarding International Cooperation and Assistance

For the reasons noted in this Section, it is in the interest of the 1540 Committee to cooperate with other international organizations and agencies and private sectors entities in promoting implementation of UNSCR 1540. In pursuing deeper cooperation with international and regional organizations and private sectors actors, the 1540 Committee could function either as an information broker or as information clearinghouse. In its information broker role, the Committee would obtain information from a variety of sources and pass that information under appropriate conditions only to the states directly involved. In its clearinghouse role, the 1540 Committee would act entirely in the public domain, sharing information received among all states through published listings. The Committee could also serve a “matchmaking” function in trying to link potential providers of technical and other forms of assistance with countries that would most benefit from such assistance.

If international organizations are to assume additional responsibilities in cooperation with the 1540 Committee, it will be important for the Committee and the organization concerned to reach clear understandings regarding the respective functions of the two parties and their communication channels. It will also be important to address the potential budgetary implications for any organization asked to assume additional responsibilities in furtherance of the objectives of UNSCR 1540. The 1540 Committee should seek to negotiate memoranda of understanding (MOUs) with potential partner entities regarding the scope and conditions of cooperation. It is important to note that other organizations stand to gain much from cooperation with the 1540 Committee, in terms of increased international prestige, greater scope of responsibilities and authority, and increased budgets.

Section 6: Information Sharing and Assessment

UNSCR 1540 has broken important new ground by obligating states to report about measures they have taken to implement the nonproliferation requirements of the resolution. Such reporting is highly significant. States that might have been inclined merely to assert having effective measures in place must now publicly demonstrate what specific legal, administrative, and institutional arrangements they have adopted to guard against the proliferation of WMD. The adequacy of those measures can be evaluated by experts on the 1540 Committee or in national governments. States with deficient regimes can be pressed to improve their performance; the public disclosure obligations of UNSCR 1540 deprive such states from being able credibly to claim that they have adequate measures in place.

Nevertheless, it is important to understand the limits of the information-sharing regime created by UNSCR 1540. The assessment of state performance is based only on self-reporting by states pursuant to the resolution. The 1540 Committee does not rely on information from third parties that would provide a basis for assessing or verifying the content of states' reports. There is certainly no international inspection regime as exists for multilateral nonproliferation or arms control treaties such as the Nuclear Nonproliferation Treaty, the Chemical Weapons Convention, the Conventional Forces in Europe Treaty, or the Open Skies Treaty.

The 1540 Committee to date has received and shared information on: (a) states' domestic legislative and administrative authorities; and (b) opportunities for international assistance and coordination. With respect to these topics, self-reporting by states is arguably adequate to provide a basis for assessment.

Particularly if the 1540 Committee adopts the recommendations we have made in Section 3 regarding shifting its focus to *implementation* of nonproliferation measures and policies, it will become important for the Committee to pursue supplemental approaches to information sharing. In this regard, we recommend the following measures:

First, the 1540 Committee should be authorized to receive, on a voluntary and confidential basis, information beyond what states are mandated to provide under UNSCR 1540. States may wish to disclose to the Committee gaps or deficiencies in their nonproliferation measures as part of an effort to seek assistance in improving their capacity. They may be reluctant to make these disclosures publicly, however. Moreover, public disclosure of such deficiencies could serve as a blueprint for potential terrorists on how to obtain WMD-related goods or technologies.

Second, the 1540 Committee should be authorized to receive information from international or regional organizations, NGOs, businesses, non-state groups, or individuals as discussed in Section 5. The Committee has to date relied on information provided by states, and has not been able to officially consider information from non-state sources in developing strategies for further implementation of UNSCR 1540. It is important for the Committee to have the capacity to receive information from non-state

sources as a way of assessing the information states report, and to be able in appropriate cases to hold such information on a confidential basis.

A subsidiary recommendation in this regard is that reports that go directly to the U.N. Security Council under existing mandates (e.g., IAEA reports and nonproliferation-related reports under other international conventions and resolutions) should be available to the 1540 Committee.

Third, the 1540 Committee should have the authority to disseminate confidential information it has received on a restricted basis, subject to the consent of the provider of the information. This is a departure from the norm of transparency that has guided the work of the Committee so far. Nevertheless, if the 1540 Committee discovers, based on information provided to it by states and others, a significant gap in a state's nonproliferation regime, the Committee should be able to convey that information to a limited number of states able to provide assistance to address the problem, rather than to all U.N. member states or the public at large.

Because of the difficulties that restrictive information sharing may pose to the 1540 Committee, however, we also recommend that the Committee should in some cases encourage states to share information directly with one another, rather than with the Committee itself. This would be appropriate when the information to be shared is particularly sensitive and could serve as a basis for bilateral assistance or cooperation.

Section 7: Organizational Implications

UNSCR 1540 (along with its predecessor U.N. Security Council Resolution 1373) represents a novel approach to law-making in the international system. In acting under its Chapter VII authorities and imposing legal obligations on all U.N. member states to address the general threat of the risk of acquisition of WMD by terrorists, the Security Council departed from its traditional practice of adopting legally binding measures only in response to particular security crises in a single country or region. The Security Council, in essence, has endeavored to enact a form of general international legislation. Through the creation of the 1540 Committee, the Security Council has in addition created a modest administrative apparatus to promote enforcement of that legislation.

At the time Resolution 1540 was adopted, some states expressed concern about this approach to creating new international legal obligations. India's representative to the U.N., for instance, expressed concern

“over the increasing tendency of the Council in recent years to assume new and wider powers of legislation on behalf of the international community, with its resolutions binding on all States. . . . We are concerned that the exercise of legislative functions by the Council, combined with recourse to Chapter VII

mandates, could disrupt the balance of power between the General Assembly and the Security Council, as enshrined in the Charter.”³⁹

The limited membership of the UNSC and the perception that it is dominated by Western powers heighten these concerns.

In developing our recommendations regarding enhanced implementation of UNSCR 1540, one of our objectives has been to incorporate ideas that may induce states to comply with legal rules they may perceive were imposed on them without much consultation or their express consent (notwithstanding their obligation under Article 25 of the U.N. Charter to “accept and carry out the decisions of the Security Council”). To assuage concerns about this law-making process, the 1540 Committee should focus less on traditional approaches to inspection/verification of legal rules (such as those employed in the Nuclear Nonproliferation Treaty, the Chemical Weapons Convention, the Conventional Forces in Europe Treaty, or the Open Skies Treaty) or on threats to seek Security Council sanctions to compel compliance.

Rather, we believe the Security Council and the 1540 Committee should employ the approach used in multilateral environmental agreements (MEAs) like the Montreal Protocol on Substances that Deplete the Ozone Layer and the Kyoto Protocol to the Framework Convention on Climate Change, known as the “managerial model.” Key elements of the managerial model are: (1) transparency regarding states’ domestic procedures and robust information exchange, including independent expert review and the capacity for seeking follow-up information; and (2) facilitative approaches to noncompliance that focus not on sanctions, but on capacity building and financial assistance.⁴⁰

In order to function in a “managerial” capacity, and to carry out the other recommendations we have made, the 1540 Committee would require a different structure than it now possesses. The new structure would include:

1. A longer term/indefinite mandate: Management of the security challenge posed by the threat of WMD proliferation is an ongoing process. It is not a problem to be “fixed” in two, or even four, years.
2. Expanded funding: The expanded activities we have recommended in Section 5 that the 1540 Committee should pursue in cooperation with international organizations in order to further promote the objectives of UNSCR 1540 will require additional resources.
3. A staff of independent experts: Currently, “experts” are supplied to the 1540 Committee by member states. Some of these individuals have genuine

³⁹ U.N. SCOR, 59th Sess., 4950th mtg. at 23, U.N. Doc. S/PV.4950 (Apr. 22, 2004) (statement of representative of India).

⁴⁰ See generally Michael Faure & Jürgen Lefevère, *Compliance with Global Environmental Policy*, in *The Global Environment: Institutions, Law, and Policy* 163 (Regina S. Axelrod, David Leonard Downie & Norman J. Vig eds., 2d ed. 2005).

nonproliferation and export control expertise, but others are essentially foreign policy generalists from their nations' diplomatic corps. They also may in some cases be primarily concerned with advancing the interests of the country that employs them. Moreover, the short-term mandate of the committee serves to limit the pool of qualified candidates. The 1540 Committee should be staffed by a permanent cadre of independent and professional experts.

4. Broader authority with respect to information exchange: Transparency is the key to the managerial model. The 1540 Committee, if comprised of an independent professional staff, needs independent authority to decide what information to seek/exchange on a case-by-case basis. The recommendations in Section 4 stress the importance for the 1540 Committee, in its discretion, to be able to request information on a tailored, country-by-country basis, in view of all the information available to it.
5. Greater authority to facilitate compliance: The Security Council should establish a voluntary fund to which states can contribute to promote implementation of UNSCR 1540. The 1540 Committee could use resources from this fund to facilitate efforts by states to comply with the requirements of UNSCR 1540, just as the Multilateral Fund under the Montreal Protocol is used to support efforts by developing states to comply with their obligations under that treaty.

The experience of the multilateral environmental agreements suggests that having the 1540 Committee move in the direction of a managerial model – with the associated institutional capacities – presents the best opportunity for ensuring “buy-in” by states that might have been skeptical about the unusual approach to law-making represented by UNSCR 1540. More importantly, it seems to offer the best approach to enhancing states' actual implementation of the nonproliferation requirements of the resolution.

Appendix: Evaluation of Country Responses relevant to Proposed Indicators

The 1540 Committee requested information on how each country was fulfilling its obligations under UNSCR 1540. In an attempt to see to what extent the “implementation indicators” developed in Section 3 may have already been addressed by states in their UNSCR 1540 reports, the responses of the following 37 countries, plus that of the European Union, were examined:

Argentina	India	Nigeria	Switzerland
Belarus	Indonesia	Pakistan	Syria
Brazil	Iran	Romania	Turkey
Canada	Israel	Russia	Ukraine
China	Japan	Saudi Arabia	UAE
Czech Republic	Kazakhstan	Singapore	UK
Egypt	Korea (ROK)	Slovakia	USA
European Union	Libya	South Africa	Viet Nam
France	Malaysia	Spain	
Germany	Netherlands	Sweden	

The list, while somewhat arbitrary, attempted to find a representative sample of states that are known to possess weapons of mass destruction (or have done so or tried to do so in the past), countries that have the technological capability to provide the elements that could be used to construct such weapons or their means of delivery, countries that might serve as transshipment points, and more generally countries in politically unstable parts of the world.

As might be expected, since UNSCR 1540 did not specifically request states to provide information regarding the implementation indicator questions discussed in Section 3, states provided very little information about those indicators. Most of the implementation indicator questions concern information that would have required states to volunteer information beyond what was required in their reports. Few countries undertook the added burden of elaborating on their plans, activities, and practices – even those countries such as the United States that provided a great deal of information.

1. General indicators

Most states reported on what laws were already on their books to deal with the problem of terrorists or non-state groups obtaining WMD or their means of delivery (since this was specifically requested by the 1540 Committee). Most states also reported that they had or were going to enact new laws or strengthened regulations to meet the growing WMD terrorism danger, and a number of states indicated that they had issued executive orders to strengthen the government’s capability to meet the threat. A few states (such as Singapore and Switzerland) seemed to indicate that their existing laws and practices were quite adequate to deal with the problem. Most states indicated that they had (or were preparing) anti-terrorist statutes (although whether such anti-terrorist

legislation will specifically address preventing non-state actors from obtaining WMD is generally only implied rather than made specific).

No state reported on the resources of its agencies or any plans to do risk assessments to help rationally allocate its resources to fight the WMD terrorism threat. Little or no information was provided on the interaction between law enforcement and intelligence agencies. Also, little indication was given about whether special units had been formed to focus on the terrorist WMD threat, although this was implied in some cases. Other than the United States, which gave a few examples, no information was provided on the record of measures taken to enforce legal provisions, such as reports of investigations and prosecutions. Almost half the states indicated that they are working with other states (particularly neighbors) to share information and to undertake joint activities. The United States indicated that it has an extensive program of information sharing with a large number of states (although the report does not elaborate on this).

2. Indicators regarding effective accounting and physical protection measures for WMD-related materials

Only about a third of the states indicated that the government may be involved in direct inspections of nuclear, chemical, or biological facilities (and in some cases these reports are ambiguous, e.g., they indicate that the state has the option for such inspections). Some reports refer to inspections in connection with IAEA or OPCW activities (which involve outside inspectors, not state inspectors).

With regard to state practices regarding the storage/disposal of radiological sources, about two-thirds of the states indicated that they support the IAEA Code of Conduct on the Safety and Security of Radioactive Sources. (By 2007, 89 countries worldwide had expressed support for this non-binding set of guidelines.)

No state reported on activities to test its physical protection measures through unannounced “red team” exercises, although the United States is known to do this for its nuclear facilities.

3. Indicators regarding export and transshipment controls to prevent the export of WMD-related equipment, goods, technologies, and means of delivery to terrorist groups

Most of the implementation indicator questions in this group were not addressed at all by the country responses.

About half of the countries reported that they applied export control licensing regulations to re-exports by foreign enterprises. Enforcement procedures were not generally explained, except (in some cases) to say that permission was required to re-

export sensitive items. In some cases (e.g., Canada), states reported that re-export rules apply only to nuclear materials.

As to the other implementation indicator questions, only the United States specifically addressed some of them. For example:

- U.S. licensing criteria seems to be established primarily by regulation;
- Of all the requests for export of dual-use items in 2003, 11,285 were approved, 251 were denied, and no action was taken on 1,928 other requests;
- Different export rules apply for designated terrorist organizations (the Department of Commerce maintains a website list); and
- There have been a number of criminal prosecutions for export control licensing regulations violations by corporations.

4. Indicators regarding border controls to prevent the export of WMD-related equipment, goods, technologies, and means of delivery to terrorist groups

Again, very few states addressed the implementation indicator questions posed in this section. The most frequently addressed question was whether the state possessed technology to enable it to detect contraband WMD-related goods. More than half of the countries surveyed indicated that they had such equipment, but often only radiation detectors were indicated (although the United States and a few other countries noted a number of other technologies that they were deploying, and France noted that it is leading a “Euritrack” program to develop new inspection technologies). Several countries (such as Viet Nam) suggested that they could use help in improving their detection systems.

Only a few states indicated that they have the legal authority to inspect both the import and export of goods, to inspect foreign flag ships/aircrafts in their ports/territorial waters/airspace, and that customs/border guards are legally empowered to impound/seize suspect materials on their own authority. They may actually have such authority, but simply not have mentioned it. Only the United States noted examples of prosecutions of illicit trafficking, and only a few countries, such as the UAE, mentioned that they had the authority to inspect goods in transit (although the frequency of such activity was not noted).

In addition, seven of the 37 states noted that they participated in the U.S.-initiated Container Security Initiative. Since the reports were filed, ten more of the 37 states joined. (As of August 2007, about 26 non-U.S. customs administrations worldwide were participating in CSI, including 52 foreign ports). Also, 21 states noted that they supported the Proliferation Security Initiative (PSI) (currently over 70 states worldwide support the initiative). Iran’s report denounced the PSI concept (while not specifically mentioning the Proliferation Security Initiative).

5. Indicators regarding outreach programs

Most countries noted that they were working closely with industry, often providing seminars, pamphlets, and internet websites. Few details were given. Only France noted that it placed particular emphasis on small- and medium-sized firms.