

SIPRI YEARBOOK 2007

ARMAMENTS, DISARMAMENT AND INTERNATIONAL SECURITY

Chapter summaries

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Introduction. A world of risk

Alyson J. K. Bailes

Security analysts, commentators and policymakers have increasingly employed the language and concept of ‘risk’ in place of the more traditional, and narrower, concept of ‘threat’. Risk embraces a wide range of problems for human security and survival. Public policies that take into account the whole spectrum of risk have more chance of correctly assessing priorities. Risk-based analysis also helps to underline the fact that risks result partly from a country’s—or an individual’s—own choices.

However, for both objective and subjective reasons, it is difficult to compile and compare all the risks facing a country. All relevant attributes of risk—not just impact and probability, but also domino effects and susceptibility to human influence—need to be assessed and compared across fields as diverse as conflict, terrorism, natural disaster and economic or social vulnerability. Subjectivity adds many distortions, including those caused by the observer’s own agenda and sense of responsibility. Comparing the views on risk hierarchies of government, private business and social actors might help to offset such biases. The focus of technical models for comparing and forecasting risk should be expanded in order to cover the transnational, often global, diffusion of many major risk factors today and to assess the vulnerabilities or resilience of the world system as a whole.

Risk-based security analysis may be a useful brake on potential recklessness.

It is tempting to act to pre-empt, as well as limit and eliminate, risk. In traditional warfare or power play, the costs of this and the ways to reduce possible backlash are relatively well understood. The post-cold war environment has facilitated many kinds of interventionist action (not just military) but has made the consequences harder to assess and to master—especially when confronting non-state actors. Views on targets and the legitimacy of various methods vary widely around the world. Forceful approaches such as the USA’s military

‘pre-emption’ efforts can bring a stronger backlash than anticipated from stubborn opponents, the domestic audience and world opinion. Risk may also be ‘displaced’, so that the consequences affect innocent parties or rebound on the initiator by another route. **Fundamentally, it is futile to address a risk without considering how one’s own behaviour may generate or aggravate it.** Thus, risk-based security analysis may actually be a useful brake on potential recklessness.

Awareness of these complications could lead to decisions simply to live with some risks and focus on resilience and recovery. It also provides an argument for intensifying multilateral cooperation to seek shared solutions to shared risks—and to share the inevitable costs of tackling them. The modern concept of a ‘risk society’ may, thus, lead back to the older vision of a ‘global society’ with common security governance.

Chapter 1. Euro-Atlantic security and institutions

Pál Dunay and Zdzisław Lachowski

Since the fundamental shift in focus in the West's security concerns that followed the terrorist attacks of 11 September 2001—giving priority to the threat posed by international terrorism—mainstream security analysis has remained essentially unchanged. The US-led invasion and subsequent counter-insurgency campaign in Iraq seems to have created long-term vulnerability for the international community. It is becoming clear that the cause of counterterrorism will be best served by keeping its major strands separate from the issues at stake in Iraq.

Although transatlantic relations improved during 2006, the two main Euro-Atlantic security institutions—the European Union (EU) and the North Atlantic Treaty Organization (NATO)—are still in a transitional phase, seeking ways to prove their relevance in the context of new challenges. The EU's foreign and security policies are handicapped by the organization's constitutional crisis and, perhaps even more seriously, by 'enlargement fatigue'—and they are likely to remain so for some time to come. NATO's long-heralded transformation process has made little further progress. Neither institution has reached a consensual 'grand vision' of global and European security, which also hinders closer EU–NATO cooperation.

Efforts to establish lasting state structures in the Western Balkans

continued to advance slowly in 2006 with the separation of Serbia and Montenegro and the prospect of self-government for Kosovo. Kosovo also stands as a reminder that ethnic composition and population trends can still influence international security. In the shorter term, the focus of attention will shift to Serbia's ability to adjust, both internally and externally, to the emerging realities.

The EU and NATO are seeking ways to prove their relevance in the context of new challenges.

Russia has altered the paradigm of international security by turning the security of oil and gas supplies into a major strategic issue. In response, European states have agreed in principle to coordinate their positions on this matter.

Other aspects of Russia's current propensity for antagonistic behaviour towards much of the Euro-Atlantic community may similarly push West European states into closer cooperation.

Russia has used its energy wealth to revive national pride, to restore its influence in its 'near abroad' and to maximize its geopolitical power. In doing so, it has shown a disregard for other states' goodwill that may work against it in the longer term. One consequence of Russia's current course is the emergence of a—still not geographically precise—'soft' division between the new, expanded West and the under-reformed, less-integrated parts of Eastern Europe.

Chapter 2. Major armed conflicts

Sara Lindberg and Neil J. Melvin

Transnationalism has been recognized as an important aspect of international relations for several decades. It has recently also become an important factor in the analysis of conflict, helping to provide explanations for and definitions of conflict that link local incidents of violence to broader social, political and economic developments in the world order. Important transnational aspects of collective armed violence are population displacement and the role of diasporas; state-based transnational conflict networks; and international terrorism and crime.

Three conflict areas that claimed international attention in 2006 and most starkly demonstrate transnational dimensions of modern conflict are Afghanistan, the Middle East and Somalia.

In **Afghanistan** the main transnational element of the conflict was the Taliban’s ability to operate from bases in neighbouring Pakistan—an allegation that has been contested by the Pakistani Government but is otherwise generally accepted as fact.

The conflict involving **Israel, the Palestinian territories and Lebanon** illustrated the greater role of regional and transnational conflict networks and the link between state and non-state actors, as both Hamas in the Palestinian territories and Hezbollah in Lebanon received political, ideological and practical support from states such as Iran and Syria. Recognition was given to the interlinked nature of the conflicts in the Middle East by British Prime Minister Tony Blair in his call for a

‘Whole Middle East Strategy’ to resolve the problems of the region.

In **Somalia** violent battles and humanitarian crises caused scores of civilian casualties and led to widespread population displacement. The inability of the Transitional Federal Government to extend its control throughout the country enabled the Union of Islamic Courts to broaden its influence, at first challenged only by US-supported Mogadishu warlords. Devoid of any state authority to impose internal order and to

counter destructive external influences, Somalia provided a base where transnational criminal and terrorist interests could intersect. The international Somali diaspora continues to affect the conflict in various ways, and large Somali refugee populations outside the country may also be a destabilizing factor.

A growing awareness of the transnational character of security issues in 2006, the urgent need to counter the negative aspects of this phenomenon and the potential for making positive use of transnational actors and influences to promote conflict resolution and peacebuilding all suggest that, in the future, finding ways to address transnational aspects of conflict will be high on the international policy agenda.

Appendix 2A, by *Lotta Harbom and Peter Wallensteen*, presents data on the **patterns of major armed conflicts** in the period 1997–2006. In 2006 there were 17 major armed conflicts in 16 locations, with the same conflicts active as in 2005. No

Addressing transnational aspects of conflict will in the future be high on the international policy agenda.

interstate conflicts were active and Asia was for the third year the region with the highest number of conflicts. In the period 1997–2006, there were 34 different major armed conflicts. In all but one year of the period, most of the conflicts were in Africa. There has been a decline in the total annual number of conflicts since 1999. **Appendix 2B** explains the **definitions, sources and methods** for the data presented in appendix 2A.

Appendix 2C. Collective violence beyond the standard definition of armed conflict

Michael Brzoska

The coverage of available quantitative data on armed conflicts as reported in the SIPRI Yearbook and elsewhere has been found inadequate for measuring trends in security and insecurity.

Data on armed conflicts are currently collected and analysed on the basis of well-established criteria—the participation of a state as one of the warring parties, a political objective and the exchange of violence in battles—which together constitute the standard definition of armed conflict. Recent trends in warfare have tended to reduce the importance of all three elements. There are today many instances of fighting between non-state actors; the objectives of warfare (or other forms of collective violence) are often economic or ideological and not purely political; and rather than fighting battles, violence targets unarmed civilians. Furthermore, there have been shifts in the perception of what constitute the major threats to peace and security. From a

human security perspective, all kinds of violence are important; in most industrialized countries threats are often judged according to their potential impacts on the social fabric, such as those already caused by international terrorism.

These and other changes in perceptions of war and peace, insecurity and security, have given rise to requests for different kinds of data. Data collectors have responded by introducing new data sets, for example on non-state conflict, one-sided violence and terrorism. However, there are still major gaps in the data, for example on the total numbers of victims of almost all forms of collective violence. Data collection efforts are often partial, selective and without a clear focus. While different conceptions of conflict and security will require different data, a focus on collective violence can at least provide

a common framework. This framework helps to identify where the major gaps in data collection are. Besides the numbers of victims, these gaps are particularly in the various fields of non-state violence, including crime. Such data are difficult to collect, both conceptually—because of the lack of good definitions—and technically—because of the lack of easily available sources. If the gaps were filled, these data would go a long way towards addressing the doubts of critics of the available data on armed conflict. Only then

could it be determined whether the downward trend indicated in the available data on armed conflicts between the second half of the 1990s and into the new decade has to do with definitions or reflects a genuine decline in collective violence worldwide.

Data on the many forms of collective violence, not just that involving states, would help show whether the recent downward trend indicated in the armed conflict data reflects a genuine decline in collective violence worldwide.

Chapter 3. Peacekeeping: keeping pace with changes in conflict

Sharon Wiharta

The massive expansion of multilateral peace missions in 2006, and unforeseen political and strategic developments in mid-year, prompted the United Nations and other multilateral security organizations to address some recurring political and operational dilemmas in peacekeeping and to re-evaluate the role of peacekeeping as a strategic tool in the resolution of contemporary conflicts.

The conflict in **Lebanon** and the mounting violence in **Afghanistan** necessitated major expansions of the long-established UN Interim Force in Lebanon (UNIFIL) and the International Security Assistance Force (ISAF) in Afghanistan. Both the UN and NATO—which in 2006 took over nationwide command of ISAF—struggled to realize these expansions as contributing countries hesitated and imposed restrictive conditions on the deployment of their troops.

One important innovation related to the expansion of UNIFIL was the creation of a special Strategic Military Cell at the UN to take strategic military command of the mission. This cell liaises directly with the UNIFIL Force Commander and reports directly to the UN Under-Secretary-General for Peacekeeping Operations. Strategic command of UN peace missions has always previously been the responsibility of the UN Department of Peacekeeping Operations.

In **Timor-Leste**, a breakdown of order necessitated deployment of a large, multidimensional mission, the UN

Integrated Mission in Timor-Leste (UNMIT), just as the UN was intending to withdraw entirely from the country. This sparked new debate about the shortcomings of past international peacebuilding efforts. The apparent failure in Timor-Leste also demonstrated the crucial importance of local ownership in peacebuilding.

Long-standing core principles of peacekeeping, such as consent, impartiality and neutrality, came to the fore in policy discussions and were severely tested in their practical implementation in 2006. After the signing of the Darfur Peace Agreement in May, intensive negotiations were needed to

obtain the Sudanese Government's consent to the deployment of UN peacekeepers in the **Darfur region of Sudan**. A joint African Union–UN 'hybrid mission' was eventually accepted. Political resistance to UN engagement in the stalled peace process in Côte d'Ivoire meant that UN and French

peacekeepers were obliged to leave the country. Similarly, following a decision by the European Union (EU) to include the Liberation Tigers of Tamil Eelam (LTTE) in its list of international terrorist organizations, the LTTE demanded that EU monitors be expelled from the Norwegian-led Sri Lanka Monitoring Mission (SLMM), arguing that the mission was no longer either impartial or neutral. While the established principle of the use of force only in self-defence has withstood the test of time, it has undergone

More military and civilian personnel were deployed to more multilateral peace missions in 2006 than in any previous year.

considerable reinterpretation in the light of the new range of tasks being given to peace missions and has now come to include defence of the mission's mandate.

This comes at a time when peace missions are becoming increasingly robust in nature, as illustrated most starkly and controversially by ISAF.

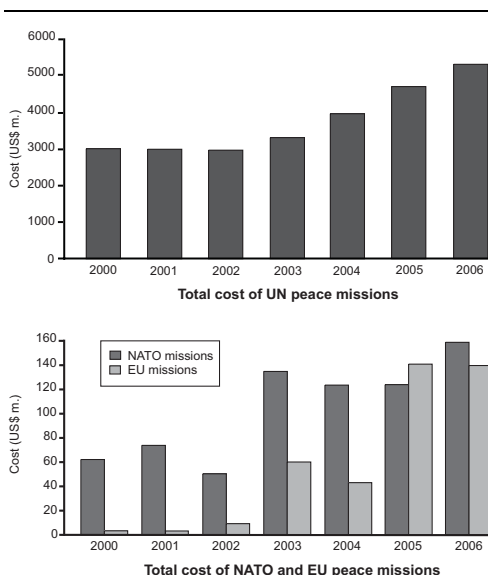
Appendix 3A by Sharon Wiharta and Kirsten Soder, lists all **multilateral peace missions** that started, were active or were concluded in 2006. It also provides data on contributing countries, the number and type of personnel, the financial cost and the casualties of the missions.

More military and civilian personnel were deployed to more multilateral peace missions in 2006 than in any previous year.

Excluding the Multinational Force in Iraq, 167 600 personnel were deployed to 59 operations, a 28 per cent increase in deployments since 2005.

With 73 500 troops and military observers and 14 000 civilian police and civilian staff deployed to 20 missions in 2006, the UN remains the single largest

actor in peace operations and deployed more than twice as many personnel as it did in 2000. European countries accounted for several large deployments under the UN banner in 2006, something that has not been seen for some time. The steady growth in the number of peace missions since 2002 has brought about increased spending on peacekeeping. The combined known cost of UN, EU and NATO peace missions reached the record level of \$5.5 billion in 2006.



Figures for UN missions are for core operational costs. Figures for EU and NATO missions are for common costs.

Chapter 4. Regional security cooperation in the former Soviet area

Alyson J. K. Bailes, Vladimir Baranovsky and Pál Dunay

The major security organizations of the post-Soviet space are the Russia-led Commonwealth of Independent States (CIS) and the Collective Security Treaty Organization (CSTO); the grouping of Georgia, Ukraine, Azerbaijan and Moldova known as GUAM; and the Shanghai Cooperation Organization (SCO), which includes China as well as Russia and four Central Asian states. Their specific environment is characterized by Russia's predominance and the reactions to it, other historical antagonisms, diverse security conditions, the rather slow stabilization of new national identities, and an often over-politicized approach to security. **Westerners often see the CIS, the CSTO and the SCO as hostile or ineffective groupings, and question marks also remain over GUAM's effectiveness.**

Analytical tools developed by SIPRI for evaluating regional security institutions help to flesh out a picture of these four post-Soviet groupings. The CIS contains all (non-Baltic) post-Soviet states and claims competence for military cooperation (notably air defence), peace operations and anti-terrorism. Its survival is remarkable but its practical achievements are very limited. Russia has increasingly diverted serious military cooperation to the smaller—seven-member—CSTO, which has a structure mirroring that of NATO. The CSTO has established joint rapid-deployment forces, is developing a united air defence, promotes equipment

collaboration, and has anti-drug and counterterrorism policies. Its smaller members seem to value Russia's leadership and the institution is more dynamic than the CIS. The four GUAM nations seek an alternative to Russia's policies and in particular want to solve their respective internal conflicts on a basis of national integrity. They coordinate their positions at the Organization for Security and Co-operation in Europe and the United Nations, have a counterterrorism programme, and have discussed joint peacekeeping. Practical outputs have been limited by the members' diversity and the

tendency to relapse into bilateralism for any serious purpose. The SCO engages in mutual confidence building and military cooperation against 'terrorist, extremist and separatist elements'. It rejects what it calls interference in internal affairs, but promotes economic and other functional programmes designed to advance development. The SCO's membership is subtly balanced in power terms and it has shown dynamism and flexibility, although central resources are few and the impact achieved is hard to judge.

Negative views of the CIS, the CSTO and the SCO reflect the outside world's problematic security relations with both Russia and China, as well as normative concerns. Yet these groupings are a fact of life in the Eurasian space that will not quickly change. At best they give their members some experience of what modern multilateralism means.

Negative views of the CIS, the CSTO and the SCO reflect the outside world's problematic security relations with both Russia and China.

Chapter 5. Democratic accountability of intelligence services

Hans Born and Ian Leigh

Following the 11 September 2001 terrorist attacks on the USA and the invasion of Iraq, much attention has focused on the professional adequacy of the Western world's intelligence services, the risk of their role and findings being distorted by political measures, and alleged human rights abuses. This has led to public and parliamentary special investigations into claims of failings or misconduct by intelligence services in a number of countries—examples include the 9/11 Commission in the USA; the Hutton Inquiry in the United Kingdom; the Arar Commission in Canada; the German special parliamentary inquest; and the Dutch Parliament's request for an investigation into the alleged torture practices of the Dutch Military Intelligence and Security Service in Iraq. **Concerns about the external accountability of intelligence services are clearly high on the public policy agenda.**

Concern about democratic oversight of the intelligence services is, however, not just a phenomenon of the past five years. Comparative research on intelligence accountability reveals that, over the past 30 years, several states have moved towards greater accountability. Although executive oversight of intelligence is well established, the introduction of parliamentary and independent oversight mechanisms is comparatively recent, having come into existence only between

the 1970s and 1990s in different states. The states compared are all democracies whose

legislatures have adopted laws that put the functioning of their intelligence services on a legal footing and to provide for oversight of intelligence. They include Argentina, Bosnia and Herzegovina, Canada, Germany, Hungary, the Netherlands, Norway, Poland, South Africa, the UK and the USA.

Intelligence oversight systems in these countries are confronted with several

recurring challenges and problems:

- balancing the legitimate need for **transparency** with the operational need for **secrecy** of operations, sources and methods;
- the danger of **politicization** and executive misuse of the intelligence services;
- the challenge of **establishing democratic oversight** of intelligence services in post-authoritarian and post-communist states; and
- the challenge for national oversight institutions of **keeping track** of international intelligence cooperation.

The extent to which the relatively young oversight systems in existence are capable of fully addressing these challenges in the post-11 September climate remains to be seen.

Chapter 6. Energy and security: regional and global dimensions

Kamila Pronińska

Efforts to secure energy supplies are an important factor shaping states' foreign policy and foreign relations. Many features of the international environment influence the conceptualization of energy security and thinking about what are the best national, regional and global methods to ensure it.

The recent intensification of debate about energy security has been motivated by the rising global demand for energy, a tight oil market, high oil prices, rising dependency on energy imports, and the prospect of future scarcity of oil and gas. Concerns have also been exacerbated by external events such as terrorist attacks on energy infrastructure, power blackouts in some cities and instability in some energy-producing countries. All these factors have heightened awareness in both energy consumer and producer countries of the many new challenges and threats to their energy security in the near future. In response to these challenges, **some countries have adopted a nationalistic approach to energy security**, even going as far as being ready to use force—military or economic—to protect their energy interests. **Others have shown more understanding of the need for collective, institutional measures.**

Energy security concerns shape contemporary international relations in ways that go beyond the direct strategic and geopolitical dimensions of energy security as such. On the one hand, they

lead to new strategic alliances and cooperation between states that are major energy market players; on the other, they are sources of international tension, rivalry and conflict, due mainly to the divergent energy interests of:

In energy security, international cooperation can coexist with international competition—but they need to be better balanced.

- consumer countries and greater competition between them in world energy markets;
- consumer–producer relations and fears that energy supply will be used as a weapon; and
- disputes over ownership of energy resources.

Although most states would regard actual armed conflict as an extreme measure, intra-state conflicts with an energy resource dimension are likely to occur, particularly in Africa. Also, the strategic importance of geographical areas with rich oil and gas reserves will certainly rise: not only the Middle East but also Africa, Central Asia, South America and South-East Asia will be areas of potential tension and conflict in the coming decades.

Some aspects of energy security, which has traditionally been regarded as a purely national or internal matter, are clearly best addressed collectively on a multilateral basis. International cooperation with exporters and transit countries, and with other importers, can make an important contribution to the security of energy imports. In a field like energy security, international cooperation can coexist with international competition—but they need to be better balanced.

Chapter 7. Analysing risks to human lives

Elisabeth Sköns

Governments allocate large sums of money to their military sectors with the stated purpose of providing security for their citizens. The rationale that underlies this is based on a narrow traditional concept of security that links it to the risk of organized violence. **Recent security analyses—taking different and broader definitions**

of security—call into question how far military measures can go towards providing security. They recognize a range of non-traditional security risks that cannot be addressed by military means.

The field of public health offers many examples of areas where non-military spending could be far more cost-effective as a means to provide security of human lives. According to reports by the World Health Organization (WHO), among the 10 leading global risk factors identified for developing countries with high mortality rates, four are related to hunger and two are related to the physical environment—unsafe water, sanitation and hygiene, and indoor smoke. Both of these are in turn linked to poverty. Thus, preventive interventions to reduce hunger, improve the physical environment and reduce poverty are important means of improving the security of human lives. Furthermore, in comparison with military expenditure,

the prevention strategies developed for the WHO and other parts of the United Nations to reduce the risks to human lives are highly cost-effective. For example, 8 million lives could be saved annually for an annual investment of \$57 billion in basic health interventions, and the cost of attaining the Millennium Development

Goals has been estimated at \$135 billion. These levels of investment are small compared with the level of world military expenditure, which amounted to \$1204 billion in 2006.

More importantly, there are significant overlaps between the risk factors for disease and for collective violence, which suggests that there is an overlap in the agendas for

Using the world's resources to address hunger, environmental factors and poverty is likely both to improve human survival and to strengthen international security.

‘freedom from want’ and ‘freedom from fear’. This has implications for different types of security strategy. In particular, it means that in addressing one type of security threat, others can also be considered. While economic scarcity and competition for resources are potential sources of conflict and violence, using the world's resources constructively to address hunger, environmental factors and poverty—including by transfers from the richer countries to the high-mortality developing countries—is likely both to improve human survival directly and to strengthen international security indirectly.

Chapter 8. Military expenditure

Petter Stålenheim, Catalina Perdomo and Elisabeth Sköns

World military expenditure in 2006 is estimated to have reached \$1204 billion in current dollars. **This represents a 3.5 per cent increase in real terms since 2005** and a 37 per cent increase over the 10-year period since 1997. Average spending per capita increased from \$173 in 2005 to \$184.

World military expenditure is extremely unevenly distributed. In 2006 the 15 countries with the highest spending accounted for 83 per cent of the world total.

The large increase in the USA’s military spending is to a great extent due to the costly military operations in Afghanistan and Iraq. Most of the increase resulted from supplementary allocations in addition to the regular budget. Between September 2001 and June 2006, the US Government provided a total of

\$432 billion in annual and supplemental appropriations under the heading ‘global war on terrorism’. This increase in US military spending has contributed to the deterioration of the US economy since 2001. Taking both immediate and long-term factors into account, the overall past and future costs until year 2016 to the USA for the war in Iraq have been estimated at \$2267 billion.

In 2006 **China’s military expenditure continued to increase rapidly**, for the first time surpassing that of Japan and hence making China the biggest military

spender in Asia and the fourth biggest in the world. Amid intense discussions, Japan decided, for the fifth consecutive year, to reduce its military spending in 2006 and to focus its military budget on missile defence.

In a comparison of government spending priorities between samples of countries in different per capita income groups, the ratio of military spending to social spending was found to be highest in those countries with the lowest per capita incomes. However, between 1999 and 2003, the share of military expenditure in GDP stayed at a

constant level in the high- and middle-income country sample and decreased somewhat in the low-income sample. At the same time social spending as a share of GDP increased in the high- and low-income groups and remained relatively stable in middle-income countries.

Appendices 8A–8D contain **tables of military expenditure** by region, country and income group, in local currency and constant dollars, and as a share of GDP for the period 1997–2006; data on the **military expenditure of NATO members**, by category, for the period 2000–2006; explanation of SIPRI’s **sources and methods** for the military expenditure data collection; and data on **the reporting of military expenditure** to SIPRI and the UN.

World military expenditure in 2006 is estimated to have reached \$1204 billion.

	Country	Spending (\$ b.)	Per capita (\$)	World share
1	USA	528.7	1 756	46%
2	UK	59.2	990	5%
3	France	53.1	875	5%
4	China*	49.5	37	4%
5	Japan	43.7	341	4%

* Figures for China are estimates.

Chapter 9. Arms production

Elisabeth Sköns and Eamon Surry

The arms sales of the 100 largest arms-producing companies in the world apart from China in 2005—the SIPRI Top 100—increased by 3 per cent in real terms over the arms sales of the Top 100 for 2004 and by 18 per cent over those of the Top 100 for 2002. US companies dominate the SIPRI Top 100: **40 US firms accounted for 63 per cent of the combined Top 100 arms sales of \$290 billion in 2005.** Some

32 West European companies accounted for another 29 per cent and 9 Russian companies for 2 per cent. Companies based in Japan, Israel and India, in descending order, accounted for most of the remaining 6 per cent of world arms sales. Four US companies, one British company and one Italian company increased their arms

sales by more than \$1 billion in 2005 and 11 companies increased their arms sales by more than 30 per cent. Of these, four were Russian companies and five were companies that increased their arms sales in the areas of information technology and services. Most of these sharp increases were the result of acquisitions of other companies (or parts of other companies) rather than of organic growth.

Parts of the US arms industry have benefited substantially from the USA's post-September 2001 policies, particularly the increased demand for new equipment generated by the military operations in Afghanistan and Iraq. These policies have also stimulated strong growth in government expenditure on homeland security, thereby increasing demand in the broader security industry.

A major factor behind current developments in the arms industry has been the high and rising fixed costs of advanced weapon systems.

A major factor behind current developments in the arms industry has been the high and rising fixed costs of advanced weapon systems. Companies use mergers and acquisitions to achieve economies of scale, but the increased concentration of production can also lead to reduced competition and thus remove incentives to keep prices down and innovation up. Government strategies to

deal with this economic dilemma have included international collaboration and arms exports; using commercial technology in weapon systems; and outsourcing, privatization and partnerships with the private sector. However, most governments still cannot afford to maintain their current levels of arms procurement and have

had to make choices affecting their defence policies and the structure of their arms industries. The debate in the UK in 2006 over a new defence industrial strategy provided a good illustration of the challenges confronting the European arms industry. One of the tasks of the European Defence Agency, established in 2004, is to achieve cost savings, primarily by promoting European collaboration in armaments development and production.

Appendix 9A, by *Eamon Surry and the SIPRI Arms Industry Network*, lists the **100 largest arms-producing companies in 2005**, along with data on their size and profits. **Appendix 9B**, by *Eamon Surry*, gives details of the **major mergers and acquisitions** in the North American and European arms industry in 2006.

Chapter 10. International arms transfers

Siemon T. Wezeman, Mark Bromley, Damien Fruchart, Paul Holtom and Pieter D. Wezeman

There has been an almost 50 per cent increase in the volume of major conventional arms transfers over the past four years, reversing a downward trend after 1997. **The USA and Russia were the largest suppliers in the five-year period 2002–2006**, each accounting for around 30 per cent of global deliveries. Exports from European Union (EU) members to non-EU countries accounted for just over 20 per cent of global deliveries. Because of its very limited internal market, the Russian arms industry remains heavily dependent on exports—most newly produced weapons in Russia are exported—to maintain an arms industry and fund development of new weapons and technology. This limits the possibility that Russia will exercise restraint in its arms exports. The arms industries of the USA and EU members are in general far less export dependent.

China and India remained the largest arms importers in the world. Also among the top 10 importers were five Middle Eastern countries. While much media attention was given to arms deliveries to Iran, mainly from Russia, deliveries from

the USA and European countries to Israel, Saudi Arabia and the United Arab Emirates were significantly larger.

Especially worrisome are deliveries of long-range conventional strike systems to these states and the effects this may have on regional stability.

Because the development of large weapon systems is becoming increasingly costly, **nearly all countries have become or soon will become**

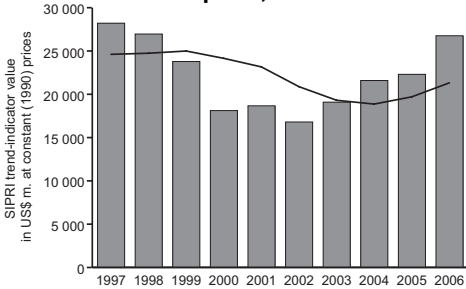
dependent on other countries for weapons or weapon technology. This could lead to mutual dependency—as in US–Europe relations—or to one-sided dependency, as is the case for most developing countries. Some countries may be unwilling to accept dependency or be

unable to access arms and technology. They may try, at high economic cost, to become autonomous in arms production or may focus on relatively cheap alternative weapons such as weapons of mass destruction, or war-fighting strategies such as terrorism and IT warfare.

The problem of controlling state supplies of weapons to rebel groups, while not new, was highlighted in 2006 by the arsenal acquired by Hezbollah from Iran and used in its war with Israel, and by

There has been an almost 50 per cent increase in the volume of major conventional arms transfers over the past four years.

The trend in transfers of major conventional weapons, 1997–2006



The bar graph shows annual totals and the line graph shows the five-year moving average. Five-year averages are plotted at the last year of each five-year period

serious breaches by state actors of the UN arms embargo on Somalia.

Transparency in arms transfers, which in the 1990s saw significant improvement, with more and better national export reports, has remained stagnant in the past few years.

Appendices 10A and 10B provide **data on the recipients and suppliers of major conventional weapons** and the size of the international arms trade and explain SIPRI's **sources and methods** for the data collection.

Appendix 10C. Towards an arms trade treaty?

Paul Holtom and Siemon T. Wezeman

In December 2006, 153 governments voted in favour of a UN General Assembly resolution towards creation of an

international arms trade treaty; the USA was the only country that voted against. At the July 2006 UN Small Arms Review Conference the USA also opposed

expansion of the UN Programme of Action on Small Arms and Light Weapons. Both processes have their origins in civil society campaigns that were later taken up by governments.

Despite the diverse challenges that the arms trade treaty initiative faces, it remains the most significant global development in conventional arms transfer controls since the end of the cold war.

The arms trade treaty initiative remains the most significant global development in conventional arms transfer controls since the end of the cold war.

The SIPRI Yearbook in other languages

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Chapter 11. Reducing security risks by controlling possession and use of civil materials

Ian Anthony

The threat posed by mass-impact terrorism demands a multidimensional response that links diverse but synergistic contributions from state and non-state actors. Part of this response aims to **ensure the peaceful use of civilian materials, equipment, knowledge and technology.**

Arms control aims to manage the risk that attacks could be mounted by the armed forces of states; arms control agreements refer to state behaviour when defining what is prohibited or limited. Arms controls apply to items specially designed and developed for military use or to ‘dual-use’ items (items designed for civilian purposes that are controlled because of their military potential).

However, some items that have no military application—and therefore fall outside the scope of arms control—also need to be controlled. These items are purely civilian in their origin and technical specifications but could nevertheless be misused for harmful ends.

Many such items are in locations outside state ownership and control, particularly in the private sector. Any system developed to control them should not undermine economic activities by escalating business costs or distort markets by centralizing ownership and control in government hands. Furthermore, even though the security need is acute, governance solutions cannot be based on emergency powers, nor should they take extensive

control away from civil society and put it into the hands of government. Given these challenges there is a growing consensus that business and government will increasingly have to work together as partners in building security. This partnership will have to develop gradually as awareness is raised, in different business sectors, of the corporate responsibility for security.

Business and government will increasingly have to work together as partners in building security.

Under this partnership regulators need to create a more integrated set of rules to counter the threat of mass-impact terrorism and to prevent the proliferation of weapons of mass destruction and the diversion of technologies provided for civilian purposes to

unauthorized military use. **Regulators will then need to be proactive in raising awareness about corporate security responsibilities** across the business community at national, regional and global levels.

Voluntary, certified security standards for industry should become a part of total quality management within companies. Regulators and companies need to work together to create this set of standards. Existing processes taking place in the International Organization for Standardization (ISO) and the European Committee for Standardization (CEN) could be the starting point for the development of a comprehensive family of security standards.

Appendix 11A. United Nations Security Council Resolution 1540: non-proliferation by means of international legislation

Christer Ahlström

The terrorist attacks of 11 September 2001 put the threat of proliferation of weapons of mass destruction among non-state actors firmly on the international agenda. The attacks demonstrated the fact that terrorists had the will, and even the capacity, to perpetrate acts of destruction on a massive scale. Thus, it became clear that non-proliferation efforts could no longer ignore non-state actors.

In September 2003 President Bush called on the United Nations Security Council to adopt a binding 'anti-proliferation' resolution that would remedy the lack of focus on non-state actors in the existing international non-proliferation legislation. The decision to adopt the resolution was prompted by a desire to fill the gaps in the non-proliferation regime quickly and avoid the drawn-out and politically complicated negotiations likely to accompany attempts to formally amend the existing treaties. On 28 April 2004, after seven months of negotiations, Resolution 1540 was adopted by consensus in the Security Council. Under the resolution, states will not provide any form of support to non-state actors attempting to manufacture, acquire, possess, develop, transport, transfer or use WMD and their means of delivery.

The adoption of Resolution 1540 raises important questions. First, what authority

does the Security Council have to adopt binding resolutions that contain 'legislative' elements under Chapter VII of the UN Charter? Second, what are the precise extent and character of the legal obligations established by the resolution? Third, how can Resolution 1540 be implemented effectively?

The record of implementation of Resolution 1540 to date seems to indicate that it is still far from universally accepted among the UN member states. Many states have missed their deadlines for submitting national reports on their implementation of the resolution, and those reports that have been submitted suggest that the resolution has had little impact on national legislation and practices. Full implementation of Resolution 1540 by all UN member states probably lies several years ahead.

On the evidence of Resolution 1540's current level of implementation, it appears that **the innovation of securing a 'legislative' Security Council resolution in order to bypass the normal international law-making process—even one that has legally binding force under the UN Charter—offers no guarantee of an effective and prompt response to an urgent threat to international peace and security.**

The text of **UN Security Council Resolution 1540** is reproduced in **Appendix 11B.**

States will not provide any form of support to non-state actors attempting to manufacture, acquire, possess, develop, transport, transfer or use WMD and their means of delivery.

Chapter 12. Nuclear arms control and non-proliferation

Shannon N. Kile

In October 2006 **North Korea** carried out a nuclear test explosion using technology and material that it had imported for peaceful purposes. The explosion, which followed a series of ballistic missile flight-tests, sent a clear message that North Korea was seeking to develop a nuclear arsenal. The test explosion was widely condemned and the United Nations Security Council responded by demanding that North Korea return to the Six-Party Talks with China, Japan, South Korea, Russia and the USA and imposing financial and trade restrictions aimed at denying North Korea access to the nuclear- and missile-related technology, equipment and expertise.

In January **Iran** ended the voluntary suspension of its uranium enrichment programme and resumed installation of gas centrifuges at the pilot enrichment plant at Natanz. The move prompted the Board of Governors of the International Atomic Energy Agency (IAEA) to refer Iran’s nuclear file to the UN Security Council, which adopted a resolution in July demanding that Iran suspend all uranium enrichment-related and plutonium reprocessing activities, including research and development, subject to IAEA verification. Iran defied this demand and the Security Council adopted a new resolution in December imposing sanctions targeting Iran’s nuclear and ballistic missile programmes.

The controversial **Indian–US Civil Nuclear Cooperation Initiative**—aimed at resuming full civil nuclear co-operation between the two countries—remained in limbo at the end of 2006. In March both sides approved a plan for separating India’s nuclear programme into civilian and military components. In December the US Congress approved an India-specific

exemption from the 1954 Atomic Energy Act, a crucial step towards the resumption of trade in nuclear materials and technology. However, India objected to conditions imposed by the US legislation.

At the Conference on Disarmament (CD), the USA submitted a draft text for a **global fissile material cut-off treaty** (FMCT). The text did not include any provisions for an international verification mechanism, which put the USA at odds with most other CD members. Despite renewed efforts during the year, the long-delayed negotiations on a FMCT remained stalled on procedural matters.

Appendix 12A, by *Shannon N. Kile, Vitaly Fedchenko and Hans M. Kristensen*, contains **tables of data on nuclear forces** held by nine states. At the beginning of 2007, the five nuclear weapon states recognized under the Non-Proliferation Treaty (NPT)—China, France, Russia, the United Kingdom and the USA—

The five nuclear weapon states recognized under the NPT possessed a total of more than 26 000 nuclear warheads.

possessed a total of more than 26 000 nuclear warheads, including deployed weapons, spares and those in both active and inactive storage. All of these states, with the exception of the UK, had significant nuclear weapon modernization programmes under way. The UK announced its intention to replace its Trident submarine fleet with a new submarine-based nuclear deterrent beginning in the 2020s. India and Pakistan, which along with Israel are de facto nuclear weapon states outside the NPT,

continued to develop new missile systems capable of delivering nuclear weapons. North Korea's nuclear test explosion in October 2006 was widely believed to have been only a partial success and raised doubts about whether North Korea could manufacture operational nuclear weapons.

Appendix 12B, by *Vitaly Fedchenko and Ragnhild Ferm Hellgren*, describes the **nuclear explosion in North Korea** in October 2006 and lists **all nuclear explosions since 1945**.

Appendix 12C. Fissile materials: global stocks, production and elimination

Harold Feiveson, Alexander Glaser, Zia Mian and Frank von Hippel

Today, there are roughly 1700 tonnes of highly enriched uranium (HEU) and 500 tonnes of separated plutonium in the world, sufficient to produce over 100 000 nuclear weapons. Access to these fissile materials is the main technical barrier determining whether a state can acquire nuclear weapons. Russia and the USA possess more than 90 per cent of the fissile materials produced for weapons, but half of the separated plutonium has been produced for civilian purposes. While the five NPT-recognized nuclear weapon states have all stopped producing fissile materials for weapons, India, Pakistan and perhaps Israel and North Korea continue to do so.

Russia and the USA have declared significant amounts of HEU as being in excess of military needs. About 285 tonnes of Russian HEU and 92 tonnes of US HEU from redundant nuclear warheads have been down-blended and sold for use in US civilian power reactors. However, Russia, the United Kingdom and the USA have very large stocks of weapon-usable HEU for future use in their naval reactors. The USA alone has a declared naval reserve of

weapon-grade HEU large enough to make approximately 5000 nuclear warheads.

The global stockpile of separated plutonium is a little over 500 tonnes.

Almost half of this stockpile is military and is held by the USA and Russia. About 250 tonnes of plutonium has been separated from spent fuel from civilian nuclear power reactors, mostly in the UK, France and Russia. **The growing stock of civilian separated plutonium will soon be significantly larger than the amount intended for use in weapons—and it is all weapon-usable.**

The civilian nuclear fuel cycle relies on uranium enrichment, increasingly by use of gas-centrifuge technology. Significant facilities are operating, under construction or planned in 12 countries. The uneconomical practice of separating plutonium from civilian power-reactor fuel for recycling continues primarily because of difficulties in obtaining local acceptance of centralized spent-fuel storage facilities. Sizeable reprocessing facilities operate in France, India, Israel, Japan, Pakistan, Russia and the UK.

Major uncertainties remain about the size of the stockpiles of military fissile material held by all the nuclear weapon states other than the USA and the UK. Declarations of fissile material stocks and greater transparency about their production and disposition histories in other countries could build confidence for further reductions in nuclear arsenals and fissile material holdings.

There are roughly 1700 tonnes of highly enriched uranium and 500 tonnes of separated plutonium in the world, sufficient to produce over 100 000 nuclear weapons.

Chapter 13. Chemical and biological weapon developments and arms control

John Hart and Frida Kuhlau

The Sixth Review Conference of the 1972 Biological and Toxin Weapons Convention (BTWC) took place in Geneva from 20 November to 8 December 2006. The participants agreed that a series of annual meetings should be held in 2007–10 to consider measures to promote effective implementation of the BTWC; improve bio-safety and bio-security at biological facilities; and improve national capabilities for disease surveillance, detection and diagnosis. The participants also established a temporary unit to provide administrative support to the annual meetings. The unit will additionally facilitate the annual exchange of information among the BTWC parties, which will serve as a confidence-building measure.

At the 11th Conference of the States Parties to the 1993 Chemical Weapons Convention (CWC), which took place in December 2006, it was decided that representatives of the Executive Council should visit chemical weapon facilities on the territories of states parties that have requested extensions of chemical weapon destruction deadlines. This decision reflected heightened concern among the parties to the CWC that the convention's deadline for destruction of all chemical weapon stockpiles—29 April 2012—will not be met by all states in possession of chemical weapons.

There was increasing recognition in 2006 that achieving universal adherence to the BTWC and the CWC and effectively

implementing their provisions will substantially reduce the risk of proliferation and terrorism. The fundamental policy challenge is to define the threat posed by chemical and biological weapons (both generally and in specific cases) and identify what combination of national and international measures would best mitigate such threats.

There is still too little authoritative public information that can be used to evaluate proliferation threat assessments.

Bio-security and bio-safety-related developments were addressed in various initiatives and frameworks in 2006, including ad hoc arrangements and activities at the national and regional levels. Some efforts were devoted to improving disease surveillance and response, others to international non-proliferation

and disarmament assistance measures. Further allegations were made about the development or use of chemical and biological weapons and more information became available about past programmes.

A proper appreciation of the threats posed by chemical and biological weapons requires an interdisciplinary approach that encompasses historical, legal, political and technical factors. However, there is still too little authoritative public information that can be used to evaluate proliferation threat assessments and accusations that state and non-state actors wish to acquire, develop or use such weapons. The ways to develop effective policies to implement threat assessments and risk-remediation strategies are not always well understood.

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Chapter 14. Conventional arms control

Zdzislaw Lachowski and Martin Sjögren

The year 2006 was the seventh ‘lean year’ since the signing of the 1999 Agreement on Adaptation of the Treaty on Conventional Armed Forces in Europe (CFE Treaty). There were no signs of progress at the Third Review Conference of the Certain Conventional Weapons (CCW) Convention in May. The adapted CFE Treaty regime remained hostage to disagreements between Russia and Western states over political texts adopted at the 1999 Istanbul Summit of the Organization for Security and Co-operation in Europe (OSCE). As a result, the entry into force of the Agreement on Adaptation will remain stalled until Russia completes its promised military pullouts, especially from Moldova. At present, **progress in conventional arms control seems virtually impossible** due to Russia’s non-compliance with its own commitments, the

The adapted CFE Treaty regime remained hostage to disagreements between Russia and Western states.

measures and military doctrines, to improve capacity to meet the common and regional risks and challenges facing Europe. The 2006 Vienna military doctrine seminar enabled discussion and clarification of the current military security thinking and postures of the OSCE participants. It is to be hoped that it will give impetus to further doctrinal changes in response to rapid political and technological developments. Other steps in the fields of confidence building, transparency and stability enhancement in 2006 focused on the multiple dangers created by stockpiles of small arms and ammunition. In Latin America, there is sustained interest in putting confidence-building measures into practice. The number of states adhering to the 1997 Anti-Personnel Mines Convention is rising, although there is concern that some

CFE Treaty limits and holdings of states in the area of application, as of 1 January 2006

	Tanks	ACVs	Artillery	Aircraft	Helicopters	Personnel
Limit	39 142	59 822	38 286	13 462	4 000	5 789 181
Holding	24 774	44 140	28 236	7 135	1 971	2 892 667

political tug of war between Russia and the member states of the North Atlantic Treaty Organization (NATO), ‘arms control fatigue’ and the deteriorating status of the OSCE.

The OSCE participant states continued to consider, review and develop certain military-related efforts, including confidence- and stability-building

parties to the convention seem likely to miss their current deadlines for the elimination of the landmine stockpiles. The successful entry into force in 2006 of Protocol V on explosive remnants of war of the 1981 CCW Convention, and developments at the Third CCW Convention Review Conference showed that, despite reluctance on the part of some

powerful countries, **interest in humanitarian efforts to contain the scourge of 'inhumane weapons' is steadily growing.**

Appendix 14A. The global campaign against MANPADS

Matt Schroeder

Terrorists have been acquiring—and using—man-portable air defence systems (MANPADS) since the early 1970s, perhaps even earlier. However, it was not until two MANPADS missiles nearly hit an Israeli airliner as it departed from a Kenyan airport in 2002 that the international community finally mobilized to address the threat. Since then, the USA and other countries have taken unprecedented steps to curtail the illicit trade in MANPADS and protect civilian airliners from missile attacks. These countries have secured five multilateral agreements on controls for MANPADS exports, destroyed thousands of surplus and poorly secured MANPADS, and improved the security of stockpiles holding thousands more. Equally important are ongoing efforts to raise awareness of the threat, improve perimeter security at major airports and adapt military anti-missile systems for use on commercial airliners. Together, **these initiatives have substantially reduced the pool of missiles vulnerable to theft, loss and diversion**, and laid the groundwork for significant improvements in airport

perimeter security, export controls and aircraft protection.

Despite this progress, **the terrorist threat from MANPADS persists.** Recent reports of missiles seized from, transferred to or used by non-state groups in Afghanistan, El Salvador, Iraq, Lebanon and Somalia underscore the need for additional control strategies and the expansion of existing programmes and initiatives. Historically, transfers from governments to non-state actors have been a major, if not the largest, source of MANPADS for these groups. Of particular importance is the development of launch-control features, which limit the utility and lifespan of missiles that have been lost, stolen or diverted to terrorists and other unauthorized end-users. Producer states should conduct feasibility studies of possible launch-control features and support the rapid production and installation of the most promising

Since 2002 the USA and other countries have taken unprecedented steps to curtail the illicit trade in MANPADS and protect civilian airliners from missile attacks.

technologies. Another prerequisite for eliminating the threat from MANPADS is the universal adoption of rigorous physical security and stockpile-management practices. The international community should universalize best practices in stockpile security by converting existing best practice guides into a binding international agreement.

Finally, donor governments should expand foreign aid programmes that help to secure weapons depots and destroy surplus MANPADS, many of which are severely under-funded.

Chapter 15. Controls on security-related international transfers

Ian Anthony and Sibylle Bauer

In 2006 the United Nations Security Council adopted resolutions restricting access by Iran and North Korea to international supplies of certain proliferation-sensitive items. These resolutions form part of the overall effort to persuade Iran and North Korea to change their national nuclear policies in order to achieve nuclear non-proliferation and disarmament goals supported by the international community. However, if they are to be effective, the restrictions laid down by the Security Council will require all UN member states to apply their national export controls.

The number of countries that participate in informal groups to strengthen national export controls has grown continuously since the mid-1990s. The states that participate in these groups have all adopted national legislation to ensure that

The number of countries that participate in informal groups to strengthen national export controls has grown continuously since the mid-1990s.

proliferation-sensitive items are assessed and authorized by national authorities prior to export. However, participation in this cooperation is far from universal. The number of participants in the relevant groups ranges from 34 partners in the Missile Technology Control Regime to 45 partners in the Nuclear Suppliers Group.

Law enforcement communities have recently begun to strengthen their cooperation under the Proliferation Security Initiative in an attempt to impede and stop illegal shipments of proliferation-sensitive items. **This cooperation could help to ensure that illegal shipments of proliferation-sensitive items do not reach their intended end-users** in cases where it has not been possible to prevent export.

Annexes

Annex A, by *Nenne Bodell*, summarizes the major **arms control and disarmament agreements** and lists the states parties as of February 2007.

Annex B, by *Nenne Bodell*, is a **chronology** of the major arms control and security-related events of 2006.

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