SIPRI
YEARBOOK
2008

ARMAMENTS, DISARMAMENT AND INTERNATIONAL SECURITY

Summary

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SIPRI and the SIPRI Yearbook

The Stockholm International Peace Research Institute (SIPRI) is an independent international institute for research into problems of peace and conflict, especially those of arms control and disarmament. SIPRI was established in 1966 to commemorate 150 years of unbroken peace in Sweden.

Research is conducted at SIPRI by an international staff of researchers. The Institute's current research programme centres on the following projects:

- Armed Conflicts and Conflict Management
- Arms Transfers
- Euro-Atlantic, Regional and Global Security
- Military Expenditure and Arms Production
- Non-proliferation and Export Control
- Arms Control and Disarmament Documentary Survey
- IT projects, including the FIRST (Facts on International Relations and Security Trends) online database

The SIPRI Yearbook was first published in 1969 and is now in its 39th edition. *SIPRI Yearbook 2008* presents a combination of original data in areas such as world military expenditure, international arms transfers, arms production, nuclear forces, major armed conflicts and multilateral peace operations with state-of-the-art analysis of important aspects of arms control, peace and international security. The Yearbook is written by both SIPRI researchers and invited outside experts.

This booklet summarizes the contents of the SIPRI Yearbook 2008 and gives samples of the data and information in its appendices and annexes.

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Introduction. A call to arms control

Bates Gill

The next one to two years will see far more high-level discussion and debate on the merits of arms control and disarmament. This emerges from a broadening consensus around the world that more serious and effective arms control and disarmament measures should be implemented. Two trends have converged in ways that raise the arms control policy debate to new and interesting levels. One points to increasing concerns about, threats to and the potential collapse of long-standing arms control and non-proliferation agreements and understandings. The other points to new and emergent opportunities for more effective arms control, non-proliferation and disarmament steps.

There are a number of reasons to see a widening window of opportunity for important gains in arms control. Disarmament and related confidence- and security-building measures by the two principal nuclear weapon powers—Russia and the USA—will be especially important, and these two states should take a number of critical steps forward in the near term. A broader, global effort will also be needed which reaches beyond these two countries, which pulls in both nuclear and non-nuclear weapon states, and which firmly stakes out common ground across political divides.

Three caveats are in order which should cast a more realistic light on coming prospects for arms control. First, the priorities of the next US Administration will have a critical role in shaping the progress for arms control. Second, while progress on existing and potentially new multilateral treaties might garner most international attention, these approaches should not overshadow other mechanisms which hold out good prospects for concrete progress in arms control and disarmament. Finally, arms control and disarmament cannot solve all the world's problems. For 'arms control' to have greater relevance, the traditional meaning of the term should undergo some broadening to encompass non-treaty- and non-state-based approaches to security building. These approaches can also effectively lower the threat of unnecessary and indiscriminate violence while building confidence among security actors at the international, national and sub-state levels.

Voices from across the political spectrum are coming to recognize again the value of arms control in the face of looming threats to humankind. While moving ahead faces tremendous obstacles, in the coming years a new window of opportunity will open even wider to realize constructive progress on arms control and disarmament. It is clearly in the interest of citizens and governments alike to take pragmatic and positive steps in the right direction.

1. Euro-Atlantic security institutions and relationships

Jean-Yves Haine, Gunilla Herolf and Zdzislaw Lachowski

During 2007 the main Euro-Atlantic actors confronted renewed estrangements and managed old ones. The outstanding features of this dynamic were sharpened differences between Russia and other states of the Euro-Atlantic community, the challenges confronting the European Union's cohesion and efficiency and the lack of purpose of the Atlantic community's security cooperation. Greater pragmatism characterized the United States' security policy.

The most significant development in Euro-Atlantic relations in 2007 was Russia's restored confidence and aspirations to equal status in security matters with its Western partners. Increasingly assured by the lucrative exploitation of its natural resources and emboldened by their use as a successful political weapon, Russia has returned to its traditional policy of playing its European partners against each other—seeking to weaken the transatlantic ties and to reassert its influence over the former Soviet states. At the same time, Russia appears eager to maintain cooperative relations with the West and it is unlikely to risk challenging it too forcefully.

The EU adopted the Lisbon Treaty, which broadly maintains the main elements of the rejected 2004 Constitutional Treaty, especially in foreign and security policy areas. However, the EU has not yet fully recovered from the Constitutional Treaty debacle, which has considerably hampered its programme for the wider European neighbourhood, external relations and common foreign and security policy. The EU can now harness its considerable potential by translating the new legal framework into political action. Yet the treaty ratification processes and the differences over leadership and new competences may absorb the EU's energies by emphasizing once again national preferences and opt-outs rather than genuine foreign agendas.

The challenges of the transatlantic partnership are increasingly global. Consensus and commitment are difficult to achieve and sustain. When acting together, the partnership still suffers from self-imposed constraints, divergent approaches or insufficient leverage. The European–US rapprochement that emerged in 2007 was based more on acknowledged weaknesses than projected strengths. In the USA, the policies that had diminished the country's influence and prestige at home and abroad have largely been abandoned in favour of a more pragmatic approach to world affairs. Yet the USA remains heavily involved in Iraq and its diplomatic impact has shrunk globally. With a pending election, no foreseeable exit from Iraq and a worsening economy, the USA may become more inward-looking. Thus, transition will be the Euro-Atlantic community's theme in 2008 and 2009.

2. Trends in armed conflicts

Ekaterina Stepanova

Major armed conflicts, 2007

In 2007, 14 major armed conflicts were active in 13 locations around the world.

Africa
  Somalia
Americas
  Colombia
  Peru
  USA
Asia
  Afghanistan
  India (Kashmir)
  Myanmar (Karen State)
  Philippines
  Philippines (Mindanao)
  Sri Lanka ('Tamil Eelam')
Europe
  Russia (Chechnya)
Middle East
  Iraq
  Israel (Palestinian territories)
  Turkey (Kurdistan)

Over the past decade the global number of active major armed conflicts has declined overall, but the decline has been very uneven, with major drops in 2002 and 2004 and an increase in 2005.

Three of the major armed conflicts in 2007 were not active in 2006 (i.e. had not started or had fewer than 25 battle-related deaths): Peru, the Philippines (Mindanao) and Somalia. Three conflicts in 2006 were no longer active in 2007: Burundi, Sudan and Uganda.

Four of the 14 major armed conflicts that were active in 2007 increased in intensity compared to 2006: Sri Lanka (Tamil Eelam), Afghanistan, Myanmar (Karen State) and Turkey (Kurdistan). In the latter three, battle-related deaths increased by more than 50 per cent.

In 2007 the fragmentation of armed violence, the diversification of armed actors and the blurring of boundaries between categories of violence and between their actors were among the predominant trends in armed conflicts. These patterns were evident in some of the world's deadliest armed conflicts and conflict-prone zones, including Darfur (Sudan), Iraq and Pakistan.

While changes in the US-led military surge and counter-insurgency strategy had some stabilizing effect in parts of Iraq from mid-2007, the overall security situation remained uneven. The modest decline in inter-sectarian violence in some mixed areas can also be attributed to increased population displacement. At the local level, the rise of militant power brokers ranging from neighbourhood security groups to street gangs and smuggling networks contributed to the further fragmentation of violence.

Decline in state-based fighting in Darfur did not lead to improved security conditions. The main patterns of violence continued to shift from state-based armed confrontation to a complex mix of less intensive but numerous mini conflicts. Rebel, defecting and state-affiliated armed groups switched alliances depending on circumstances and engaged in predatory violence, local power-brokering and cross-border incursions. Violence against civilians continued unabated, and

the number of people killed by tribal and factional violence was greater than the number killed in battles between the government and the rebels.

In Pakistan, following the breakdown of a ceasefire between the government and pro-Taliban militants, the tribal areas saw some of the fiercest violence for several years, including an increase of incursions into Afghanistan, attacks on government forces and suicide terrorism. Growing 'Talibanization' of the tribal areas was paralleled by Islamist radicalization across Pakistan that culminated in the Red Mosque siege in July 2007. The overlapping of local, national, regional and transnational political and religious violence in Pakistan was demonstrated by the dynamics of terrorist activity, including the assassination of former Prime Minister Benazir Bhutto.

In all three locations, state weakness was one of the critical factors stimulating the fragmentation and the growing intractability of armed violence in 2007. In order to reduce violence in weak, conflict-torn states, efforts to support state building that combine functionality with local legitimacy should be seen as a priority. Domestically generated movements that enjoy considerable popular support and pursue broad social, political and security agendas may be most capable of achieving this combination—even if their ideologies and agendas are significantly different from those promoted by the leading international actors.

Regional distribution and total number of major armed conflicts, 1998–2007
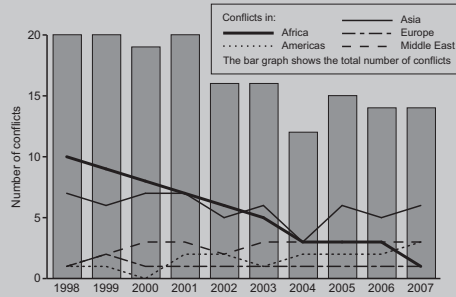
For the fourth consecutive year no interstate conflict was recorded in 2007. Only three major armed conflicts were fought between states during the entire period 1998–2007: Eritrea–Ethiopia (1998–2000); India–Pakistan (1998–2003); and Iraq versus the USA and its allies (2003). The remaining 30 major armed conflicts recorded for this period were all fought within states.

In 2007 four conflicts were categorized as internationalized—that is, they included troops from a state that was not a primary party to the conflict but was aiding one of the conflict parties. This is an increase of one over the number in 2006. Just as in 2006, all the internationalized conflicts in 2007 were in some way linked to the US-led 'global war on terrorism'.

While major armed conflicts are the most intense and result in largest battle-related death tolls, they only comprise roughly half of all state-based conflicts and about one fourth of all armed conflicts, including non-state based conflicts fought between non-state actors, mostly in Africa and Asia.

These facts and data are taken from appendix 2A, 'Patterns of major armed conflicts, 1998–2007', by Lotta Harbom and Peter Wallensteen of the Uppsala Conflict Data Program (UCDP), and are based on the UCDP Database, <http://www.ucdp.uu.se/database/>.

2C. The human security approach to direct and structural violence

Albrecht Schnabel

Human suffering on an individual level and conflict and violence on communal, regional and international levels can be significantly reduced if individuals and communities feel secure and protected from the threats that emanate from direct and structural violence—that is, if their basic human security is guaranteed. In contrast, violation of the basic human needs of individuals and communities leads to human suffering and social and communal deterioration, and therefore to more violence in its direct and structural manifestations. This, in turn, perpetuates the frustration of human needs. Breaking this cyclical relationship hinges on the ability to reduce or avoid violence and thus provide human security.

The concept of human security is much debated and has been given varying definitions by scholars and governments alike. 'Human security threats' are identified here as those that threaten the lives of individuals and communities through direct and structural violence. This approach is manageable both in research and in practice. Although it covers threats posed by both direct and structural violence, the approach applies an impact threshold requiring violence to be life-threatening to individuals and communities. The mere avoidance of direct and structural violence does not satisfy the full range of requirements for positive peace, broad human security provision and the satisfaction of the complete hierarchy of human needs. Yet it offers a manageable definition that links population security with national security, structural violence with direct violence, and accountability for human insecurity with responsibility for the provision of human security.

Opting for direct and structural violence as interdependent core variables in human security analysis and provision offers opportunities to address the most crucial threats to populations and to prepare the grounds for the most effective mitigation mechanisms. Human insecurity mitigation requires:

- population- and context-specific threat and violence identification and analysis;
- threat-, context- and actor-specific designs of preventive and response measures;
- targeted prevention of direct and structural violence through multi-actor strategies; and
- monitoring and assessment of threat levels and of the implementation of mitigation and adaptation measures.

While such a systematic approach is relevant in the presence of structural violence—which is not always easy to recognize and where the identification of responsible causes and actors are a challenge at best—attention must be paid to the role of armed violence and its potential for escalating existing and creating new waves of direct and structural violence.

3. Planning and deploying peace operations

Sharon Wiharta

The continuing rise in the demand for peace operations and the growing diversity in their political, humanitarian and military nature and complexity require a more nuanced approach to operation planning. Planning demands greater internal coordination among different departments and agencies and enhanced cooperation among the multiplicity of external actors. In 2007 the United Nations, as part of its wider and long-term 'Peacekeeping 2010' reform strategy, sought to fully implement its Integrated Missions Planning Process (IMPP). The IMPP aims to provide a sequential, coherent and unified framework for pre-mission and transition planning of UN operations.

Although it is a complex process, pre-deployment planning is necessary for the success of any peace operation. Coupled with a coherent strategy, this planning can ensure that an operation has clearly defined objectives and mandates and is equipped with the necessary human, material and financial resources. Lessons gleaned from previous peace operations in Kosovo, Liberia and Timor-Leste indicate that planning needs to extend beyond a headquarters-based process and involve a wider set of stakeholders, particularly the host government and affected population.

One of the most frequently cited problems of operation planning occurs during the implementation phase, when an operation's
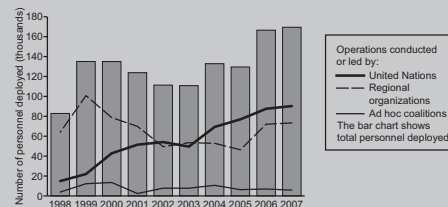
Peace operations, 2007

A total of 61 peace operations were conducted in 2007, two more than in 2006 and the highest number since 1999. This continues a rising trend since 2002, when 48 operations were carried out. The known costs of peace operations also continued to rise in 2007 and the number of personnel deployed to such operations reached an all-time high of 169 467.

Number of peace operations, 1998–2007
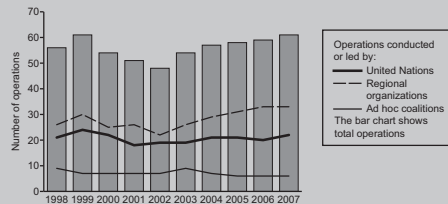
Personnel deployments to peace operations, 1998–2007

Note: The figures for 1998 do not include civilians deployed by the United Nations.

The number of personnel deployed to peace operations in 2007 was 2.5 per cent more than in 2006 and 60 per cent more than in 2003. Of the deployed personnel, 150 651 were military and 18 816 were civilian. The United Nations remained the largest actor in peacekeeping, conducting 22 operations—its largest number since 2000—deploying

90 305 personnel during 2007. A new record of participating countries was established during 2007: 119 countries contributed troops, military observers or police. NATO deployed the second highest number of personnel—57 930—in three operations. The African Union deployed 7371 personnel in three operations. All three of these organizations increased their total personnel deployments during 2007. In contrast, the EU deployed 5900 fewer personnel in 2007 than in 2006.

Number of peace operations and personnel deployed, by region, 2007

	No. of Operations	Total personnel deployed
Africa	18	69 355
Americas	3	9 406
Asia	10	46 019
Europe	20	27 018
Middle East	10	17 689
World	**61**	**169 467**

Most of the peace operations in Europe were conducted by regional organizations and alliances, principally the Organization for Security and Co-operation in Europe (OSCE). The UN continues to be the main actor in Africa, with 10 operations—the highest number of UN peace operations in one region—and 58 076 personnel, 85 per cent of all personnel deployed in the region.

In 2007, 41 per cent of all personnel were deployed to operations in Africa. Another 27 per cent were deployed in Asia, the great majority of whom were the 41 741 troops participating in the International Security Assistance Force (ISAF) in Afghanistan.

responsibility is transferred from headquarters to the field. This is usually because the team involved in the planning process is rarely the same team that will manage the operation. Nevertheless, the African Union/UN Hybrid Operation in Darfur, Sudan (UNAMID)—distinguished by its long lead-in time and intensive planning period—also demonstrated that even a well-planned mission may suffer from implementation challenges.

The examples of UNAMID, the UN Mission in the Central African Republic and Chad (MINURCAT) and the EU Military Operation in Chad and the Central African Republic (EUFOR Tchad/RCA) illustrate that there are limits to participation by domestic stakeholders during pre-deployment planning. Indeed, an inclusive and transparent planning process that embraces the principle of local ownership can undermine the actual deployment of a peace operation. Inclusive operation planning carries with it an understanding that there are trade-offs to be made. Revisions to both the UN and EU planning processes have been made in deference to the need to seek consent from the host government. However, these revisions neither match the needs of the situation nor take into account the demands of the civilian population.

These facts and data are taken from appendix 3A, 'Multilateral peace operations in 2007', by Kirsten Soder, and are based on the SIPRI Multilateral Peace Missions Database, <http://www.sipri.org/contents/conflict/database-Intro/>.

4. Integrating gender in post-conflict security sector reform

Megan Bastick

Security sector reform (SSR) is essential to post-conflict peacebuilding in order to prevent the reoccurrence of conflict, to enhance public security, and to create the conditions for reconstruction and development. The importance of women's participation and gender equality in peacebuilding and security is recognized by many governments and United Nations and donor agencies. However, efforts to promote these goals are often planned and implemented independently of each other, with the result that SSR fails to include women and to address the security needs of the entire population—including women, girls and boys.

Post-conflict SSR processes have used various approaches to address gender issues.

- In Afghanistan, Kosovo and Liberia SSR measures to recruit and retain women, and to make security institutions more responsive to gender issues presented challenges but also yielded positive results.
- In Peru, Sierra Leone and Timor-Leste truth and reconciliation commissions included mechanisms to address the experiences and justice needs of women.
- Rwandan women parliamentarians made distinctive contributions to SSR by uniting across party and ethnic lines to address issues of women's security.

- In Liberia and Sierra Leone disarmament, demobilization and reintegration processes contributed to developing operational procedures to ensure that women and girls are not excluded, and that the needs of men and boys are also addressed.
- In Liberia and South Africa women's civil society organizations were important partners in linking SSR with local security and justice concerns.

Gender mainstreaming—assessing the impact of SSR policies and activities on women, men, boys and girls at every stage of the process—is a key strategy. It must be accompanied by steps to ensure that both men and women participate and are represented in SSR processes.

Participation of women in post-conflict security services is crucial to creating structures that are representative, trusted and legitimate, and are able to meet the security needs of both men and women.

'Transitional justice' and justice reform processes have made advances in responding to gender issues. Ad hoc criminal tribunals have prioritized prosecution of sexual violence.

Successful integration of gender in SSR shares the broader challenges of SSR. External actors can encourage and support, but initiatives must be led by local stakeholders. SSR has much to gain by integrating gender.

5. Military expenditure

Petter Stålenheim, Catalina Perdomo and Elisabeth Sköns
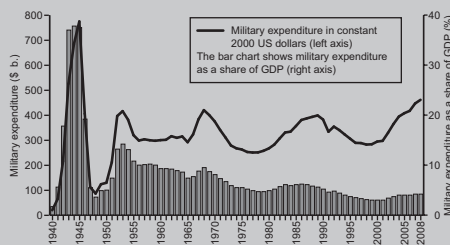
Military expenditure, 2007

Military expenditure by region and by income group, 2007

	Military spending, 2007 ($ b.)	Change, 1998–2007 (%)
World total	**1 339**	**+45**
Africa	18.5	*+51*
Americas	640	*+63*
Asia and Oceania	219	*+52*
Europe	370	*+16*
Middle East	91.5	*+62*
Low-income countries	41.9	
Lower middle-income countries	152	
Upper middle-income countries	107	
High-income countries	1 039	

Spending figures are in current US$. Change figures are based on spending in constant (2005) US$ prices and exchange rates.

The USA has by far the largest military expenditure. US military spending is now higher than at any time since World War II.

Trends in US military expenditure, 1940–2008

Military expenditure in constant 2000 US dollars (left axis)
The bar chart shows military expenditure as a share of GDP (right axis)

World military expenditure is estimated to have been $1339 billion in 2007—a real-terms increase of 6 per cent over 2006 and of 45 per cent since 1998. This corresponded to 2.5 per cent of world gross domestic product (GDP) and $202 for each person in the world.

The subregion with the highest increase in military expenditure over the 10-year period 1998–2007 was Eastern Europe, at 162 per cent. It was also the region with the highest increase in 2007, at 15 per cent. Russia, with a 13 per cent increase in 2007, accounted for 86 per cent of this regional increase. Other subregions with 10-year growth rates exceeding 50 per cent are North America (65 per cent), the Middle East (62 per cent), South Asia (57 per cent), Africa and East Asia (both 51 per cent). The subregions with the lowest growth in military spending over the past 10 years were Western Europe (6 per cent) and Central America (14 per cent).

The USA's military spending accounted for 45 per cent of the world total in 2007, followed by the UK, China, France and Japan, with 4–5 per cent each. Since 2001 US military expenditure has increased by 59 per cent in real terms, principally because of massive spending on military operations in Afghanistan and Iraq, but also because of increases in the 'base' defence budget. By 2007, US spending was higher than

at any time since World War II. However, because of the growth of the US economy and of total US Government spending, the economic and financial burden of military spending (i.e. its share of GDP and of total US Government outlays) is lower now than during previous peak spending years in the post-World War II period.

China has increased its military spending threefold in real terms during the past decade. However, due to its rapid economic growth, the economic burden of military spending is still moderate, at 2.1 per cent of GDP.

Military spending is rising rapidly in the South Caucasus—Armenia, Azerbaijan and Georgia—largely due to the region's three 'frozen' conflicts and the involvement of external actors. The rises have been made possible by economic upswings largely based on oil and gas revenues.

The number of countries that increased their military spending in 2007 was higher than in recent years. The factors driving increases in world military spending include countries' foreign policy objectives, real or perceived threats, armed conflict and policies to contribute to multilateral peacekeeping operations, combined with the availability of economic resources.

International comparison of military expenditure data is problematic. SIPRI uses market exchange rates for its analysis of military expenditure. The table below shows the five biggest spenders ranked according to their military spending converted into constant (2005) US dollars using market exchange rates.

The 15 countries with the highest military expenditure in 2007 in market exchange rate terms

Rank	Country	Spending ($ b.)	World share (%)
1	USA	547	45
2	UK	59.7	5
3	China	58.3	5
4	France	53.6	4
5	Japan	43.6	4
6	Germany	36.9	3
7	Russia	35.4	3
8	Saudi Arabia	33.8	3
9	Italy	33.1	3
10	India	24.2	2
11	South Korea	22.6	2
12	Brazil	15.3	1
13	Canada	15.2	1
14	Australia	15.1	1
15	Spain	14.6	1

Figures are in US$, at constant (2005) prices and exchange rates.

6. Arms production

Sam Perlo-Freeman and Elisabeth Sköns

The SIPRI Top 100

The SIPRI Top 100 list ranks the largest arms-producing companies in the world (outside China) according to their arms sales. The 10 largest companies in 2006 are listed below.

The 10 largest arms-producing companies, 2006

Rank	Company (country)	Arms sales, 2006 ($ m.)	Profit, 2006 ($ m.)
1	Boeing (USA)	30 690	2 215
2	Lockheed Martin (USA)	28 120	2 529
3	BAE Systems (UK)	24 060	1 189
4	Northrop Grumman (USA)	23 650	1 542
5	Raytheon (USA)	19 530	1 283
6	General Dynamics (USA)	18 770	1 856
7	EADS (West Europe)	12 600	124
8	L-3 Communications (USA)	9 980	526
9	Finmeccanica (Italy)	8 990	1 280
10	Thales (France)	8 240	487

Twelve companies entered the Top 100 list for 2006, six of them for the first time. US companies dominate the Top 100 list, both numerically and financially, with West European companies some way behind.

Global arms production is increasing. Arms sales by the 100 largest arms-producing companies in the world (excluding China)—the SIPRI Top 100— amounted to $315 billion in 2006, an increase of 9 per cent in nominal terms and 5 per cent in real terms. Forty-one US companies accounted for 63 per cent of the combined arms sales of the Top 100, while 34 West European companies accounted for 29 per cent. Generally, companies specializing in armoured vehicles— in demand by the USA for the conflict in Iraq—and in expanding sectors, such as military services and high-technology electronics and communications, had the biggest increases in arms sales in 2006. Russian companies also experienced high growth rates during 2006, primarily in aerospace and air defence.

There were 53 significant mergers and acquisitions in the North American and West European arms industry in 2007. Three of these were cross-border deals within Europe and 16 were transatlantic deals. Almost all the transatlantic mergers and acquisitions were between British and US companies. Most of the merger and acquisition activity was related to military services or to sub-systems, especially electronics and aerospace. Seven acquisitions had values over $1 billion. Four of these were domestic US acquisitions, two involved the acquisition of US companies by a British firm, and

one the acquisition of a British operation by a US company.

In Western Europe, 2007 saw major naval consolidation deals in France and the UK, both actively encouraged by the respective government. The French state-owned shipbuilder DCN took over the naval operations of Thales in a deal worth $714 million, while in the UK BAE Systems and VT Group agreed a joint venture amalgamating their surface shipbuilding and service operations.

There was a continued political push within the European Union (EU) in 2007 to promote a more integrated intra-EU arms industry and market. The European Defence Agency (EDA) agreed two strategy documents, one on building a European defence-technological and industrial base and the other on a military research and technology strategy. The European Commission proposed two directives, one to open up intra-EU arms procurement, the other to relax export control regulations for intra-EU arms transfers.

The Russian Government continued to consolidate the arms industry into large state-owned conglomerates. In 2007 the United Aircraft Corporation (UAC)—which amalgamates most of Russia's civil and military fixed-wing aircraft production—commenced operation and two new conglomerates were created: the United Shipbuilding Corporation (USC)—which consolidates the shipbuilding sector—and Rostekhnologii—which amalgamates military and civilian manufacturers and raw materials suppliers with Rosoboronexport, the state arms export agency.

Regional/national shares of arms sales for the SIPRI Top 100 for 2006

Region or country	No. of companies	Arms sales, 2006 ($ b.)
USA	41	200.2
Western Europe	34	92.1
Russia	8	6.1
Japan	4	5.2
Israel	4	4.6
India	3	3.5
South Korea	3	1.8
Singapore	1	0.9
Australia	1	0.5
Canada	1	0.5
Total	**100**	**315.3**

Figures for a country or region refer to the arms sales of Top 100 companies headquartered in that country or region, including those in its foreign subsidiaries, and thus do not reflect the sales of arms actually produced in that country or region.

The largest acquisitions in the West European and North American arms industry, 2007

Buyer company	Acquired company	Deal value ($ m.)
General Electric	Smiths Aerospace	4 800
BAE Systems	Armor Holdings	4 532
URS Corporation	Washington Group Intl	3 100
Carlyle Group	ARINC	. .
ITT Corporation	EDO Corporation	1 700
Meggitt	K&F Industries	1 300
Veritas Capital	Aeroflex	1 300
Textron	United Industrial Corporation	1 100

These facts and data are taken from chapter 6, appendix 6A, 'The SIPRI Top 100 arms producing companies, 2006', by Sam Perlo-Freeman and the SIPRI Arms Industry Network, and appendix 6B, 'Major arms industry acquisitions, 2007', by Sam Perlo-Freeman, and are based on the SIPRI Arms Industry Database and Files.

7. International arms transfers

Paul Holtom, Mark Bromley and Pieter D. Wezeman

The five largest suppliers of major conventional weapons and their main recipients, 2003–2007

Supplier	Share of global arms transfers (%)	Main recipients (share of supplier's transfers, %)
USA	31	South Korea (*12*), Israel (*12*), UAE (*9*), Greece (*8*)
Russia	25	China (*45*), India (*22*), Venezuela (*5*), Algeria (*4*)
Germany	10	Turkey (*15*), Greece (*14*), South Africa (*12*), Australia (*9*)
France	9	UAE (*41*), Greece (*12*), Saudi Arabia (*9*), Singapore (*7*)
UK	4	USA (*17*), Romania (*9*), Chile (*9*), India (*8*)

The five largest recipients of major conventional weapons, 2003–2007

Recipient	Share of global arms imports (%)
China	*12*
India	*8*
UAE	*7*
Greece	*6*
South Korea	*5*

Approximately 80 per cent of the volume of exports of major conventional weapons for the period 2003–2007 were accounted for by the five largest suppliers—the USA, Russia, Germany, France and the UK. Although these five suppliers are likely to continue to account for an overwhelmingly large share of international arms transfers, concerns were expressed in 2007 regarding the export prospects for French and Russian major conventional weapons.

Asia, Europe and the Middle East continued to be the largest recipient regions for the period 2003–2007. The largest recipient countries were China, India, the United Arab Emirates (UAE), Greece and South Korea. However, 2007 gave the first signs of a potentially significant change among the largest recipients, with decreased deliveries to and orders by China. The largest suppliers to Asia and the Middle East will continue to engage in intense competition for export orders, with Libya and Saudi Arabia likely to become large recipients once again.

SIPRI data show the volume of international arms transfers to South America in the period 2003–2007 to be 47 per cent higher than in 1998–2002. Despite attention-grabbing headlines and some evidence of competitive behaviour (e.g. the nature and timing of acquisitions by Brazil, Columbia and Venezuela), it seems unlikely that South America is in the midst of a classically

defined arms race. Acquisitions have been primarily motivated by efforts to replace or upgrade military inventories in order to maintain existing capabilities; to respond to predominantly domestic security threats; to strengthen ties with supplier governments; to enhance domestic arms industry capability; or to bolster regional or international profile.

Arms suppliers meet the demand for weapons that a conflict creates for a number of reasons: to gain political and economic influence, to substitute for an interested external party's direct military presence and to meet the powerful economic pressures to sell arms. The international transfer of arms to conflict zones in Afghanistan and Sudan illustrates a number of related tendencies. First, UN arms embargoes imposed on armed non-state actors have thus far failed to stop their arms acquisitions. Second, major arms suppliers have been willing to show their support for the government in a conflict zone by directly supplying it with arms. Third, internationally sanctioned peacekeeping operations often struggle to obtain suitable arms and military equipment.

While the volume of international transfers of major conventional weapons for the period 2003–2007 has continued the increase since 2000–2004, the volume transferred in 2007 alone was 8 per cent lower than in 2006.

The trend in transfers of major conventional weapons, 1998–2007
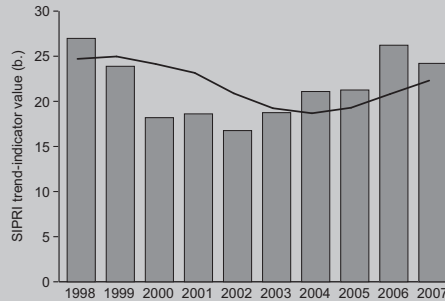
The bar graph shows annual totals and the line graph shows the five-year moving average. Five-year averages are plotted at the last year of each five-year period. The SIPRI trend-indicator value measures the volume of arms transfers.

It is not possible to ascribe a precise financial value to the international arms trade. However, by aggregating financial data from the main suppliers, it is possible to make an indicative estimate. The estimated financial value of the international arms trade in 2006 is $45.6 billion, which represents 0.4 per cent of world trade.

The financial value of global arms exports according to national government and industry sources.

World total	45 628
USA	14 008
Russia	6 500
France	5 061
UK	3 792
Israel	3 000

Figures are in US$ m. at constant (2006) prices.

These facts and data are taken from chapter 7, appendix 7A, 'The suppliers and recipients of major conventional weapons', by the SIPRI Arms Transfers Project, and appendix 7B, 'The financial value of the arms trade', by Mark Bromley, and are based on the SIPRI Arms Transfers Database, <http://armstrade.sipri.org/>.

8. Nuclear arms control and non-proliferation

Shannon N. Kile

In 2007 Iran's nuclear programme remained at the centre of international controversy. Iran continued to install gas centrifuges at its pilot uranium enrichment plant at Natanz, leading the United Nations Security Council to adopt Resolution 1747, demanding that Iran suspend all enrichment-related and reprocessing activities and imposing additional sanctions on Iran.

In August Iran and the International Atomic Energy Agency (IAEA) finalized a work plan to address outstanding safeguards compliance issues in Iran and set a timeline for concluding remaining issues related to the IAEA's investigation into Iran's past nuclear activities. However, there continued to be controversy over allegations that Iran had carried out undeclared studies related to nuclear weapons. In December the USA released an unclassified summary of a new National Intelligence Estimate that concluded 'with high confidence' that Iran had halted its nuclear weapon programme in the autumn of 2003 and had not resumed it.

In February 2007 the Six-Party Talks—between China, Japan, North Korea, South Korea, Russia and the USA—agreed an Action Plan under which North Korea would shut down for the 'purpose of eventual dismantlement' its nuclear facilities at Yongbyon in return for energy assistance and other economic and political benefits.

However, North Korea failed to disable the nuclear facilities and to provide a comprehensive declaration of its nuclear programmes and past activites by the year-end deadline set out in an October 2007 agreement for implementing the Action Plan. There were two main controversies left unresolved by the North Korean declaration: how much plutonium North Korea had separated; and whether North Korea had engaged in suspected work on uranium enrichment.

India and the USA announced a draft '123 agreement' that specified the terms governing the resumption of Indian–US trade in nuclear material and technology that was envisaged in the 2005 Indian–US Civil Nuclear Cooperation Initiative (CNCI). The draft agreement was criticized in the USA for contravening conditions imposed by the US Congress in 2006 which were aimed at ensuring that the CNCI complied with US non-proliferation and other legislation. It continued to face strong political opposition in India.

In Geneva the Conference on Disarmament (CD) again failed to open the long-delayed negotiations on a global fissile material cut-off treaty. The CD remained unable to adopt a work programme because of a dispute over whether to establish negotiating committees for other items on its agenda. Several states continued to show a general lack of enthusiasm for concluding a ban, at least in the near term, on producing fissile material for weapon purposes.

in 2005 that it had developed nuclear weapons and conducted a nuclear test in 2006, but there is no public information to verify that North Korea has weaponized its nuclear capability.

As of 2007, global stocks of highly enriched uranium totalled approximately 1370 tonnes (not including 346 tonnes to be blended down). Global military stocks of separated plutonium totalled approximately 228–282 tonnes and civilian stocks totalled 244.9 tonnes.

The United States continues to pursue an expansive array of programmes for active defence against perceived emerging threats from ballistic missiles, including missiles potentially carrying nuclear warheads

Funding for the US Missile Defense Agency, financial years 2003–13

Year	Funding
2003	6 714
2004	7 674
2005	9 169
2006	7 695
2007	9 388
2008	8 899
2008–13[a]	56 666

Figures are for requested funds, in US $m. at current prices. Years are financial years (1 Oct.–30 Sep.). Figures do not include Defense-Wide Resources funding for missile defence programmes.
[a] This is a projected figure.

In 2007 the US Government Accountability Office (GAO) estimated that the USA had spent $107 billion on missile defence since the mid-1980s.

These facts and data are taken from appendix 8A, 'World nuclear forces, 2008', by Shannon N. Kile, Vitaly Fedchenko and Hans M. Kristensen, appendix 8B, 'Global stocks of fissile materials, 2007', by Harold Feiveson, Alexander Glaser, Zia Mian and Frank Von Hippel of the International Panel on Fissile Materials, Princeton University, and appendix 8C, 'A survey of US ballistic missile defence programmes', by Shannon N. Kile.

Appendix 8D. Nuclear forensic analysis

Vitaly Fedchenko

Many international treaties and national laws require mechanisms to verify compliance. Many such mechanisms rely on technology, and so encourage the development of better technical means for verification. Nuclear forensic analysis (nuclear forensics) is a newly emerging scientific discipline with direct applications in treaty verification and law enforcement. It is defined as 'the analysis of a sample of nuclear or radioactive material and any associated information to provide evidence for determining the history of the sample material'.

Individual nuclear forensic techniques were first developed during World War II when the USA collected samples of air and water in the vicinity of alleged German reactors in order to verify if plutonium production was taking place. They were routinely used in the context of Russian–US bilateral arms control treaties verification. With the emergence of the phenomenon of illicit trafficking of nuclear and radioactive materials in the early 1990s, nuclear forensics began to be applied to investigating many individual cases. Technological advances provided an opportunity for nuclear forensics to be successfully used in verifying a country's compliance with the International Atomic Energy Agency's safeguards. For instance, the collection of environmental ('swipe') samples at the nuclear fuel reprocessing line in Yongbyon, North Korea, in 1992 demonstrated that North Korea failed to declare all plutonium separation activities. Analysis of similar samples collected in Iran in 2003 provided strong evidence of undeclared uranium enrichment activities and helped to uncover the clandestine nuclear trade network led by Abdul Qadeer Khan.

The development of the verification mechanism for the 1996 Comprehensive Nuclear Test-Ban Treaty has demonstrated that nuclear forensic techniques can play a crucial role in confirming the nuclear nature of an explosion and determining key features of the explosive device. The same technologies will be essential for attribution of a nuclear explosive device if one were ever used in a terrorist attack. Nuclear forensics will also be pertinent to verification of the proposed fissile material cut-off treaty, because it can determine the 'age' (i.e. time since the last purification) of nuclear material and thus whether it was produced before a certain date.

The amount of information that can be obtained from application of nuclear forensic techniques depends on access to relevant sites and samples, which is often limited by legal or political considerations.

9. Reducing security threats from chemical and biological materials

John Hart and Peter Clevestig

Chemical and biological warfare (CBW) prevention and response measures encompass non-state and threat scenarios such as those involving improvised devices that contain toxic chemicals or pathogens. Actors that were on the periphery of efforts to prohibit CBW, such as public health providers, are now routinely included in threat perceptions and risk analyses. The developing field of microbial forensics is integral to bio-preparedness planning and law enforcement.

As of December 2007 approximately 26 000 agent tonnes of chemical weapons had been verifiably destroyed (of about 71 000 agent tonnes declared). Twelve states had declared 65 chemical weapon production facilities, of which 42 had been destroyed and 19 converted for peaceful purposes not prohibited under the 1993 Chemical Weapons Convention.

The temporary three-person Implementation Support Unit, established by the Sixth Review Conference of the 1972 Biological and Toxin Weapons Convention (BTWC), began operation in August 2007. It receives and distributes politically binding information exchanges meant to serve as confidence-building measures (CBMs) among the BTWC parties. In 2007 it produced a CD-ROM containing all CBM returns in 1987–2007.

In 2007 the United Nations Special Commission on Iraq (UNMOVIC) was disbanded. An Iraqi court sentenced Ali Hassan al-Majid ('Chemical Ali') for his role in the 1988 Anfal campaign against the Kurdish population in northern Iraq where chemical weapons were used.

A series of chlorine attacks occurred in Iraq in 2007 that injured or killed many. The use of chemicals together with conventional explosives for dispersal caused concern that insurgents might refine their dispersal techniques.

The use of chlorine was also a factor in discussions in the USA on how to protect its municipal water supplies and whether to replace chlorine with other chemicals.

Failures in bio-containment and bio-security received wide publicity in 2007, including at facilities where awareness and compliance with procedures were thought to be high. One such breach occurred in August at a farm near Pirbright, UK, where an outbreak of foot-and-mouth disease (FMD) was discovered.

In order to maintain and strengthen the international prohibition against CBW, studies bridging the gap between political and technical issues should continue to be carried out to:
- inform analyses of how dual-use technologies and equipment are handled in practice, and
- to promote better understanding of the derivation and use of information.

9A. International public health diplomacy and the global surveillance of avian influenza

Bernice Raveché

Influenza has caused some of the most devastating epidemics in human history, and experts widely agree that another influenza pandemic is on the horizon. Avian influenza, a variation of the H5N1 virus, is a likely candidate for the next strain to cause a global influenza pandemic.

Globalization has multiplied the quantity and types of international flows of people and goods. Given the potential for globalization to cause or exacerbate public health problems in different parts of the World, the World Health Organization (WHO) is likely to play an important role as part of a collective effort to build societal security. The role of the WHO in governing global health is changing, as evidenced by the revised International Health Regulations (IHR) that were adopted in 2005 and began to be implemented in June 2007. Because of the IHR's long history of ineffectiveness and non-compliance by a minority of member states, the WHO revised the IHR using a legal framework that gives the WHO an unprecedented legal authority over the global disease surveillance and reporting requirements of the member states. The new IHR have serious implications for the actions required of countries with cases of severe acute respiratory syndrome (SARS) and H5N1.

Indonesia is currently the 'hot zone' of the H5N1 outbreak in both humans and poultry, but in December 2006 the Indonesian Government withheld samples from the WHO because of uneven distribution of influenza vaccines, especially those made from virus samples collected in Indonesia. The Indonesian Government demanded that prior approval be obtained for the development of a vaccine from a virus found in the country and that a discount price for such a vaccine be negotiated for countries where the H5N1 virus is endemic. This stalemate was in violation of the revised IHR. However, in early 2008, Indonesia received assurance that its rights to vaccines produced from avian influenza samples would be recognized, and the country sent 12 avian influenza samples to the WHO.

The revised IHR reflect a shifting paradigm in global health as well as the changing role of the WHO. The future will show if the WHO can maintain impartiality and neutrality throughout the implementation of the revised IHR. If the WHO cannot prove its credibility to both developing and developed countries, it will lose its place as the leading international global health organization and global health will be further dictated by individual countries' foreign policy.

10. Conventional arms control

Zdzislaw Lachowski

The year 2007 witnessed the biggest challenge yet to the 1990 Treaty on Conventional Armed Forces in Europe (CFE Treaty) when Russia 'suspended' its participation in the regime. The brinkmanship over the treaty is a reflection of the wider spectrum of political and military issues that divide the participants in the Organization for Security and Co-operation in Europe (OSCE) rather than a conflict in its own right. Russia's separation of its legal arms control obligations and its 1999 Istanbul political commitments put it at loggerheads with other CFE parties which insist on treating the CFE process as a whole. The Western states have belatedly acknowledged the need to pay more serious attention to Russia's CFE-related concerns. However, given Russia's current behaviour and its non-observance of the treaty's flank restrictions, a quick reconciliation does not seem likely. In addition, both the members of the North Atlantic Treaty Organization (NATO) and states that are poised to join the agreed adapted CFE regime will be unwilling to accede to a treaty that is to be substantially changed to accommodate the demands of one party, at the apparent expense of others' sense of security.

Paradoxically, despite—or because of—the CFE crisis, arms control has moved up the European security agenda. The weakening of the CFE arms control regime has led to some disquieting reactions in the South Caucasus, while in Moldova the deadlock over the removal of Russian personnel and equipment persisted. In contrast, implementation of the 2005 Georgia–Russia agreement on the closure of Russian military bases and facilities in Georgia was all but completed, while the subregional arms control regime in the Balkans continued to operate smoothly.

With 'hard' arms control deadlocked, a 'soft' arms control regime of confidence- and security-building measures has been suggested as a substitute. However, with confidence being undermined in one place, it is difficult to restore and develop it in another. Nevertheless, the OSCE Code of Conduct on Politico-Military Aspects of Security retains its relevance, and other confidence-building steps among OSCE participants continue to focus on the multiple dangers created by surplus stockpiles of small arms, ammunition and toxic rocket fuel.

The number of states adhering to the 1997 Anti-Personnel Mines Convention rose to 156, taking it further towards universalization. More and more countries are participating in the 'Oslo process' to ban the use of cluster munitions.

11. Controls on security-related international transfers

Ian Anthony, Sibylle Bauer and Anna Wetter

Export controls are preventive measures intended to ensure that exported goods do not contribute to activities in other countries that are either illegal or undesirable from the perspective of the exporting state. The role of export controls in supporting the main multilateral non-proliferation treaties is now supplemented by the important role that they play in implementing decisions of the United Nations Security Council on particular countries (such as Iran or North Korea).

A number of multilateral cooperation arrangements attempt to improve the effectiveness of the participating states' national export controls. The participation in these arrangements continued to expand in 2007 when Croatia joined the Australia Group. The Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies completed a review and evaluation of its overall performance.

In 2007 the European Commission proposed simplifying the rules governing transfers of items specially designed and developed for military use from one European Union (EU) member state to another. The Commission has also proposed modifications to the legislation governing exports of items that are not specifically designed or developed for military use but that can have military uses ('dual-use items').

In 2006 and 2007 the UN Security Council adopted resolutions that prohibit and restrict certain types of international trade with Iran as part of a wider effort to address nuclear proliferation concerns. The prohibitions and restrictions decided by the UN focus on items that could contribute to the most sensitive activities from a proliferation perspective—uranium enrichment, the recovery of plutonium and the development of ballistic missiles that could deliver a nuclear weapon. The EU has taken steps to translate the UN decisions into rules binding on EU exporters. Indeed, the EU has extended the range of prohibitions and restrictions on trade with Iran beyond those mandated by the UN.

Export control authorities' enforcement of both export controls and non-proliferation sanctions requires that legal bases be adapted and institutional set-ups and procedures rethought. Effective enforcement demands the active, competent and cooperative involvement of a range of national actors—including customs, police, intelligence and prosecution services—and an appropriate legal framework—including penalties for export control violations. An international debate about what constitutes dissuasive, effective and proportionate sanctions in response to violations of export control law has been initiated, in particular within the EU.

Annexes

Nenne Bodell

Annex A, 'Arms control and disarmament agreements', contains summaries of multi- and bilateral treaties, conventions, protocols and agreements relating to arms control and disarmament, and lists of signatories and states parties.

Annex B, 'International organizations and intergovernmental bodies', describes the main international organizations, intergovernmental bodies, treaty-implementing bodies and export control regimes whose aims include the promotion of security, stability, peace or arms control and lists their members or participants as of 1 January 2008.

Annex C, 'Chronology 2007', lists the significant events in 2007 related to armaments, disarmament and international security

Treaties in force as of 1 January 2008

1925 Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare (1925 Geneva Protocol)

1948 Convention on the Prevention and Punishment of the Crime of Genocide (Genocide Convention)

1949 Geneva Convention (IV) Relative to the Protection of Civilian Persons in Time of War

1959 Antarctic Treaty

1963 Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water (Partial Test-Ban Treaty, PTBT)

1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (Outer Space Treaty)

1967 Treaty for the Prohibition of Nuclear Weapons in Latin America and the Caribbean (Treaty of Tlatelolco)

1968 Treaty on the Non-proliferation of Nuclear Weapons (Non-Proliferation Treaty, NPT)

1971 Treaty on the Prohibition of the Emplacement of Nuclear Weapons and other Weapons of Mass Destruction on the Seabed and the Ocean Floor and in the Subsoil thereof (Seabed Treaty)

1972 Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction (Biological and Toxin Weapons Convention, BTWC)

1974 Treaty on the Limitation of Underground Nuclear Weapon Tests (Threshold Test-Ban Treaty, TTBT)

1976 Treaty on Underground Nuclear Explosions for Peaceful Purposes (Peaceful Nuclear Explosions Treaty, PNET)

1977 Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (Enmod Convention)

1977 Protocol I Additional to the 1949 Geneva Conventions, and Relating to the Protection of Victims of International Armed Conflicts

1977 Protocol II Additional to the 1949 Geneva Conventions, and Relating to the Protection of Victims of Non-International Armed Conflicts

1980 Convention on the Physical Protection of Nuclear Material and Nuclear Facilities

1981 Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons which may be Deemed to be Excessively Injurious or to have Indiscriminate Effects (CCW Convention, or 'Inhumane Weapons' Convention)

1985 South Pacific Nuclear Free Zone Treaty (Treaty of Rarotonga)

1987 Treaty on the Elimination of Intermediate-Range and Shorter-Range Missiles (INF Treaty)

1990 Treaty on Conventional Armed Forces in Europe (CFE Treaty)

1991 Treaty on the Reduction and Limitation of Strategic Offensive Arms (START I Treaty)

1992 Treaty on Open Skies

1993 Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction (Chemical Weapons Convention, CWC)

1995 Treaty on the Southeast Asia Nuclear Weapon-Free Zone (Treaty of Bangkok)

1996 Agreement on Sub-Regional Arms Control (Florence Agreement)

1997 Inter-American Convention Against the Illicit Manufacturing of and Trafficking in Firearms, Ammunition, Explosives, and Other Related Materials

1997 Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction (APM Convention)

1999 Inter-American Convention on Transparency in Conventional Weapons Acquisitions

1999 Vienna Document 1999 on Confidence- and Security-Building Measures

2002 Treaty on Strategic Offensive Reductions (SORT)

Treaties not in force as of 1 January 2008

1972 Treaty on the Limitation of Anti-Ballistic Missile Systems (ABM Treaty)

1993 Treaty on Further Reduction and Limitation of Strategic Offensive Arms (START II Treaty)

1996 African Nuclear-Weapon-Free Zone Treaty (Treaty of Pelindaba)

1996 Comprehensive Nuclear Test-Ban Treaty (CTBT)

1999 Agreement on Adaptation of the CFE Treaty

2006 ECOWAS Convention on Small Arms, Light Weapons, their Ammunition and Other Related Materials

2006 Treaty on a Nuclear-Weapon-Free Zone in Central Asia (Treaty of Semipalatinsk)

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SIPRI Yearbook 2008: Armaments, Disarmament and International Security

Published in July 2008 by Oxford University Press on behalf of
Stockholm International Peace Research Institute

ISBN 978–0–19–954895–8 hardback c. 610 pp. £85/$150

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