Verification Yearbook 2000

VERTIC

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contents

Acronyms

ABACC	Argentina–Brazil Agency for Accounting and Control of Nuclear Material
ABM	Anti-Ballistic Missile
ACA	Agency for the Control of Armaments
AIT	Aerial Inspection Team
ASEAN	Association of South East Asian Nations
BMVC	Baghdad Monitoring and Verification Centre
BW	Biological Weapons
BWC	Biological Weapons Convention
CBM	Confidence-Building Measure
CCD	Conference of the Committee on Disarmament
CD	Conference on Disarmament (previously Committee)
CDM	Clean Development Mechanism
CFE	Conventional Armed Forces in Europe
CIA	Central Intelligence Agency
CIS	Commonwealth of Independent States
CITES	Convention on International Trade in Endangered Species
CIVPOL	Civilian Police
CNA	Computer Network Attack
CNI	Critical National Infrastructure
CNN	Cable News Network
COP/MOP	Conference of Parties/Meeting of Parties
COW	Committee of the Whole
CRF	Common Reporting Format
CSBM	Confidence- and Security-Building Measure
CSI	Commercial Satellite Imagery
CSP	Conference of States Parties
CTBT	Comprehensive Nuclear Test Ban Treaty
CTBTO	Comprehensive Nuclear Test Ban Treaty Organization
CW	Chemical Weapons

CWC	Chemical Weapons Convention
CWPF	Chemical Weapons Production Facility
D&D	Denial and Deception
DOC	Discrete Organic Chemical
ECMM	European Community Monitoring Mission
ECOMOG	Economic Community of West African States' Monitoring Group
EDMS	Electronic Document Management System
EM	Electromagnetic
EURATOM	European Atomic Energy Community
EEC	European Economic Community
EU	European Union
EXCO	Executive Council
FCC	Federal Court of Canada
FMCT	Fissile Material Cut-off Treaty
FRG	Federal Republic of Germany
FRY	Federal Republic of Yugoslavia
GAO	General Accounting Office
GEF	Global Environment Fund
GHG	Greenhouse Gas
GSE	Group of Scientific Experts
GSETT	Group of Scientific Experts Technical Test
HEU	Highly Enriched Uranium
HNP	Haitian National Police
HTML	Hyper Text Mark-up Language
IAEA	International Atomic Energy Agency
IAU	Investigations of Alleged Use
ICBL	International Campaign to Ban Landmines
ICBM	Intercontinental Ballistic Missile
ICJ	International Court of Justice
ICRC	International Committee of the Red Cross
ICRW	International Convention for the Regulation of Whaling
ICT	Information and Communication Technology
IDC	International Data Centre
IET	International Emissions Trading

IFOR	Implementation Force
IFOV	Instantaneous Field of View
IGO	Inter-Governmental Organisation
ILO	International Labour Organization
IMS	International Monitoring System
INF	Intermediate-range Nuclear Forces
INTERFET	International Force for East Timor
IPCC	Intergovernmental Panel on Climate Change
IPF	Intergovernmental Panel on Forests
IPM	International Police Monitor
IPSF	Interim Public Security Force
IR	Infrared
ISMA	International Satellite Monitoring Agency
IT	Information Technology
IVO	International Verification Organisation
IW	Information Warfare
JCIC	Joint Compliance and Inspection Commission
JI	Joint Implementation
KFOR	Kosovo Force
KPS	Kosovo Police Service
LTBT	Limited Test Ban Treaty
LUCF	Land-Use Change and Forestry
MBFR	Mutual and Balanced Force Reduction
MEA	Multilateral Environmental Agreement
MCP	Multilateral Consultative Process
MFO	Multinational Force and Observers in the Sinai
MIRV	Multiple Independently Targetable Re-entry Vehicle
MLF	Multi-Lateral Fund
MOMEP	Military Observer Mission Ecuador–Peru
MTM	Multinational Technical Means
NAFTA	North American Free Trade Agreement
NATO	North Atlantic Treaty Organization
NCP	Non-Compliance Procedure
NGO	Non-Governmental Organisation
NNWS	Non-Nuclear Weapon State

NPT	Non-Proliferation Treaty
NRDC	Natural Resources Defense Council
NTM	National Technical Means (of verification)
NWFZ	Nuclear Weapon-Free Zone
NWC	Nuclear Weapons Convention
NWS	Nuclear Weapon State
OECD	Organization for Economic Cooperation and Development
OMV	Ongoing Monitoring and Verification
ONUC	United Nations Operation in the Congo
ONUCA	United Nations Observer Group in Central America
OPBW	Organization for the Prohibition of Bacteriological (Biological) and Toxin Weapons
OPCW	Organization for the Prohibition of Chemical Weapons
ORCI	Office for Research and Collection of Information
OSCE	Organisation for Security and Co-operation in Europe
OSI	On-Site Inspection
PCI	Practice Challenge Inspection
PDD	Presidential Decision Directive
PNE	Peaceful Nuclear Explosion
PNET	Peaceful Nuclear Explosions Treaty
PREPCOM	Preparatory Commission
PTBT	Partial Test Ban Treaty
PTS	Provisional Technical Secretariat
RSMA	Regional Satellite Monitoring Agency
SAB	Scientific Advisory Board
SALT	Strategic Arms Limitation Talks
SAR	Synthetic Aperture Radar
SCC	Standing Consultative Commission
SFOR	Stabilization Force
SIGINT	Signals Intelligence
SIPRI	Stockholm International Peace Research Institute
SIR	Status of Implementation Report
SLBM	Submarine-Launched Ballistic Missile
SLCM	Sea-Launched Cruise Missile

SRG	Special Republican Guard
START	Strategic Arms Reduction Talks
TRAFFIC	Trade Records Analysis of Fauna and Flora in Commerce
TS	Technical Secretariat
TTBT	Threshold Test Ban Treaty
UNAMIR	United NationsAssistance Mission for Rwanda
UNAVEM	United Nations Angola Verification Mission
UNEF	United Nations Emergency Force
UNFCCC	United Nations Framework Convention on Climate Change
UNFICYP	United Nations Peacekeeping Force in Cyprus
UNGOMAP	United Nations Good offices Mission in Afghanistan and Pakistan
UNHCR	United Nations High Commissioner for Refugees
UNIFIL	United Nations Interim Force in Lebanon
UNIIMOG	United Nations Iran–Iraq Military Observer Group
UNITAR	United Nations Institute for Training and Research
UNMIK	United Nations Interim Administration Mission in Kosovo
UNMOVIC	United Nations Monitoring, Verification and Inspection Commission
UNMOT	United Nations Mission of Observers in Tajikistan
UNOMIL	United Nations Observer Mission in Liberia
UNOSOM	United Nations Operation in Somalia
UNPROFOR	United Nations Protection Force
UNSCOM	United Nations Special Commission
USGS	US Geological Survey
UNTAC	United Nations Transitional Authority in Cambodia
UNTAES	United Nations Transitional Authority in Eastern Slavonia, Baranja and the Western Sirmium
UNTAG	United Nations Transition Assistance Group
UNTSO	United Nations Truce Supervision Organization
VEREX	Ad Hoc Group of Verification Experts
WMD	Weapon of Mass Destruction
WTMU	Wildlife Trade Monitoring Unit

Preface

Richard Butler

The modern era of arms control and disarmament began over 50 years ago, immediately following the advent of nuclear weapons—the most devastating of weapons of mass destruction. Since then, the process has been tortuous, uneven, and often halting. Of its many features, two are outstanding. First, the significant corpus of treaties and agreements that now exists would not have been possible had reliance been placed solely, or even substantially, on the work of governments and their professional officials. Non-governmental actors and other groups of citizens (often amateurs) were the driving force behind many crucial accords—from the 1968 Nuclear Non-Proliferation Treaty (NPT) to the 1992 Chemical Weapons Convention. Second, these actors have shown great determination, which has often been exercised at significant personal cost. Their reward is the sense of accomplishment they can feel at having spoken truth to power in the name of all humanity.

Yet many of those involved in the arms control enterprise during the Cold War—one of the most constructive achievements in an intensely difficult and potentially catastrophic period in international relations—believe that there is still work to be done. They know that, at the moment, the tapestry of treaties is neither complete nor acceptably reliable.

All of the major arms control and disarmament regimes share three fundamental characteristics:

- a moral, consensus-based value that a given weapon is inadmissible in a civilised world;
- a binding legal document in which states make a political and behavioural commitment to that view; and
- the construction of a means of verifying that treaty partners meet their obligations and commitments.

If this system is to survive, all three elements—like a three-legged stool—need to be maintained. Instability in one part could bring down the entire structure.

Sadly, in recent years, we have witnessed attacks on the fundamental moral consensus about the worth of arms control and disarmament, particularly by Iraq. Also of increasing concern is the reluctance of other states to join certain treaties—thereby refusing to make an initial basic political commitment—and some nations' failure to sustain their obligations under accords already adhered to. It was a reasonable expectation that, with the passage of time, such concerns would diminish.

These developments have put additional pressure on the third element of the system: verification. I have been involved in the negotiation and implementation of major arms control and disarmament treaties for more than 20 years, but two issues have persistently caused great anxiety. The first is whether or not compliance with undertakings can be verified. The bases of such doubts range from the technical to the motivational. In large measure, the answer can be gained by recourse to science and technology. It is possible to achieve high levels of verification by applying appropriate monitoring and inspection methods. These are known and/or can be designed, and they can be successfully implemented if states allow them to be applied to their relevant activities. While the question of access can be sensitive, it can be eased by resourceful design of verification modalities and technologies. But such ingenuity may not be sufficient to overcome a situation in which a treaty member's motivation has waned dramatically or has changed completely, in contradiction to its treaty undertaking.

The verification aspect of arms control and disarmament treaties is by far the most difficult. It is essential to bear in mind that the purpose of verification cannot be to prevent cheating, but to deter it through the possibility of detection. Verification is a continual process that grows in strength over time. Every report delivered to treaty partners confirming that a state party is in compliance, strengthens that particular treaty. This builds long-term confidence. It is the gift of verification.

The second source of anxiety is more problematic, and the one to which the answer is least developed: what happens if it becomes clear that a treaty partner is cheating? And—at its simplest—who will enforce the law? The answer usually given today is that the 'international community', as represented by the UN Security Council, will solve the problem.

Conceptually and legally, that is the right answer. Sadly, and for good reason, it is not one that fills treaty partners with confidence. This is a political question that urgently requires attention. The Security Council needs to agree to exclude the enforcement of arms control treaties from the veto power of its five permanent

members—from politics as usual. Were there to be reliable enforcement of treaties whenever a credible, verified report of an infraction was received, the three-legged stool would be transformed into a solid four-legged table.

A key requirement for this to become possible is the existence of credible verification. VERTIC's achievements in fostering the continuing development of such instruments have been of irreducible importance and have exceeded its modest budget. It is an outstanding example of the invaluable role played in arms control and disarmament by non-governmental actors. VERTIC's research and its effort to conduct training and to disseminate information in the field of verification naturally has relevance beyond arms control and disarmament.

Other important fields of international endeavour, such as protecting the environment and implementing peace accords, are equally in need of good verification. Indeed, verification has become, and should remain, a critical element in attempts to ensure human safety. The *Verification Yearbook 2000* is both an illustration of, and an inspiration to, the continued efforts of those who are committed to the effective and efficient verification of international agreements—not only for its own sake, but also as a contribution to a just and more peaceful world.

Richard Butler, former Australian diplomat, is Diplomat in Residence, Council on Foreign Relations, New York, US. From 1997–99, he was Executive Chairman of the UN Special Commission on Iraq. His book, *Saddam Defiant: The Threat of Weapons of Mass Destruction, and the Crisis of Global Security,* was published in 2000.

I

Introduction: the salience and future of verification

Trevor Findlay

This volume marks the re-launch of Vertic's *Verification Yearbook* after an absence of two years. For this reason, and to signify the start of a new century, we thought it fitting to publish a special millennial edition that surveys the evolution of verification in various fields over several decades, as opposed to the more traditional approach of analysing a single year. While future versions of the *Yearbook* will revert to the usual pattern, this one should serve as a useful 'baseline' against which events covered in later volumes may be judged.

While examining the past 50 years of verification developments across a number of areas, it soon emerged that the point at which verification became important in each of them differs considerably. The chapters reflect these differences. For example, ever since the term arms control was 'invented' in the 1960s, verification has been a vital consideration in decisions about whether or not to negotiate particular treaties and how to cast them once the decision was made to proceed. In the environmental field, by comparison, treaties that mandate verification are more recent and relatively rare, although that situation is changing as global environmental problems requiring international co-operation become more pressing. In the case of peace agreements, the term 'verification' has tended to be substituted by 'monitoring', which implies a less judgemental undertaking. But even in this field there is increasing realisation that effective verification can improve immeasurably the chances of an agreement being implemented successfully.

This *Yearbook* spans the three areas—arms control and disarmament, the environment and peace agreements—that are at the heart of Vertic's work. The section on arms control and disarmament covers the verification aspects of all major agreements relating to weapons of mass destruction (nuclear, chemical and biological), as well as conventional armaments. In addition there is a chapter on a

unique disarmament verification mission: the UN Special Commission (UNSCOM) on Iraq. No doubt future editions will look at the work of its successor: the UN Monitoring, Verification and Inspection Commission (UNMOVIC).

The environmental section reflects the focus that VERTIC has maintained for many years on the verification aspects of the 1997 Kyoto Protocol to the 1992 UN Framework Convention on Climate Change. But we have also included a chapter on the monitoring and verification of multilateral environmental agreements generally, in recognition of the growing interest in verification in the field.

With regard to peace accords, the chapters assess two of the most widely known aspects of monitoring and verification: the military and civilian police aspects. This is not to suggest that other elements, such as those pertaining to human rights and elections, are not equally significant. We hope to cover them in future editions of the *Yearbook*.

Finally, the volume ends with a section on verification compliance tools and mechanisms, many of which apply to a range of international agreements.

What is verification?

VERTIC defines verification as the process of gathering, interpreting and using information to make a judgement about parties' compliance or non-compliance with an agreement. The aim of verification is to establish or increase confidence that all parties are implementing a treaty fairly and effectively. Verification achieves this objective by:

- detecting non-compliance;
- deterring parties that might be tempted not to comply; and
- providing compliant parties with the opportunity to demonstrate convincingly their compliance.

Early detection is important so that other parties may be able to take appropriate action, ranging from seeking clarification from the party concerned to imposition of some form of sanction. The latter, at least in theory, may encompass diplomatic measures, economic penalties and military action.

The effectiveness of verification will be determined by several elements and circumstances:

- the monitoring mechanisms, techniques and technologies;

- the credibility of the compliance arrangements; and
- the political environment in which the treaty operates, particularly the amount of political support given to the verification system.

VERTIC is acutely conscious that verification and compliance regimes should be tailor-made for each particular agreement. There is no 'one-size-fits-all' model in the verification world. Verification regimes vary in comprehensiveness, sophistication and intrusiveness, as well as in the degree to which they are perceived to be coercive. The gamut runs from the strict enforcement regime with punitive possibilities to an arrangement that gently encourages and assists parties to comply. Clearly, for instance, the Kyoto Protocol is further from the 'sharp, pointy end' of verification than the 1990 Conventional Armed Forces in Europe (CFE) Treaty.

A continuing verification revolution?

In 1999 VERTIC held a conference at Wilton Park in the UK to consider the question of whether or not there had been a 'revolution' in verification over the past several years. The revolution was seen as comprising a wide range of political, organisational and technological developments, which had increased the salience and power of verification. Sceptics, however, pointed to the fate of UNSCOM, a valiant but doomed effort to verify that Iraq had complied with its legal obligation to destroy its weapons of mass destruction and means of re-acquiring them. Other participants noted the recidivism affecting the policies of major countries towards proposals to emulate, for biological weapons, the intrusive verification system negotiated for the 1992 Chemical Weapons Convention (CWC). Others alleged that verification was an essentially Western construct that a bemused developing world grudgingly accepted in return for increased scientific, technological and financial assistance. Such a trade-off was seen as inherently unstable.

While the meeting was concerned largely with arms control, environmentalists might have decried the poor record even of national self-reporting under many environmental agreements—including the 1946 Whaling Convention and the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer—not to mention the absence of co-operative international verification from such accords. Still others, involved with implementing peace agreements, might have drawn attention to the ineffectuality of the Kosovo Verification Mission fielded by the Organisation for Security and Co-operation in Europe in 1998 and of the Indepen-

dent Commission on Decommissioning, established to verify compliance with the disarmament aspects of the 1998 Good Friday Agreement to end the conflict in Northern Ireland.

Yet running counter to these admittedly discouraging facts are other, often little noticed developments, which have amounted to, if not a verification revolution, then at least a rapid accretion of verification capacity and experience worldwide. For example, as a result of the CWC, to which the vast majority of states are now party, most countries are required to establish a National Authority to assist in verifying matters relating to chemical weapons. Even those parties that have had nothing to do with chemical weapons in the past, or do not even have a chemical industry, are required to do so. All these states, many of which will not have had any connection with verification before, much less laid themselves open to on-site inspection, will now at least have some notion of what verification is and have had some contact with an international verification organisation. This is an unprecedented development.

Consider also that the last decade of the twentieth century saw the establishment of two new multilateral verification organisations: the Organization for the Prohibition of Chemical Weapons in The Hague, Netherlands; and the Comprehensive Nuclear Test Ban Treaty Organization in Vienna, Austria. And there is the possibility that a third new one—for verifying the 1972 Biological Weapons Convention—will be created in the near future. As a result of the setting up of these organisations, not to mention the verification arrangements for the CFE treaty, the various US–Russia bilateral nuclear agreements, and the advent of UNSCOM, there has emerged a new and permanent profession: international verifier. In future, entire careers will be devoted to the business of verification.

Industry is also becoming involved in verification, not just as targets for verification activities—as in the case of the nuclear, chemical and biotechnology sectors—but also in researching and producing new verification technology. In the US, nuclear weapon laboratories have increasingly devoted themselves to the challenges of verifying nuclear and other types of arms control, as their nuclear weapons research and development work has declined with the end of the Cold War. In the same vein, the UK commenced, in 2000, a verification research programme at its Atomic Weapons Establishment at Aldermaston.

Its shortcomings aside, UNSCOM's existence and successful operation over several years made a singular contribution to the verification 'revolution'. Apart from its

successor, UNMOVIC, which has yet to become fully operational, it is the only multilateral verification organisation ever established by the Security Council, and the only UN organisation ever mandated to monitor the activities of a single UN member state. Its powers of inspection and level of intrusiveness were previously seen only during military occupation. Given the manner of its demise, it is not clear that there will ever be another case of its kind—its successor is not identical in terms of its mandate, governance or organisational structure. Nonetheless, UNSCOM has established extraordinarily high verification benchmarks. An especially startling aspect was the provision of an American U-2 spy plane to help with its operations. Notwithstanding allegations that the US, and no doubt others, used UNSCOM for their own intelligence gathering purposes, one should not lose sight of the unprecedented degree of intelligence information that states were willing to provide the Commission to facilitate its work. This is being emulated in other treaty regimes.

Turning away from the hyper-publicised UNSCOM, consider the little-remembered 1992 Open Skies Treaty, which permits unheard-of over-flight access—from Vancouver to Vladivostok—for any arms control monitoring purpose. Although not fully in force, the Treaty has the potential to contribute substantially to international stability through the power of transparency.

Another heartening development is the widespread recognition, following the discovery of Iraq's clandestine nuclear weapons programme in the early 1990s, that the International Atomic Energy Agency (IAEA) needed a new philosophy of verification. The Agency's Strengthened Safeguards System (formerly the '93+2' programme), while not perfect, is philosophically and practically light years away from its tame predecessor. The Additional Protocols that are to be attached to states' nuclear safeguards agreements with the Agency, and the IAEA's own attempts to integrate the old and new safeguards systems, are further harbingers of important changes in the verification of nuclear non-proliferation undertakings.

The shift in the national policies of some states toward verification is also encouraging. Few can match the drama associated with former Soviet President Mikhail Gorbachev's sudden agreement to on-site inspections, as part of the 1986 Stockholm Accord on confidence-building initiatives. Yet, not many observers would have predicted a few years ago that China would ultimately agree to the intrusive verification measures provided for in the CWC and the 1996 Comprehensive Nuclear Test Ban Treaty (CTBT)—it has become a party to the first and has signed the second.

And Brazil and Argentina, former nascent nuclear rivals in Latin America, are now inspecting each other's nuclear facilities through their own bilateral verification organisation and are subject to comprehensive IAEA safeguards.

Even non-governmental organisations (NGOs) are entering the verification realm. For the first time, a global consortium of NGOs—Landmine Monitor—is attempting to monitor implementation of a multilateral disarmament treaty: the 1997 Landmine Convention. Moreover, Landmine Monitor is partly funded by some states parties and reports directly to their annual conferences on its view of progress in implementation. Similarly, in the environmental area, NGOs concerned with unabated logging of the world's forests committed themselves in 1997 to monitoring collectively and systematically state compliance with decisions emanating from the Intergovernmental Panel on Forests (IPF). In August 2000, VERTIC established an Independent Commission on the Verifiability of the CTBT, as a contribution to the debate over how best to verify the Treaty and to secure its entry into force as soon as possible.

Finally, the technology revolution that is affecting so many other aspects of human endeavour is having a marked effect on verification. The most significant developments include:

- the data-handling capacities of modern computers;
- the World Wide Web, providing overwhelming amounts of open source data for verification purposes;
- increasingly fine resolution images and other capabilities offered by remote sensing from space;
- communication advances, permitting instantaneous transmission of data from monitoring equipment;
- the invention of increasingly more capable, lightweight and compact detection equipment, such as micro-detectors; and
- the use of virtual reality techniques for training on-site inspectors.

If these developments together do not constitute a verification revolution, then they at least represent large evolutionary leaps in many directions.

Challenges facing verification

Of course, all is not perfect in the world of verification, and VERTIC would be the last to claim that it is. New technology, for instance, can be a double-edged sword,

helping potential and actual treaty violators, as well as verifiers, in often unpredictable ways. Many new technologies are 'dual use', equally suitable for peaceful and non-peaceful purposes, thereby complicating the verification task enormously.

Verification can also fail disastrously, bringing the entire enterprise into disrepute. The failure of so-called national technical means of verification—essentially satellites and intelligence gathering—to detect preparations by India and Pakistan for their multiple nuclear tests in 1998, is now legendary. Human cognition can be as much a part of such failures as technology—including our capacity to be lulled by an apparently familiar pattern of events; our unwillingness and/or inability to cope with cognitive dissonance; our inability to interpret mixed political and technical signals; and our lack of creativity in imagining the simplest of evasion tactics.

The case of UNSCOM is instructive. Many lessons have been learned about the difficulty of conducting effective and efficient verification in the face of deliberate, systematic deception and political chicanery. This was demonstrated not only by Iraq, but also, more shockingly, by the UN Security Council's permanent members, which are supposed to be fully committed to supporting their own resolutions. Unlike UNSCOM, some of the great new verification edifices that are being constructed—for chemical and toxin weapons, for biological weapons, and for the CTBT—remain untested, as does the IAEA's new safeguards system. We may be building sturdy bulwarks or houses of cards.

In the environmental world, negotiators are still putting together the verification and compliance details for the Kyoto Protocol three years after it was signed. Many environmental agreements have no verification system at all, and those that rely on self-reporting arrangements are often widely disregarded.

In the area of peace accords, the UN still has no concept of operations for monitoring and verifying compliance, including for peacekeeping missions. The deployment of monitors in armed conflict situations is often not a contribution to verification but a substitute for taking the tough decisions necessary to end the fighting. In almost all cases, training in monitoring and verification is either nonexistent or superficial and heavily dependent on the military. Nobody seems to be studying systematically the use of new technologies for verifying peace agreements.

In the end, of course, verification will always be work in progress. Since 100% certainty is unlikely in verifying international agreements, particularly when one is trying to prove that a particular event has not taken place or that a capability or object does not exist, the task is endless, as UNSCOM discovered. Ultimately,

verification will always be nested in a political context: after all, it is verification of compliance that is of concern, not verification in a vacuum. Political decisions will always be required once reasonable proof of lack of compliance has been established. The absence of credible compliance measures in most international agreements is emerging as a compelling new verification-related issue, at which this volume takes an initial glimpse.

We hope that this *Yearbook* is the first of many that will track the continuing evolution of verification in a variety of international fields. It is the product of the combined efforts of a large number of talented individuals. VERTIC would like to thank all of the chapter writers, those who commented on drafts and, in particular, Richard Jones, who designed, produced and co-edited the volume. Finally, VERTIC is grateful to the John D. and Catherine T. MacArthur Foundation of Chicago, US—as well as to its other funders—for the financial support that made possible the re-launch of the *Verification Yearbook*.

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arms control and disarmament

2

Nuclear test ban verification: work in progress

Oliver Meier

On 10 September 1996 the UN General Assembly endorsed the Comprehensive Nuclear Test Ban Treaty (CTBT) by 158 votes to three. After decades of difficult negotiations the international community had not only agreed to end nuclear testing, but it had also reached consensus on the verification requirements for such a restriction. One of the major stumbling blocks to the conclusion of a universal interdiction on nuclear testing had been conflicting attitudes towards 'efficient' and 'effective' verification. This chapter considers the debate about the verifiability of a nuclear test ban by examining the verification discussions leading to the 1963 Limited Test Ban Treaty (LTBT), the 1974 Threshold Test Ban Treaty (TTBT), the 1976 Peaceful Nuclear Explosions Treaty (PNET) and the CTBT itself.

The CTBT's verification system, which is currently being set up by the provisional CTBT Organization (CTBTO) in Vienna, Austria, is widely believed to be sufficient to assure compliance and to detect cheating. This chapter outlines the regime, as well as the status of its implementation. Unfortunately, however, the story does not end there. Four years after the CTBT was opened for signature, prospects for its entry into force are still uncertain, with some key countries still refusing to sign and ratify the accord. As of 20 October 2000, 160 states had signed the Treaty, and 66 had ratified it.[1] The chapter concludes by summarising the key challenges that need to be overcome before the CTBT can enter into force and its verification system becomes fully functional.

The Limited Test Ban Treaty[2]

In the early 1950s concern about the consequences of fallout from atmospheric nuclear tests triggered international pressure to end such activity. Given the advent of the nuclear arms race, though, it was difficult to agree on a ban, since both the

East and the West wanted to test their emerging nuclear weapon designs. In addition, they pursued different arms control strategies. The US and other Western governments initially linked the test ban issue to general progress in arms control, while the Soviet Union wished to treat it as a separate matter.

During the Cold War, the East and the West also held different views on the verification requirements for a test ban. The US favoured a 'verification first' approach, arguing that talks could only take place after strict standards for verification had been agreed. Many in Washington saw verification as a technical problem and argued that the technical possibilities for verification should determine the scope of a test ban. For its part, the Soviet Union purported to place verification in a broader 'political' context in which arms control *per se,* preferably of the purely declatory variety, was seen as building confidence, rather than requiring verification to enhance confidence in its own implementation.[3] In reality, the Soviet Union was opposed to any kind of intrusive verification, especially on-site measures, such as inspections or monitoring stations, which it saw as 'legalised espionage'.

A breakthrough came in 1957, when the Soviet Union accepted, for the first time, that monitoring stations could be placed on its territory. The administration of US President Dwight D. Eisenhower subsequently proposed the establishment of a group of scientific experts, which would analyse verification measures for a test ban. An international Conference of Experts convened in Geneva in July–August 1958. Their report, presented on 21 August 1958, concluded that a 'control system' of some 170 monitoring stations, using different verification technologies, would be sufficient to detect, with high probability, tests involving yields of more than one kiloton (kt).[4]

The scientists identified seismology as the technology with the greatest potential for monitoring a nuclear test ban, but they argued that some on-site inspections (OSIs) would be necessary.[5] The Conference of Experts was the first of a series of such meetings that would be central to establishing international consensus on the verification requirements for a comprehensive test ban.[6] The meetings prepared the ground for political negotiations, kept the test ban issue alive in times of political tension, created a common understanding of the problems that needed to be addressed, and sometimes developed novel solutions to such problems.[7]

In November 1958 the existing nuclear weapon states—the Soviet Union, the UK and the US—began tripartite negotiations on a comprehensive test ban. In January 1959 the West dropped its insistence that a test ban be linked to progress

in general disarmament, thereby removing a major obstacle to a treaty restricting nuclear explosions. Once tripartite talks were underway, all negotiating states agreed to observe a three-year test moratorium, lasting until 1961.[8] During the discussions, the different verification concepts of the interlocutors again became clear.

The number of OSIs was the most visible point of disagreement: Washington wanted more than Moscow was willing to tolerate. But these disagreements were rooted in deeper conflicts about the nature of the OSIs, including triggering mechanisms and the decision-making procedure.[9]

Negotiations broke down after an American U-2 spy plane was brought down over the Soviet Union in 1960 and the Berlin Wall was constructed in 1961. For a short period test ban talks assumed a multilateral character, after negotiations moved, in March 1962, to the new Eighteen Nation Disarmament Committee in Geneva. The Cuban missile crisis of October 1962 convinced the leaderships of both superpowers that progress in nuclear arms control was urgently needed if similar confrontations were to be avoided in future.

But test ban opponents, especially in the US, continued to argue that a comprehensive interdiction would be unverifiable, because small underground tests could not be detected by a monitoring system. To avoid such difficulties, the US proposed, on several occasions, a limited ban on atmospheric and underwater nuclear testing. On 2 July 1963, Soviet Premier Nikita Krushchev accepted the West's proposal to keep underground nuclear tests outside the scope of the Treaty. Tripartite discussions resumed on 15 July 1963, and the LTBT was negotiated in just 10 days.[10]

Representatives of the Soviet Union, the UK and the US signed the LTBT in Moscow on 5 August 1963, and the Treaty entered into force on 10 October 1963. It is of unlimited duration and open for signature by all states. More than 100 nations have acceded to it. Under the accord, parties are obliged 'to prohibit, to prevent, and not to carry out any nuclear weapon test explosion, or any other nuclear explosion, at any place under its jurisdiction or control . . . in the atmosphere; beyond its limits, including outer space; or under water, including territorial waters or high seas; or . . . in any other environment if such explosion causes radioactive debris to be present outside the territorial limits of the State under whose jurisdiction or control such explosion is conducted . . .'.[11]

Treaty members had to rely on their national technical means (NTM)[12] to assess compliance. Given that both sides were confident that atmospheric tests would not go undetected, the LTBT contains no formal verification mechanism. Advances

in satellite technology enabled the Soviet Union and the US to identify above ground nuclear explosions via optical sensors and radiation and electromagnetic pulse detectors.[13] There was also no mechanism to verify compliance with the prohibition of cross-border contamination by nuclear debris, which would have required an international mechanism to measure minute traces of radioactivity.[14]

The Threshold Test Ban Treaty

Notwithstanding the *détente* between the Soviet Union and the US in the 1970s, the military and political context was not conducive to agreement on a low threshold or comprehensive test ban. Both sides' militaries were pressing for the development of new nuclear weapon technologies. Little progress towards negotiation of a nuclear test ban was made in the years immediately following the conclusion of the LTBT. But advances in verification technology made it harder for test ban opponents in the US and elsewhere to use verification as an argument against the prohibition of nuclear tests. Increased technical capabilities and an improved understanding of the differences between seismic waves created by earthquakes and those caused by explosions (nuclear and conventional) led the technical community to believe that 'a threshold somewhere between 5 and 30 kt was technically feasible, using verification by technical means only'.[15] Despite such advances in remote monitoring, the US refused to relax its demands for a stringent OSI regime.[16] Moscow, however, insisted that a comprehensive test ban could be verified using only NTM.

The TTBT[17] was signed in Moscow on 3 July 1974, and fulfilled two objectives: continuation of the arms control process without hampering nuclear weapons research and development. The Treaty (a bilateral agreement not open to other states) established a 150kt threshold for military tests, which was to take effect on 31 March 1976. While advances in verification technology had made agreement on a lower threshold or a comprehensive test ban easier, the TTBT did not take advantage of these opportunities. In contrast to the LTBT, however, the TTBT did contain basic verification provisions, which were detailed in a two-page protocol. But verification was again left to NTM, such as satellites and national seismic stations.[18] The parties agreed not to interfere with each other's NTM, although the TTBT did 'not expressly prohibit concealment measures because there were no plausible scenarios for hiding the signals from very high-yield underground tests'.[19]

The 150kt threshold of the TTBT created a different kind of verification problem: how could the parties tell the difference between a 150kt test and one with a yield

of 151kt, the latter constituting a treaty violation? To alleviate this problem, they consented to an information exchange, which helped to establish the basic parameters for measuring the yields of each other's tests through remote monitoring. Specifically, they agreed to share the exact locations of nuclear test sites, information about the geology of these sites, the co-ordinates of past nuclear tests, and, in order to calibrate their monitoring stations, the yield, date, time, depth and co-ordinates of two nuclear tests. They also agreed that nuclear weapon tests would be conducted only within declared sites. Even though these verification provisions appear limited today, the TTBT was the first bilateral nuclear arms accord that went beyond national technical means of verification.

At the same time, there was improved scientific understanding of the verification requirements of a multilateral and comprehensive test ban. In 1971, 1973 and 1976, the Conference of the Committee on Disarmament (CCD)—the successor to the Eighteen Nation Disarmament Committee—organised informal meetings with seismologists to discuss international verification of a test ban. These meetings led to the establishment of the Ad Hoc Group of Scientific Experts to Consider International Co-operation Measures to Detect and Identify Seismic Events, which became known as the Group of Scientific Experts (GSE). The GSE, which met twice a year, was open to all members of the CCD—and, later, the Committee (then Conference) on Disarmament (CD)—and experts from invited non-member states.

The GSE delivered its first report to the CD in March 1978, and in July elaborated the technical details of the proposed monitoring system.[20] The reports established parameters for the international monitoring system that would become part of the CTBT. The GSE recommended the setting up of:

- an international network of seismographic stations;
- an international communication facility; and
- several international data centres.[21]

The GSE conducted three extended technical tests (GSETTS)—in 1984, 1991 and 1995—using existing seismological stations to study the ability of an international seismic network to monitor a ban on nuclear testing. The participating stations later formed the core of the CTBT international monitoring system. The third and final test established an International Data Centre in Arlington, Virginia, US, which would eventually become the prototype for the CTBT International Data Centre in Vienna, Austria.

The Peaceful Nuclear Explosions Treaty

Even though the TTBT threshold was high by any standard, debates about its verifiability continued. The US, even after signing the Treaty, argued that its verification regime was insufficient because it contained no provisions for OSIs. One loophole that had to be closed was the conduct of so-called peaceful nuclear explosions (PNEs). Driven by the US, which had effectively ended its PNE programme by 1974,[22] talks began in October 1974 on a PNET, as foreseen in Article III of the TTBT. Again, discussions about verifiability were central to the outcome.

The product of these talks, which ended in April 1976, was sobering. The PNET established the same threshold for underground explosions conducted outside nuclear test sites as the TTBT: 150kt. This was designed to remove any potential advantage being gained from substituting nuclear weapon tests with PNEs.[23] But the Treaty contained neither a limit on the number of such (presumably) peaceful explosions, nor a ban on multiple PNEs. To ensure implementation of the TTBT's consultation and verification provisions, the parties agreed to establish a Joint Consultative Commission. In an Agreed Statement, Moscow and Washington also announced that they would not use PNEs to advance their knowledge about nuclear weapons technology, although this was not verifiable.

While the Treaty itself may have been 'worse than no solution'[24] to the problem of PNEs, an important advance was made in verification. Again, verification of PNEs was mainly left to NTM. But it was difficult to distinguish so-called group explosions (when several are conducted almost simultaneously at a single site). The Soviet Union wanted to maintain the option of conducting multiple nuclear explosions with a combined yield that might exceed 150kt.[25] Moscow, therefore, was willing to accept 'ways that will permit identification of each individual explosion and determination of the yield of each individual explosion'.[26] Under Article IV of the protocol to the PNET, OSIs could be requested at the site of a planned group explosion. The inspection team was allowed to bring its own equipment (detailed in the protocol) to determine the number and yield of nuclear explosions. Even though these provisions are rather modest by modern standards, the resulting PNET had a technical content that went beyond any other arms control agreement of the time.[27] Most important, OSIs had, for the first time, been included in an arms control accord between the Soviet Union and the US.[28]

Following the conclusion of the PNET, the Soviet Union, the UK and the US continued, from 1977 until 1980, trilateral talks on a comprehensive ban. The

tripartite report presented to the CD in July 1980 contained no agreement on a comprehensive test ban, but it broke new ground on verification. The report included an agreement on the exchange of seismic data, the establishment of a committee of experts and OSIS.[29]

These recommendations were not pursued because the administration of US President Ronald Reagan, which came to office in 1981, stopped discussions with the Soviet Union on most arms control issues, including a CTBT. The administration believed that TTBT and PNET verification provisions were insufficient and accused the Russians of violating the former Treaty.[30] Moscow and Washington separately announced that they would observe the 150kt limit for nuclear explosions, but they did not implement any of the verification or confidence-building measures contained in the TTBT and PNET.[31]

While high-level agreement on verification could not be reached, the first 'track two' attempt at advancing the debate on verifiability was made. In 1986 the Natural Resources Defense Council, a US non-governmental organisation, and the Soviet Academy of Sciences signed an agreement that led to the installation of seismic monitoring equipment near one of the Soviet test sites, Semipalatinsk in Kazakhstan, and at the US Test Site in Nevada. Even though the agreement was opposed by the Reagan administration, as well as by Soviet hardliners, American and Soviet scientists operated seismic stations near a Soviet test site during a nuclear test moratorium and were later allowed to monitor Soviet tests from 600 miles away. For the first time, on-site and off-site monitoring in the Soviet Union had been conducted by an independent third party.[32] This non-governmental initiative, which was followed in 1987 by an official Joint Verification Experiment, played an important role in overcoming the Reagan administration's test ban 'blocking strategy'.[33]

Debate about the verification of a test ban changed when Soviet President Mikhail Gorbachev took office in March 1985. Soon the Soviet Union compromised on many US demands, paving the way for an understanding on TTBT and PNET verification. In 1987 the Soviet Union and the US started 'nuclear testing talks' on an extended verification protocol for the TTBT. But it was not until 1 June 1990, when Gorbachev and US President George Bush signed protocols to the TTBT and the PNET, that the two Treaties were ratified in the US and subsequently entered into force on 11 December 1990. The new 70-page TTBT protocol, which replaced the original, detailed the use of in-country seismic monitoring technologies, including: hydrodynamic yield measurements of all tests with a planned yield exceeding

50kt; seismic monitoring; and OSIs for all tests with a planned yield exceeding 35kt. It also allowed inspectors to take geological samples to confirm data collected by remote stations.[34]

While the TTBT and the PNET were 'lowest-common-denominator treaties meant to symbolize superpower cooperation without triggering verification dilemmas or domestic opposition',[35] they both helped to advance discussions on the verifiability of a comprehensive test ban. States were also able to gain first-hand experience of verification and confidence building. Consequently, these test ban agreements' limited verification measures and associated scientific research laid the ground for a multilateral and comprehensive ban on nuclear tests.

The Comprehensive Nuclear Test Ban Treaty

Negotiations on a CTBT began in the CD in January 1994. This was the first time a multilateral body had a mandate to negotiate a comprehensive ban.[36] The change of setting, as well as different ideas about the function and scope of such an accord, made for a slow start to talks in the CD's subsidiary body, the Ad Hoc Committee on a Nuclear Test Ban.

On verification, however, negotiators could draw on a rich body of scientific work.[37] Four decades of international discussions on CTBT verification had led to a common understanding of the capabilities of many verification technologies, especially seismic. The GSE, in particular, constituted an international core group of scientists (the 'detection club') that was able to advise negotiators in Geneva.[38] The GSE made a powerful argument that a global network of seismic stations would be the core of the verification system and that the International Monitoring System (IMS) should use hydroacoustic, radionuclide and infrasound stations.

Positive experiences in arms control verification generally had been acquired in the 10 years prior to the conclusion of the CTBT. In 1987, for example, the US–Soviet Agreement on Intermediate-range Nuclear Forces had been concluded, with intrusive verification arrangements. This positive experience was reinforced by implementation of the 1991 Strategic Arms Reduction Talks (START) Treaty. In 1990, he member states of NATO and the Warsaw Treaty Organization signed the Conventional Armed Forces in Europe (CFE) Treaty, and, in 1992, the CD concluded negotiations on the Chemical Weapons Convention.[39] This latter multilateral agreement contained an unprecedented verification regime that was to be implemented by an international organisation.[40] The final push for conclusion of the CTBT came

in May 1995, when the Nuclear Non-Proliferation Treaty (NPT) Review and Extension Conference agreed that a universal and internationally and effectively verifiable CTBT should be concluded no later than 1996.

In the course of 1995 it became clear that a CTBT would most likely prohibit 'any nuclear weapon test explosion or any other nuclear explosion'.[41] The main role of the CTBT verification regime, therefore, was clear: the IMS would have to be able to detect and identify any nuclear explosion, no matter where it occurred. By December 1995, the Verification Working Group's technical experts had reached broad consensus on the number and distribution of stations, which determined the eventual design of the IMS.[42] But this still left a number of important questions about scope unanswered, such as whether so-called hydronuclear experiments and other subcritical tests would be permitted and whether the Treaty should also cover test preparations. In the end, acceptable compromises were made on these and other questions.

Negotiations concluded in August 1996. India vetoed the Treaty's adoption in the CD because it was included in a list of 44 states that had to ratify the CTBT before it could enter into force.[43] Australia initiated its transfer to the UN General Assembly, where it was adopted and opened for signature on 24 September 1996.[44]

The CTBT verification system

The agreed verification system is robust and effective enough to assure member states that attempts to cheat the system will be detected with a high degree of probability, even though it does not use all available verification technologies.[45] The IMS will consist of 321 monitoring facilities and 16 radionuclide laboratories, located in some 90 countries. Four types of stations are to be established:

- seismological;
- infrasound;
- hydroacoustic; and
- radionuclide.

The seismic network will form the core of the verification system. Seismic waves generated by earthquakes, explosions or other phenomena will be detected using 50 primary and 120 auxiliary seismic stations, distributed globally. In addition, 11 underwater hydroacoustic stations are being set up.[46] Sixty land-based infrasound stations will use sonar to detect atmospheric tests, while 80 radionuclide stations

will measure radioactive particles in the atmosphere from atmospheric nuclear tests or underground tests that vent. Sixteen radionuclide laboratories will analyse filters from the stations, as well as samples taken by inspectors.

The four different technologies operated by the IMS are complementary and are able to detect tests in different environments. It is also becoming increasingly clear that synergy between the different technologies may considerably improve the System's detection capability.[47] During the negotiations, a one-kiloton threshold for fully coupled underground nuclear explosions was used as a guide. In many instances, the IMS will be able to detect much smaller tests.[48] The task of realising the potential for complementarity will rest with the International Data Centre (IDC), which will receive and process information from all IMS monitoring facilities and will distribute data to member states.

After a slow start, implementation of the CTBT verification system is making good progress.[49] The future CTBTO will consist of a Conference of the States Parties, an Executive Council and a Technical Secretariat. A Preparatory Commission is in charge of setting up the verification system until the Treaty enters into force. Its two Working Groups—on verification and finance—have been making the necessary political decisions to guide the work of the Provisional Technical Secretariat (PTS).

Remaining challenges

The debate about the CTBT's verifiability did not end, however, with its opening for signature. Three issues are at the centre of the current debate:

- the question of OSIs;
- the confidentiality of monitoring data; and
- the possibilities for evading detection.

Given the test ban's negotiating history, it was not surprising that the purpose and scope of OSIs were among the most controversial aspects of verification discussions during the CTBT negotiations. But the OSI provisions agreed are among the most intrusive in multilateral arms control. An OSI may be requested by any party and will be conducted only if at least 30 of the Executive Council's 51 member states support the proposal.[50] An OSI request may be based on information collected by the IMS, and/or, more controversially, on 'any relevant technical information' obtained by NTM 'in a manner consistent with generally recognised principles of

international law'.[51] During an OSI—which can last for a maximum of 70 days—a team of no more than 40 persons can inspect up to 1,000 square kilometres.

Inspectors' rights during OSIs were not only a contentious issue in the negotiations, but they remain problematic in the Preparatory Commission (PrepCom). Progress is slow in developing an Operations Manual for OSIs.[52] Some states, which are fearful of overly intrusive OSIs, are attempting to constrain them through a

Chronology of the CTBT

1958 Group of Experts (from Canada, Czechoslovakia, France, Poland, Romania, Soviet Union, UK and US) convenes in Geneva on 1 July. Report presented on 21 August 1958. UK–US–Soviet Conference on Discontinuance of Nuclear Tests opened in Geneva (31 October) (Recess 5 December 1960–March 1961; adjourned 29 January 1962)

1962 Eighteen Nation Disarmament Committee puts issue of a comprehensive test ban on its agenda (4 March) and establishes subcommittee on nuclear test ban (21 March 1962)

1963 The LTBT signed in Moscow by Soviet Union, UK and US (5 August)

1968 International meeting of seismic experts in Sweden at invitation of Stockholm International Peace Research Institute

1970 Nuclear Non-Proliferation Treaty enters into force, making full-scope nuclear safeguards for non-nuclear weapon states mandatory (5 March)

1974 The TTBT signed in Moscow by Soviet Union and US (3 July)

1976 The PNET signed by Soviet Union and US (28 May). Establishment of Group of Scientific Experts (GSE) by Geneva Conference of the Committee on Disarmament (CCD) (July)

1977 Trilateral test ban negotiations begin (until 1980)

1978 First comprehensive GSE report to CCD (9 March)

1980 GSE Global Telecommunication System technical tests (until 1983)

1982 Ad Hoc Committee at Conference on Disarmament (until 1983)

1984 First GSE technical test (GSETT-1)

1986 Natural Resources Defense Council–Soviet Academy of Sciences verification experiment

1987 Joint Verification Experiment at test sites in Nevada, US, and Semipalatinsk, Kazakhstan (August–September). US–Soviet 'nuclear testing talks' on verification protocol (until 1990)

1990 Additional Verification Protocols to TTBT and PNET signed in Washington by Soviet Union and US (1 June)

1991 Second GSE technical test (GSETT-2)

1994 Negotiations on CTBT begin in Conference on Disarmament, Geneva (January). Third GSE technical test (GSETT-3) with prototype International Data Centre, Arlington, Virginia, US

1996 The CTBT opened for signature (24 September)

1997 Provisional Technical Secretariat of PrepCom for CTBTO established in Vienna, Austria (March)

1999 Article XIV Special Conference, Vienna (6–8 October)

2000 International Data Centre in Vienna assumes responsibility for IMS data analysis and distribution (20 February)

highly detailed manual; others favour giving on-site inspectors greater liberty and flexibility. International experts are also assisting in identifying elements of an OSI infrastructure, including an Operations Support Centre, Information Data Bank and an equipment storage and maintenance facility.

Access to, and distribution of, verification data were other issues that proved difficult to resolve in the test ban negotiations. Some countries—led by the US—opposed an independent analytical capability, fearing 'politicisation' of the Organization. Many associated problems still preoccupy the PrepCom. States without significant national technical and analytical means will naturally look to the IDC for more precise information once initial suspicions of non-compliance are aroused. Citing the CTBT's 'confidentiality' provision, some states continue to object to the use of IDC information for other purposes, like early warning of natural disasters, assisting humanitarian relief organisations and scientific research.[53]

Finally, debates about verifiability continue. After India and Pakistan conducted a series of nuclear test explosions in May 1998, uncertainties about the number and yields were used to question the effectiveness of the IMS. However, 'the most surprising verification failure in the whole episode was not that of the nascent international monitoring system, but that of US NTM,[54] which failed to pick up test preparations. The US should, therefore, have an interest in supplementing its NTM for monitoring a test ban by ratifying the CTBT, supporting the IMS and ensuring its full implementation.[55] Instead, doubts about 'verifiability' were partly responsible for the Senate's refusal to give advice and consent to US ratification.[56] Test ban opponents argued that the IMS could not reliably detect very small nuclear tests, and that this 'grey area' provides an opportunity for cheating.[57] These developments highlight the need for an informed, balanced debate in the US about the benefits and shortcomings of the CTBT and its verification provisions.[58]

Meanwhile, the PrepCom has to continue to implement the verification system, so that it is ready when the Treaty enters into force.[59] In so doing, it will have to scale political, financial and legal hurdles. Among the dangers confronting the PrepCom is a lack of financial support. So far, member states have generally paid their dues on time.[60] It is important to maintain this level of political and financial backing for the CTBT. The PrepCom also has to solve problems relating to its ambivalent legal status. The CTBTO will only be able to conclude, for example, the legal arrangements with member states that are necessary for setting up and maintaining IMS stations after the Treaty has entered into force.[61]

But all of these difficulties can be overcome. And even with only about one-third of IMS stations reporting to Vienna, some of the synergies between the different verification technologies are already apparent. The international community has almost achieved the goal that has occupied politicians, diplomats, activists, arms control and technical experts for several decades: an effective and efficient verification system to ensure compliance with a CTBT.

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Endnotes

[1] Updates on the state of verification and other basic information on the CTBT can be found on the Preparatory Commission's website at www.ctbto.org.

[2] This Treaty is often referred to as the Partial Test Ban Treaty (PTBT).

[3] The Russians argued that 'science must not interfere with the task' of designing a test ban monitoring system. Quoted in Nancy Gallagher, *The Politics of Verification,* The Johns Hopkins University Press, Baltimore and London, 1999, p. 86.

[4] The US originally proposed a network of 650 stations; the Soviet Union preferred 100–110 land-based stations. See Matthew Evangelista, *Unarmed Forces: The Transnational Movement to End the Cold War*, Cornell University Press, Ithaca and London, 1999, p. 62.

[5] These findings were based on data from the first fully contained underground nuclear explosion, conducted at the US Test Site in Nevada on 19 September 1957, and several partially contained underground explosions. See Peter W. Basham and Ola Dahlman, 'International seismological verification', in Jozef Goldblat and David Cox (eds.), *Nuclear Weapon Tests: Prohibition or Limitation?,* Oxford University Press, Oxford, 1988, pp. 169–189; pp. 170–171.

[6] The Geneva Conference of Experts was 'part of a transnational effort' to advance arms control issues. For a good analysis of the role of non-governmental actors, especially in the Soviet Union and Russia, in achieving consensus on a comprehensive test ban and its verification systems, see Evangelista.

[7] See Martin B. Kalinowski, 'Nuclear Physics and Peace', *INES Newsletter,* no. 28, March 2000. Available at www.inesglobal.org.

[8] France conducted its first three nuclear tests in 1960, undermining the moratorium.

[9] In December 1962, both sides came very close to agreeing an annual quota for on-site inspections, with the Soviets offering three and the US wanting 8–10. If misunderstandings about each other's position had been avoided this might have been an early breakthrough towards a comprehensive test ban. See, for instance, Evangelista, pp. 78–79.

[10] The full title of the Treaty is the Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water. The text of the LTBT and of other treaties can be found on the US Department of State's website at www.state.gov.

[11] Article I of the LTBT.

[12] As defined in arms control treaties, national technical means (NTM) of verification are usually understood to encompass all methods of remote sensing, such as satellites. 'Illegitimate' intelligence means—like espionage—are viewed as being outside of this definition. Of course, they contribute to national assessments of other states' capabilities. There is also a large grey area between NTM and espionage, to which many means of gathering intelligence belong. See, for example, Allan S. Krass, *Verification: How Much Is Enough?,* Taylor & Francis, London and Philadelphia, 1985, p. 7.

[13] This capability has been constantly expanded. Meanwhile the US has developed the space-based 'Nuclear Detonation Detection System' (NDS), which is based on all 24 'Global Positioning System' (GPS) satellites. This network provides 24-hour, global coverage for detecting and locating nuclear detonations. In addition the US possesses the Advanced Radiation Detection Capability Data Unit (ARDU), which processes nuclear detonation detection data from its Defense Support Program satellites. See Jozef Goldblat, 'The Nuclear Test-Limitation Treaties', in Serge Sur (ed.), *Verification of Current Disarmament and Arms Limitation Agreements: Ways, Means and Practices*, Aldershot (England) and Brookfield (US), Dartmouth, 1991 (United Nations Institute for Disarmament Research), pp. 95–122.

[14] See Trevor Findlay, *Paper for Project on Implementation of Multilateral Arms Control Agreements: Questions of Compliance: Nuclear Tests,* Geneva Centre for Security Policy, www.gcsp.ch.

[15] Coit D. Blacker and Gloria Duffy (eds.), *International Arms Control: Issues and Agreements,* Stanford University Press, Stanford, California, 1984, p. 137. For a summary of the discussion on differentiating between earthquakes and nuclear explosions, see Jack F. Evernden and Charles B. Archambeau, 'Some Seismological Aspects of Monitoring a CTBT', in Kosta Tsipis, David W. Hafemeister and Penny Janeway (eds.), *Arms Control Verification: The Technologies That Make It Possible,* Pergamon–Brassey's, Washington, DC, 1986, pp. 223–263.

[16] Politicians on both sides used verification arguments to 'avoid making clear-cut choices between co-operation and competition'. The US was willing to go a long way to maintain this 'avoidance strategy'. When American scientists concluded in 1970 that it was possible to tell a nuclear explosion from an earthquake even at low seismic magnitudes and thereby 'removed the last shreds of plausibility from a continued US insistence on OSIS for a CTB', the report was classified and its results distorted by the US Advanced Research Projects Agency. See Gallagher, p. 220.

[17] The full title of the Treaty is the Treaty Between The United States of America and the Union of Soviet Socialist Republics on the Limitation of Underground Nuclear Weapon Tests.

[18] Article II of the TTBT specified that, 'for the purpose of providing assurance of compliance with the provisions of this Treaty, each Party shall use national technical means of verification at its disposal in a manner consistent with the generally recognised principles of international law'. TTBT, Article II.

[19] Gallagher, p. 160.

[20] The GSE eventually produced six reports: the first three identified the basic requirements for a CTBT verification system; and the final three reported on the results of the GSE's technical tests.

[21] See Peter W. Basham and Ola Dahlman, 'International seismological verification', in Goldblat and Cox (eds.), pp. 169–189.

[22] The US Plowshare Program had lost most of its domestic support by the mid-1970s. See Trevor Findlay, *Nuclear Dynamite. The Peaceful Nuclear Explosions Fiasco,* Brassey's Australia, Rushcutter's Bay, 1990, pp. 220–237.

[23] The full title of the Treaty is the Treaty on Underground Nuclear Explosions for Peaceful Purposes.

[24] Findlay, *Nuclear Dynamite, The Peaceful Nuclear Explosions Fiasco,* p. 253.

[25] In the end, a group of explosions for peaceful purposes were allowed a combined yield of up to 1.5 megatons.

[26] Article III, paragraph 2 of the PNET.

[27] Allen Greb, 'Survey of past nuclear test ban negotiations', in Goldblat and Cox (eds.), pp. 95–117.

[28] Findlay, *Nuclear Dynamite. The Peaceful Nuclear Explosions Fiasco,* pp. 259–260.

[29] Greb, p. 106.

[30] Gallagher, p. 190.

[31] According to the Treaties, both confidence building and verification would commence only after the documents of ratification had been exchanged.

[32] For a description of the experiment, see Philip G. Schrag, *Listening for the Bomb: A Study in Nuclear Arms Control Verification Policy,* Westview Special Studies in National Security and Defense Policy, Westview Press, Boulder, San Francisco and London, 1989.

[33] The Joint Verification Experiment (JVE) was conducted in August 1988. US and Soviet scientists evaluated hydrodynamic and teleseismic monitoring technologies. The Reagan administration had insisted that continuous reflectometry for radius versus time experiments (CORRTEX), an on-site hydrodynamic yield estimation method that has to be applied in or near the actual shaft of an underground test, should be added to the list of verification technologies. The JVE experts concluded that this new, highly intrusive verification method was not superior to conventional means of monitoring nuclear tests. The JVE, however, was an important confidence-building measure. See Jozef Goldblat, *The Nuclear Test-Limitation Treaties,* in Sur (ed.), p. 102, and Gallagher, p. 191.

[34] Protocol to the Treaty Between the United States of America and Union of Soviet Socialist Republics on the Limitation of Underground Nuclear Weapon Tests, Moscow, 1 June 1990.

[35] Gallagher, p. 149.

[36] For an analysis of the negotiating framework, see Rebecca Johnson, 'Nuclear Arms Control Through Multilateral Negotiations,' in Nancy W. Gallagher (ed.), *Arms Control: New Approaches to Theory and Policy*, Frank Cass, London, 1998, pp. 83–115.

[37] During the CTBT negotiations, interaction between the scientific community and negotiators was sometimes difficult. Scientists could not always deliver results on time, and diplomats forced new requirements on the scientists. See Gallagher, *Politics of Verification,* p. 231.

[38] For an account of the GSE until the early 1990s, see Thomas Schmalberger, 'In Pursuit of a Nuclear Test Ban Treaty, A Guide to the Debate in the Conference on Disarmament', United Nations Institute for Disarmament Research, Geneva, April 1991, UNIDIR/91/16, pp. 61–91.

[39] See the chapters in this volume by Pál Dunay and Annette Schaper.

[40] Implementation only started after entry into force of the CWC in 1997. But the negotiations demonstrated that disagreements over verification questions could be overcome and that the outcome would still be a viable verification system. It can also be argued that it is more complex to monitor the CWC than a CTBT.

[41] Article I of the Comprehensive Nuclear Test Ban Treaty. The formula was introduced by Australia in March 1995 and subsequently endorsed by the major nuclear weapon states. See Rebecca Johnson, 'The CTBT Endgame: the Major Obstacles', in Poole and Guthrie (eds.), *Verification 1996: Arms Control, Peacekeeping and the Environment*, VERTIC Yearbook, Westview Press, Boulder, Colorado and Oxford, UK, 1996, pp. 87–104.

[42] Joachim Schulze, 'Verification for CTBT Compliance: Developments during the 1995 Negotiations', in John B. Poole and Richard Guthrie (eds.), *Verification 1996*, pp. 105–124.

[43] The 44 states named in Annex 2 are: Algeria, Argentina, Australia, Austria, Bangladesh, Belgium, Brazil, Bulgaria, Canada, Chile, China, Colombia, Democratic People's Republic of Korea, Egypt, Finland, France, Germany, Hungary, India, Indonesia, Iran, Israel, Italy, Japan, Mexico, Netherlands, Norway, Pakistan, Peru, Poland, Romania, Republic of Korea, Russian Federation, Slovakia, South Africa, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom, United States of America, Vietnam, Zaire.

[44] Only Bhutan, India and Libya voted against the Treaty in the General Assembly. Cuba, Lebanon, Mauritius, Syria and Tanzania abstained.

[45] Verification technologies that were under consideration but not included in the IMS include ground-based optical, ground-based electromagnetic pulse (EMP) detection networks, and satellites. The CTBT, however, specifically provides that additional monitoring technologies 'shall, when agreed, be incorporated in existing provisions in this Treaty'. Article IV, paragraph II of the CTBT.

[46] For a description of hydroacoustics as a monitoring technique, see Ruth Weinberg, 'Hydroacoustic Monitoring of the World's Oceans', *Verification Matters no. 8*, Verification Technology Information Centre (VERTIC), London, January 1995.

[47] A good summary of synergies between the different IMS components is given in Larry S. Walker, 'A Systems Perspective of Comprehensive Test Ban Treaty Monitoring and Verification', *Sandia Report*, Sandia National Laboratories, Albuquerque, New Mexico, US, November 1996, SAND96-2740/UC-700.

[48] Peter Marshall mentions the example of two 100 and 25 ton conventional test explosions in Kazakhstan, as well as a 2–2.5 ton underwater test explosion in the Red Sea, which were successfully identified and located by a partially completed IMS. See Peter D. Marshall, 'Achievements of the CTBT, Efficacy and Benefits of the Treaty Regime', presentation at the Third Anniversary of the Preparatory Commission in Vienna, Austria, 4 April 2000.

[49] The CTBT Preparatory Commission, charged with setting up the Organization and the IMS, was founded in November 1996. The Provisional Technical Secretariat and the PrepCom started work in March 1997. An update of the work of the PrepCom can be found in Trevor Findlay and Oliver Meier, 'Fulfilling the NPT: A Verifiable Test Ban', *Briefing Paper 00/1,* Verification Research, Training and Information Centre, London, April 2000.

[50] This was the outcome of a last minute deal between the US and China in the final stages of the negotiations. Rebecca Johnson, 'A Comprehensive Test Ban Treaty: Signed but not Sealed. A Review of the CTBT Negotiations in the Conference on Disarmament January–September 1996', *Acronym* no. 10, London, May 1997, p. 43.

[51] Article V (D), paragraph 37 of the CTBT.

[52] During the tenth session of Working Group B in August 1999, the Chairman, Ola Dahlman, complained that 'OSI is lagging behind the other elements of the verification system'. *Introductory Comments by the Chairman of Working Group B to the Tenth Session*, CTBT/PC-10/1/Annex II, Appendix I, 30 August 1999, p. 19.

[53] See, for example, CTBT/PC-10/1/Annex II, p. 6.

[54] Trevor Findlay, 'The Indian and Pakistani Tests: Did Verification Fail?', *Trust & Verify*, Verification Research, Training and Information Centre, London, no. 80, May 1998, pp. 1–4.

[55] A good summary of the history of the US nuclear detection network is contained in Charles A. Ziegler and David Jacobson, *Spying without Spies: Origins of America's Secret Nuclear Surveillance System,* Praeger, Westport, Connecticut and London, 1995.

[56] For a summary of the debate, see Oliver Meier, 'Verifying the CTBT: Responses to Republican Criticisms', *Disarmament Diplomacy*, no. 40, September–October 1999, pp. 19–21; and Daryl Kimball, 'What Went Wrong:

Repairing the Damage to the CTBT', *Arms Control Today,* no. 8, vol. 29, December 1999, pp. 6–9.

[57] Robert Suro, 'CIA Admits Test-Ban Shortcomings', *International Herald Tribune*, 4 October 1999. Colin Macilwain, 'US Senate ignores scientific advice in failing to ratify test ban treaty', *Nature 401*, 6755, 21 October 1999, p. 735. The possibility of evading the CTBT, in the context of the US debate on ratification, is discussed in Lynn R. Sykes, 'False and Misleading Claims about Verification during the Debate on the Comprehensive Nuclear Test Ban Treaty', *FAS Public Interest Report*, Journal of the Federation of American Scientists, Washington, DC, volume 53, no. 3, May–June 2000.

[58] To prepare for the next ratification debate in the US Senate, President Bill Clinton's administration has established a high-level task force under the leadership of retired General John Shalikashvili. See Statement of Secretary of State Madeleine K. Albright on the Comprehensive Test Ban Treaty, Davos, Switzerland, 28 January 2000, secretary.state.gov. Moreover, VERTIC has established an Independent Commission on the Verifiability of the Comprehensive Nuclear Test Ban Treaty to support an informed debate on current and future capabilities of the CTBT's verification system. Information on the Commission, which consists of eminent scientific experts, and its final report can be found on VERTIC's website at www.vertic.org or on the Commission's website at www.ctbtcommission.org.

[59] A good summary of progress is contained in the reader of a seminar that was conducted by the CTBTO on the third anniversary of the establishment of the PTS. See CTBTO PrepCom, 'Summary Report of Panel Discussion "CTBT Three Years On—Significance, Achievements, The Way Forward"', Vienna, Austria, 4 April 2000, www.clw.org.

[60] Collection rates from member states have been above 90%, higher than in most other international organisations.

[61] To enable the PrepCom to certify the IMS, 'facility agreements or arrangements' have to be negotiated between the PTS and member states. By April 2000, the PrepCom had concluded nine facility agreements.

3

Nuclear safeguards: evolution and future

David Fischer

Nuclear safeguards were first publicly proposed in a November 1945 declaration by US President Harry Truman, UK Prime Minister Clement Attlee and Canadian Prime Minister William Mackenzie King. The three allies said that they would be willing 'to proceed with the exchange of fundamental scientific literature about atomic energy', but only when 'it is possible to devise acceptable, reciprocal and enforceable safeguards acceptable to all nations' against its destructive use.[1] By the end of 1959, the US had concluded agreements with 42 countries to co-operate in the peaceful application of atomic energy. These agreements required the use of safeguards—initially by the US, but, later, in many cases, by the International Atomic Energy Agency (IAEA).[2]

Safeguards were institutionalised regionally in 1957 with the creation of the European Atomic Energy Community (EURATOM),[3] and internationally with the establishment of the IAEA. In Latin America, Argentina and Brazil have also set up a bilateral safeguards system, administered by the Argentina–Brazil Agency for Accounting and Control of Nuclear Material (ABACC). ABACC and the IAEA co-operate closely in applying safeguards, each retaining, however, the ability to verify independently compliance with their joint safeguards agreement.[4] Since 1967, nuclear weapon-free zones have been set up by treaty in several regions.

These safeguards aim to verify that nuclear material and technology are only used for purposes permitted by their charters. All of the charters (with the exception of EURATOM's)[5] prohibit the diversion of safeguarded nuclear material to nuclear weapons or to other nuclear explosive devices,[6] or go further and ban all non-peaceful uses of nuclear energy.[7] The treaties call on the IAEA to verify compliance with these restrictions.

The IAEA and EURATOM

The main international safeguards applied today are those of the IAEA. This is an autonomous, intergovernmental body controlled by a General Conference, comprising, as of the end of 1999, the 131 member states of the IAEA, and a 35-nation Board of Governors.[8] The IAEA reports on its work to the UN General Assembly and the Security Council.

Like the IAEA, EURATOM, which is the nuclear branch of the European Union (EU), owes the development of its safeguards regime largely to US policy requirements. In the early 1950s, the leading Western European states shared the general belief that nuclear power would be the energy of the future, that it would free them from dependence on Arab oil, and that it would be the driving force behind a united Europe. To launch a nuclear power programme, though, Western Europe would have to draw heavily on American nuclear fuel and technology, which would only be available under certain restrictions. Consequently, they equipped EURATOM with safeguards that met American demands.

In 1958, the framers of US nuclear policy were divided. Some wanted the country's nuclear exports to Western Europe to fall under the safeguards of the IAEA (largely an American creation), while others backed EURATOM safeguards as a means of strengthening the unity of Western Europe and its bonds with the US. The latter carried the day.

In the late 1960s, it became urgent to decide what safeguards should apply in non-nuclear weapon states parties to the Nuclear Non-Proliferation Treaty (NPT), which had been opened for signature in 1968 and which required full-scope safeguards for such states. Anxious about the nuclear potential of West Germany, the Soviet Union successfully resisted Western European attempts to retain EURATOM's safeguards monopoly. The IAEA, EURATOM and EURATOM's non-nuclear weapon states agreed in 1973 to amalgamate the safeguards that the two agencies would apply in these countries. This opened the way for EURATOM's non-nuclear weapon member states to ratify the NPT in 1975. In so doing, they also renounced the right to acquire nuclear weapons and accepted joint verification of this decision by EURATOM and the IAEA.[9] The integration of the two safeguards operations was taken further in 1992 by an agreement between the Secretariats of the two organisations 'on a new partnership approach'. This move has already reduced by nearly 25% the number of inspections that the IAEA carries out in these states. Today the size and cost of the two agencies' safeguards operations are roughly comparable.

As the EU expands, so too does the coverage of the IAEA–EURATOM agreement. EURATOM's safeguards are comprehensive in the case of the EU's 13 non-nuclear weapon states, but only apply to the civilian nuclear activities of its two nuclear weapon states: France and the UK.

Growth of IAEA safeguards

The Agency's safeguards initially encountered mistrust and resistance, especially from its developing country members, but also from the Soviet bloc and some West European states intent on protecting EURATOM. In the mid-1960s, the coverage of IAEA safeguards began to expand as a result of the US decision to transfer to the IAEA responsibility for safeguarding its nuclear exports to non-European Economic Community (EEC) countries and of the 1963 Soviet decision to give IAEA safeguards full Eastern bloc support. This change of policy probably reflected the *détente* in East–West relations that followed the resolution of the 1962 Cuban missile crisis, the fact that China turned into the Soviet Union's harshest critic after the latter had helped it to make 'the bomb', and, above all, Soviet concerns about the Federal Republic of Germany (FRG)'s emerging nuclear programme. By 1968, the IAEA was able to draw up safeguards covering almost every type of nuclear plant.

When the NPT came into force in 1970 it became urgent to construct a safeguards system covering the entire nuclear fuel cycles of the non-nuclear weapon states that would soon join the Treaty. The Agency's Board approved the new system in 1971.[10] By the beginning of the 1980s, almost all industrialised countries and many developing nations had joined the NPT, and, with the exception of the nuclear weapon states, most of them had placed all of their nuclear material under IAEA safeguards, as required by Article III of the NPT.[11]

In 1991, it was discovered that Iraq was conducting an extensive nuclear weapons programme, undetected by IAEA safeguards, even though it had foresworn nuclear weapons when it ratified the NPT in October 1969. This led to a fundamental review of the existing (1971) system. Henceforth, the IAEA should be able to monitor both the nuclear and nuclear-related activities of a state, and not just (as heretofore) the individual nuclear plants declared to the Agency.

Despite the Iraqi setback, the early 1990s marked a high point in the evolution of the NPT and international acceptance of IAEA safeguards mainly because of the unexpected end of the Cold War. At the 1995 quinquennial NPT conference the parties agreed to an indefinite extension of the Treaty. By this point all except three

of the countries that had significant nuclear programmes (India, Israel and Pakistan) had acceded to the NPT or to one of the regional accords banning nuclear weapons.[12]

Since then, however, there have been threats to the non proliferation regime. North Korea has been in violation of its IAEA safeguards agreement for the past seven years. At the end of 1998, UN Special Commission (UNSCOM) and IAEA inspectors were banned from Iraq,[13] and, earlier the same year, India and Pakistan damaged the emerging norm against nuclear testing enshrined in the 1996 Comprehensive Nuclear Test Ban Treaty (CTBT). In 1999, the US Senate rejected ratification of the CTBT, which the international community has been striving for since the 1950s. In addition, moves towards nuclear disarmament, envisaged in Article VI of the NPT, have ground to a halt. Until early 2000, the Russian Duma had failed to ratify the second Strategic Arms Reduction Talks (START) Treaty, despite encouragement from the government. And pressure is mounting in the US for a nationwide anti-ballistic missile defence system, endangering a cornerstone of nuclear disarmament, the 1972 Anti-Ballistic Missile (ABM) Treaty.

Many nations have helped to promote IAEA safeguards, but their effectiveness has largely depended on American initiatives and support. This dependence has become of critical significance at a time when some US political leaders appear to be turning away from collective security as a mainstay of foreign policy and towards US technical supremacy in a world in which it has become the supreme power.

Three phases of IAEA safeguards

Phase one: IAEA safeguards face an uphill struggle until the mid-1960s

In January 1959, the Agency's Board of Governors approved the first agreement for the application of safeguards, covering a small Japanese reactor and its fuel. However, several members of the Board vigorously opposed the agreement. Although the Soviet Union was engaged in a Cold War propaganda contest with the West, it genuinely doubted the wisdom of a global diffusion of nuclear technology. It likened IAEA safeguards to a 'spider's web', designed to ensnare developing countries and to stifle their scientific and technical progress. Some of the leading EEC countries saw IAEA safeguards as a potential threat to EURATOM. India and its 'Third World' supporters believed that nuclear power was the energy of the future and were mistrustful of international controls on their infant nuclear programmes. They would accept IAEA safeguards only when it became clear that this was the price they would have to pay for obtaining access to US civilian nuclear technology.

As proof of the need for an agreed and standardised system, proponents cited the lengthy discussions on safeguards for the small Japanese reactor. The Board of Governors approved the first IAEA safeguards system in 1961, but many Western European countries only went along reluctantly. The accompanying directive on the work of IAEA inspectors showed how far the Board had to go to get the document accepted. For instance, the IAEA would have to give at least one week's notice of each routine inspection. The government concerned would stipulate the port or airport through which inspectors must enter and leave the country and the routes that must be followed in that state. It also had the right to insist that the inspectors be accompanied everywhere by national officials.

In 1963, the Soviet Union unexpectedly expressed its full support for IAEA safeguards. As a result, the Agency's Board was soon able to approve a system that covered all types and sizes of nuclear plants (except enrichment facilities).[14] Canada, the UK and the US could now turn to the IAEA to monitor the use of the nuclear reactors that they were supplying to India, Japan and several other countries.[15] These safeguards were designed to apply to individual supplies of plants and fuel, rather than to the entire fuel cycle of a non-nuclear weapon state. Nonetheless, they provided the NPT (under negotiation from 1965) with a tested verification system on which to build the comprehensive safeguards foreseen in Article III of the Treaty. But the five non-nuclear weapon states, which were then members of the EEC (now the EU), also insisted on preserving EURATOM safeguards.

Phase two: the NPT's entry into force and comprehensive IAEA safeguards

The NPT entered into force on 5 March 1970. According to Russia, the main objective of the Treaty was to enable other parties to keep an eye on their former enemy, the FRG, which was building plants capable of producing nuclear weapon material: plutonium and enriched uranium. Some of the Federal Republic's neighbours shared Soviet apprehensions; some countries in East Asia felt the same about Japan. But Germany, Japan and other non-nuclear weapon states with substantial nuclear energy activities were determined that the NPT should not impair their nuclear industries' right to engage in all non-military nuclear activities, including reprocessing spent fuel to recover plutonium and the enrichment of uranium. They also sought to ensure that safeguards should not be unduly intrusive, especially since the NPT would not require their nuclear weapon state rivals (France, the UK and the US) to accept any safeguards whatsoever. In the eyes of the non-nuclear

weapon states only the application of safeguards to the nuclear industries of their nuclear weapon state competitors would 'level the playing field'.

The NPT would have little value if it were not accepted by the leading non-nuclear weapon states: the FRG, Japan, and some other non-nuclear weapon state members of the EEC. It was therefore imperative to take account of their concerns. Human inspections would have be kept to a minimum in order to reduce opportunities for industrial espionage, and safeguards would only be applied to nuclear material in nuclear plants which the government concerned had declared to the IAEA. In normal operations, the Agency's inspectors were to have access only to a limited number of previously agreed 'strategic points' in declared nuclear facilities in the country concerned. The last two limitations proved crucial.

It was also agreed that a comprehensive new safeguards system reflecting these concepts should be drawn up as soon as possible. A good reason for speed was that the NPT required its non-nuclear weapon state parties to negotiate and conclude full-scope safeguards agreements with the IAEA—a process to be completed within 18 months of their accession to the Treaty. It would also become illegal for any NPT party to supply nuclear material and technology to a non-nuclear weapon state not party to the NPT, unless the nuclear material itself or that resulting from the transaction was under IAEA safeguards.[16] In practice, this meant that the US could no longer legally supply fuel for Belgian, Italian and West German reactors or for other plants in EURATOM non-nuclear weapon states until all those nations had ratified the NPT and accepted full-scope IAEA safeguards.[17]

The Agency's Board of Governors approved the new system in 1971.[18] But it was not until 1975–76 that the EEC non-nuclear weapon states and Japan ratified the NPT. These ratifications were made possible by the conclusion of agreements that dovetailed IAEA safeguards with those of EURATOM and the Japanese verification system respectively. Almost all industrialised states and a wide range of developing countries, therefore, were able to ratify the NPT and to accept comprehensive safeguards before the end of the 1970s. But the leading absentees in 1980, and until the early 1990s, included two nuclear weapon states, China and France, and several leading developing countries in regions then marked by intense political tension and regional rivalry: Argentina, Brazil, India, Israel, Pakistan, and South Africa.

Phase three: the 1980s and 1990s

The end of the Cold War transformed relations between the leading nuclear states, redrew the political map of Eastern Europe and the former Soviet Union, and,

as a result, laid the ground for major advances in nuclear disarmament. In addition, the transformation of internal politics and of relations between erstwhile enemies or rivals made it possible for Argentina and Brazil to renounce their nuclear weapon options and for South Africa to give up its nuclear weapons, leaving only India, Israel and Pakistan as significant nuclear absentees. These political developments also encouraged the creation of new nuclear weapon-free zones in Africa and, by force of example, in Southeast Asia, and helped strengthen and clarify the Treaty for the Prohibition of Nuclear Weapons in Latin America.[19] By 1995, the NPT seemed to be coming close to universality and IAEA safeguards appeared to be nearing the point at which they might cover all the nuclear activities of the non-nuclear weapon states.

The 1995 Conference on the Review and Extension of the NPT extended indefinitely the duration of the Treaty. Its full-scope safeguards agreements were also made permanent (except in the unlikely event that the state party concerned withdrew from the NPT). The Conference reaffirmed the commitment of the NPT states—in particular the nuclear weapon nations—to work towards total nuclear disarmament, to conclude a CTBT no later than 1996, and to finalise a convention to ban fissile material for nuclear weapon purposes. The prospects for a world free of nuclear weapons, in which IAEA safeguards would verify compliance and maintain confidence, had never seemed brighter.

Nonetheless, IAEA safeguards were facing serious challenges. The 1991 revelation that Iraq (a long-standing party to the NPT and to a comprehensive safeguards agreement with the IAEA) had been able to establish clandestinely an impressive nuclear weapons programme came as a severe shock and disclosed a major defect in the 1971 system. That system had proved effective in verifying that no diversion of nuclear material was taking place in the stocks and plants that parties had declared to the IAEA, but it had failed to detect Iraq's undeclared nuclear activities.

In 1992–93, it became clear that North Korea was also conducting undeclared nuclear activities and had produced and separated plutonium. In this case, however, the IAEA, applying some of the lessons learnt from its experience in Iraq, detected traces of the undeclared plutonium, and, consequently, a potential violation of Pyongyang's safeguards agreement with the Agency. It also received satellite images from the US showing two undeclared nuclear facilities of the type usually used to store nuclear waste. The IAEA called on North Korea to open the plants to special inspection. Pyongyang refused, and the IAEA reported to the Security Council that

the country was in violation of its safeguards agreement. As a result of US intervention and its willingness to arrange for the supply of two American-designed power reactors, North Korea agreed to halt its suspect programme and eventually to dismantle its suspect nuclear plants. Most of the political heat was thus taken out of the dispute between the IAEA and North Korea. Nevertheless, at the end of 1999, the Agency had still not been able to inspect the installations and Pyongyang was still in violation of its safeguards agreement.

With the end of *apartheid* in 1991, and the beginning of multiracial democracy, the government of South African President F.W. de Klerk also reversed its nuclear policy. It unobtrusively scrapped its small arsenal of six nuclear warheads (plus one that was under construction), acceded to the NPT, and, in record time, concluded a comprehensive safeguards agreement with the IAEA. South Africa then sent the Agency the required 'Initial Report', listing all of its nuclear material and plants. At the request of the IAEA General Conference, the Agency's Secretariat verified the completeness of the document. In 1993, President de Klerk disclosed that South Africa had indeed manufactured and subsequently dismantled a small nuclear arsenal. The IAEA accepted the South African government's invitation to verify that the arsenal no longer existed and that its nuclear weapons programme had been terminated.[20] South Africa thus became the first nuclear weapon state to renounce and dismantle a nuclear arsenal.[21]

These events, and, particularly, the IAEA's failure to detect the Iraqi programme, prompted the Board of Governors to begin a radical review and to revise the IAEA's 1971 NPT safeguards system. In the first stage of this review, the Board and the member states took a number of individual measures to strengthen safeguards without formally seeking any additional authority or touching the 1971 safeguards document. These so-called 'Part 1' measures, agreed in 1995, included:

- a requirement that states should submit information about the design of new nuclear plants much earlier than had been the practice since 1971;
- a directive to the Secretariat to make full use of its existing but unused power to conduct special inspections anywhere in a state with comprehensive safeguards;
- arrangements to give the Agency access to national intelligence information;
- an agreement by EU states to provide full information about all exports and imports of certain nuclear equipment and non-nuclear material;
- the use of certain environmental sampling techniques, which had already been tried out in Iraq; and

- the reaffirmation by the Security Council of its support for the IAEA in case of a safeguards violation.

In May 1997, the Board approved a major strengthening of the 1971 system, which greatly extended the scope and intrusiveness of safeguards. The new 'Model Protocol Additional to the Agreements between States and the International Atomic Energy Agency'[22] was designed to remedy the weaknesses of traditional instruments, but not to replace them. The 1971 system verified that no diversion of nuclear material took place at individual plants and stores that the non-nuclear weapon states had declared to the IAEA and which had thus come under safeguards.[23] The modified 'Strengthened Safeguards System' would seek to verify that there was no diversion of nuclear material *anywhere* in the state concerned—in other words, the new system would assess the state as a whole. The Agency was now also in a position to look actively for undeclared nuclear activities.

To enable the IAEA to widen its focus in this manner each non-nuclear weapon state would be required (as in the past) to provide comprehensive information on all the nuclear material that it held, produced and received, as well as on all its past, present and future nuclear and nuclear-related activities, ranging from uranium mining to waste disposal, regardless of whether or not these activities involved the use, production or processing of nuclear material. For instance data must henceforth be provided about the location and operation of all facilities that manufacture enrichment plants or their major components, even though such facilities would not normally contain any nuclear material.

This expansion of the scope and intrusiveness of verification applied equally to the IAEA's rights of access. Inspectors were now to enjoy 'complimentary access' to any part of a nuclear plant (not just previously agreed 'strategic points'), any location in a nuclear centre and any installation conducting 'nuclear-related' activities.

It is expected that the expanded flow of information and improved access, as well as better use of regional systems and advanced verification technology, will enhance the effectiveness of safeguards. Thus the strengthening of nuclear safeguards will enable the IAEA to redirect verification resources towards those countries where questions persist about the completeness and correctness of declarations. The integration of safeguards also has the potential to increase the efficiency of safeguards. Under the label 'integrated safeguards', the Agency and member states are currently evaluating proposals to reduce the need for routine inspections to such an extent that the net cost of applying safeguards will not increase, despite the growing

workload. For the Agency's Board of Governors, cost has always been an important consideration: indeed for 20 years the IAEA has had to live within the confines of a 'zero-growth' budget. 'Integrated safeguards' could result in a major shift in the its activities: away from nuclear material accounting towards a more proactive approach that verifies a state's compliance based on information from a wide variety of sources, random checks and state level evaluations.

Non-nuclear weapon states bring the strengthened system into effect for themselves by signing and ratifying a standard additional protocol to their comprehensive (INFCIRC/153) safeguards agreements with the IAEA. By the end of December 1999, 46 states had accepted the strengthened system by signing additional protocols. They included all the EU's 13 non-nuclear weapon states (Austria, Belgium, Denmark, Finland, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain and Sweden), as well as Australia, Canada, Indonesia, Japan, the Republic of Korea and almost all of the states in Eastern Europe. The nuclear weapon states are expected to apply relevant clauses of the strengthened system to the civilian nuclear plants that they have already voluntarily placed under safeguards. All five nuclear weapon states have signed an additional protocol.

It will probably take a few years before the strengthened system becomes law in all non-nuclear weapon states that have, or plan to have, significant nuclear plants. Nonetheless, if a state in this category unduly delays its acceptance of the new system it may arouse mistrust about its motives.

The new system should be considerably better than its predecessor in detecting any clandestine attempt to acquire nuclear weapons, but much will continue to depend on the competence and commitment of the IAEA Secretariat and the resources that states make available to it. Secret transfers of complete weapons or fissile material from one party to another (if they take place) are more likely to be a challenge to the authorities in the country of origin than to international inspectorates. The IAEA would be more directly on trial if a nation that had accepted comprehensive safeguards attempted, like Iraq, to put together a large clandestine complex to produce fissile material and to 'weaponise' the product.[24]

One should also ask how probable it is that any other nation would try to copy Iraq, and, if it did, how much better are contemporary nuclear export controls than those of the 1970s and 1980s? A fair comment would be that it is difficult to identify any state that might have the incentive and the means to follow Iraq,[25] and that is not already the subject of much more intense scrutiny than Baghdad

was in the 1980s. North Korea is in the process of becoming dependent on Western nuclear technology and fuel. A detected move towards a secret bomb would politically be very risky for South Korea and Taiwan. Iran, the most frequently cited candidate, would jeopardise its improving relationship with Western Europe. And if Iran 'went nuclear', Russia could hardly continue its nuclear supplies. Unless the relevant Security Council resolutions are lifted there is little chance of Iraq rebuilding its shattered nuclear programme. The nuclear non-proliferation regime would be more at risk if there were a breakdown in co-operation between China, Russia and the US, which is the basis for effective non proliferation.

Future prospects and problems

Despite the achievements of recent years, IAEA safeguards face several problems. The perennial challenge is the shortfall in resources needed to deal with growing demands on the system, such as the mounting stocks of separated plutonium from the reprocessing of civilian spent fuel. These inventories may already exceed those in nuclear arsenals and in other military stocks.

Other sources of safeguarded fissile material result from current projects—in particular, the Trilateral Initiative between Russia, the US and the IAEA—to place former military material under the Agency's supervision in order to verify that it remains permanently in civilian hands. The highly enriched uranium released by this process can be rendered militarily unusable by 'blending it down' into fuel for nuclear power reactors. It is much more difficult to make plutonium harmless or to develop means of storing plutonium pits under international auspices without risking the disclosure of sensitive information about weapons design.

It is always possible that one or more of the non-nuclear weapon states will renounce commitments made under the NPT or regional treaties and will openly seek to acquire nuclear weapons (in other words, to 'break out'). This has become unlikely in Europe, Latin America and the Caribbean. In Africa, Central Asia, Southeast Asia and the Pacific, the incentive has been fading and non proliferation institutions are multiplying. The Middle East and East Asia remain the regions where mistrust and hostility run deep and technical capacities are advancing.

A potentially more damaging threat comes not from 'rogue states', but from the country that has done more than any other to foster IAEA safeguards and the regime on which they depend. The bombing of the former Yugoslavia without a prior Security Council mandate, growing domestic support for the deployment

of anti-ballistic missiles, and, in particular, the Senate's rejection of the CTBT, might indicate that the US is turning away from internationally agreed objectives and operations and is placing more reliance on its own superior military strength and a compliant NATO. So far, however, there has been no perceptible change in US policy towards the IAEA and no weakening of American support.

In the past, the scope of IAEA safeguards has partly depended on the extent to which the world planned to make use of nuclear power. Apart from a few states in East and South Asia and Eastern Europe, nuclear power is not a growth industry. The future prospects for safeguards are thus more likely to depend on progress in nuclear disarmament than on the spread of nuclear power.

The prospects for 'a treaty on general and complete disarmament under strict and effective control' (a goal of Article VI of the NPT) are probably distant. The role of the IAEA in such a treaty can only be speculative at this time. New regional nuclear weapon-free zones may come into force, but it is likely that most of the countries joining them would already be parties to the NPT, and it is unlikely that there would be any need for significant additional safeguards.

Two developments in nuclear arms control may have a more immediate effect. The first, which has already been discussed, is the intention of some nuclear weapon states to place significant amounts of former military fissile material under IAEA supervision (for instance, the Trilateral Initiative). The second is the proposed convention to ban the production of fissile material for nuclear weapon purposes. Negotiations have still not started, although preliminary studies have been made of the additional safeguards that such a convention might require. At a minimum, all reprocessing and enrichment plants should be put under safeguards or shut down. At the upper end it might be desirable to safeguard all civilian nuclear operations of the nuclear weapon states. Since verifying that Germany and Japan are not producing material for nuclear weapons requires that their entire nuclear industries be safeguarded, it could be argued that the same should apply *a fortiori* to the nuclear weapon states' industries, which, from the start, were also designed to produce material for nuclear weapons.

David Fischer, as a South African diplomat, took part in the drafting of the Statute of the IAEA from 1954–56. From 1957–82, he was in charge of external relations for the IAEA, eventually as Assistant Director General.

Endnotes

[1] This was the gist of a Three Nation Agreed Declaration on Atomic Energy. See Bernard G. Bechoefer, *Postwar Negotiations for Arms Control,* The Brookings Institution, Washington, DC, 1961, p. 33.

[2] Congress of the United States, 'Background Material for the Review of the International Atomic Energy Policies and Programs of the United States', Report to the Joint Committee on Atomic Energy, vol. 3, US Government Printing Office, Washington, DC, 1960, p. 897.

[3] The nuclear arm of the EEC and its successor, the EU.

[4] ABACC is broadly modelled on EURATOM, and its relationship with IAEA safeguards was forged by an agreement similar to that concluded in 1973 between EURATOM and the IAEA. The Quadripartite Agreement between Argentina, Brazil, ABACC and the IAEA was concluded in December 1991 and entered into force in March 1994.

[5] The EURATOM Treaty stipulates that its safeguards are to verify that nuclear materials 'are not diverted from their intended use as declared by the users' (Treaty of Rome, 25 March 1957, Article 77). This wording reflects the fact that, when the Treaty was negotiated, France was well on its way to becoming a nuclear weapon state. It was, therefore, impossible to stipulate that all nuclear material in the EEC be used only for peaceful purposes or that EURATOM safeguards should verify fulfilment of this stipulation. However, the effect of another clause in the Treaty of Rome, as well as of the IAEA–EURATOM 1973 Safeguards Agreement and the ratification of the NPT by all the EU's non-nuclear weapon states, is that EURATOM safeguards (together with those of the IAEA) verify that there is no diversion of nuclear materials to nuclear weapons or other nuclear explosives in any of the EU's non-nuclear weapon states.

[6] The NPT, for example. This prohibition implicitly leaves open the possibility of using nuclear energy in reactors that propel submarines or surface warships.

[7] Article II of the IAEA Statute seeks to ensure that nuclear material and activities with which it is associated are not used 'in such a way as to further any military purpose'. Article I of the Latin American Treaty of Tlatelolco is ambiguous on this point.

[8] In 1999, the IAEA's Board and General Conference approved an amendment to the Agency's Statute that, when it comes into force, will increase the Board's membership to 41 states.

[9] The FRG had already renounced the right to make atomic, biological and chemical weapons when it signed the Treaty on the Western European Union in 1954, although there were still some uncertainties about the scope and status of this renunciation.

[10] Known by the number of the IAEA document in which it was published, INFCIRC/153.

[11] As of June 2000, more than 50 NPT member states are still in breach of their Treaty obligations because they have not concluded the required safeguards agreement. See 'Statement to the Review Conference of the Treaty on the Non-Proliferation of Nuclear Weapons' by the IAEA Director-General, Mohamed ElBaradei, New York, 24 April 2000.

[12] The NPT's ban on nuclear weapons does not apply to the five states that had made and exploded nuclear weapons before 1 January 1967. Aside from the end of the nuclear rivalry between NATO and the defunct Warsaw Pact, other factors promoting nuclear disarmament were, of course, also at work, including profound political changes in South Africa and Latin America.

[13] Meanwhile, the IAEA has been allowed back into Iraq to perform routine inspections under its safeguards agreements. But it has been barred from resuming inspections under the relevant UN Security Council resolutions.

[14] At the time, enrichment technology was confined to the nuclear weapon states and was not exported.

[15] The model safeguards document for safeguards agreements covering individual facilities is known by its IAEA document number, INFCIRC/66/rev.2.

[16] The five non-nuclear weapon states of the EEC had signed the NPT, but they did not bring it into force until 1975. Consequently, there were no IAEA safeguards in those countries for several years. A period of grace was tacitly granted to allow them to continue importing nuclear material and plants without IAEA (but under EURATOM) safeguards until they had completed the process of ratification and the safeguards agreement between those states, EURATOM and the IAEA had been brought into force in February 1977.

[17] The countries were Belgium, Italy, the FRG, Luxembourg and the Netherlands, which were subsequently joined by eight more European states. In practice, the Soviet Union, as well as the US, tacitly accepted that the

EURATOM nations concerned should have a reasonably long grace period for negotiating the agreement with the IAEA. When the discussions ran into problems and delays, which they frequently did, the US would put pressure on the EU—and presumably Moscow would put pressure on Washington.

[18] Known by its IAEA document number, INFCIRC/153.

[19] At the end of 1999, five nuclear weapon-free zones were in force or in gestation: the Antarctic Treaty; the Tlatelolco Treaty in Latin America and the Caribbean; the Rarotonga Treaty in the South Pacific; the Pelindaba Treaty in Africa; and the Bangkok Treaty in Southeast Asia. The Tlatelolco Treaty had been amended and could no longer be interpreted in such a way as to permit its parties to carry out nuclear explosions for peaceful purposes. The nations of Central Asia were negotiating a treaty to establish a nuclear weapon-free zone in that region. Unfortunately, no progress had been made in the regions that most need such treaties: the Middle East and South Asia.

[20] David Fischer, *History of the International Atomic Energy Agency, The First Forty Years,* IAEA, Vienna, 1997, pp. 110–111.

[21] Eventually, the three former Soviet republics—Belarus, Kazakhstan and Ukraine—would follow the South African example and give up the nuclear weapons they inherited when the Soviet Union collapsed.

[22] Also known by its document number, INFCIRC/540.

[23] The non-nuclear weapon states were legally obliged to declare all their nuclear plants and stocks to the IAEA, but the 1971 safeguards system did not seek assurance that they had done so. It would have been impossible for an international body with a staff of 200 inspectors to carry out a 'blind search for undeclared facilities', as the IAEA Director-General, Hans Blix, put it. Only national intelligence operations involving satellite observation could effectively undertake targeted searches, and, until 1991, national intelligence services were not prepared to share the results of such activities with any international body.

[24] The IAEA is now assessing methods of detecting 'weaponisation'.

[25] Since Iraqi President Saddam Hussein expelled UNSCOM inspectors in late 1998, and the US and the UK launched a new series of aerial attacks against Iraqi targets, neither the IAEA nor the now defunct UNSCOM has been able to deploy inspectors and verify that the Iraqi government has not revived its nuclear weapons programme. However, the Security Council has replaced UNSCOM with the UN Monitoring, Verification and Inspection Commission (UNMOVIC)—headed by Hans Blix—and both the US and the UK are actively seeking to reintroduce inspections in Iraq.

4

Verifying nuclear arms control and disarmament

Annette Schaper

FROM THE OUTSET verification has been an essential element of attempts to control the nuclear arms race. This chapter assesses what has been accomplished in nuclear verification and compares it to the requirements for achieving comprehensive nuclear disarmament and for the maintenance of a nuclear weapon-free world.

Verification of a nuclear weapon-free world consists of two separate tasks: establishing with sufficient confidence that former nuclear weapon possessors have completely destroyed their arsenals and production capacities; and creating sufficient confidence that a world free of nuclear weapons will remain so.[1] Verifying nuclear reductions is a simpler task than verifying the transition to zero, since the latter must ensure that no clandestine nuclear arsenals remain and that all production complexes have been destroyed or converted. For both tasks some rudimentary elements are already in place or soon will be.

The first steps towards a nuclear weapon-free world comprise reductions in the number of nuclear warheads. The technical processes required encompass many individual initiatives, some of which are already being implemented as part of existing treaties, namely deactivation measures, separation of warheads from delivery vehicles, destruction or conversion of delivery vehicles and launch systems, and the destruction of missile silos. Others are taking place voluntarily, such as the destruction of warheads. Until now these latter steps have not been verified, although they could be integrated into future disarmament treaties. One of the last moves would be the disposition or re-use of fissile material retrieved from nuclear weapons for non-military purposes.

Treaties that limit or reduce nuclear weapons are: the 1972 Strategic Arms Limitation Talks (SALT) I Interim Agreement; the 1979 SALT II agreements; the 1987 Intermediate-range Nuclear Forces (INF) Treaty; the 1991 Strategic Arms

Reduction Talks (START) I Treaty; and the 1993 START II Treaty. All of these are bilateral agreements between the US and the Soviet Union or Russia.[2]

As the objectives of these treaties have become successively more ambitious, so too have the accompanying verification measures. The verification arrangements for the early treaties seem modest by today's standards, but they represented a major advance at the time. Negotiations are likely to begin soon on a START III Treaty, which has been under discussion since the Helsinki Summit in March 1997 between US President Bill Clinton and then Russian President Boris Yeltsin.

SALT I set upper limits for land-based and sea-based strategic nuclear missiles. There were two major components to its verification system: national technical means (NTM); and co-operative measures. The former—'consistent with recognised principles of international law'—were understood to mean the use of satellite imagery, aircraft-based reconnaissance (for example, employing radars and optical cameras), and sea- and ground-based monitoring systems. These are operated unilaterally and non-intrusively, being located entirely outside the other party's territory. To enhance confidence in verification, Washington and Moscow agreed to renounce deliberate concealment of, and not to interfere with, each other's NTM.

They also agreed to co-operative measures, including information exchanges and the establishment of a Standing Consultative Commission (SCC). The SCC's task is to clarify differing interpretations of the treaty's provisions and ambiguous situations, consider additional arms control measures, evaluate changes in the strategic situation, and to promote further development of verification. Although the SCC has no monitoring function itself, it has the important job of raising confidence through consultation.

The priority given to NTM and co-operative but non-intrusive measures is typical of arms limitation agreements concluded in the early 1970s. The Soviet Union feared intrusiveness, and the negotiations would have failed had the US insisted on on-site inspections (OSIs). These were hardly mentioned during the talks, and their advantages were not investigated. Since permissible verification means were constrained, so the scope of the treaty was correspondingly limited. While missile launchers were visible using national satellite capabilities, delivery systems were not. Consequently, SALT I froze the number of strategic missile launchers, but not of delivery systems. Similarly, sea-launched cruise missiles (SLCMs) were left unconstrained because their limitation was considered too difficult to verify at the time.

SALT II was more progressive. It set additional limits on several classes of strategic nuclear delivery vehicles. Although the basis of verification was (again) NTM, together with a SCC, its functions were expanded. More detailed and regular information exchanges, specific evaluation and counting rules, and notification of flight tests were agreed. The role of the SCC became more complex. For example, it was charged with developing agreed dismantlement procedures. What were still lacking, though, were co-operative verification procedures. US President Ronald Reagan's administration was suspicious of the SCC's ability to resolve charges of non-compliance, relying instead on making them public. The effectiveness of the treaty mechanisms for resolving disputes was thus seriously undermined.

The verification regime for the INF agreement was much more impressive and intrusive. It eliminated an entire category of weapons—all land-based nuclear missiles with ranges between 300 and 3,400 miles—as well as launchers, and support structures and equipment. It also banned production and flight-testing. As the prohibited systems were small and easy to conceal, non-intrusive measures were no longer sufficient. Since an entire class of weapons was to be eliminated, the verification task was to detect a single prohibited missile or launcher. As a result, OSIs were introduced for the first time—in addition to notifications and NTM. Such intrusiveness was unprecedented. The OSIs included:

- routine inspections at specified sites;
- inspections to verify the elimination of systems;
- 'close-out' inspections to verify the cessation of production; and
- continuous monitoring of portals.

Technologies that could be used included sensors, surveillance systems, measuring equipment to monitor traffic and x-ray imaging. In addition, short-notice inspections were to be permitted to enhance the probability of detecting non-compliance. As in previous treaties, NTM were allowed, complemented (again) by rules prohibiting non-interference. Co-operative measures, such as each party's right to request the open display of road-mobile ground-launched ballistic missiles six times per year, were more wide-ranging than before.

A Special Verification Commission was established to promote the objectives and implementation of the Treaty. It was authorised to resolve questions relating to compliance and to determine measures to improve the effectiveness of the accord. The verification experience was judged a major success by both sides, and

as a result, acceptance of OSIs has increased substantially. Nevertheless, it was also recognised that OSIs have their limits and that they are not able to provide complete assurance. On-site inspections with no right of refusal would have been more effective than those provided for, but fears of possible leaks of sensitive information remained too high to reach agreement on them.

More progress was made with START I, which mandated deep cuts in American and Soviet strategic arsenals (although it did not eliminate whole categories of such weapons). Its verification provisions exceeded previous achievements. They included the use of NTM, transparency rules, such as a ban on encryption of telemetric measurements during test flights, co-operative initiatives, like open displays of road mobile launchers, notification of various activities, and a large variety of inspections and continuous monitoring. Inspections were to be conducted to verify baseline data, information updates, establishment of new facilities, and suspect sites. Re-entry vehicles of deployed intercontinental ballistic missiles (ICBMs) and submarine-launched ballistic missiles (SLBMs) could also be inspected to corroborate that they contained no more re-entry vehicles than the number attributed to them.

Following dispersal exercises, inspections could also be made of deployed mobile ICBM launchers and their associated missiles to authenticate quantities. Conversion, elimination and 'close-out' inspections could be conducted to validate that the eradication of facilities was complete, while inspections could also be carried out at declared former plants to ensure that they had not been re-commissioned. In addition, technical characteristics exhibitions were required, at which the other party had the right to conduct inspections of ICBMs, SLBMs, bombers, cruise missiles and mobile launchers to substantiate that technical characteristics corresponded to specified data. Moreover, continuous monitoring of production facilities for ICBMs and mobile launchers was permitted to confirm that no more than the allowed number was produced. A Joint Compliance and Inspection Commission (JCIC) was set up to resolve questions relating to compliance and to agree on additional measures to improve the application of the Treaty.

START II brought more progress in substance, mandating even deeper cuts, and, most extraordinarily, eliminating all ICBMs with multiple independently targetable re-entry vehicles (MIRVs).[3] Its verification provisions are the same as for START I. But the Treaty covers only delivery vehicles, not nuclear weapons themselves. Both sides still believed that measures necessary for warhead dismantlement would be far too intrusive.

Verification of warhead dismantlement

The treaties described so far have served to limit the nuclear arms race and have achieved reductions. Should the process continue, verification must, sooner or later, deal with warheads themselves. At their 1997 Helsinki Summit, Clinton and Yeltsin announced that a START III treaty would include destruction of nuclear warheads and the promotion of warhead transparency.[4] It is also likely that verification measures relating to the dismantlement of warheads will be included in START III. This would be unprecedented and an indispensable step towards a verifiable nuclear weapon-free world.

If nuclear disarmament is to proceed further, a variety of verification and transparency measures for nuclear warheads is indispensable. These measures will have the following objectives:

- to identify warheads and distinguish them from fakes;
- to monitor warheads permanently, particularly during transport from place of deployment to an intermediate storage site, and from there to a dismantlement facility—until completion of the destruction process, there must be assurance that declared warheads cannot be exchanged for fakes; and
- to verify destruction—there must be assurance that no intact warhead leaves a dismantlement facility.

The main difficulty with more intrusive verification of warhead dismantlement and destruction is the desire on the part of the nuclear weapon states (NWS) to maintain secrecy. This has several purposes:

- to avoid disclosure of the technical details of warhead design and construction, which would pose dangers for nuclear non proliferation; it could also conflict with the commitment of the NWS in Article I of the 1968 Nuclear Non-Proliferation Treaty (NPT) not to transfer nuclear weapons or the means by which they might be manufactured to non-nuclear weapon states (NNWS);
- to hide their level of technological development, whether weak or superior;
- to avoid any damage to national prestige.

The first two purposes, in particular, must be taken into account in designing verification and transparency measures. The third might become insignificant with time, especially if suitable political initiatives lead to greater openness. But continuous resistance to such transparency from the scientific and military communities

involved in nuclear weapon research, development, production and maintenance must be expected over a long period. Clear variations in the degree of secrecy can be seen among the NWS, which can largely be explained by tradition. The highest degree of openness is in the US.[5]

While OSIs and permanent monitoring must become more intrusive in order to achieve verification goals, they must also be designed to protect sensitive data. Since 1996 there has been bilateral technological co-operation between Russia and the US in studying verification of the destruction of nuclear warheads. The results were discussed at the Helsinki Summit, but have not yet been published.[6] There are many additional studies dealing with technical verification methods,[7] some focussing on technical applications.[8]

Most studies assume that warheads will be placed in sealed containers prior to the dismantlement process. Since a warhead contains radioactive material, it emits radioactive radiation that is characteristic of its type. The radiation depends on the kind of nuclear material and the absorption characteristics of the warhead materials, as well as the additional shields of the container and their geometric distribution. In the simplest case, the released radiation can be measured despite the shields (so-called 'passive detection'). In certain cases, this is insufficient, and radiation that can be measured from outside must be induced by 'active' measures, such as neutron bombardment. X-raying is also an active detection measure.

A measured radiation spectrum is known as a 'fingerprint'. In a verification scenario, fingerprints of all types of warheads will first be recorded. Then every further measurement of a warhead in a sealed container can be compared to these records, so that identification of the warhead is possible without opening the container and revealing proliferation-relevant information. It would also be possible to distinguish real warheads from fakes.

Fears have been expressed, however, that this method would still reveal too much secret information.[9] Chinese analysts have raised this objection, but have offered a technical solution. They claim that the identification of warheads would still be possible if only a small part of the spectrum was revealed. A further possibility would be largely to automate the process with the aid of 'sealed' computer programmes. A fingerprint with such a masked spectrum would be taken for reference, and the information fed into a computer. This method requires no further involvement by inspectors, provided the software and anti-tampering measures ensure that the programme cannot be manipulated.

In order to guarantee that real warheads—and not fakes—are destroyed, the warheads that have been identified must be delivered to a dismantlement facility in the sealed containers with assurance that they have not been opened.[10] The exit must also be checked so that no warheads can be removed intact. The inside of the installation can remain closed to inspectors. Once the non-nuclear components have been destroyed they can no longer reveal sensitive information. The final stage of the dismantlement procedure is to deal with the radioactive 'loose material' —uranium and plutonium—which must be recorded at the exit. As long as strict monitoring ensures that no nuclear pits and loose material are diverted, it is not necessary to know the amount of material contained in a specific warhead. But an average figure would be helpful.

Verifying comprehensive nuclear disarmament

It would be a major achievement if START III established such a verification regime. For the verification of comprehensive nuclear disarmament, however, the process would have to go even further. The scenario described above would be well suited to verifying dismantlement and destruction of declared numbers and types of warheads. For comprehensive nuclear disarmament, a high probability of detecting *undeclared* warheads is also indispensable, so as to create assurance that no clandestine arsenals are being maintained. An important prerequisite would be much higher transparency regarding existing arsenals, such as a comprehensive overview of all existing warheads, including tactical nuclear weapons, which, to date, have not been subject to any arms control treaty.[11] A 1993 proposal by then German Foreign Minister Klaus Kinkel for a nuclear weapons register at the United Nations should be revived.[12]

The disarmament treaties described so far are bilateral agreements. Indeed, the nuclear reductions that have been agreed and will be negotiated soon, involve only the holders of the two largest arsenals, Russia and the United States. At least all of the declared NWS and additional unofficial nuclear weapon possessors must be involved in the final moves towards nuclear disarmament. The Treaty and its verification system must be multilateral, requiring a different organisation, decision-making procedures and compliance mechanisms. A major exemplar of a multilateral verification organisation is the Vienna-based International Atomic Energy Agency (IAEA). Nevertheless, valuable technical lessons can also be drawn from the bilateral treaties.

The task of detecting undeclared warheads cannot be undertaken solely with technical means. These can be employed when concrete evidence exists of undeclared warheads: specially trained inspectors with the relevant equipment would be able to find and catalogue warheads at an identified location. But there is no guarantee that such evidence will ever manifest itself. The following elements would, however, be important in increasing the possibility of detection:

- the highest possible level of transparency regarding production histories, above all declarations and documentation, the publication of historic documents and the possibility of interviews with former employees;
- full exploitation of all relevant technologies, particularly aerial reconnaissance and environmental measurements, and the full range of NTM, including intelligence gathering;
- freedom of the press and a democratic climate, which should generate a sense of obligation on the part of individuals involved in illegal nuclear weapons activity to 'whistle-blow';
- the possibility of enforcing a multilateral verification authority's demand for clarification in the case of suspicion, through mandatory challenge inspections; and
- increased international trust, resulting from positive experiences of verification.

Taken individually, each of these factors is important for the verification of total nuclear disarmament. Together, they would improve verification to such an extent as to constitute 'sufficient criteria' for effective verifiability. It would be unrealistic to expect the verification of comprehensive nuclear disarmament to be achieved in one step, but it is realistic to expect each successive step to build on past experience.

Verifying the absence of clandestine nuclear programmes

Once a nuclear weapon-free world has been achieved, permanent verification would be necessary to provide assurance that clandestine nuclear weapon programmes could be detected early enough for countermeasures to be taken. The five factors listed in the preceding section are equally important to continuing verification of a nuclear weapon-free world.

Treaties that ban the possession of nuclear weapons already exist, namely the NPT and several agreements creating nuclear weapon-free zones (NWFZs).[13] The

IAEA effectively verifies the NPT and the NWFZs through its system of full-scope safeguards.[14] In addition, there is one regional safeguards agency, EURATOM, which includes all members of the European Union, and one sub-regional system, the Argentina–Brazil Agency for Accounting and Control of Nuclear Materials (ABACC). These systems can play a crucial role in raising acceptance of IAEA safeguards. ABACC is an important example of the remarkably positive role that a regional safeguards system can play in non proliferation: within a few years, strong suspicion about and between the two countries has been replaced by confidence in their peaceful intentions. The negotiation of an NWFZ could be the vehicle for nuclear disarmament of one or more participating states, as has frequently been suggested for the Middle East.[15] A nuclear weapon-free world can only become possible when the security problems of such regions are resolved. An advantage of an NWFZ, compared to the NPT, is the possibility of making them non-discriminatory.

Measures that detect clandestine programmes—in addition to verifying declared materials and activities—are an indispensable prerequisite for verification of a nuclear weapon-free world. Prior to the safeguards reform instituted after Iraq's violation of the NPT, IAEA safeguards concentrated on verifying compliance with declared commitments and neglected the detection of undeclared activities. The reform introduced many measures that strongly increase the chance of early detection of a violation.[16]

This task is most difficult in the NWS. The IAEA safeguards in the NWS are voluntary, and only a small number of facilities are currently subject to them. The civilian nuclear fuel cycles of France and the UK are at least subject to EURATOM safeguards, although they have the right to withdraw facilities and materials from safeguards for defence needs.

Next steps

If nuclear verification is to develop in preparation for a nuclear weapon-free world, more binding measures need to be introduced for the NWS. The aim should be to have a universal safeguards system, applying equally to NWS and NNWS.[17]

A Fissile Material Cut-off Treaty

A Fissile Material Cut-off Treaty (FMCT) would serve as a good starting point for the extension of safeguards in the NWS.[18] It has been on the disarmament agenda for several years, although very little progress has been made. It has become a

symbol for further advancement towards nuclear disarmament, but its most important benefit would be to introduce increased verification measures in the NWS. Its verification task would be to provide assurance that no state party was producing or diverting nuclear material for weapon purposes. This is almost the same as the verification of compliance by NNWS with their obligations under the NPT. It is not clear, though, whether the Treaty will cover only future production of weapon-usable materials or previously produced materials, too. Theoretically, verification should be the same as for full-scope IAEA safeguards. But some of the NWS do not seem to agree: their verification proposals envisage much more limited measures, such as verification of only the most sensitive facilities. Even these proposals, however, would set precedents and create an important basis for future developments. Verification at former production facilities would be a major milestone, and the experience gained would create additional confidence.

The Trilateral Initiative

A positive step towards increased nuclear verification in the NWS is the trilateral process between Russia, the US and the IAEA. Under the initiative, excess nuclear materials from disarmament are submitted to verification. The task is to provide assurance that steps taken to deal with nuclear materials when reducing nuclear arsenals are irreversible.[19] Negotiations that have taken place since 1996 have been slow. There are differences over how to provide assurance that plutonium to be stored in storage facilities is of weapons-origin,[20] as well as concern about protecting sensitive information from international inspections. In Russia, much technical data that would be needed if safeguards were applied are classified, such as the isotopic composition of weapons-origin plutonium. And at many of the facilities involved, such as former nuclear weapon production sites, much proliferation-relevant information could be revealed if verification measures were too intrusive. Some of the security arrangements for access and inspections will be very different from those encountered elsewhere.

Nevertheless, in 1998, substantial progress was made in developing and testing verification equipment.[21] So-called 'information barriers' have been jointly developed that prevent access to classified information, but, at the same time, seem to satisfy verification needs. This new role for the IAEA is unprecedented and may trigger additional efforts to make nuclear facilities more safeguards friendly. It is also a necessary first step towards the goal of full-scope safeguards in the NWS.

Other transparency measures

Declarations of intent to allow IAEA controls on excess nuclear weapon materials can be found in the statement of the 'P8' countries at the 1996 Moscow Summit,[22] in several co-operation projects between various countries and Russia, and in the Plutonium Management Guidelines agreed among plutonium user countries. As a transparency initiative, the US started, in 1993, to publish estimates of its plutonium stocks. The UK has also begun to publish estimates of its stocks and declared its intention to submit excess plutonium to IAEA inspection.[23] But its excess highly enriched uranium (HEU) for nuclear submarines will be retained outside safeguards.

In the longer term, it will be necessary to have more fundamental safeguards reforms—to achieve a universal system without distinction between the NWS and the NNWS. Such a future system must be characterised by a new safeguards culture, based more on qualitative and political judgements than schematic, quantitative measures. Reform will have to address: finances; organisation; decision-making; effectiveness; measures to deal with non-compliance; and underlying principles, such as the amount of nuclear material considered to be a 'significant quantity' in weapon terms. Reform will become necessary even without an FMCT because of the various non-proliferation and disarmament problems requiring new solutions. Such a global approach could lay the ground for a nuclear weapon-free world.

Conclusion

Total nuclear disarmament will only become possible after many intermediate steps have been taken. But each prepares the next, and will change both the security and security perceptions of the states involved, thereby influencing their subsequent decisions regarding further moves. In each phase, what is possible or impossible will be defined anew. The experience gained will also affect verification. An essential prerequisite for each new step is the enhancement of transparency and trust, and, as a result, trust in verification will also need to grow. It is wise, therefore, to design verification as if a nuclear weapon-free world is the objective, even though a decision as to whether it should become reality may be delayed.

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Endnotes

[1] The many studies that deal with verification of a nuclear weapon-free world include: Annette Schaper and Katja Frank, A Nuclear Weapon Free World – Can it be verified?, *PRIF Reports*, no. 53, Frankfurt, December 1999; Steve Fetter, Verifying Nuclear Disarmament, The Henry L. Stimson Center, *Occasional Paper no. 29,* October 1996; Frank von Hippel and Roald Z. Sagdeev, *Reversing the Arms Race—How to Achieve and Verify Deep Reductions in the Nuclear Arsenals,* Gordon and Breach, New York, 1990; and Christopher E. Paine, Thomas B. Cochran and Robert P. Norris, Techniques and Procedures for Verifying Nuclear Weapons Elimination, *Background Papers of the Canberra Commission on the Elimination of Nuclear Weapons,* August 1996, p. 167. VERTIC has published a series on verification of a nuclear weapon-free world: Patricia M. Lewis, 'Laying the Foundations for Getting to Zero: Verifying the Transition to Low Levels of Nuclear Weapons', VERTIC *Research Report,* no. 1; Tom Milne and Henrietta Wilson, 'Verifying the Transition from Low Levels of Nuclear Weapons to a Nuclear Weapon-Free World', VERTIC *Research Report,* no. 2; and Suzanna Van Moyland, 'Sustaining a Verification Regime in a Nuclear Weapon-Free World', VERTIC *Research Report,* no.4.

[2] START II was negotiated bilaterally by the Soviet Union and the US. It was subsequently multilateralised to include Belarus, Kazakhstan and the Ukraine, where former Soviet nuclear weapons were stationed.

[3] START II was ratified by the Russian Duma on 21 April 2000. The next step required for the Treaty to enter into force is US Senate approval of American ratification of the 1997 agreements that amended the Treaty. This has been the prerequisite for US willingness to start negotiations on START III.

[4] President Clinton and President Yeltsin, Joint Statement on Parameters on Future Reductions in Nuclear Forces, *White House Fact Sheet,* Helsinki, 21 March 1997. Printed in full in *Disarmament Diplomacy,* April 1997, p. 32. A START III treaty should contain, among other things, 'Measures relating to the transparency of strategic nuclear warhead inventories and the destruction of strategic nuclear warheads . . .'.

[5] At the end of 1993, as part of the policy of 'openness', the US Department of Energy began an initiative to reform transparency in government. On 29 June 1998, a new directive on classification came into force, incorporating the advice of several advisory panels. See Department of Energy, Office of the Secretary, 10 CFR Part 1045, RIN 1901-AA21, Nuclear Classification and Declassification, Action (Final Rule).

[6] The partners in this are the Sandia National Laboratory (SNL) and the Russian Federal Nuclear Center–All Russian Research Institute of Technical Physics (RFNC–VNIITF). The latter is a research laboratory in Snezhinsk (previously known as Chelyabinsk-70), which was responsible for research and development of new nuclear weapons. See Oleg Bukharin and Kenneth Luongo, 'U.S.-Russian Warhead Dismantlement Transparency: The Status, Problems, and Proposals,' *PU/CEES Report,* no. 314, Center for Energy and Environmental Studies, Princeton, NJ, April 1999, and Nikolai F. Rubanenko, 'Nuclear Weapons Transparent Dismantlement', paper presented at the International Pugwash Workshop, 11–13 September 1997, Snezhinsk, Russia. There is a volume with approximately 50 technological contributions from a conference involving both research institutions, held from 18–22 August 1997. To date, this has only been made available to the US and Russian governments.

[7] Examples include: Christopher E. Paine, Thomas B. Cochran and Robert P. Norris, p. 167; Natural Resources Defense Council, *Report on the Third International Workshop on Verified Storage and Destruction of Nuclear Warheads,* Moscow and Kiev, 16–20 December 1991; Federation of American Scientists and Natural Resources Defense Council, *Report on the Fourth International Workshop on Verified Storage and Destruction of Nuclear Warheads,* Washington, DC, 26–27 February 1992; William G. Sutcliffe, *Warheads and Fissile Materials: Declarations and Counting,* Report UCRL-JC-108073, CTS-27-91, Livermore, 5 August 1991. Chinese examples are contained in the volume of the Institute of Applied Physics and Computational Mathematics (IAPCM), Program for Science and National Security Studies (Arms Control Collected Works), Beijing, 1995.

[8] Wolfgang Rosenstock *et al.*, Entwicklung und Untersuchung von transportablen Meßsystemen zur Verifikation von Kernwaffen (Development and investigation of transportable measuring systems for the verification of nuclear weapons), INT-Bericht no. 162, Euskirchen, December 1995; Wolfgang Rosenstock *et al.*, Aufbau einer transportablen Detektoranordnung zur Verifikation von A-Waffen (Construction of a transportable detector device for the verification of nuclear weapons), INT-Bericht no. 169, Euskirchen, April 1997.

[9] Tian Dongfeng, Xie Dong and Liu Gongliang, High Energy Gamma-Ray 'Fingerprint' – A Feasible Approach to Verify Nuclear Warhead, in IAPCM.

[10] There are various, some very cheap, methods of sealing. Many are being applied and further developed by the IAEA and EURATOM. One example is a forgery-proof method, in which characteristic optical samples are created by means of fibre optic bundles. IAEA, *Safeguards Techniques and Equipment,* International Nuclear Verification Series, no. 1, Vienna, 1995.

[11] Nikolai Sokov, 'Tactical Nuclear Weapons Elimination: Next Stop for Arms Control', *The Nonproliferation Review,* vol. 4, no.2, 1997.

[12] Klaus Kinkel, 'German 10-point initiative for nuclear nonproliferation', Bonn, Germany, 15 December 1993. For the significance of this proposal and the reaction of the NWS, see Harald Müller, 'The Nuclear Weapons Register – A Good Idea Whose Time Has Come', *PRIF Reports,* no. 51, June 1998.

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[16] See chapter by David Fischer in this volume.

[17] Annette Schaper, The Case for Universal Full Scope Safeguards on Nuclear Material, *The Nonproliferation Review*, vol. 5, no. 2, winter 1998, p. 69.

[18] See Annette Schaper, 'A Treaty on the Cutoff of Fissile Material for Nuclear Weapons – What to Cover? How to Verify?' *PRIF Reports,* no. 48, July 1997.

[19] Press Statement on the Trilateral Initiative, *IAEA Press Release,* PR 97/26, 30 September 1997; Thomas Shea, 'Verification of Weapon-Origin Fissile Material in the Russian Federation &United States', *IAEA Bulletin,* vol. 41, no. 4, 1999, p. 36.

[20] Bukharin and Handler.

[21] Shea.

[22] Moscow Nuclear Safety and Security Summit Declaration, 20 April 1996. The P8 countries are Canada, France, Germany, Italy, Japan, Russia, UK and US.

[23] Strategic Defence Review, presented to UK Parliament by the Secretary of State for Defence by Command of Her Majesty, London, July 1998. See www.mod.uk.

5

Chemical disarmament: advent and performance of the OPCW

Robert J. Mathews

Following the extensive use of chemical weapons (CW) in the First World War, there were preliminary discussions at the League of Nations in the early 1920s on the feasibility of negotiating a chemical disarmament treaty. On the issue of verification of 'non-production' of CW by the chemical industry, however, it was concluded that, 'it would be useless to seek to restrict the use of gases in wartime by prohibiting or limiting their manufacture in peacetime'.[1] So diplomats settled for the easier option of prohibiting the use of CW based on the principles of international humanitarian law—as specified in the 1925 Geneva Protocol—which lacked any verification mechanism.[2] But the use of CW since 1925, most notably in the 1980–88 Iran–Iraq War, demonstrated the limited effectiveness of the Geneva Protocol and the need for a chemical disarmament treaty.

Negotiation of the Chemical Weapons Convention (CWC)[3] commenced in the Geneva-based Conference on Disarmament in 1969 and was finally concluded in 1992.[4] Although this 23-year process was slow and tortuous, it was ultimately rewarding. Unlike the Geneva Protocol, the CWC requires the complete elimination of CW and introduces a verification regime that has been designed to provide assurance of compliance by states parties, while not hindering the development of the peaceful chemical industry. The CWC was justifiably heralded as a major breakthrough in multilateral arms control. It was the first comprehensively verifiable multilateral treaty that completely banned an entire class of weapons and firmly limited activities that might contribute to the production of such weapons. It went further than any previous treaty in terms of the depth, extent and intrusiveness of its verification provisions.

Verification under the CWC includes compulsory national declarations of relevant industrial and military activities, and routine inspections of declared industrial

and military facilities. An additional feature is provision for a 'challenge inspection', whereby a state party can request an inspection of any site in another state party at short notice. The international community's concern at the extensive use of CW by Iraq against Iranian soldiers, civilians and Kurds in the mid-to-late 1980s, as well as the improvement in international relations after the end of the Cold War, were key factors enabling the conclusion of CWC negotiations in 1992.

The Organization for the Prohibition of Chemical Weapons (OPCW) was established in The Hague, Netherlands, to administer the CWC. Eighty-seven states were party to the Convention on its entry into force on 29 April 1997. By the end of that year, there were 105 states parties, including: Russia and the US, the two largest possessors of chemical weapons; the major chemical producing and exporting states of Europe and Asia; and many of the major developing nations with chemical production capabilities. Since the end of 1997, a further 23 countries have either ratified or acceded to the Convention, bringing the total number of states parties to 128.[5] At the end of 1999, there were still 41 signatory states that had not ratified the agreement, and 22 non-signatory states.

This chapter examines the early operational phase of the CWC. In particular, it looks at the creation of the OPCW and the early experience of CWC implementation between entry into force and the end of 1999.

Preparations for entry into force: establishment of the OPCW

One month after the CWC signing ceremony in Paris in January 1993, the Preparatory Commission (PrepCom) of the OPCW was set up in The Hague. Under the terms of the Paris Resolution,[6] it was assigned a number of tasks, including:

- establishing the new international Organization;[7]
- developing detailed regulations and verification procedures;
- resolving many detailed provisions for the operation of the CWC; and
- assisting signatory states in their preparations to ratify the Convention.

To accomplish its assigned tasks, the PrepCom, with the support of the Provisional Technical Secretariat (PTS), created a number of subsidiary bodies, like committees, expert groups and task forces. Given that it took longer than expected to achieve 65 ratifications, the PrepCom gained some 'extra time' over the two years that were originally earmarked for its preparations.[8] This time was well spent on establishing the Organization (completing tasks that had suffered unanticipated delays,

such as construction of the OPCW building and laboratory) and outreach programmes to signatory states (including various workshops and regional seminars). With regard to the development of verification provisions by the expert groups, though, the delay gave signatory states more time to attempt to renegotiate CWC provisions, rather than developing practical implementation procedures that accurately reflected the agreed text. A minority of states appeared to be concerned mostly with minimising the cost and intrusiveness of the OPCW and maximising the protection of confidential information, as opposed to achieving effective verification. As a result, there were many unresolved issues that were referred to the First Conference of the States Parties (First CSP) for further consideration.

The organs of the OPCW

The OPCW consists of the following organs: the Conference of the States Parties (CSP); the Executive Council (EXCO); and the Technical Secretariat (TS).

The Conference of the States Parties

The First CSP on 6–24 May 1997 elected a Director-General, Ambassador José Mauricio Bustani of Brazil, and members of the EXCO. It also adopted the recommendations of the PrepCom, including: declaration formats and detailed procedures for verification and the conduct of inspections; draft OPCW policies on confidentiality, health and safety, media and public affairs; and visa procedures for OPCW inspectors.[9] The First CSP endorsed other PrepCom recommendations, such as those on the voluntary fund for assistance to victims of a CW attack, and the data bank on protection against CW use. Issues that related to the OPCW budget provoked the most intensive and controversial negotiations. These included staff levels in the TS, an acceptable formula for determining the costs that CW possessors should pay for verification activities associated with the destruction of CW and Chemical Weapons Production Facilities (CWPFS),[10] and the budget for technical co-operation and assistance. Many issues were agreed on an interim basis on the understanding that decisions taken for the 1997 OPCW budget would not prejudice those pertaining to subsequent budgets. Furthermore, the First CSP adopted a number of administrative arrangements, like OPCW staff rules and regulations, the transfer of property (from the PrepCom to the OPCW), and the Headquarters Agreement with the host country. These are examples of the many time-consuming arrangements that were necessary to create a new international organisation and to achieve an operational convention.

Subsequent CSPs have followed the same pattern as the First. At the Second (1–6 December 1997), Third (16–20 November 1998) and Fourth (28 June–2 July 1999), the major issue was approval of the draft OPCW budget, prepared by the EXCO. Each CSP has also provided the opportunity for states parties to express concerns about the status of implementation.

Executive Council

Between the First CSP and the Second CSP, the EXCO held regular sessions for approximately one week each month. More recently, the pattern of meetings has changed, with a regular session of the EXCO every couple of months and short 'special meetings' to address a particular issue when necessary. The EXCO's most time consuming and difficult task has been consideration and development of the draft OPCW budget for the following year. At each session, it has reviewed the status of CWC implementation and considered many administrative and technical issues, including several draft Facility Agreements.[11] Finally, the EXCO has dealt with requests for conversion of CWPFs for purposes not prohibited under the CWC and matters associated with the handling and protection of confidential information, as well as with the confidentiality audit on the OPCW's electronic document management system (EDMS).

Unfortunately, the EXCO has been characterised—even more than one might have anticipated—by considerable politicisation, inertia and conservatism. As a result, there have been difficulties in reaching decisions, even on relatively straightforward matters. But usually there have been underlying political factors. A welcome trend has been the active role taken by interested observer states parties in the deliberations of the EXCO.

Technical Secretariat

The First CSP approved 405 positions (including 140 inspectors) for the TS in 1997. It was also agreed that an additional 71 inspectors would join the OPCW the following year to cope with the extra workload anticipated in 1998, resulting from new ratifications—in particular that of Russia, which has the largest stocks of chemical weapons. At the Second CSP, the staffing level within the TS was also a major issue, especially the need to have reasonable representation by states that had become parties after entry into force. Eventually, 15 new positions were created, bringing the total number of posts approved in the 1998 budget to 491. The 2000 budget increased this number to 507.

The creation of the TS, commencing with the embryonic PTS in 1993, is arguably the most successful aspect of the OPCW's early years. The TS, including the Inspectorate, is also earning the respect of states parties and the international community through the highly professional way that it has conducted its activities.[12] Following the decision of the Fourth CSP that the maximum tenure of TS staff should be seven years—based on agreement among states parties that the OPCW should not offer 'career positions'—concerns have been expressed about the possible adverse implications for the smooth operation of the Organization as a whole, in view of the highly specialised nature of many of the positions in the Inspectorate and in the Verification Division.

Roles and functions of OPCW organs

Uncertainties have been experienced in the roles and functions of the CSP, the EXCO and the TS. For example, concerns have been raised that the EXCO is attempting to 'micro-manage' the TS. By the end of 1999, though, there were signs that the EXCO was beginning to work more effectively. In particular, the various organs appeared to be settling into their respective roles, with: the EXCO managing current issues; the TS having more flexibility to conduct its activities, benefiting from experience gained since entry into force; and the CSP acting as a forum to approve formally EXCO recommendations, to settle the OPCW budget, and to provide an annual review of OPCW operations.

While a small minority of states parties still appear inclined to stick to long-held positions, a more constructive atmosphere is evolving within the OPCW that is more conducive to reaching agreements. This is occurring between states parties and the TS, and between states parties from different regional groups. Despite their differences of view, the more active states have recognised that all parties to the Convention share core interests. And they appear more willing to see various issues and problems from the perspective of other states parties. This sense of co-operation among the majority has not yet been reflected in decision-making—which is usually by consensus—but it does augur well for the OPCW's future.

Status of current activities

Declarations

After the CWC's entry into force, its parties were required to meet several important deadlines so that an effective verification regime could be established as soon as

possible. Each state party, for example, has to submit to the OPCW within 30 days of entry into force declarations identifying chemical weapon stockpiles, production and destruction facilities (under Article III, IV and V), and facilities involved in the production, processing and consumption of relevant chemicals (Article VI).[13]

Of most interest to many states parties were the declarations related to chemical weapon activities. Four states parties (India, Russia, the US and 'another state party') have declared possession of chemical weapons. Seven states parties (Belgium, China, France, Germany, Italy, Japan and the UK) have declared old and/or abandoned chemical weapons on their territory. Nine states parties (China, France, India, Iran, Japan, Russia, the UK, the US and 'another state party') have declared possession of existing or former CWPFs.[14] A clearer picture has already emerged, therefore, about past and present CW endeavour based on the declarations received so far. This is one of the major early benefits of the operational CWC.

But the overall rate of initial declaration submissions has been a major disappointment. Only 36 % of initial declarations, for instance, were filed within the specified timeframe in 1997, and, by the end of 1999, 26% of the states parties still had not submitted their initial declarations. In addition, it has become clear that a considerable number of initial declarations is incomplete. Several of the states parties yet to submit a declaration are very small countries with either extremely modest or no chemical industries, and they are not considered to pose a serious CW-proliferation risk. At least some of these states, however, have Discrete Organic Chemical (DOC) production facilities, which would be suitable for CW purposes.

Concerns have been expressed in EXCO meetings and during CSPs about the serious implications of 'technical non-compliance' for the successful implementation of the Convention, including the application of Article VI (chemical industry) verification in a fair and balanced manner. It has been recognised that the establishment of a legal framework for national implementation of the CWC and the declaration requirements for states parties are complex. And some states have experienced difficulty in compiling the required information because of the technicalities involved. The TS, in co-operation with a number of interested states parties, has offered to assist those nations that have had problems in completing their declaration requirements.

Given that the TS has had to handle the majority of declaration-related documentation in hard-copy format, as opposed to storing and processing declarations and associated documentation electronically using an EDMS, the processing of

materials has been made considerably more difficult and labour intensive than originally planned. This was a result of the greater than anticipated time necessary to establish the system and to confirm its security status. It is expected that the EDMS will become available for processing declarations in 2000.

Routine inspections

The first OPCW inspection commenced on 1 June 1997 (just over one month after entry into force) at an American facility that was already in the process of destroying CW from the US stockpile. By the end of December 1999, the TS had carried out 617 inspections at 312 sites in 35 states parties. The breakdown of inspections is as follows:

- 14 to abandoned CW sites;
- 135 inspections at CW destruction facilities;
- 150 to CW production facilities;
- 91 to CW storage facilities;
- 25 to 'old CW' sites;
- 54 to Schedule 1 facilities;
- 110 to Schedule 2 facilities; and
- 38 to Schedule 3 facilities.

During this period, the OPCW inspectors spent a total of 39,211 days on missions. By the end of 1999, they had monitored the destruction of approximately 3,500 tonnes of chemical agents and almost one million munitions. The Inspectorate managed to meet the CWC-imposed timelines for the conduct of initial inspections of CW-related and Schedule 1 facilities.[15] But some of the verification-related timelines, such as the conclusion of Facility Agreements, have proved problematic.

To date, a large majority of industry inspections have been conducted at Schedule 2 facilities, which are located in a limited number of states parties. In 1998, for example, 79% of total industry inspections took place in only eight countries, and 101 of the (then) 121 states parties did not receive any industry inspections. This situation improved slightly in 1999 (27 states parties received at least one industry inspection), with the carrying out of a larger number of Schedule 3 inspections, and also with the development of a selection methodology aimed at achieving greater 'equitable geographic distribution'.[16]

Things should improve further in 2000 with the commencement of DOC inspections in May, the decision of the Fourth CSP that 'unused' Schedule 2 inspection

resources[17] can be used for Schedule 3 and DOC inspections, and the submission of outstanding initial declarations by states parties (a number of these are likely to have DOC facilities).

Overall, the OPCW, states parties and facility personnel are highly satisfied with the way that the industry inspections have been conducted. Although minor problems have occasionally arisen, inspections have, for the most part, been carried out smoothly and with the full co-operation of the inspected state party. Interestingly, most of the concerns expressed by industry representatives during the CWC negotiations and in the PrepCom have not eventuated. Indeed, the major problem has been with a small number of states parties which contend that they are receiving 'more than their fair share' of Schedule 2 inspections due to the US not having submitted its initial industry declarations.[18] At the same time, a number of smaller states parties yet to receive an industry inspection have petitioned the TS about the possibility of receiving inspections.

Consultations, co-operation and fact-finding

So far, only the US has reported that it has used Article IX procedures to consult and seek clarifications from several states parties on the information provided in their declarations. In a number of cases, the US has stated that it has achieved satisfactory resolution of outstanding issues through such consultations.

No Challenge Inspections had been requested or conducted by the end of 1999. But several Practice Challenge Inspections (PCIS) had taken place, including some in collaboration with OPCW inspectors. In an October 1999 PCI, the exercise simulated the entire challenge inspection process from the submission of the request and the convening of a special EXCO session to consider it, through to the conduct of the inspection and the preparation of a final report. These PCIS are viewed as valuable experience for the EXCO, the TS and states parties, in preparing for the possibility of a real challenge inspection.

No Investigations of Alleged Use (IAU) had been requested or carried out by the end of 1999. Preparations have been made, though, for the possibility of an IAU. In October 1999, for example, a combined exercise focussing on IAU and the delivery of assistance was conducted in the Czech Republic. The 'investigation team' comprised 23 OPCW inspectors; observers from 10 states parties were also present. The exercise, which focussed on the necessary field operations for an IAU, underscored the importance of human factors, such as interviewing techniques and the collection of evidence, as well as the need for appropriate equipment.

Protection assistance

By the end of 1999, only 58 states parties had provided information on the assistance they are able to provide (pursuant to Article X: assistance and protection against chemical weapons) to help another state party in the event of a CW attack, although notification of this is required within 180 days of entry into force. Nevertheless, the TS and a number of states parties are becoming active in this area. The OPCW 'Protection Network' (composed of experts from states parties) held its first meeting in October 1999, with the objective of developing a Protection Database to assist in the provision of relevant data on chemical defence to states parties.

International co-operation

Since entry into force there have been a number of developments in the International Cooperation and Assistance Division, which is tasked with initiating a range of programmes aimed at promoting technical co-operation and assistance between states parties. This has included a programme to facilitate participation in international meetings in the fields of chemistry and chemical technology, and an experimental information service, which has begun to receive attention, especially from the chemical industry in developing states parties. The TS also released some initial funds for the first in a series of programmes to support the improvement of technical competence at national chemical analytical laboratories.

There was less progress on other aspects of Article XI, though, such as national export licensing measures. There still appears to be misunderstanding in some quarters about the valuable role of these measures in enabling states parties to avoid providing (even inadvertent) assistance to CW proliferation programmes, as required under Article I of the CWC. Another issue related to Article XI and export licensing is whether all items of OPCW inspection equipment should be commercially available to all states parties.

Future challenges

Adherence to CWC timelines

One of the most immediate challenges facing the new Organization is the adherence of all states parties to CWC timelines. In addition to fears about sticking to CWC declaration-related schedules, concerns have also been expressed about whether all CW possessor states parties can meet CW destruction timeframes. (Under the provisions of the CWC, each state party possessing chemical weapons is required to

destroy them within 10 years—with a possible five-year extension—of entry into force.) So far, the US has destroyed a significant portion of its chemical weapons, and is expected to meet the CWC 10-year deadline, as are India and 'another state party', which commenced destruction of their CW stockpiles by the end of 1999.

Russia, however, is having difficulty commencing the destruction of its chemical weapons. In late 1999, the country submitted a request to the EXCO that it be granted an extension to the first intermediate destruction deadline.[19] Russia is currently receiving technical and financial assistance from several states parties, including the US and some members of the European Union, to help it meet its CWC obligations in this area.

Management of unresolved issues

The First CSP considered how to deal with issues that had not been resolved by the PrepCom. It decided that they would be addressed via a flexible, informal and transparent consultation process through the 'Committee of the Whole' (COW), enabling all interested states parties to be fully involved (not just those on the EXCO). In addition, arrangements were made for the views of signatory states to be taken into account (at that stage, a number of key states, including Iran, Pakistan and Russia, had yet to ratify the CWC). Particular attention was given to matters requiring resolution by a deadline stipulated in the Convention, and to other issues identified by states parties or by the Director-General as demanding urgent resolution.[20] Facilitators from among interested party delegates were made responsible for conducting consultations on particular unresolved subjects.

By the time of the Fourth CSP, many of the issues that could not be fully resolved in the PrepCom had been agreed or had been overtaken by events during the Convention's early operational phase. It was also recognised that it would be more efficient to address the remaining unresolved issues through the EXCO, rather than via the COW. So the Fourth CSP decided to end the role of the COW with respect to unresolved issues and to establish a working group under the EXCO. The latter body subsequently set up two working groups:

- one to focus on the resolution of outstanding PrepCom issues, particularly those requiring urgent resolution for an effective Convention, such as guidelines on 'old CW'[21] and industry declaration-related issues, like 'low concentrations'; and
- another to address matters that had arisen since entry into force ('pending issues'), like methodology for selection of Schedule 3 and DOC facilities for inspection.

Technical challenges

Being a dynamic organisation, the OPCW will face new and sometimes unexpected challenges and will need to be evolutionary. To ensure that the Convention remains effective it will be necessary to review scientific developments, changing technology and industry practices and current verification procedures. Many verification-related decisions have been adopted on an interim basis, for example, on the understanding that the issues would be further considered and refined as the OPCW gains experience. There will need to be regular review of verification procedures—based on the early experiences of the OPCW Inspectorate, including matters related to access to records, sampling and analysis, and the welfare of inspectors when following OPCW health-and-safety regulations during inspections. In addition, there will be special conferences to review comprehensively the operation of the verification regime.

Special consideration will need to be given to various issues associated with chemical analysis requirements, such as:

- the ability of 'blinded analytical instruments' to provide unambiguous results;[22]
- the scope of the OPCW analytical database;[23] and
- the roles of designated laboratories in 'off-site' analysis.

By the end of 1999, 12 laboratories had satisfied the requirements and had been designated by the OPCW for examination of authentic samples. Unfortunately, the issue of off-site analysis was brought into question because of a condition attached to US ratification of the CWC. This specified that samples taken during inspections at American facilities must not be taken to a laboratory outside of the country.[24] Clearly, issues related to off-site analysis will need to be addressed to ensure that an accurate and reliable assessment of samples is possible in situations where analysis using on-site equipment does not generate unambiguous results.

It will also be important to review advances in science and technology that may have an impact on the CWC. There have recently been interesting developments in chemistry, for example, including the production of toxic chemicals through biologically mediated processes. It will be important that the schedules of chemicals are kept up to date, based on scientific progress and in light of the OPCW's early experiences. Another interesting area over the past decade has been the creation of miniaturised sensors and portable chemical analysis equipment. Such items may reduce the current 'inspector presence' deemed necessary at CW-related facilities, and allow the development of rapid screening methodologies using portable

analytical equipment to support verification. There will be roles for the Scientific Advisory Board (SAB) and for states parties' scientific advisors in ensuring that the CWC keeps abreast with, and makes maximum use of, scientific advancements.

It will also be necessary to review and adjust, as appropriate, the relative proportion of inspection effort for Article VI verification activities. During the first few years there has been an obvious focus on initial inspections of Schedule 1 and 2 facilities to meet specific Convention timelines. Once these initial inspections have been completed, however, there will be a need to reassess the relative risks posed to the Convention by, *inter alia,* Schedule 3 and DOC facilities, which many experts regard as most relevant with respect to recent CW proliferation programmes.

Balance between transparency and protection of sensitive information

One of the difficult issues addressed by the EXCO has been the need to find an acceptable balance between transparency in the OPCW's operations, and the protection of sensitive information. This has been perhaps most pronounced in the attempts to develop an acceptable format for the Status of Implementation Report (SIR). Currently the SIR is issued in two parts: part one deals with declaration and inspection information, issued as an OPCW highly protected document; part two is concerned with implementation of Articles X and XI, and is issued as an unclassified document. The Director-General has noted the importance of establishing a culture of openness as an essential step in building the OPCW's credibility and keeping the international community informed about its activities.

Adherence to general obligations

There has been an understandable tendency during the CWC's early operational phase to focus exclusively on specific obligations. But there is also a need to recognise and adhere to more general obligations, such as those in Article 1 of the Convention. Considerable attention has been directed, for example, towards transfers of Schedule 1 chemicals, even in sub-nanogram quantities (in some cases, in amounts that are too low to incapacitate a single person), with little, if any, consideration of transfers of 'unscheduled' CW precursors, which were acquired and used by CW proliferators in the 1980s. It will be important that, as CWC parties and the OPCW gain experience, states parties develop a broader perspective on what constitutes 'CWC-relevant chemicals', which clearly go beyond those listed in the three Schedules.

Conclusion

The CWC is attempting to achieve objectives, including monitoring the chemical industry for 'non-production' of CW, which were not deemed possible in the early 1920s. The Convention is complex and ambitious in its aims, and the OPCW is on a steep learning curve. Significant progress had been made by the end of 1997 on the creation of the CWC regime. In 1998 and 1999, there was further advancement as the CSP, the EXCO, the TS and the states parties worked (for the most part reasonably co-operatively) to come to terms with their various roles, obligations and responsibilities. At the end of 1999, the OPCW was gradually taking shape and heading, rather slowly, in the right direction, as opposed to being 'rudderless', as had been suggested.[25] Certainly progress has not been as rapid as anticipated in the euphoric climate following the signing ceremony. But it has been a lot better than one might have expected in the 'dark ages' of the latter part of the PrepCom. And this is happening regardless of the generally pessimistic international attitude towards arms control at the turn of the century.

Despite the difficulties experienced so far, it appears that the basic balances and compromises of the CWC have been sufficiently retained to allow the verification regime to function as intended. In particular, the regime should provide the necessary confidence that parties are complying with their obligations and be an effective deterrent to states that may be considering violating its provisions. Most noteworthy in this respect is how rapidly the Organization's Inspectorate has developed into a credible and professional body, and how well industry inspections have been accepted by the large majority of affected facilities.

The OPCW still faces serious challenges, though, and the next few years will be critical to its long-term prospects. These challenges include:

- securing the full adherence of all states parties to CWC declaration requirements;
- problems associated with the destruction of Russia's chemical weapons;
- achieving a broader geographic distribution of industry inspections;
- better appreciation of export licensing issues; and
- increasing membership levels, including states in the Middle East.

Consequently, it will still take a few years at least until the CWC can be regarded as a fully effective multilateral treaty. This is not surprising in light of the example of the 1968 Nuclear Non-proliferation Treaty, which, after initial teething troubles, was subsequently regarded as a major arms control success.

Finally, the potential positive impact of the CWC on other arms control and disarmament issues should be recognised. Its implementation is an experiment being watched carefully by those involved in current negotiations—especially on a protocol to the 1972 Biological Weapons Convention. In addition to helping realise a world free of chemical weapons, an effective CWC should be seen as a precursor to more effective verification measures being accepted in other arms control and disarmament treaties.

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Endnotes

[1] Stockholm International Peace Research Institute, *The Problem of Chemical and Biological Warfare*, vol. IV, 'CB Disarmament Negotiations, 1920–1970', 1974, p. 44.

[2] Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or other Gases and of Bacteriological Methods of Warfare (Geneva Protocol), 17 June 1925.

[3] Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction, which opened for signature on 13 January 1993, and entered into force on 29 April 1997.

[4] Martine Letts, Robert J. Mathews, Timothy L.H. McCormack, and Chris Moraitis, 'The Conclusion of the Chemical Weapons Convention: An Australian Perspective', *Arms Control Today*, vol. 14, number 3, December 1993, pp. 311–332.

[5] In addition, San Marino ratified on 10 December 1999, becoming a state party on 9 January 2000.

[6] 'The Resolution Establishing the Preparatory Commission for the Organization for the Prohibition of Chemical Weapons', agreed at the CWC signing ceremony (henceforth known as the 'Paris Resolution'). See UN document CD/1173, Appendix 1, pp. 177–182, Geneva, 3 September 1992.

[7] It was clear from the CWC text that to meet the Convention's tight timelines for submission of declarations and the conduct of initial inspections, the OPCW would need to be fully functional within days of entry into force. Furthermore, based on initial estimates of the numbers of facilities that would be declared, a TS with approximately 400 personnel would be required.

[8] Robert J. Mathews and Timothy L.H. McCormack, 'Verification of the Chemical Weapons Convention: National Requirements', in *Verification 1995*, VERTIC, London, 1995, pp. 180–192.

[9] As recorded in PrepCom document PC-XVI/37, 15 April 1997, sections 2 and 3.

[10] There was general agreement on the application of the 'possessor pays' principle, but agreement could not be reached on how the reimbursements of verification costs should be calculated.

[11] These are agreements or arrangements for the conduct of verification activities by the TS at specific facilities, including CW-related and some chemical industry facilities. They are negotiated agreements or arrangements between the state party concerned and the TS, subject to the approval of the EXCO.

[12] Indeed, the credibility of the new Organization was demonstrated in 1999, following a request from the UN Secretary-General to assist in the clean-up of the UN Special Commission (UNSCOM) laboratory in Baghdad.

[13] For the purposes of routine verification, the CWC specifies three Schedules of chemicals. Schedule 1 chemicals pose *a high risk* to the purposes of the Convention and include nerve and blister CW agents; Schedule 2 chemicals pose *a significant risk* and include key precursor chemicals to nerve and blister agents; and Schedule 3 chemicals pose *a risk* and include toxic chemicals and precursor chemicals, which are very widely used in industry. There is also a fourth category, 'Discrete Organic Chemicals' (DOCs). Facilities that produce Scheduled and DOC chemicals above specified thresholds are required to make declarations and subject to routine inspections.

[14] The 'another state party' that made declarations under Articles IV and V has chosen to keep its declared information 'OPCW Protected'. This means that the data is not available for general release. There have been press reports that this state party is the Republic of Korea. See *CBW Conventions Bulletin*, News Chronology, 17 August 1997.

[15] In fact, the initial assumption by the PrepCom was that there would be a Russia–US bilateral agreement in place. In the absence of such an agreement, greater TS resources were required for initial inspections of CW-related facilities. It was, therefore, fortuitous from the inspection planning viewpoint that Russia ratified several months after the US.

[16] Australia and the Republic of Korea, 'Methodology for selecting Schedule 3 and Discrete Organic Chemical (DOC) Plant Sites for Inspection', EC-XVI/NAT.5, 16 September 1999.

[17] In the 2000 budget, resources were allocated to conduct 36 initial inspections at Schedule 2 facilities in the US. It was agreed that, if US industry declarations are further delayed and that less than 36 initial Schedule 2 inspections can be carried out in the US in 2000, then these 'unused' resources could be used for Schedule 3 and DOC inspections.

[18] The tension associated with this issue should gradually disappear after April 2000, when the US is expected to submit its initial industry declarations.

[19] In accordance with CWC Verification Annex Part IV (A), paragraph 17, states parties are required to destroy not less than one percent of their 'Category 1 stockpile' (which includes chemical weapons based on nerve and blister agents) no later than three years after entry into force (that is, by 29 April 2000).

[20] In addition to various unresolved PrepCom issues and other matters specified in the Convention (such as the terms of reference for the SAB), several new issues have also been considered, including development of a proposed 'technical change' to the CWC to overcome an unintended consequence regarding transfer of Saxitoxin (a chemical listed in Schedule 1) for medical/diagnostic use.

[21] 'Old CW' (that is, CW produced between 1925 and 1946) requires agreement on guidelines on their 'usability' and a verification regime. Resolution of these issues would allow the TS to close the files on more than 20 inspection reports.

[22] Blinded analytical equipment uses special 'blinded software' and a restricted database to provide only 'presence/absence' information of CWC-related chemicals.

[23] The lack of analytical data for the majority of members of the various families of scheduled chemicals is regarded as a serious gap, which should be addressed as a priority. In the interest of effective verification, it is also hoped that spectra of other relevant chemicals will be promptly added to the OPCW analytical database.

[24] US Senate, *Congressional Record*, 24 April 1997, p. s3656.

[25] See Amy Smithson, 'Rudderless: The Chemical Weapons Convention at 11/2', *The Henry L. Stimson Center Report,* no. 25, September 1998. While it would be difficult to argue with one of the major premises of that article (that the US has not played an active leadership role in the early life of the CWC) a more accurate assessment would have to be that the CWC is still heading in the right direction, despite developments in Washington.

6

Verifying biological disarmament: towards a protocol and organisation

Nicholas Sims

Biological weapons (BW) have seldom been used, but 'the history of biological warfare is obscured and complicated by false allegations, unfounded suspicions and the repeated difficulties of separating what is true from what is false'.[1] Casualty figures and military consequences are uncertain even for the largest and most reliably attested campaign of biological warfare: Japan against China between 1939 and 1942.[2] Nevertheless, BW occupies a special place in the history of warfare and disarmament diplomacy because of the exceptional revulsion that the prospect of 'germ warfare' has inspired. It has been excoriated as 'repugnant to the conscience of mankind'[3], since it offends ethical humanitarian values and a deep rooted social taboo. Furthermore it has been described as 'an arm discreditable to modern civilisation',[4] because it is peculiarly insidious in operation and, therefore, associated with ancient notions of unchivalrous behaviour, unworthy of the warrior. Conversely, one of the principal motivations for BW disarmament has been the drive towards the control, and, wherever possible, the prevention of disease. The highest ethical standards of the medical and scientific professions point to the moral responsibility of saving life, rather than destroying it through the deliberate infliction of disease, thereby betraying a high calling.[5]

In the last three decades of the twentieth century a new urgency was added to these eternal verities, as biological warfare assumed a renewed salience and acquired a new aura of invincibility through developments in science and technology. A much stronger perception of the threat from biological weapons—in the hands of terrorists and unfriendly governments—arose primarily as a result of the revolution in genetics from around 1973. The development opened up the prospect of mutated or gene-spliced 'super-germ' weapons, giving the offence a permanent advantage over the defence.[6] This novel threat was accompanied by disturbing evidence of

deception by one or two governments that professed to be in favour of disarmament. In 1992, for instance, Russian President Boris Yeltsin accused the former Soviet Union of having maintained an offensive BW programme, although doubts remained over whether the Russian Federation had succeeded in dismantling it completely. Furthermore, a small number of governments had an enduring military interest in the most feared, classic (bacterial and viral) agents of microbiological warfare, such as anthrax, smallpox and plague, as well as toxins like botulin.[7] The experience of the UN Special Commission (UNSCOM) on Iraq (1991–98) was a sobering reminder of how a regime intent on evasion and defence of its BW programme might continue to obstruct even the most determined inspectors.[8] Such phenomena were all the more alarming given that they persisted long after biological disarmament was formally accepted as a norm in international law through the treaty-governed prohibition of BW.

Interest in verifying governments' compliance with their obligations in this regard can be traced back a long way.[9] Although it intensified over the last 15 years of the twentieth century, verification remained elusive. If BW disarmament is ever to be subjected to systematic international verification—through an Organization for the Prohibition of Bacteriological (Biological) and Toxin Weapons (OPBW)—this will be a twenty-first century achievement, building on foundations laid principally in the 1990s.

This chapter examines the reasons for the historic reluctance to apply verification to BW disarmament, the movement of verification issues from marginality to centrality in the evolution of the treaty regime, the principal issues under debate, and the prospects for an OPBW.

Treaties

The Geneva Protocol of 1925 is the earliest example of the general prohibition of biological weapons by treaty, but this was only concerned with use. One could have assumed that possession and other activities that logically precede use would have soon been included in the wider restrictions of a general disarmament treaty, for which preparatory negotiations started in 1926 under the auspices of the League of Nations. The eventual failure of the Geneva Disarmament Conference of 1932–34 meant that this assumption did not hold.

The Geneva Protocol, which entered into force progressively from 1928, prohibited the use in war of bacteriological (as well as chemical) methods, but only

among parties to the accord. There were no restrictions regarding use against non-parties, except in so far as a norm of customary international law was evolving independently of treaty obligations. The existence and extent of such a legal standard against biological warfare was long contested. Its reliability, if put to the test, was as uncertain as the associated social, ethical or humanitarian taboo. It could also be debated whether bacteriological was to be construed as extending to everything microbial, including viruses.

Moreover the Protocol contained no provision for verification or enforcement of compliance, even of the limited prohibition on use. And it did not even attempt to constrain the development, production, stockpiling, acquisition, retention or transfer of biological weapons. These six constraints were instead negotiated in 1968–71 and enshrined in the Biological Weapons Convention (BWC) of 10 April 1972, which entered into force on 26 March 1975. The accord is at the heart of the disarmament treaty regime under which the renunciation of biological weapons is required. This regime is capable of evolution and reinforcement by an array of strengthening measures, which may eventually come to include verification.

There are currently 143 states parties to the BWC. Eighteen more have yet to ratify their signatures, and 30 have not even signed the Convention. As a result, the BWC is in force for some 75% of countries in the world. Participation has historically been lowest in Africa and the Middle East.

The principal obligations with which compliance might be susceptible to verification are: Article I, 'Each State Party to this Convention undertakes never in any circumstances to develop, produce, stockpile or otherwise acquire or retain: 1. microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes; 2. weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict. Article II, requiring disarmament within nine months, applies only to those states that possess biological weapons at the time the Convention enters into force for them. Article III prohibits their transfer. It should be emphasised that, like the 1992 Chemical Weapons Convention (CWC), the BWC contains a 'general purpose criterion' in Article I: prohibitions are not limited to named microbes or vectors, but are applied to all agents and toxins of types and in quantities not justifiable by the criterion of 'prophylactic, protective or other peaceful purposes'. This structure was necessary to ensure the comprehensive scope of the Convention.

Absence of verification

Verification was deliberately omitted from the BWC. The Treaty's origins lie in a 1968 British initiative tabled in Geneva,[10] which was followed in 1969 by the first UK draft Convention (revised in 1970 to include toxins) and by the unilateral US renunciations of biological and toxin weapons in 1969 and 1970 respectively. President Richard Nixon's decisions were unconditional and did much to generate momentum for a multilateral treaty without verification. This was to be concluded as soon as possible, so that the US would not be alone in its biological disarmament.

In 1968 the classic verification technique was on-site inspection, but this would have been unacceptably intrusive to the Soviet Union, even if it was acceptable to the US (which did not propose it for the BWC). A new technology for verification—remote sensing from space—was about to enter the realm of arms control. The US–Soviet Union Strategic Arms Limitation Talks (1969–72), resulted in agreement to use national photo-reconnaissance satellites to verify strategic nuclear arms control and a compact not to interfere with each other's so-called national technical means of verification, including such satellites. Such verification was only available to two states, though, and would have made no sense in the context of biological disarmament (even on a bilateral basis) because violations would not have been detectable and identifiable by remote monitoring.

In launching its initiative for what became the BWC, the United Kingdom thus concluded that:[11]

> No verification is possible in the sense of the term as we normally use it in disarmament discussions [so] we must make a choice—balance the risks of evasion if we go ahead with the formulation of new obligations, against the risks for the world if we do nothing and allow the fears of eventual use of microbiological methods of warfare to continue and intensify. My choice is emphatically to go ahead; we cannot afford to do nothing. While we cannot offer a fully effective system of verification and we believe it beyond the wit of man to devise one, we can provide arrangements which should satisfy States, given the intractable nature of the problem, that they will not be exposing themselves to unacceptable risks.

While the UK initiative gradually attracted support between 1969 and 1971, it was also criticised for omitting chemical weapons. The US praised it as 'a careful effort, in short compass, to deal with the major problems involved in eliminating

BW in a world composed of countries of many different kinds and sizes, with varying degrees of reluctance to submit to on-site verification'.[12] The US view that the treaty was acceptable without verification (a view opposed principally by France and Sweden) may have been based partly on a judgement that BW was unlikely to be militarily attractive to any state, but that any BW threats that did arise could be deterred by nuclear weapons, and partly on a technical assessment of the non-verifiability of the BWC prohibitions.

The arrangements proposed by the UK may be regarded as functional substitutes for verification. Some of the most important components were discarded in the US–Soviet negotiations in April–August 1971, which radically diluted the UK concept of a BWC. Nevertheless, enough survived to endow the Convention with the rudimentary elements of a compliance regime to support prohibitions in Articles I, II and III.

Functional substitutes for verification

There were four functional substitutes for verification that survived negotiation in 1971. They can be summarised as:

- national implementation (Article IV);
- consultation (Article V);
- complaints (Article VI); and
- assistance (Article VII).

Articles IV–VII have evolved through the declarations of BWC Review Conferences[13] into the first layer of a compliance regime. Article V, in particular, has generated a Consultative Meeting procedure as a contingency mechanism for handling compliance concerns multilaterally. Its foundations were laid in 1980,[14] and it was first invoked in 1997, when Cuba accused the US of violating the BWC by introducing an insect (*thrips palmi*), which caused crop infestation, into western Cuba. Although these consultation mechanisms are imperfect, even with an inconclusive outcome they may serve a useful purpose, if only in providing a channel for the multilateral ventilation of concerns.

New approaches

The appeal of new approaches grew insistent in the 1980s, though, as the credibility of the Convention was eroded by doubts over whether biological disarmament

had been achieved after all. Western concerns over Soviet BW activity, fuelled by defector testimony, were not allayed by unconvincing explanations of an anthrax outbreak at Sverdlovsk (now Yekaterinburg) in 1979. Rumours of incipient BW research and development programmes in the Middle East and elsewhere persisted. The Convention was weakened by the inability of its states parties to agree on baseline data, such as: how many possessors of BW stockpiles existed in 1975; whether or when they had destroyed these stockpiles; and whether any new possessors had emerged.

There was a pressing need to resolve ambiguities and suspicions, but the existing procedures for handling compliance concerns (under Articles V and VI) were seen as weak and long remained untried. Meanwhile unilateral accusations of non-compliance abounded, unrestrained by any multilateral process for testing their veracity. Reliance on defector testimony and competing national intelligence estimates—in the absence of authoritative international fact-finding procedures—encouraged sensationalist journalism and opportunist claims that the Convention was toothless and, therefore, useless.

Confidence-building measures

The first new approach was transparency in legitimate activity. A set of co-operative measures—soon to be given the then fashionable name of confidence-building measures (CBMs)—was introduced by the Second BWC Review Conference in 1986. From 1987 states parties were required to exchange information through the UN on: their biological research centres and laboratories with high-containment facilities; unusual outbreaks of disease; and publications and conferences relevant to the Convention. The idea was that greater transparency in respect of legitimate scientific activity with micro-organisms and toxins at high biosafety levels, and of naturally occurring diseases, would provide a background of 'normal' activity against which suspicious abnormalities would be more pronounced. The other CBMs would promote international co-operation in the peaceful applications of microbiology and scientific exchanges that would be helpful in the prevention of disease (Article X) and in providing reassurance of compliance (Article V). Openness, it was hoped, would prevail.[15]

New CBMs were added by the Third Review Conference in 1991. These encompassed BW defence research and development programmes and BW offensive activities back to 1946, so as to increase transparency in areas of greatest concern. To fill in

the picture of 'normal' activity, vaccine production facilities were also to be declared. The original CBMs of 1986 were maintained, with some modifications. A new, more user-friendly reporting format of initial declarations was mandated, to take effect from 1992, with annual declarations thereafter. Yet the programme of CBMs remained unenforceable, representing a political commitment, but not a legally binding obligation. By 1996 only 75 of the BWC states parties had taken part even once since 1987, and only 11 had made annual declarations as required.[16] Doubts remained over whether all declarations were full and credible, and also over whether the CBM items requested were sharply focused enough to generate well-founded confidence. The Fourth Review Conference left the CBM programme unchanged, since, by 1996, it seemed likely that CBMs would be subsumed under other 'measures to promote compliance' within a new BWC protocol that might extend to verification.

Verification

As a new approach to strengthening the Convention, verification only came to occupy the diplomatic centre stage in the late 1990s, after a series of false starts. The essential elements of a verification system were already in the public domain as a result of proposals made between the Second and Third Review Conferences by the Federation of American Scientists and individual authors.[17] Yet the US government insisted that the BWC was not susceptible to verification. It opposed verification as engendering a dangerous illusion of security. In 1986, a Soviet proposal for a verification protocol had been rebuffed; Soviet compliance with the BWC was already suspect, notably because of its failure to explain satisfactorily the 1979 anthrax outbreak. In 1991, French-led Western pressure for the BWC to be subject to verification was successfully diluted. As a result, the Third Review Conference mandated only a technical and scientific study of possible verification measures by an Ad Hoc Group of Verification Experts (VEREX).

The VEREX exercise (1992–93) was limited to identifying, examining and evaluating 21 measures. It concluded that some on-site and off-site measures in combination were worth pursuing. A majority of states parties convened a Special Conference in 1994 to consider the VEREX report. The Special Conference declared that effective verification could reinforce the Convention and it decided to elevate the issue from the scientific to the diplomatic agenda. A new Ad Hoc Group, open (like VEREX) to all BWC states parties, was set up and given a mandate to consider appro-

priate procedures, including possible verification measures, and to draft proposals for strengthening the BWC. These were to be included, as appropriate, in a legally binding instrument. Their purpose would be to strengthen the effectiveness and improve the implementation of the Convention. Attempts to secure a mandate more explicitly centred on verification failed in 1994 and 1996.

This new Ad Hoc Group started work in 1995 and moved into negotiating mode in 1997. By March 2000 it had held 19 sessions to draft a protocol to the BWC, but not necessarily a 'verification' protocol. In deference to the US and to take account of other sensitivities, the word verification is being avoided, even if much of the substance in respect of 'measures to promote compliance' resembles the verification sought by its proponents (Australia, Brazil, Canada, and South Africa, as well as the members of the European Union and those countries associated with its position—to name the most actively committed delegations).

Another large part (Article VII) of the protocol is likely to be devoted to the promotion of international co-operation in the peaceful application of microbiology, especially for the prevention of disease, and other measures for economic and technological development. Article X of the BWC requires that such development not be hampered; the protocol must give effect to that principle.[18]

When completed, this legally binding instrument is to be submitted to a second Special Conference for adoption not later than 2001. If a protocol is still not ready, the Fifth Review Conference in 2001 will presumably encourage the Ad Hoc Group to intensify its efforts, as the Fourth Review Conference did in 1996.

The protocol will probably include provision for:[19]

- mandatory declarations of certain facilities, such as those involved in BW defence, vaccine production and the handling of certain listed micro-organisms for other purposes;
- visits; and
- investigations.

Visits are designed to build confidence in the accuracy of declarations on a non-adversarial basis, unlike investigations, which would only be launched if one state party challenged another. It remains contested whether 'non-challenge' visits will be allowed in several categories for clarification of declarations and/or on a random basis for transparency, as well as for the wider purpose of compliance reassurance. Also among the issues to be resolved are the criteria for triggering mandatory

declarations of facilities, the modalities of investigations, decision-making procedures when challenges occur and the future of the CBM programme.[20] Investigations of alleged non-compliance and other regulatory and promotional functions will be undertaken by the OPBW.

Towards an OPBW

Proposals for an OPBW in Article IX of the draft protocol[21] envisage a structure similar to that of the Organization for the Prohibition of Chemical Weapons (OPCW):

- a Conference of States Parties;
- an Executive Council; and
- a Technical Secretariat.

Like the OPCW it would have a Scientific Advisory Board, a Confidentiality Commission and a Director-General would head its staff. Unlike the original OPCW it would probably have a Co-operation Committee from the outset. This would act as a dedicated forum for consultation, assisting the OPBW to develop a framework of activities to implement the 'promotional' aspects of Article VII of the protocol. This builds on the international co-operation content of Article X of the BWC, and is of the greatest interest to developing countries participating in the Ad Hoc Group, which wish to promote biotechnology and medical advances.

The seat of the OPBW has yet to be decided: Switzerland has proposed Geneva, and the Netherlands has put forward The Hague. The Organization would only come into being after the protocol entered into force, but it might be preceded by a Provisional Technical Secretariat. This would serve the Preparatory Commission of signatory states between the protocol's opening for signature and its entry into force (as happened in 1993–97 with the CWC).

The members of an OPBW would be the parties to the protocol, a subset of the total roster of parties to the BWC. Other parties to the BWC would have no place in the Organization or obligations under the protocol. It is desirable for the success of the protocol and the OPBW that the great majority of BWC parties are drawn into membership sooner rather than later. However the entry into force proposals under consideration in the Ad Hoc Group recognise that this will not happen straight away and that it should not be a prerequisite that holds back the protocol.[22]

Before committing themselves the more cautious BWC parties may wait and see whether the protocol proves successful and what compliance costs are involved

in its implementation. It follows that there will be a continuing need to promote the evolution of the BWC itself through the review process and to strengthen the commitment of all parties to implementing these politically binding measures and to improving the mechanisms already agreed. The BWC, as it stands, will continue to need sustained attention during at least the early years of the protocol.

Conclusion

Verifying BW disarmament will not be easy, but it is central to the next stage in reinforcing the compliance regime. A CBM programme has been introduced on top of the BWC's original elements (Articles IV–VII), and eventually the protocol's compliance measures will be an additional layer on the two-tier structure.

If the protocol includes verification in the new third layer, the procedure will have come very late in the BW disarmament process. Six factors made it thinkable in the late 1990s:

- awareness of the fragility of the existing (two layer) BWC compliance regime, given the reality of non-compliance by at least the Soviet Union and Iraq;
- concern over the military implications of biotechnology and the revolution in genetics and thus the relative ease of acquisition of BW by terrorists or governments unhindered by BWC constraints;
- growing international acceptance of on-site inspections, challenges and investigations as necessary components of compliance regimes for other arms control and disarmament treaties;
- familiarisation with potential verification techniques applicable to the BWC through practice inspections, visits organised by governments and through VEREX and the Ad Hoc Group;[23]
- acceptance (still far from complete) by the biotechnological and pharmaceutical industries of a necessary degree of intrusion by national authorities and OPBW inspectors, subject to safeguards for confidential proprietary information, in the higher interest of verifying BW disarmament;[24] and
- above all, the successful conclusion and entry into force of the CWC, with OPCW inspectors carrying out global verification tasks from 1997.[25]

The emergence of a CWC, let alone a CWC with a verification system of unparalleled dimensions, with deep ramifications for civil industry and research and extending to on-site challenge inspection, was almost inconceivable when the BWC was negotia-

ted. But now that it exists, it constitutes a model to be emulated. An OPBW will not be an exact, scaled-down imitation of the OPCW. However, verification of the CWC, accepted by most of the states that are also parties to the BWC, gives hope that many of the same elements can be put to use in the service of biological disarmament. The BW danger is at least as great as the CW threat: in principle, therefore, the means adopted to counter it should be at least as strong.

The challenge to all BWC parties is continually to demonstrate their compliance: to devise transparency and other measures which will persuade other parties that they are engaged in a coherent pattern of peaceful activity and that their compliance is full and genuine. It is hard to prove a negative, but that is essentially what the BWC (like the CWC) demands of its states parties. A verification system of declarations, visits and investigations, administered by an OPBW under a carefully integrated protocol,[26] should enable those BWC parties which ratify the document to demonstrate their own compliance with greater certainty and credibility and to learn more about the compliance of other states. Only then can the BWC fulfil its potential as more than merely the treaty expression of an international norm—by turning aspiration into achievement as an effective safeguard against the threat of biological weapons, in the common interest of all humanity.

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7

Verification of conventional arms control

Pál Dunay

The 1990s was the decade of structural conventional arms control in Europe. During this period, several agreements on the limitation, reduction or banning of certain types of conventional weapons were signed. These included: the 1990 Conventional Armed Forces in Europe (CFE) Treaty, together with its revised version of 1999; the 1996 agreement on sub-regional arms control under the 1995 General Framework Agreement for Peace in Bosnia and Herzegovina (Dayton Accord); and the 1997 Landmine Convention. This situation differs fundamentally from earlier decades, when either no attempt was made to limit conventional weapons or the efforts that were made failed.

The first attempts at quantitative and qualitative limitations on conventional armaments occurred between the First and Second World Wars. The three great naval treaties—the 1922 Washington Treaty and the 1930 and 1936 London Treaties—only partially prevented a naval arms race between the parties,[1] were threatened by naval build-ups by non-parties, and contained no verification provisions. Bearing in mind the small number of parties and the nature of the armaments subject to limitation (large warships in the navies of a few major powers), it was reasonably easy for parties to detect non-compliance themselves. The fact that not all of the major powers were party to the accords resulted in smaller countries refusing to join. Withdrawals from one treaty or the other also occurred.[2] The agreements broke down before the outbreak of the Second World War.

The 1954 arms control arrangements for the Federal Republic of Germany (FRG) were an interesting mixture of co-operative and imposed arms control, with some intrusive verification measures. The 1954 Paris Protocols integrated the FRG into NATO, and, with the inclusion of Italy and Germany, established the Western European Union (WEU). The FRG was to be subject to verifiable constraints on its

procurement of certain types and quantities of weapons, including a verified ban on the acquisition of weapons of mass destruction (WMD). Long-range power projection capabilities, like guided missiles, warships and strategic bombers, were also exposed to stringent restraints.

With WMD there could be no exceptions, although exemptions could be made in the case of conventional weapons. The decision rested with the military commander of NATO and with the WEU Council. German stocks of conventional armaments were initially fixed, as agreed in the European Defence Community in May 1952, and modified according to standard NATO annual review procedures. The more formal limitations were revised a number of times between 1959 and 1977, so that Germany was not deprived of its legitimate means of defence.

There were several arms categories not subject to limitation, only to monitoring. They included almost every major offensive weapon system, such as:

- artillery pieces with a calibre above 90 millimetres;
- battle tanks;
- armoured combat vehicles;
- ships above 1,500 metric tons; and
- military aircraft.

Certain pieces of ammunition and gravity bombs also belonged to this category, which was to be subject to inspection by the WEU's Agency for the Control of Armaments (ACA). This was one of the few activities that the WEU undertook between the mid-1950s and mid-1980s—the organisation's 'sleepy years'.

Verification was carried out by comparing responses to an annual questionnaire sent to Germany with other sources of information. It may seem surprising that a questionnaire was used as the primary means of acquiring data. But the FRG was still occupied by its major allies—France, the UK and the US—and its armed forces had no general staff. Consequently, there was no reason to be concerned about the reliability of the answers. The information gained was complemented by on-site inspections (OSIS) by the ACA.

As the situation in the country normalised, the WEU gradually exempted Germany from the limitations and relaxed the verification regime. The last remaining restrictions, concerning production of conventional weapons, were lifted at the 1984 WEU meeting in The Hague. Regular inspections were conducted until 1985 and the on-site inspection regime was formally terminated on 1 January 1986.

In return for accepting both the Protocol's requirements for providing extensive information and its verification system, the FRG had been able to integrate itself into the Western democracies' co-operative structures and become an equal partner in international affairs.

The Mutual and Balanced Force Reduction talks

A fruitless attempt at conventional arms control for Central Europe was the Mutual and Balanced Force Reduction (MBFR) talks, which began in Vienna in 1973. These talks aimed to limit conventional arms in countries located near the NATO–Warsaw Pact line of confrontation: the Benelux nations (Belgium, Netherlands and Luxembourg), Czechoslovakia, the two German states and Poland. The talks ended without agreement in 1989, following 16 years of negotiations. Due to the different structures of the armed forces in the East and West, it was not possible to compare readily their personnel strength. One difficulty was that civilians in NATO countries conducted many of the functions carried out by uniformed military staff in Warsaw Pact states. Despite the failure of the talks, valuable lessons for verifying conventional disarmament can be drawn from the experience.

- First, no inspection system can function without a reliable and verifiable exchange of baseline data. This was fundamental to the failure of the MBFR talks: it proved impossible to agree on baseline data relating to numbers of military personnel fielded by NATO and the Warsaw Pact in the proposed area of application. The lesson gained from the MBFR experience is that exchange of such data can probably only happen on treaty signature (at the earliest).
- Second, a close link between information exchange and verification, such as inspections, must be established early and maintained throughout treaty implementation. If initial baseline data cannot be verified, the temptation to cheat will significantly increase during subsequent information exchanges.
- Third, only a tiny minority of states have access to their own 'national technical means' (NTM) of verification, such as satellite imagery. Adequate means of multilateral verification must, therefore, be identified: OSIs are essential.
- Fourth, different components of conventional forces present different verification problems. It is far easier to count battle tanks or other pieces of heavy armament than military personnel. Unfortunately the MBFR debates after 1975 focused on personnel strength—one of the most heated discussions centred on the difference

between NATO and Warsaw Pact structures—a category difficult to verify and where circumvention of limitations is relatively easy.

Until the second half of the 1980s, there was no co-operative conventional arms control verification experience in Europe. The most momentous agreement on conventional arms control, the CFE agreement, did not, however, appear out of thin air. The prehistory of its verification regime includes four important elements.

- First, the largely negative experience of the MBFR talks and the lessons for verification derived from them.
- Second, the legacy of military confidence-building measures from 1975 onwards. The voluntary hosting of inspections at major military exercises provided for under the 1975 Helsinki Final Act, and the limited mandatory ones under the 1986 Stockholm Accord on Confidence- and Security-Building Measures (CSBMs), were a symbolic breakthrough. The Stockholm agreement was the first multilateral OSI regime involving (with the exception of Albania) every European country. But it limited the number of inspections a participating state was obliged to host (its passive quota) to a maximum of three per year. Moreover, since the inspections were of large-scale military exercises, they were irrelevant for conventional arms reductions.
- Third, the Soviet–US Intermediate-range Nuclear Forces (INF) Agreement of 1987, and its extensive OSI regime, was further evidence of the possibilities for co-operative verification.
- Fourth, in the second half of the 1980s, as relations between the Soviet Union and the West improved significantly, doctrinaire attitudes towards arms control verification changed sufficiently to lead to talks on conventional armed forces. Even though the shift in Soviet attitudes was the most visible,[3] particularly as far as acceptance of OSIs was concerned, Western demands for intrusive verification also eased.

The Conventional Armed Forces in Europe Treaty

The mandate of the CFE talks elaborated in Vienna between early 1987 and 1989 reflected the parties' tacit agreement on verification principles, resulting from the change in views as the end of the Cold War approached.[4] After 20 months of intensive negotiation, the heads of state and government of the then 22 member countries of NATO and the Warsaw Pact signed the CFE Treaty in Paris on 19

November 1990. It restricted five major types of armament belonging to states parties in the area of application (from the Atlantic Ocean to the Ural Mountains), namely: battle tanks; armoured combat vehicles; artillery pieces; combat aircraft; and attack helicopters. The CFE Treaty also established an institutional structure consisting of the Joint Consultative Group (JCG)—a negotiating body that meets frequently in Vienna to deal with implementation problems and to arrange the necessary Treaty conferences. The most important of these is the review conference, which must be held every five years,[5] although extraordinary conferences of states parties played an extremely important role before entry into force.

The CFE agreement's verification system[6] was based on several key principles. Its structure recognised the existence of two groups of states parties: those belonging to NATO and those to the Warsaw Pact. Verification would, therefore, be carried out by states belonging to one group or the other. The Treaty mentioned three types of verification: national or multinational technical means; aerial inspections; and on-site inspections. Inspections would be conducted to ascertain that the data submitted in the information exchanges were correct. And only in exceptional circumstances would they involve locations where no treaty-limited armaments and equipment were reported.

The number of inspections that a party was annually obliged to host (a passive inspection quota)[7] would be based on its declared number of 'objects of verification'. Understandably, the highest number of inspections were mandated right after entry into force, during the so-called baseline validation period, in order to confirm that information supplied about the state party's current holdings was correct. A second peak occurred in the so-called residual level validation period, after the end of the 40-month reduction phase. During the latter and after full implementation of reductions, a somewhat lower number of inspections was to be conducted.

Following the adoption of the Treaty, the rules were somewhat modified as implementation evolved. There was even an amendment right before signature. After the revolutions of 1989 in Eastern Europe, an arms control regime based on alliance-to-alliance verification became irrelevant for many Eastern bloc countries. The Warsaw Pact collapsed *de facto* during the CFE talks, and was terminated *de jure* in July 1991. Some of the Pact's smaller members insisted on obtaining the right to inspect their erstwhile alliance partners. The concern in the West, however, was that countries belonging to the same group would use up each other's passive quotas to such an extent that the inspection rights of states belonging to the other

group would be seriously constrained. Moreover, as one American official pointed out, NATO wanted to avoid a situation where the Turks and the Greeks were inspecting each other.[8]

The solution, achieved 10 days before treaty signature at a meeting between the Soviet and US Foreign Ministers, limited to five the annual number of inspections by one state party of another state party 'belonging to the same group of states parties'.[9] This would mean, for instance, that Romania was entitled to conduct five inspections per year in Hungary, while Greece could carry out five in Turkey. Alliance members, however, reached a gentlemen's agreement that they would not inspect each other.

The deviation from the strict bloc-to-bloc nature of the CFE accord reflected the fact that the bipolar structure was outdated the day the Treaty was signed. In the new geopolitical climate, the West and the Soviet Union's smaller former allies were primarily interested in reducing the threat from Soviet rather than NATO forces. It was of major strategic importance, though, that the Treaty was concluded before fundamental changes in underlying conditions made its adoption impossible. That is why the fiction of a bloc-to-bloc structure was maintained until signature and for many years beyond.

After the signing of the CFE agreement, negotiations continued—far less intensively—in an attempt to agree complementary limitations on military personnel. The resulting accord, the 1992 CFE IA agreement, contains a list of unilateral commitments regarding the peacetime personnel strength of the parties' armed forces. Given the MBFR experience, no verification system was established to monitor compliance. This underlined the parties' recognition that a strategically significant violation of conventional arms limitations is more likely to be in the form of a major increase in armaments than in personnel.

Implementation of the CFE Treaty

The practice of CFE implementation has been characterised by some unique features. Due to doubts concerning compliance and the uncertainties of state succession in the former Soviet Union, it did not enter into force for more than 18 months after signature. Although this led to postponement of the reduction phase, it had one major advantage in that the signatories had sufficient time to rehearse both the exchanges of information and the conduct of OSIs. When trial inspections revealed ambiguities in the Treaty's rules, interpretative decisions were made by the JCG.

Among the three main types of verification, OSIs gained clear prominence. National technical means were not available to many states, and those that had left the Warsaw Pact no longer even had access to satellite information.[10] High-resolution satellite imagery is now widely available commercially to every party. But this is not the case with real-time processed information, particularly relating to conflict zones. Even if initially available, no state can be confident that it will be uninterrupted. As a result, NTM continue to play a limited role in CFE verification.

Aerial inspection has remained a missing link in the CFE verification system. During the follow-on negotiations that led to the CFEIA protocol, no attention was paid to this matter. This was due to the fact that the so-called Open Skies talks were being conducted in parallel in Vienna, resulting in the signature of the Open Skies Treaty on 24 March 1992. In the absence of ratification by two signatories, Belarus and Russia, the latter has not yet entered into force.

Verification of the CFE agreement has, therefore, relied almost exclusively on OSIs. According to the Treaty, national inspection teams can be used or two or more states parties can form a multinational team. Both the members of NATO and the 'newly non-aligned' countries of the East have relied extensively on such co-operation. The conduct of OSIs is not, however, an obligation, but an entitlement. It is questionable whether it is worth using an active OSI quota to the maximum, simply to maintain military-to-military communication, when no doubts exist concerning the compliance of other parties.

Although a few problems have emerged over the years, treaty compliance has been remarkably good overall. Since entry into force, approximately 3,800 OSIs have been conducted. While some inspections may have failed to eliminate all ambiguity, 94 percent, according to NATO, left no doubt that the inspected party was in compliance. It is a moot point whether or not this record has been due to intrusive verification. Given the concentration of non-compliance in one country, Russia, and the almost unblemished record of other states parties, one is tempted to conclude that inspections have had very little to do with compliance. The democratisation of states and the declining significance of gaining marginal military advantage through cheating may well have more to do with it.

Moreover, the importance attributed to transparency is not entirely convincing. The information gained from exchanges and inspections only ever had political and strategic relevance for a few countries and has been of diminishing importance. In cases where the principal security interests of a state party have been sub-regional

rather than pan-European, or where a country has had limited analytical capabilities, the data have simply been filed. This is not to argue that the information exchanges should be replaced by a less extensive regime.

The presumed benefits of the CFE accord are similarly inconclusive with respect to increased communication between states on military matters. With the end of the East–West conflict, many other channels opened up, diminishing the relative importance of CFE routes.

In summarising the compliance record of the CFE agreement, the following conclusions can be drawn. Immediately after signature, it was revealed that the Soviet Union had moved several thousand pieces of hardware outside the area of application (behind the Ural Mountains) and that it had reassigned the armaments of three divisions to its naval infantry. This was not contrary to the letter of the Treaty, though, as these actions took place before it was concluded. But other states parties found this highly disquieting and a compromise solution was necessary.

Russia has since exceeded the limits set forth in the Treaty for its southern flank. It has argued that the change in its strategic situation after the dissolution of the Soviet Union (the former transcaucasus military district is now covered by three independent states, Armenia, Azerbaijan and Georgia) made necessary the increased deployment of treaty-limited weaponry in the North Caucasus military district. Moreover, non-compliance with treaty limits on the flank has not reached strategic proportions, but has remained limited.[11] When the deadline for completion of the reduction process passed, the JCG declared only that Russia was in 'technical non-compliance'.[12]

Another major case of Russian non-compliance occurred in the same area after it became involved in armed conflict against secessionist movements. The first and second wars in Chechnya—between 1994 and 1996 and in 1999, respectively—and the subsequent military 'stabilisation' led to a significant increase in Russia's military presence in the region, putting it in temporary violation of the Treaty. Russia has declared that it intends to maintain its strategic superiority in the area to prevent secession.

Other Soviet successor states, Belarus and Ukraine, in particular, have attempted to use Russian non-compliance to justify their own failure to carry out reductions in treaty-limited armaments on time. The analysis of the CFE compliance record shows that, overall, three of the four cases of non-compliance were rooted in the Soviet past and none aimed to change the strategic situation in Europe.

Verification in the CFE adaptation process

Only when the idea of enlarging NATO through the addition of former Warsaw Pact members was actively pursued, not just by the self-appointed candidates, the Czech Republic, Hungary and Poland, but also by NATO itself, did it become clear that the CFE structure could not survive such a move. One experienced CFE negotiator said that the day former Warsaw Pact member states joined NATO would be the day that the Treaty would become political science fiction. This was recognised at the Organisation for Security and Co-operation in Europe (OSCE)'s Lisbon Summit of December 1996, which initiated the so-called CFE adaptation talks.

When negotiations started in February 1997, it rapidly became clear that the bloc-to-bloc structure of CFE obligations could not be maintained and, hence, the verification system would also have to change.[13] Verification issues were not high on the agenda, however. It was far more important to agree on the new structure, based on national commitments. The West was ready to offer certain concessions to Russia in order that the adaptation process could proceed. Some measures were approved, both to prevent the destabilising concentration of forces and to accommodate the Treaty's so-called flank rule to the satisfaction of Russia and Ukraine. This was supplemented by the promise of further unilateral reductions below current holdings by several NATO states when the adapted agreement enters into force.

The structure of the adapted treaty, signed on 19 November 1999 at the OSCE's Istanbul Summit, closely resembles that of the CFE proper. The main text is supplemented by several documents, mainly protocols, which are an integral part of the agreement. They are largely identical to the protocols of the 1990 CFE accord. There are two new protocols that reflect the change in structure: a Protocol on National Ceilings; and a Protocol on Territorial Ceilings.[14] There are also several politically binding unilateral statements attached to the agreement that are not an integral part of it.

A number of states made commitments to reduce further their conventional armaments 'upon the successful and satisfactory conclusion of the adaptation process'.[15] Several governments interpret the latter as identical to the entry into force of the adapted CFE treaty. Belarus made a unilateral commitment not to host foreign treaty-limited armaments (such as battle tanks) on its territory. This is important, since it constrains Russian forward deployments in Belarus for the time being. If the 'union' of the two countries advances to the point at which they become one state, however, there is no guarantee that this obligation would hold.

A unilateral statement by Moldova and a joint announcement by Russia and Georgia—both made on 19 November 1999—dealt with the stationing of Russian troops on the other two countries' territory and their withdrawal. In the case of Georgia, Russia made a commitment to, and presented a timetable for, pulling out. By contrast, Moscow did not consent to Moldova's call for withdrawal.

In the adaptation process, associated measures, information exchanges and verification played a marginal role. But it is clear that, as the structure of CFE commitments change, so will the verification system. This is due to the fact that the overwhelming majority of rules governing inspections are technical and procedural. They deal with such matters as the objects to be inspected, the process to be carried out before the inspection team's arrival at the site, the inspectors' privileges and immunities, and the reports to be written about the inspection.

There are some changes in these details compared to the agreement adopted in 1990. The most fundamental difference stems from the elimination of the bloc-to-bloc structure. Parties can now formally conduct inspections on any other state party's territory. Since the gentlemen's agreement among NATO countries has remained in force, this means that the 19 NATO nations can use their quotas to inspect the other 11 states parties and countries that may later join the Treaty. There are also three states—the Czech Republic, Hungary and Poland—that are in a unique position as a result of joining the Alliance in March 1999. When they belonged to the Eastern bloc, they had the same inspection rights under the 1990 Treaty as countries like Bulgaria, Slovakia and Russia. Since becoming NATO members, however, they are subject to the intra-Alliance inspection ban. Consequently, their inspection rights will remain limited until the adapted CFE accord comes into force.

Again, there is no mention of aerial inspection in the adapted Treaty, in recognition of the fact that this gap should be filled by the Open Skies Treaty. Since (like Open Skies) the adapted CFE agreement permits the accession of any OSCE state located between the Atlantic and the Urals, the discrepancy that existed between membership of the 1990 CFE accord and that of the Open Skies Treaty is no longer necessarily present.[16]

Special regulations have been agreed concerning inspection of objects of verification in areas that used to belong to the flank of the Russian Federation and Ukraine. These were re-categorised as belonging to the so-called rear zone, where the least stringent limitations were applied under the CFE agreement. There the two countries

are obliged to host 'extra' inspections, which are counted against the active inspection quota of the inspecting state party.[17] It is an important achievement in two respects. First, it contributes to increased transparency in areas close to the flank zones in the two countries. Second, it reduces the asymmetry that stems from the fact that the majority of states parties will be most interested in inspecting Russia's armed forces. As NATO countries do not inspect each other, and there is no point militarily in inspecting like-minded nations that actively seek membership of the Alliance, it is predictable that there will be a concentration of requests to inspect a few states, primarily Russia.

For several reasons, the adapted treaty is unlikely to come into force soon. Entry into force is dependent on ratification by each signatory, and it is unlikely that Georgia and Moldova will do so before the departure of Russian troops from their territory. Another important reason is that Russia has increased its military presence in Chechnya, and, as a consequence, continues to violate the flank rule. Although some other signatories show understanding of Russia's attempts to stabilise the north Caucuses, it is unlikely that many legislative bodies will ratify the adapted treaty before Russian violations end or at least a political solution is found to the problem. Moreover, a number of countries' executive branches will not submit the adapted CFE for ratification until underlying conditions change. Given that Russia has also recently refused a number of inspections in the Caucuses (most recently in February 2000) the ratification process may be stalemated for a long period.

Implications of the CFE regime

As a model for arms control regimes, the CFE Treaty and its additions and adaptations may only have relevance as far as its 'technical solutions' go. In strategic and political terms, it is open to question whether similar solutions will be required elsewhere. To date, no other region has indicated a willingness to engage in the same kind of conventional arms regulation. Moreover, the extent of institutional integration in Europe, which helped foster a conventional arms control process, makes it unique.

Within Europe, however, the Balkans region has adopted some of the precedents of the CFE process. Under the Dayton Accord (Annex 1-B), two agreements were presaged.[18] The first, signed on 26 January 1996, deals with CSBMs in Bosnia–Herzegovina. The second—the Florence Agreement of 14 June 1996—deals with

sub-regional arms control. The Dayton process establishes force ratios between three of the Yugoslav successor states (Bosnia and Herzegovina, Croatia and Serbia) and between the two Bosnian entities (the Croat–Bosniak Federation and Republika Srpska) through reductions in their conventional holdings. The five main armament and equipment categories subject to limitation are the same as those of the CFE Treaty. The only difference is that artillery pieces above 75mm calibre are subject to limitation, whereas in the CFE agreement only artillery above 100mm was restricted. The difference is due to the need to close a loophole and to limit the 82mm howitzers that were widely employed during the Bosnian conflict.

According to the Florence Agreement, the force ratios applied ('based on the approximate ratio of populations of the parties') are 5:2:2 for the Federal Republic of Yugoslavia, Croatia and Bosnia–Herzegovina, respectively. The allocations for Bosnia–Herzegovina were divided between the two entities on the basis of two for the Federation of Bosnia and Herzegovina and one for the Republika Srpska. The OSCE 'assisted' both in the negotiation and verification of the Florence Agreement. Implementation turned out to be extremely successful, primarily because of the strong military presence of the NATO-led Implementation Force (IFOR) and its successor, the Stabilization Force (SFOR).

The Florence Agreement is intended to be only the first phase of implementation of the Dayton Accord's so-called Article IV measures for sub-regional arms control. It is supposed to be followed by a wider regional arms control agreement 'with the goal of establishing a regional balance in and around the former Yugoslavia'. This is so-called Article V arms control under Annex 1-B of the Dayton agreement.[19] The negotiations to advance this process began in mid-1999, after a long delay due to the Kosovo conflict. They involve 20 regional states, including several parties to the CFE Treaty. The regional arms control regime will benefit from many solutions included in the adapted CFE agreement, but it stands no chance of being concluded until the latter enters into force. To establish the connection between the CFE accord and a regional arms control regime that includes the successor states of the former Yugoslavia and Albania (none of them parties to the CFE agreement) will be a demanding task for years to come.

Conclusion

Europe has to date led the way in conventional arms control. The idea of extending conventional arms control to other regions has remained unfulfilled. Sporadic

efforts, like confidence-building measures in the non-European states of the Mediterranean, have not yet come to fruition. In some regions, there is no need to achieve regional arms limitations and the incentive for negotiating them is, therefore, lacking. And, in others, the situation is so different to that of Europe as to require alternative solutions. As a result, there are currently no conventional structural arms control agreements in regions outside Europe.

The end of the East–West conflict, and the absence of a major conventional threat to the industrialised world, has led to calls to reduce the danger posed by conventional armaments. The possibility of limiting or banning such weapons, which presently cause extensive human suffering, excites public opinion. Some non-governmental organisations have initiated campaigns that may lead to commitments that are difficult to verify. Even though the non-verifiability of such accords is not the fault of those advocating them, many observers in the arms control community are suspicious of agreements that are unaccompanied by monitoring and verification measures. This occurred with the Landmine Convention and may happen in future with regard to certain categories of small arms. It remains to be seen to what extent the international community has relinquished the notion that conventional arms control requires stringent verification of the type that applied until the end of the Cold War.

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Endnotes

[1] Treaty of the Washington Conference on the Limitation of Naval Armament (November 1921–February 1922) between France, Italy, Japan, the UK and the US. Treaty of the London Conference on Naval Armament (January–April 1930) between France, Italy, Japan, the UK and the US. The Treaty of the London Conference on Naval Armament (December 1935–March 1936) between France, the UK, and the US.

[2] For a more detailed account, see Jozef Goldblat, *Agreements for Arms Control: A Critical Survey*, Taylor and Francis, London, 1982, pp. 2–4.

[3] Then Soviet President Mikhail Gorbachev spoke openly about intrusive measures, including OSIS, on several highly publicised occasions, including speeches at the Congresses of the East German and Czechoslovak Communist Parties in 1986 and 1987 respectively.

[4] The negotiations on the mandate, as well as the negotiations proper, were held under the auspices of the Conference on Security and Co-operation in Europe (CSCE).

[5] The first review conference was held in May 1996 and resulted in the modification of the Treaty's so-called flank rule. The next conference is due in 2001.

[6] For details of the verification provisions in the CFE agreement, see Particia M. Lewis, 'The Conventional Forces in Europe Treaty' in John B. Poole (ed.), *Verification Report 1991,* VERTIC, London, 1991, pp. 55–66.

[7] It consists of a 'passive declared site inspection quota' and a 'passive challenge inspection quota'. For more details, see Protocol on Inspection, CFE Treaty, Section I: Definitions, paragraphs (S) and (T).

[8] *Arms Control Reporter,* 1990, 407.B.407.

[9] Inspection Protocol, CFE Treaty, Section II, paragraph 24.

[10] Some former Warsaw Pact countries received satellite data from the US, such as Hungary during an early phase of the war in the former Yugoslavia. But such information is not guaranteed.

[11] This approach prevailed even in 1995, when the US intelligence view was that Russia without relocation would have had about 400 tanks, 2,000 armoured combat vehicles and 500 artillery pieces in excess of the flank limit. Zdzislaw Lachowski, 'Conventional arms control and security dialogue in Europe', in *SIPRI Yearbook 1995: Armaments, Disarmament and International Security*, Oxford University Press, Oxford, 1995, p. 771.

[12] Cited in Jeffrey D. McCausland, *Conventional Arms Control and European Security,* Adelphi Paper no. 301, IISS, Oxford University Press, Oxford, 1996, p. 34.

[13] For summaries of the course of the adaptation talks, see Pál Dunay and Wolfgang Zellner, 'When the Past Meets the Future—Adapting the CFE Treaty', Institut für Friedensforschung und Sicherheitspolitik Hamburg (ed.), *OSCE Yearbook 1997*, Nomos Verlag, Baden-Baden, 1998, pp. 281–299. Also see Pál Dunay and Wolfgang Zellner, 'The Adaptation of the CFE Treaty—Between Creeping Marginalisation and a New Conceptual Definition of European Arms Control', Institut für Friedensforschung und Sicherheitspolitik Hamburg (ed.), *OSCE Yearbook 1999*, Nomos Verlag, Baden-Baden, 2000, pp. 349–363.

[14] A consolidated text of the adapted Treaty on Conventional Armed Forces in Europe, as amended by the Agreement on Adaptation in November 1999, and the politically binding unilateral statements, are available at the OSCE website, www.osce.org. Hopefully, the depositary will soon provide a fully consolidated text to the states parties.

[15] OSCE Istanbul Summit: Final Act of the Conference of the States Parties to the Treaty on Conventional Armed Forces in Europe, Annex 2: Statement on behalf of the Republic of Hungary. The statement of the Czech Republic is similarly worded. See Annex I.

[16] The remaining discrepancies exist mainly in Central Asia: the only country that is party to the CFE Treaty but not to Open Skies is Kyrgyzstan. The nations that are party to Open Skies but not to the CFE Treaty are Armenia, Azerbaijan, Kazakhstan and Moldova. Cf. Article XVIII of the adapted CFE Treaty and Article XVII of the Open Skies Treaty.

[17] Protocol on Inspection, Adapted CFE Treaty, Section II, paragraphs 15–16.

[18] The main difference compared to the CFE Treaty, however, is that the Dayton agreements comprised a mixture of imposed and mutually agreed arms control measures.

[19] See General Framework Agreement for Peace in Bosnia and Herzegovina, Annex I-B. Reproduced in *SIPRI Yearbook 1996: Armaments, Disarmament and International Security*, Oxford University Press, 1996, pp. 240–243.

8

Verification under duress: the case of UNSCOM

Stephen Black

When the United Nations Special Commission (UNSCOM) was created in 1991 most observers felt that the disarmament of Iraq would be completed in less than a year. Nine years later, however, UNSCOM no longer exists, the disarmament process is unfinished, and the future of the arms control regime is uncertain. Despite almost a decade of probing and inspections—including the identification and destruction of enormous, initially undeclared weapons of mass destruction (WMD) assets—UNSCOM was never able to declare Iraq effectively disarmed.[1] Surprisingly, the years of successful investigations and WMD destruction operations resulted in UNSCOM's elimination, rather than the end of the Iraqi WMD threat.

The history of UNSCOM is characterised by increasing investigative skill and intrusiveness in the face of constant Iraqi obstruction and dissemblance. The Commission started from scratch, with no personnel, corporate memory or experience. In a matter of months it was planning and conducting on-site inspections of chemical, biological, nuclear, and ballistic missile facilities. Most impressive was the fact that several of these early inspections managed to uncover significant Iraqi capabilities. As the disarmament regime progressed, and UNSCOM matured, the inspections became increasingly focused and proficient. Every advance by the Commission resulted in more evidence of Iraqi efforts to hide its full WMD capabilities. By the late 1990s, UNSCOM had developed sufficient investigative and inspection skills to prove repeatedly that Iraq was providing false declarations about its WMD programmes and failing to abide by the access requirements of the disarmament regime.

In the end it was politics, not arms control verification difficulties, which caused the Commission's demise. The inherent conflict between Iraq's consistent policy of retaining WMD and UNSCOM's increasingly effective investigation could only be solved by direct action in the Security Council. In stark contrast to the unanimity

of policy in 1991, the Council was no longer willing, or able, by the end of the 1990s to provide sufficient pressure to compel Iraq to comply.

Clear and conspicuous requirements (1991–93)

Soon after the end of the 1990–91 Gulf War, and as an integral part of the cease-fire agreement between the Coalition and Iraq, the Security Council created its first subsidiary body. UNSCOM began its operations with a clear, concise mandate: to eliminate Iraq's WMD and ballistic missile delivery systems.[2] In just a few months, Commission staff developed the plans, procedures, and resources needed to fulfil UNSCOM's mandate. With only a few exceptions the first two years of activity focused on developing operational capabilities, assessing Iraqi declarations, and creating the organisational infrastructure needed to conduct more intrusive, complex investigative tasks. Benefiting from existing international arms control experience, the Special Commission was able to field its first inspection in May 1991—one month after the creation of the disarmament regime. UNSCOM was initially not active in searching for undeclared capabilities: its early actions centred around known problems, of which there were many, rather than the more intangible search for 'hidden' items.

At first the Commission had a number of difficult, but obvious tasks. For the most part UNSCOM spent 1991–92 addressing admissions by Iraq of its WMD capabilities. Baghdad declared its primary chemical weapons (CW) factory, a huge 25-square kilometre facility, and a large stockpile of more than 46,000 filled chemical munitions and bulk agent.[3] It also professed the existence of 62 ballistic missiles, 10 mobile launchers, and numerous related facilities and equipment.[4] As part of these, and other declarations, Iraq provided data on a host of sites throughout the country. The declared WMD capabilities, all of the related sites, and many industrial/scientific aspects of the weapons programme required evaluation by the Commission. While it was soon clear that the Iraqi declarations were incomplete, the veracity of the information that was disclosed still had to be verified. There was also the complex and dangerous task of planning and executing the destruction of proscribed weapons and facilities.

Development of tools and techniques

Given its mandate and Iraq's initial declarations, the first duties of the Commission were clear. However, they were not easy. UNSCOM began its work with little more than a small executive office and 21 commissioners. The infrastructure and capabili-

ties that later inspectors would take for granted did not exist yet. In 1991 it had no staff experienced in 'anytime, anywhere' inspections, no maps, no secure communication systems, and no corporate knowledge of Iraqi industry and personnel. One important and surprisingly time-consuming requirement was the creation of health and safety procedures for the inspections.

In August 1991 the US provided the Special Commission with the services of a U-2 high altitude reconnaissance aircraft. By making over-flights of large tracts of Iraq, the U-2 was able to provide information not readily available to inspection teams on the ground. The aerial surveillance was used to support on-site inspection planning, industrial infrastructure monitoring, and the search for undeclared facilities. While Iraq constantly protested about the over-flights, the U-2 support effort continued with little interruption over the entire life of the Commission.[5]

In 1991 and 1992, UNSCOM developed low altitude aerial capabilities. In October 1991 Germany provided it with three CH-53 helicopters and a ground support unit. The helicopters were used to move inspectors and to offer logistic support until an Aerial Inspection Team (AIT) was created in summer 1992. The AIT provided overhead security at inspection sites and conducted aerial photography.[6]

Most of the new capabilities developed by the Commission involved the collection of data about Iraq's WMD capabilities and related infrastructure. An important technique was the solicitation of relevant information from supporting governments. In many cases, such governments possessed information that could facilitate the work of the Commission, such as supplier data or technical analysis. Early in its activities, UNSCOM worked to foster their trust and assistance. As the Commission proved its trustworthiness and capability to make use of sensitive information, the quantity and quality of externally provided data increased.

Most important, the Commission created and sustained a cadre of experienced and skilled investigators and inspectors. It maintained only a small headquarters staff; the majority of inspection team members were seconded, on request, by supporting governments. As inspection efforts progressed, UNSCOM developed a pool of experienced personnel who would form the nucleus of operations throughout the existence of the Commission.

Early crises

Most of UNSCOM's early efforts were directed towards obvious and relatively uncontentious tasks, but there were a number of important exceptions. These events, which pushed the envelope of verification procedures and broke new ground for

the Commission, caused the major diplomatic crises of 1991 and 1992. They also illuminated the true nature of Baghdad's post-war WMD policies and motivated the Commission to increase further the intrusiveness of its investigations.

In June 1991, acting on information provided by a supportive government, a nuclear inspection team tried to examine two facilities suspected of containing undeclared components of the Iraqi nuclear programme. In clear violation of the requirements of resolution 687, Iraq barred the inspectors from entering both sites. At the second facility inspectors witnessed loaded trucks fleeing from the back of the site.[7] When they attempted to follow the convoy, Iraqi personnel fired at them. The Security Council eventually passed resolution 707, condemning Iraq's actions as 'a material breach' of the cease-fire.[8] Iraq would later admit that the materials were components of its covert uranium enrichment programme.

Three months on, another nuclear inspection, also acting on external information, raided several facilities in Baghdad. The inspectors discovered documents proving the existence of 'a programme for developing implosion-type nuclear weapons'.[9] At one site Iraqi personnel forcibly seized the discovered documents and refused to relinquish them. The next day, Iraqi personnel would not let the inspectors leave a different site until they returned other incriminating papers. The inspection team stood firm and was detained in a parking lot for several days.[10] In direct contradiction of Iraqi declarations and statements made in early 1991, the inspections proved not only that Baghdad had a nuclear weapons programme, but that it also intended to keep WMD information secret.

By summer 1992 UNSCOM had conducted 40 on-site inspections. An increasing number of these missions attempted to address concerns about hidden weapons or related documents. For the most part the missions reported little evidence of such concealment. In July 1992 an inspection team specifically tasked with searching for a cache of hidden papers attempted to inspect a facility in Baghdad, which was later discovered to be the Ministry of Agriculture.[11] Iraqi personnel prevented the inspectors from entering the building and a three-week stand-off ensued. As government-orchestrated protests became increasingly threatening, inspectors were withdrawn to their hotels. When an inspection team was finally allowed into the building it found only empty rooms. Years later the Commission would learn that a large archive of materials from Iraqi WMD programmes had been stored there.

While most of these inspection conflicts did not yield material evidence of hidden Iraqi WMD assets, they raised significant concerns at UNSCOM headquarters

about Baghdad's intention to comply with the cease-fire's disarmament requirements. As early as October 1991 UNSCOM reported to the Security Council: 'The elements of misinformation, concealment, lack of cooperation and violation of the privileges and immunities of the Special Commission and IAEA have not created any trust in Iraq's intentions. They have had a negative impact on relations with Iraq and have engendered an atmosphere of profound scepticism . . .'.[12] This atmosphere would colour the rest of the Commission's operations and investigations.

Development of OMV (1993–95)

A key part of the Commission's mandate was the long term monitoring of Iraq to ensure that it remained disarmed. In 1991, under resolution 715, the Security Council originally accepted the plans of UNSCOM and the International Atomic Energy Agency (IAEA) for ongoing monitoring and verification (OMV). But it was not until November 1993 that Iraq agreed to this requirement.

The implementation of OMV required the Commission to develop a host of capabilities and systems not previously needed. A dedicated support facility—the Baghdad Monitoring and Verification Centre (BMVC)—was created, equipped and staffed. Air samplers, monitoring cameras, and dual-use equipment inventory control tags were installed. To support the new effort, UNSCOM also brought in new personnel with backgrounds in industrial processes and academic research.[13]

The establishment of the OMV regime caused a significant drain on Commission resources. Nearly all personnel were thrown into the monitoring process, including facility evaluations, baseline inspections and data entry. In the two-and-a-half years prior to Iraq's acceptance of OMV, UNSCOM conducted 44 inspections. In the 10 months after the start of OMV, it carried out 29 inspections, all but five of which were strictly for OMV development.[14] The creation of long-term monitoring led to an extended pause in UNSCOM's search for retained Iraqi WMD assets.

Revelations (July–October 1995)

As the implementation of OMV slowly became a standard part of Commission activities, the investigation of Iraq's WMD programmes took a remarkable set of turns in 1995.[15] The loss of momentum in the proscribed programme investigations, the paucity of new information available to investigators, and continuing Iraqi intransigence all conspired to create a false sense of completion in early 1995. UNSCOM's leadership was becoming comfortable with the level of achievement

in the missile and chemical investigations. But investigation of the Iraqi biological programme was quite a different story.[16]

The biological weapons investigation

Since 1991, Iraq had steadfastly maintained that it had no offensive military biological weapons (BW) programme. Baghdad admitted that it had engaged in research of a military nature, but scaled-up production or weaponisation had not taken place—nor was it intended in the future.[17] While UNSCOM's initial on-site inspections did not heighten concerns, they did not produce evidence to contradict directly Iraqi claims. However, the teams did gather important information on the nature, scale and scope of Iraq's biological industrial and research infrastructure. Following limited progress from 1992–94, by the beginning of 1995 the biological investigation had amassed significant evidence of an undeclared Iraqi BW programme.

The UNSCOM case indicating a concealed BW programme was based on three elements of information.[18]

- First, the Commission remained unconvinced as to the alleged peaceful purposes of the Al Hakam facility, southwest of Baghdad. Iraq had long argued that the site was intended for the production of animal feed and bio-pesticides. UNSCOM inspections, though, raised concerns about the military design and fortification of the site, the secrecy in which it had been constructed, and a number of technical features, all of which were unnecessary for peaceful applications.
- Second, UNSCOM had developed information from supporting governments, suppliers, and on-site inspections about Iraq's procurement and consumption of complex growth media—the material used to produce biological organisms. Iraq's media purchases were inconsistent with its declared peaceful projects.
- Third, UNSCOM had collected data about Iraq's acquisition of pathogenic organisms, operation of a large aerosol inhalation chamber, and the existence of filling machines and spray dryers in Iraq.

These elements, gathered from multiple Commission sources and crosschecked, were too convincing to be suppressed by Iraq.

On 1 July 1995, after four years of consistent denials, Iraq admitted to the production of significant amounts of BW agents. At a short meeting in Baghdad, Iraqi representatives admitted to the large-scale production of *Clostridium botulinum*

(essentially botulin toxin) and *Bacillus anthracis* (anthrax). Iraq declared that this production had occurred at Al Hakam in 1989 and 1990. It continued to deny that the agent was loaded into weapons, however, and insisted that all BW stocks were unilaterally destroyed in October 1990.[19]

The chicken farm

In June 1995 the Commission had reported that it was content with Iraq's declarations of its chemical weapons and missile programmes.[20] The IAEA had much earlier come to a similar conclusion about Baghdad's nuclear efforts. UNSCOM's report that the outstanding chemical and missile issues were 'no longer significant' was much more part of a diplomatic arrangement with Baghdad than a strict technical assessment.[21] Areas of inaccuracy and incomplete disclosure existed for both investigations. But in order to achieve a breakthrough in the biological investigation, the Executive Chairman, Rolf Ekéus, minimised the remaining concerns. While few in the Commission agreed with his subdued description, most were impressed by the resulting disclosure of Baghdad's BW programme.

Throughout early 1995, the Special Commission had pressed Iraq on its poorly explained VX nerve gas project and its efforts to indigenously produce ballistic missile engines (known as Project 1728). UNSCOM investigators were actively pursuing both issues, although sparse available data and consistent Iraqi denials had slowed progress significantly.

On 7 August 1995 General Hussein Kamal Hassan—a son-in-law of Iraqi President Saddam Hussein, a senior figure in the Iraqi leadership, and the former head of Iraq's WMD programmes—fled Iraq for Jordan. While Hussein Kamal would eventually provide few details and little specific evidence to the Commission, his mere presence in Amman had a major impact on Baghdad's approach to disclosure of its WMD activities.[22] Six days after Kamal's defection, Baghdad notified the Commission that he had been responsible for concealing information related to the country's WMD programmes.[23] Rolf Ekéus was asked to return to Iraq as soon as possible.

During three days of meetings in Baghdad, he was provided with new information about Iraq's biological and missile programmes, notably that the country had, in fact, loaded biological agents into aerial bombs and missile warheads. Iraq also revealed that its indigenous efforts to produce SCUD-type missiles had progressed much farther than had previously been disclosed.[24]

The most amazing aspect of Ekéus' trip came on the last day, as the delegation was preparing to depart for Bahrain. Responding to an urgent request by Iraqi personnel, Ekéus' party visited a chicken farm about 35 kilometres south-east of Baghdad. According to a note by the UN Secretary-General: 'The Chairman and his team found, in a locked chicken house, numerous metal and wooden boxes which were packed with documentation, together with microfiches, computer diskettes, videotapes, photographs and prohibited hardware components'.[25] The documents contained about 680,000 pages of original Iraqi records from its chemical, nuclear and missile programmes. There was also a much smaller amount of material pertaining to its biological programme.

Throughout autumn 1995 the Commission translated and assessed the documents and conducted interview missions in Iraq. The inspectors discovered—to the horror of some and to the satisfaction of most—that Iraqi WMD programmes were much more advanced than the country had acknowledged. Iraq also declared a number of additional BW research and production facilities. The new information proved that Baghdad had concealed at least an active VX research and trial production effort.[26] Furthermore, the documents provided new data on CW munitions research and development, invalidating the 'material balance' of Iraq's chemical programme. The new information showed that Iraq was not content with regional delivery systems.[27] The inspectors found plans for a 3,000 km-range missile system—capable of reaching Europe. Included in the farm documents was evidence that Iraq had conducted clandestine missile research at least until 1993. Most problematic, Iraq admitted that its Project 1728, of long-standing Commission interest, had succeeded in producing SCUD-type missile engines.

Significant increase of intrusiveness (1995–98)

The August disclosures, and the collection of accompanying documents, provided the Commission with long sought after materials and raised concerns about how much might still be hidden. On-site inspections and other investigative techniques developed by UNSCOM during its early operations were fully developed by the end of 1995. The Commission routinely conducted facility searches, interviews, technical assessments, and seminar-style discussions with the Iraqis. These methods yielded significant new information between 1991 and 1995 and established a sound basis for analysing the new data provided by Iraq in 1995. By February 1996, however, Iraq's willingness to provide and to discuss new data waned.[28] The Commission,

therefore, was left with major unresolved weapon issues and a set of investigative tools that had failed to detect significant parts of the concealed WMD programmes.

In order to address this situation, UNSCOM embarked on a series of new investigations and developed more intrusive investigative techniques. To collect information still being concealed by Baghdad, the Special Commission established new approaches to interviews, on-site inspections, forensic sampling and analysis.

New investigative techniques

Beginning in early 1996, UNSCOM began to use its extensive rights and privileges in new ways. Following years of asking for documentary evidence and of searching for possible hidden documents, the Commission undertook operations that, in one case, seemed more like archaeology than arms control. In February 1996, it dispatched a team to the Muthanna State Establishment, Baghdad's primary CW research, production and weaponisation facility.[29] Over two weeks, a team of 26 inspectors excavated the remains of a number of structures, including CW research laboratories, quality control offices and production plants. The mission yielded more than 5,000 pages of records and some 80 pieces of CW munitions and related components.[30] The materials provided a valuable, uncensored view of the site's activities and helped to answer a number of questions about the timing and extent of Iraqi CW research and production.

The inspectors also placed increasing emphasis on interviews with Iraqi personnel, as a means of gathering data. Discussions with Iraqi counterparts had always been a part of the Commission's investigative process. With the revelations of 1995 and the increasingly focused areas of UNSCOM interest, inspection teams were increasingly able to request specific Iraqi personnel by name, rather than extending a blanket invitation to anyone who could address a given issue or to personnel already named by Iraq. The ability to question specific individuals was combined with an improved understanding of how to conduct interviews, providing a robust and effective means to collect information—even data that Iraq was not disposed to release. The strengths of the interview process, used by all the investigations, also caused significant political problems. In one instance Iraq refused to co-operate with a biological inspection interview team.[31] Baghdad would not provide it with named individuals or accept UNSCOM's interview modalities.

Another lingering area of Commission concern was the verification of Iraq's declared unilateral destruction of proscribed items in summer 1991. In many cases,

Baghdad provided inspectors with piles of debris as evidence of its claims. For example, Iraq declared that it had unilaterally destroyed hundreds of SCUD-type ballistic missile warheads by detonating explosives on top, burning them, and burying the remnants. A cursory examination of the metal fragments indicated that they were indeed warhead components, but a quantitative evaluation of the total number of warheads destroyed required the excavation of the entire burial site. From summer 1997 until the middle of 1998, UNSCOM teams surveyed these sites with ground-penetrating radar, magnetometers and other detectors to locate and retrieve all related materials. Final accounting revealed that some 50 warheads were missing.[32]

Another new technique used to verify Iraqi declarations was the analysis of historical imagery from the U-2 aircraft and other sources. Once Iraq had declared specific locations and activities, UNSCOM photo interpreters and analysts, assisted by a supporting government, were able to retrieve relevant imagery. For example, Iraq declared that it had used about 10 trucks in 1991 to move WMD materials to a secret hide site near Tikrit. Historical imagery of the site, taken on the days in question, showed that more than 100 trucks had been used.[33]

The concealment investigation

In addition to the many technical concerns raised by the 1995 revelations was the question of how Iraq had managed to conceal the documents and related materials from UNSCOM for four years. The Commission had long suspected that Iraq had a process for ensuring that hidden materials stayed hidden, a conjecture corroborated by information from supporting governments. The provenance of the chicken farm material, however, brought the concealment issue to the fore.

In 1996 the Commission began a series of inspections, interviews, and related investigations to uncover, understand and eliminate the 'Concealment Mechanism'. By the end of 1996 Iraq had admitted that concealment activities had taken place, but that only Hussein Kamal and several of his subordinates had been engaged in them. In late 1997, however, following 15 months of denials, Iraq acknowledged that elements of the Special Republican Guard (SRG) and Iraqi Intelligence Service were involved in the concealment of proscribed materials.[34]

The Commission's investigation of the Concealment Mechanism focused in large measure on the organisations involved—those admitted by Iraq and those identified by UNSCOM. For more than two years, using 17 inspection missions, the

Commission investigated the central elements of Iraq's presidential and national security infrastructure. Inspection targets included the Iraqi Intelligence Service's headquarters, numerous SRG facilities, Special Security Organisation locations, and suspected concealment sites.

The concealment investigation caused near constant friction with Baghdad. Not only were the inspectors successfully delving into a topic that Iraq had long sought to keep secret, but they were also putting pressure on the very institutions used to maintain the security of Saddam's regime. In a bid to resolve the conflict between UNSCOM's lawful right to conduct its investigations, and its requirement to respect Iraq's legitimate security concerns, Rolf Ekéus, following a particularly heated series of stand-offs, issued, in June 1996, instructions governing the inspection of sensitive sites.[35] Access was to be limited to a four-person survey team; the team was to be accompanied by a senior Iraqi representative; the team would only survey documents and files; and it would endeavour to spend as little time on-site as possible.[36] Even these adjustments to UNSCOM's 'anytime anywhere' inspection rights—accepted by Iraq at the time—were not enough to secure Baghdad's full co-operation. Conflict over inspector access to sensitive sites continued up to and including UNSCOM's last mission in the country in December 1998.

Inevitable conflict (1997–98)

By 1998 UNSCOM's knowledge of Iraqi WMD programmes, as well as areas of uncertainty, were as developed as they would ever be. Based on seven years of inspections, hundreds of thousands of pages of Iraqi documents, hundreds of interviews, and all of the newly developed investigative techniques, Commission experts had verified much of Iraq's declarations. But they had also identified significant gaps.

The Special Commission's mandate to ensure Iraqi disarmament, its operational rights and privileges, and the investigative techniques it developed, combined to create a verification process that could not be misled. There was no longer a possibility that Iraq could—through dissemblance and subterfuge—achieve a clean bill of health from UNSCOM.

Confronting the Commission's strong investigative stand was an unrepentant Iraq. In 1991 Baghdad's policy was to retain as much of its WMD capabilities as possible, yielding only that which was absolutely necessary.[37] During the 1990s UNSCOM was able to chip away at Iraq's concealed WMD capabilities, although the fundamental policy in Baghdad never changed.

When UNSCOM and Iraq found themselves at an impasse, both turned to the Security Council for relief. The latter body had established the cease-fire, created the Special Commission, provided it with a clear mandate and given it appropriate rights of inspection and investigation. UNSCOM looked to the Council for enforcement, either through additional sanctions or military action. For its part, Iraq believed that the Council of 1998 was very different from the body that had created the disarmament regime. Baghdad realised that several members of the Security Council had no interest in enforcing compliance. It was also clear that, given the comprehensive sanctions already in place, there was little else the Council could do short of military action.

The disarmament regime experienced a series of challenges between November 1997, when Baghdad ejected all US nationals working for the Commission, and October 1998, when Iraq announced that it would stop or cease all UNSCOM activities, including monitoring. The Security Council found itself unable, or unwilling, to react effectively to Iraqi non-compliance. The international political environment needed to compel Iraqi compliance had long since vanished.

When UNSCOM conducted its final mission in December 1998 it encountered all the same problems and acts of non-compliance incurred by many inspection teams. The inspectors found rooms sanitised, access was restricted, and questions were not answered. This time, however, the result was unilateral military action by two permanent members of the Security Council: the US and the UK. Following the attacks, Baghdad stated that Commission inspectors would never again be allowed to enter the country.

Conclusion

In December 1999, after a year of debate among Security Council members, UNSCOM was disbanded and a new organisation was created to oversee the elimination of the Iraqi WMD threat. The United Nations Monitoring, Verification and Inspection Commission (UNMOVIC) was established by Security Council resolution 1284. The political environment in which it will start its work is quite different to that in which UNSCOM started its work. The autonomy granted to the Special Commission no longer exists, and UNMOVIC will be forced to operate in a political arena where every decision is second-guessed and many 'supporters', including several members of the Security Council and some high-level UN officials, apparently have no desire to see the spirit of the mandate satisfied. Given that Iraq's basic

policy towards WMD has probably not changed, and given the extensive understanding of the Iraqi WMD programme and its suspected hidden components that UNMOVIC has inherited from UNSCOM, it will be interesting to see what part of the fundamental stand-off reached in 1998 changes.

UNSCOM was a watershed experience for arms control. It was certainly coercive disarmament, but it used all of the tools of cooperative arms control verification. The Commission's investigative efforts showed that verification has become a mature science. It was also a valuable test-bed for new arms control verification methods. All of the tools and techniques needed to verify effectively arms control declarations are now available to co-operative disarmament regimes, if negotiators have the political will to use them. It is no longer an issue of determining non-compliance, but, rather, what to do after such a finding has been made.

The wider political and diplomatic experiences of the Iraqi case show that the sticking point of arms control may now be enforcement of regimes. What actions must governments and international organisations take to ensure the maintenance of disarmament regimes in the face of known or suspected non-compliance? The international bodies charged with implementation of arms control agreements must view their operations in terms of the entire disarmament regime, including enforcement. This will require that they risk a level of participation in global politics that most have assiduously avoided. If international organisations want to be regarded as more than paperwork generators and financial 'sinkholes' they will need to take on the ethical burden of their responsibilities, not just the legal mechanics.

Finally, and most important, states parties to arms control regimes must understand the need for continued active involvement. The tasks cannot simply be turned over to an international bureaucracy with no compulsive power and no direct security concerns of its own.

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Endnotes

[1] The full text of all UNSCOM reports to the Security Council and relevant Council resolutions can be found at www.un.org. The site also includes a collection of photographs and other basic information.
[2] While the International Atomic Energy Agency was tasked with investigating Iraq's nuclear programme, the Special Commission was the senior partner in the overall disarmament regime. The Commission designated sites for inspection, provided logistic support to all inspections, and held pride of place in political and diplomatic interactions.
[3] 'Note by the Secretary-General', UN document S/23165, 25 October 1991.
[4] 'Note by the Secretary-General', UN document S/23165, 25 October 1991.
[5] 'Letter Dated 6 August 1991 from the Permanent Representative of Iraq to the United Nations Addressed to the Secretary-General', UN document S/22899, 6 August 1991; 'Letter Dated 13 August from the Permanent Representative of Iraq to the United Nations Addressed to the Secretary-General', UN document S/22939, 14 August 1991; and 'Letter Dated 11 January 1993 from the Permanent Representative of Iraq to the United Nations Addressed to the Secretary-General', UN document S/25093, 14 January 1993. These are just three examples, but they capture the general content of the numerous protests.
[6] 'Note by the Secretary-General', UN document S/23165, 25 October 1991; and 'Note by the Secretary-General', UN document S/24984, 17 December 1992. The CH-53s were later replaced by five UH-1s, provided by Chile.
[7] 'Letter Dated 26 June 1991 From the Secretary-General Addressed to the President of the Security Council', UN document S/22739, 26 June 1991; and 'Letter Dated 28 June 1991 from the Secretary-General Addressed to the President of the Security Council', UN document S/22743, 28 June 1991.
[8] Security Council resolution 707 (1991).
[9] 'Note by the Secretary-General', UN document S/23122, 8 October 1991 (Report of the 6th IAEA inspection team).
[10] 'Note by the Secretary-General', UN document S/23122, 8 October 1991 (Report of the 6th IAEA inspection team).
[11] 'Note by the President of the Security Council', UN document S/24240, 6 July 1992; and 'Letter Dated 27 June 1992 from the Secretary-General Addressed to the President of the Security Council', UN document S/24443, 14 August 1992.
[12] 'Note by the Secretary-General', UN document S/23165, 25 October 1991; and 'Note by the Secretary-General', UN document S/24984, 17 December 1992.
[13] 'Report of the Secretary-General on the Status of the Implementation of the Special Commission's Plan for the Ongoing Monitoring and Verification of Iraq's Compliance with Relevant Parts of Section C of Security Council Resolution 687 (1991)', UN document S/1994/1138, 7 October 1994.
[14] 'Report of the Secretary-General on the Status of the Implementation of the Special Commission's Plan for the Ongoing Monitoring and Verification of Iraq's Compliance with Relevant Parts of Section C of Security Council Resolution 687 (1991)', UN document S/1994/1138, 7 October 1994.
[15] Stephen Black, 'UNSCOM Activities in 1995', in John B. Poole and Richard Guthrie (eds.), *Verification 1996: Arms Control, Peacekeeping and the Environment,* Westview Press, Boulder, 1996.
[16] See Stephen Black, 'UNSCOM and the Iraqi Biological Weapons Program: Implications for Arms Control', *Politics and the Life Sciences*, vol. 18, no. 1, March 1999.
[17] Iraq told the first biological inspection team that it had conducted biological research for military defensive and offensive purposes. It later retracted this statement, saying that it had only undertaken defensive BW research.
[18] 'Note by the Secretary-General', UN document S/1995/494, 20 June 1995.
[19] 'Note by the Secretary-General', UN document S/1995/494, 20 June 1995.
[20] 'Note by the Secretary-General', UN document S/1995/494, 20 June 1995.
[21] 'Note by the Secretary-General', UN document S/1995/494, 20 June 1995.
[22] 'Further Comments on Iraqi Weapons of Mass Destruction', CIA 404583, August 1995. See www.gulflink.mil.
[23] 'Note by the Secretary-General', UN document S/1995/864, 11 October 1995.
[24] 'Note by the Secretary-General', UN document S/1995/864, 11 October 1995.
[25] 'Note by the Secretary-General', UN document S/1995/864, 11 October 1995.
[26] 'Note by the Secretary-General', UN document S/1995/864, 11 October 1995.
[27] 'Note by the Secretary-General', UN document S/1995/864, 11 October 1995.

[28] 'Note by the Secretary-General', UN document S/1995/258, 11 April 1996.
[29] 'Note by the Secretary-General', UN document S/1995/258, 11 April 1996.
[30] 'Note by the Secretary-General', UN document S/1995/258, 11 April 1996.
[31] 'Note by the Secretary-General', UN document S/1995/848, 11 October 1996.
[32] 'Letter Dated 27 January 1999 from the Permanent Representatives of the Netherlands and Slovenia to the United Nations Addressed to the President of the Security Council', UN document S/1999/94, 29 January 1999.
[33] 'Letter Dated 27 January 1999 from the Permanent Representatives of the Netherlands and Slovenia to the United Nations Addressed to the President of the Security Council', UN document S/1999/94, 29 January 1999.
[34] 'Note by the Secretary-General', UN document S/1997/774, 6 October 1997.
[35] 'Note by the Secretary-General', UN document S/1996/848, 11 October 1996.
[36] 'Modalities for the Inspection of Sensitive Sites', unpublished UNSCOM document, 22 June 1996.
[37] 'Letter Dated 27 January 1999 from the Permanent Representatives of the Netherlands and Slovenia to the United Nations Addressed to the President of the Security Council', UN document S/1999/94, 29 January 1999.

the environment

9

Multilateral environmental agreements: trends in verification

Clare Tenner

Over the past 50 years there has been a dramatic increase in the number of multilateral environmental agreements (MEAs). Of the 216 listed by the United Nations Environment Programme, 209 were adopted after 1951, and approximately 75 percent of these were adopted after the 1972 UN Conference on the Human Environment in Stockholm, Sweden.[1]

The purpose of this chapter is to trace the development of verification in such accords. The term is widely used in arms control literature to describe the processes of gathering, analysing and using information to make a judgement about compliance with an agreement. According to this model, the aim of verification is to raise confidence that a treaty is being implemented fairly and effectively. This is done by detecting non-compliance, deterring states that might be tempted not to comply, and providing compliant parties with the opportunity to demonstrate compliance.[2]

In general, MEAs do not contain explicit reference to verification,[3] probably because it is seen as too difficult or provocative. Alternatively, the agreement in question may not be considered important enough to warrant the expense and trouble of setting up a verification system.[4] However, MEAs do contain elements of verification. These are usually embedded in the wider framework of systems for implementation review—'the rules and procedures by which parties to international agreements exchange data, share information on implementation, monitor activities, assess the adequacy of existing commitments and handle problems of poor implementation'.[5]

Information exchange is important because of the uncertainty surrounding many environmental agreements. Often when commitments are negotiated, it is unclear how effective they will be at solving the problem, or how parties will implement them. Initially, therefore, the primary purpose of monitoring is to gain under-

standing—it will be more closely linked to reviewing the adequacy of obligations than to assessing compliance with them.

Characteristics of verification in MEAs

The key characteristics of verification comprise information gathering, data authentication and assessment of compliance. Furthermore, MEAs may contain processes for dealing with non-compliance.

Information gathering

Three types of information gathering can be discerned with regard to environmental agreements: monitoring implementation of commitments; monitoring infractions; and monitoring the environmental problem itself.[6] While the first two types are used for verification purposes, the latter is not generally used to assess compliance. One reason for this is that action taken to ameliorate the problem often does not have an immediate effect, and, as a result, it is not possible to measure directly the outcome of parties' efforts. For example, reductions in emissions of ozone depleting substances under the 1987 Montreal Protocol[7] do not have an instant impact on ozone levels in the stratosphere. In addition, in most instances it is not possible to discern the contribution of individual parties' efforts. And it is often hard to gather data directly on the problem itself. For example, it is not easy to monitor endangered animals in the wild.

These monitoring difficulties mean that commitments negotiated under MEAs are not always directly linked to the problem. The 1973 Convention on International Trade in Endangered Species (CITES) promotes wildlife conservation through restrictions on trade of certain animals, plants and their products, rather than on activities in the field.[8] Similarly, the Montreal Protocol monitors trade in ozone depleting substances as a proxy for emissions measurements.

Although data collected on the problem is not usually used to gauge compliance, it is vital to assessing the effectiveness of the agreement. Thus MEAs often provide for exchange of information on the status of the treaty's subject,[9] usually through existing, informal scientific research networks.[10]

Data gathering on the implementation of national commitments relies heavily on self-reporting. Most MEAs require parties to report on such matters in order to assess compliance. Wolfgang Fischer has studied 13 MEAs that were adopted between 1948 and 1989 and cover a range of areas.[11] All required that parties provide

some kind of implementation report at an international level. A typical formulation is found in article 8, paragraph 7 of CITES: 'each party shall prepare periodic reports on its implementation of the present Convention'.

The reliance on self-reporting may stem, in part, from the low priority given to these accords and unwillingness to establish multilateral, co-operative data gathering systems. Sensitivity to impingement on national sovereignty is also a factor. Developing nations may be particularly averse to 'independent' monitoring, which they perceive to be controlled by developed states with greater technical capabilities.[12]

The record of self-reporting is poor, with parties often submitting late or incomplete reports, and data in inconsistent formats. In 1992 the US General Accounting Office (GAO) reviewed reporting under eight MEAs.[13] It concluded that, while informal information on implementation was available, reports submitted by the parties to the relevant treaty secretariats were the only source of formal data. Six of the agreements specified how implementation was to be measured, and required that parties provide relevant information periodically. Yet not all parties gave complete and timely information. Fewer than 50 percent of the parties to the 1972 London Convention,[14] the 1973 MARPOL agreement[15] and CITES provided the required reports. Rates were better for the 1946 International Convention for the Regulation of Whaling (ICRW),[16] the 1988 NOx Protocol[17] and the Montreal Protocol, although close to half of the reports submitted under the latter were incomplete.

The GAO study noted that reporting by developing countries was particularly poor, which, in many cases, reflected a lack of infrastructure and resources to collect and file the required information. But providing timely, comparable data is difficult even for developed states. Personnel and resources may be stretched if statistics have to be collected from disparate sources (including those outside government control) and converted into a new format.

However, non-reporting is sometimes deliberate. In the 1960s, for example, Panama failed to submit catch reports to the International Whaling Commission because its sole whaling ship, *Olympic Challenger,* was violating ICRW quotas.[18] Intentional non-reporting has also been a problem in CITES.[19]

National reports can be supplemented, formally or informally, with independent information. In the case of the ICRW regime, the Bureau on International Whaling Statistics—established by the industry in the 1920s—provides data on commercial whaling activities.[20]

Often information is provided by non-governmental organisations (NGOs). In some MEAs, formal arrangements have been established between MEAs and NGOs. For example, CITES parties' reports are supplemented by information compiled by the Wildlife Trade Monitoring Unit (WTMU), which is part of the World Council for Monitoring Conservation. It monitors trade in fauna and flora and is supported by an extensive network of NGOs working at the domestic level. The WTMU manages its database of trade records under contract to the CITES Secretariat and is obliged to report all instances of potentially illegal trade. Trade Records Analysis of Fauna and Flora in Commerce (TRAFFIC) International, a monitoring network run by the World Wide Fund for Nature and the International Union for the Conservation of Natural Resources, also informs the Secretariat of non-compliance.[21]

In other agreements NGOs provide valuable independent data on implementation outside formal treaty mechanisms.

- Greenpeace International has devoted significant attention to monitoring the whaling accords;
- Climate Action Network has published comprehensive assessments of parties' implementation of the 1992 United Nations Framework Convention on Climate Change (UNFCCC); and
- the Washington DC-based Natural Resources Defense Council (NRDC) has published state-by-state assessments of compliance with pledges made at the 1992 UN Conference on Environment and Development.

However, NGO monitoring is often less concerned with compliance in the narrow sense—adherence to the letter of an agreement—than with whether or not parties are acting in the spirit of the accord.[22]

Data verification

Clearly self-reporting systems are open to abuse: parties may not wish to disclose data, either because they believe it to be commercially sensitive or valuable, or because of what it might reveal about their (lack of) implementation.[23] Usually they choose simply to withhold information, although there are known cases of parties submitting distorted data. Throughout the 1960s, for instance, the Soviet Union filed false reports under the ICRW.[24]

The GAO study noted that secretariats often have neither the authority nor the information to verify reported data. In many MEAs, though, methods for verifying

information have evolved either formally or informally. Most of the time, these are carried out by secretariats, sometimes by NGOs, and, occasionally, by a formal body, like an implementation or infractions committee.

The first step in verifying data is to compare parties' submissions against information supplied in previous years, so as to spot any obvious inconsistencies. This is one of the first checks conducted by the UNFCCC Secretariat when it receives national greenhouse gas inventories.

Information filed from different parties can also be crosschecked. The WTMU database contains over 2.5 million wildlife trade records and allows import and export logs from the parties to be compared in order to identify anomalies. When the records do not match, WTMU informs the CITES Secretariat.

Data from the parties can also be compared with information submitted to other bodies, or with independent sources. The Montreal Protocol Secretariat, for example, has questioned Lebanese population data that significantly differed from UN figures.[25] In fishing agreements catch records can be cross-referenced with data from wholesalers or processors. Agreements on air or marine pollutants can be monitored by comparing national data with three-dimensional fusion models.[26]

Finally, some form of on-site inspection can be used to verify directly or to augment parties' reports. A facilitative, non-confrontational approach is usually taken in MEAs, emphasising information gathering as opposed to verification. Under the 1971 Ramsar Convention,[27] for instance, if the Bureau suspects that a Ramsar site is changing adversely or is likely to do so, it can apply a Monitoring Procedure. This consists of teams of experts making long visits to the site, with the focus on scientific, technical and management issues, rather than on proving non-compliance. The stated purpose of the Procedure is not to 'detect compliance', but to 'assist implementation'.[28] By contrast, the International Observer System under the ICRW was explicitly set up in response to claims of inaccurate reporting by ships and the nations whose flag they fly.[29] Vessels were obliged to allow impartial observers to monitor the killing of whales.[30] But the system was not highly intrusive, as it was based on bilateral exchanges of observers, mostly among the whaling states themselves. CITES has also created a visiting mechanism, although this is not formally provided for in the Convention or even in its resolutions. The Secretariat has visited parties suspected of serious non-compliance and has conducted follow-up visits to check that the party is implementing agreed actions.[31] In contrast to these 'soft' approaches to on-site inspections, the 1980 Convention on the Conser-

vation of Antarctic Marine Living Resources incorporates an 'anytime anywhere' inspection system, using observers nominated by states to monitor compliance. In addition, scientific observers may be present on fishing and research vessels throughout any voyage.[32]

Assessment of compliance

Although most MEAs require parties to report on implementation of their commitments, few actually use these to assess compliance. Only in six of the 13 agreements studied by Wolfgang Fischer did the provisions explicitly indicate that the national implementation reports should be examined at an international level, and, even then, they did not mention 'compliance assessment' or 'verification'. Article 14 of the 1976 Barcelona Convention,[33] for example, stipulates that the Conference of the Parties must 'consider reports submitted by the contracting parties'. The other five agreements make general reference to the necessity of monitoring implementation of the MEA at the international level, but they do not refer explicitly to the reports. A typical formulation is Article 13 of the 1974 Convention on the Protection of the Marine Environment of the Baltic Sea Area: 'the duties of the Commission shall be . . . to keep the implementation of the present Convention under continuous observation'.[34]

The ICRW and CITES are unusual among early MEAs in having systems for assessing compliance. These were both established after the MEA was adopted, possibly as a result of the high level of public awareness that the treaties have enjoyed. Interestingly, both Conventions rely heavily on independent data to assess compliance, rather than on parties' reports. Information on infractions of CITES is passed to the Secretariat by NGOs, via the WTMU and TRAFFIC, and by the parties themselves. All confirmed misdemeanours are published and tabled at each Conference of the Parties; a Standing Committee acts on them between conferences.[35] Similarly, under the ICRW, compliance assessment is based on infraction reports provided by international observers. These are reviewed by the Infraction Committee each year and made public.[36]

The Montreal Protocol was the first MEA explicitly to include from the start a formal mechanism for identifying and handling problems of non-compliance.[37] Article 8 of the Protocol provides for adoption of a Non-Compliance Procedure (NCP), which occurred in 1990, three years after the treaty was agreed. The Secretariat to the Protocol prepares a report on implementation for each meeting of the parties,

showing their annual consumption and production of ozone depleting substances. Where compliance problems are evident, these can be referred to the Implementation Committee that manages the NCP.[38] Parties can also file reports about their own, or other states' problems with compliance—the Implementation Committee can investigate them. The Committee can request further information from the Secretariat and gather data in the party's territory if invited to do so.[39]

The Montreal Protocol's NCP has paved the way for other MEAs to include formal assessment of compliance. For example, the parties to the 1979 Convention on Long-Range Transboundary Air Pollution[40] set up an Implementation Committee in December 1997 to review compliance with reporting requirements and other obligations in the protocols to the Convention.[41] Again, the Committee is able to gather extra information from the Secretariat or in the state's territory at the invitation of the party.[42] Negotiations on a compliance procedure for climate change obligations are now underway in accordance with Article 18 of the 1989 Kyoto Protocol to the UNFCCC.

Dealing with non-compliance

A facilitative approach is the norm for dealing with—when it is dealt with at all—non-compliance in MEAs. This stems from the view that non-compliance with MEAs is mostly the result of incapacity, rather than intentional disregard for the rules.[43] Facilitative responses to non-compliance usually involve the provision of financial and technical aid to the non-compliant party. But this may be linked to the threat of suspension of assistance should the affected party not co-operate in efforts to help it to comply. This approach was taken to deal with non-compliance with the Montreal Protocol by Eastern Bloc countries with 'economies in transition'. In 1994 the Protocol's reporting system revealed large-scale non-compliance with deadlines for phasing out ozone depleting substances. The Implementation Committee asked the affected parties to present detailed plans for ensuring compliance as soon as possible. Once the Committee had approved these plans they were recommended to the Global Environment Fund for financial support, conditional on the parties executing them.[44]

A simple yet effective response to non-compliance in many MEAs is public revelation of the treaty violation. This permits other states, NGOs and the public to pressure governments and may deter states from violating agreements in the first place.[45] The value of such action is well illustrated by the environmental directives

of the European Community, which were often poorly implemented by member states until compliance information started to become public. Exposure to public scrutiny and criticism led many member states to improve their performance.[46]

Where appropriate, suspension of trade arrangements can be a useful penalty for non-compliance. Between 1989 and 1992, for example, the CITES Secretariat repeatedly asked Italy to overcome serious implementation problems. In 1992 the Standing Committee concluded that Italy had not fully addressed these problems and urged the parties not to issue to, or accept from, Italy any more CITES documents. Although parties were under no legal obligation, most did so. Legal trade with Italy in endangered flora and fauna was effectively suspended until it complied. In the Montreal Protocol, too, suspension of treaty privileges can lead to a trade ban in regulated substances.

A few regimes contain provisions for levying fines or similar penalties against recalcitrant parties. The 1994 North American Agreement on Environmental Cooperation contains detailed provisions for imposing 'monetary enforcement assessments' against non-compliant parties. If a party is found to have persistently failed to enforce effectively its domestic environmental laws, it may be ordered to pay. However, these provisions have not been used to date.[47]

Trends in verification

Given the variety of MEAs adopted over the past 50 years, it is hard to define clear patterns in verification. To overcome this difficulty John Lanchbery has identified a subset of MEAs with similar objectives and structures: those covering the conservation of flora and fauna.[48] Thirty-four such agreements have been in operation since the beginning of the twentieth century: 27 were adopted after 1950.

Within this group the historical trend is for agreements increasingly to contain verification elements. Lanchbery's data shows that, while prior to the 1950s most agreements did not have formal provisions for reporting or review, those adopted from the 1970s all did so. Subsequently, some agreements have also provided for independent expert reports and some kind of on-site inspection.

It seems likely that trends in flora and fauna agreements are indicative of an MEA paradigm shift towards better verification. This is evident from the attention given to compliance issues at the 1992 UN Conference on Environment and Development ('Earth Summit') in Rio de Janeiro, Brazil, and in the negotiation of recent landmark MEAs, such as the Montreal Protocol, the Climate Change

Convention and the 1992 Convention on Biological Diversity.[49] During discussions on the Kyoto Protocol, the US advocated a strong non-compliance procedure, including the possibility of sanctions. It claimed that this was indispensable in light of the economic mechanisms available to help parties meet their targets.[50]

The increased interest in verification can be explained in a number of ways. One common explanation is that, as international environmental obligations have increasingly affected national economic interests, parties have become worried that non-compliant states may gain an unfair economic advantage over those that are in compliance. Another explanation is that the growing, competing needs of states for access to finite natural resources have made them more concerned with compliance. States have also been forced to take MEAs more seriously as they have assumed greater commitments under them.[51]

Another reason for the increased interest in verification may lie in the changing nature of environmental problems. When the effects of pollution were immediate and local or regional it was in the interest of all parties to comply with their obligations. But in the case of global problems, such as depletion of the ozone layer and climate change, there is no immediate incentive for any one country to comply. The 'free-rider' option has become more attractive. Consequently, parties have become more interested in making sure that all other parties to an MEA meet their commitments.

Rising public awareness of, and concern over, environmental issues has also forced governments to take their environmental obligations more seriously. Public awareness has been especially high with respect to two key meetings: the 1972 UN Conference on the Human Environment; and the UN Conference on Environment and Development. Both meetings spawned high-profile MEAs.[52] Closely linked to this is the increasing role of environmental NGOs in the negotiation and verification of MEAs. Before the 1970s, NGOs were only occasionally acknowledged in multilateral environmental treaties and were rarely granted access to meetings of the parties. The major environmental treaties negotiated from the mid-1980s, however, contain expansive rules for NGO participation, with the result that NGOs have become active participants in many regime activities.[53] They have also assumed a strong informal influence on the verification of MEAs, both through raising public awareness, which has put pressure on governments, and through the establishment of their own monitoring and review activities. This has been made possible by the growth in size of NGOs and the expansion of their resources in recent decades.

Multilateral environmental agreements, 1948–1997
Adoption, entry into force and objectives

1940s

International Convention for the Regulation of Whaling (ICRW)
Adoption: 2 December 1946 **Entry into force:** 10 November 1948
To establish regulations for the conservation and utilisation of whale resources. Serves as an agency for the collection, analysis and publication of scientific information related to whales and whaling.

1970s

Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar Convention)
Adoption: 2 February 1971 **Entry into force:** 21 December 1975
The conservation and wise use of wetlands. International co-operation as a means to achieve sustainable development.

Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention)
Adoption: 13 November 1972 **Entry into force:** 30 August 1975
To prevent indiscriminate disposal at sea of waste liable to create hazards to human health, harm living resources and marine life, damage amenities, and/or interfere with legitimate uses of the sea.

Convention on International Trade in Endangered Species (CITES)
Adoption: 3 March 1973 **Entry into force:** 1 July 1975
To ensure that international trade in species of wild fauna and flora does not threaten survival in the wild of the species concerned. To protect certain endangered species from over-exploitation by means of import–export permits.

International Convention for the Prevention of Pollution from Ships (MARPOL)
Adoption: 2 November 1973 (modified on 17 February 1978) **Entry into force:** 2 October 1983
To eliminate pollution of the sea by oil, chemical and other harmful discharges from ships. To minimise the amount of oil released accidentally by collision or stranding of ships. To improve further the prevention and control of marine pollution from vessels, particularly oil tankers.

Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention)
Adoption: 22 March 1974 (amended 9 April 1992) **Entry into force:** 3 May 1980
To take all appropriate measures, individually or by means of regional co-operation, to prevent and abate pollution, and to protect and enhance the marine environment of the Baltic Sea area.

Convention for the Protection and Development of the Marine Environment and Coastal Region of the Mediterranean Sea (Barcelona Convention)
Adoption: 16 February 1976 **Entry into force:** 12 February 1978
To achieve international co-operation on a co-ordinated and comprehensive approach to the protection and enhancement of the marine environment and the coastal area of the Mediterranean.

Convention on Long-Range Transboundary Air Pollution (CLRTAP)

Adoption: 13 November 1979 **Entry into force:** 16 March 1983

To limit, reduce and prevent air pollution.

1980s

Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR)

Adoption: 20 May 1980 **Entry into force:** 7 April 1982

To conserve Antarctic marine living resources.

Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol)

Adoption: 16 September 1987 **Entry into force:** 1 January 1989

To protect the ozone layer by taking measures leading to total elimination of global emissions of ozone depleting substances.

Protocol to the Convention on Long-Range Transboundary Air Pollution Concerning the Control of Emissions of Nitrogen Oxides or Their Transboundary Flux (NOx Protocol)

Adoption: 31 October 1988 **Entry into force:** 14 February 1991

To control and reduce national emissions of nitrogen oxides.

1990s

Convention on Biological Diversity (CBD)

Adoption: 22 May 1992 **Entry into force:** 29 December 1993

To ensure conservation of biological diversity and sustainable use of its components. To promote fair and equitable sharing of the benefits of the use of genetic resources.

United Nations Framework Convention on Climate Change (UNFCCC)

Adoption: 9 May 1992 **Entry into force:** 21 March 1994

To stabilise greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous interference with the climate system.

North American Agreement on Environmental Co-operation (NAAEC)

Adoption: 1 January 1994 **Entry into force:** 1 January 1994

Side agreement to the North American Free Trade Agreement. Designed to encourage co-operation between parties to better conserve, protect and enhance the environment.

Kyoto Protocol to the United Nations Framework Convention on Climate Change (Kyoto Protocol)

Adoption: 11 December 1997 **Entry into force:** not yet in force

Contains individual emission limitations and reductions commitments for developed countries, covering the six main greenhouse gases.

Source

The Fridtjof Nansen Institute, *Yearbook of International Co-operation on Environment and Development 1999/2000,* Earthscan, London, 1999.

Greenpeace International, for example, was only established in 1971, but it now has 2.5 million supporters and offices in 40 countries.[54]

A key factor in the development of MEA verification systems has been the learning experience of parties as the number of operational agreements has increased. Verification and compliance systems have evolved in many older agreements, even though they were not included in the original text. The development of methods to detect and deal with non-compliance in CITES and the ICRW are good examples. Experience with earlier agreements also demonstrated the difficulties that even parties acting in good faith have in implementing MEAs, and the need to make provision for technical and financial assistance. Negotiators of more recent agreements have been able to incorporate such mechanisms from the start. Parties to the Montreal Protocol are committed to the provision of technology transfer and financial aid—through a Multi-Lateral Fund (MLF)—to help developing countries meet their commitments to report baseline and annual data. Similar schemes operate under the auspices of the Global Environment Fund (GEF) for the UNFCCC and the Convention on Biological Diversity.

Aside from these general trends, specific events have improved verification in some instances. The end of the Cold War reduced the political barriers to data reporting in countries of the former Soviet Bloc, allowing a shift towards greater international openness and transparency, and, consequently, fuller and more honest reporting.[55] This has led to a significant improvement in the verification systems operating under the 1992 Helsinki Convention.[56] In other cases, technological advances have aided verification. For instance, it was very difficult to verify compliance with the original (1973) MARPOL agreement, forbidding ships from flushing out their oil chambers at sea. But when a new hull was developed that could not be flushed at sea, MARPOL insisted that all vessels had to be fitted with this type of hull or they could not be insured.[57]

Rapid developments in information technology (IT) have vastly improved the ability of MEAs to process and disseminate data.[58] A good example is the WTMU's computerised database, which has revolutionised verification of CITES. Another example is the centralised database set up by the European members of MARPOL to allow near real-time information on ship inspections to be made available to all port authorities. The latter supply information from inspections—via telex and computer links—to the database on a daily basis. Since the database is accessible to all members, they can acquire advance information about the ships visiting

their ports, allowing them to deploy inspection resources more efficiently and effectively. Reporting has improved under this system, presumably because the database provides useful information to the port authorities.[59]

In the most recent MEAs, verification systems are designed to use IT tools at all stages. Parties to the UNFCCC agreed in November 1999 to report their greenhouse gas inventories electronically in a 'common reporting format'. This will make it easier for the Secretariat to check for gaps and inconsistencies in the data. Both the results of this initial check and a subsequent expert review team report will be posted on the official UNFCCC website, making it possible for anyone to assess parties' implementation.

Outlook and lessons for the future

Developments in IT will continue to provide great opportunities for improving verification of MEAs in coming years. In particular, the Internet offers a powerful tool for formal and informal verification. While secretariats will be able to use it to improve transparency of reporting and review, networks of NGOs and other observers will find it easier to exchange and make public information on non-compliance.

Ultimately the Internet could allow near real-time monitoring of MEAs. It has been suggested, for example, that all major greenhouse gas emitters could be linked on-line to the extent that direct monitoring of emissions is relayed continuously to the Internet.[60] Although this might not happen for some time, it is likely that trading of emissions of greenhouse gases under the Kyoto Protocol will be monitored internationally, in real time, by connecting national databases via the Internet.[61]

Harmonisation of reporting under different MEAs has been identified as a future priority. The proliferation of reporting requirements under MEAs that have developed in recent years has left all countries, particularly developing states, struggling to meet their commitments. To make matters worse, information has to be in different formats for different MEAs, placing a heavy burden on states and means that secretariats cannot easily share data. Information harmonisation could lead to greater compliance with reporting requirements, more effective monitoring and review, more accessible information, and better, more consistent data.[62] Some of the solutions may be quite simple, such as establishing common definitions of terms and synchronising reporting obligations with national information needs. These initiatives should start to reap benefits in coming years, greatly improving the efficiency and effectiveness of verification of MEAs.

Application of computing power can help, too. In Europe efforts have already been made to harmonise reporting of air emissions under the UNFCCC and the Convention on Long-Range Transboundary Air Pollution. The European Environment Agency has developed software that enables states to gather data using their preferred national system, and then to convert this into the appropriate form for each convention.[63]

Another technology that could be used more in future is remote sensing satellites, although agreement on the use of information acquired by such means may be restricted because of concerns about infringement on national sovereignty. To date there have been no attempts to monitor routinely and systematically compliance with environmental agreements using remote sensing.[64] Yet satellites are now being launched specifically to monitor aspects of the global environment, such as land cover. They could help monitor a number of MEAs, including the UNFCCC and the 1994 Convention to Combat Desertification.[65]

While technology has the potential to achieve significant improvements in the verification of MEAs, it must be available to all states. Technical and financial assistance must, therefore, be given to parties that might otherwise have difficulty installing and operating the technology.

With regard to the institutions for verification of MEAs, NGOs look set to continue to increase their involvement. It has been suggested that, for example, they be given a formal role in monitoring or assessing compliance with some MEAs, in the same way that labour unions and employers in the International Labour Organization are able to provide data on parties' implementation of international labour agreements.[66] Businesses could also become increasingly engaged—project mechanisms and emissions trading under the Kyoto Protocol will set the precedent. Under these schemes, private entities can participate in implementation. They will also be subject to strict verification, though, which is likely to include auditing and certification by third parties. In experimental projects, both professional audit companies and NGOs have been involved in the verification of emissions reductions.

Conclusion

Fifty years ago relatively few MEAs were in operation, and verification was virtually non-existent. In comparison, over 200 agreements are now in operation, and most contain at least some mechanisms for gathering and using data to make a judgement about compliance.

This progress can be explained by increased awareness of the need to act regionally and globally to protect the environment, fuelled by high-profile conferences and increasingly influential environmental NGOs. Where MEAs have had an impact on economic competitiveness, governments seem to have been more willing to establish verification systems. Technological advances and the accumulation of experience have made better verification possible.

Verification is dealt with differently in each MEA, depending on their often unique needs. Information is mostly supplied in the form of national reports from parties, which may be supplemented by independent data (often from NGOs) or some form of inspection. Older MEAs did not use this information to assess compliance, but, today, more agreements have formal compliance assessment procedures. Emphasis is often placed on assessing the overall progress of the MEA in tackling the environmental issue at hand, rather than on the efforts of individual parties. Where parties have persistently failed to meet their commitments, though, many MEAs do impose some kind of consequence.

In future verification of MEAs could be further strengthened as technological developments allow for more accurate and timely monitoring. Whether verification in MEAs ever gains the status it enjoys in other types of agreements will continue to depend on the importance attached to the MEAs themselves.

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10

Verification and compliance systems in the climate change regime

Clare Tenner

At the end of the nineteenth century, the Swedish scientist Svante August Arrhenius postulated that the growing volume of carbon dioxide emitted by the factories of the industrial revolution was changing the composition of the atmosphere, and that this would cause the earth's surface temperature to rise. But it was not until 1990 that scientific consensus on this so-called 'greenhouse effect' was reached. The First Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)[1] stated that rising concentrations of carbon dioxide and other greenhouse gases (GHGs) in the atmosphere were caused by human activities and would result in increased global temperatures with accompanying climate changes. The IPCC report, together with rising public concern about environmental issues, provided the impetus for states to negotiate a global treaty to mitigate climate change.[2]

The United Nations Framework Convention on Climate Change (UNFCCC) was opened for signature in June 1992 at the United Nations Conference on Environment and Development ('Earth Summit') in Rio de Janeiro, Brazil.[3] The Convention entered into force in 1994. Its objective is the 'stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system'. The Convention does not contain legally binding greenhouse gas emissions reduction targets, but it does include other obligations that provide the basis for the subsequent development of such objectives.[4] All parties agreed to:

- develop national inventories of anthropogenic GHG emissions and removals;
- elaborate and implement programmes to mitigate and facilitate adaptation to climate change;
- promote sustainable management of GHG sinks and reservoirs;[5]
- co-operate in preparing for adaptation to climate change;

- promote and co-operate in relevant research, technology development and transfer, information exchange, education programmes, and in integrating climate considerations into other policy areas; and
- report GHG inventories and information related to implementation.

In December 1997 in Kyoto, Japan, a Protocol for the Convention was adopted, under which developed countries—listed in Annex I of the Convention—agreed to reduce their overall emissions of six GHGs by 5.2 percent below 1990 levels between 2008 and 2012. This overall target is the sum of individual emissions reduction and limitation commitments negotiated by the parties. These obligations are given as a percentage of base year emissions, and may be multiplied by five to produce an 'assigned amount' of emissions for the five-year commitment period.[6] The inclusion of six gases in a so-called 'basket approach' means that parties may offset increases in emissions of some gases with deeper cuts in others.

The Protocol contains unique mechanisms to help Annex I parties meet their targets: International Emissions Trading (IET); Joint Implementation (JI); and the Clean Development Mechanism (CDM). Trading will allow parties that are struggling to meet their targets to buy extra assigned amount units from states that are able to reduce their emissions below their assigned amount. Under the JI mechanism, parties will be able to claim 'emission reduction units' (ERUs) for projects carried out in another Annex I nation—again a portion of the assigned amount will be transferred. Finally, the CDM will allow Annex I parties to set up and gain credit from emission reduction projects in developing countries.

Despite this flexibility, many parties believe that the Protocol will be costly to implement. If they are to ratify it, and to implement their commitments, they want to be sure that other states are also meeting their obligations. Otherwise they fear that their industrial competitiveness could be jeopardised. Probably for this reason, the Protocol is littered with references to verification. But, like much of the rest of the document, many important details were left unresolved. A deadline for making decisions on outstanding matters related to implementation of the Protocol was agreed at the Fourth Conference of the Parties to the Convention in 1998. The deadline is the Sixth Conference of the Parties, which is to take place in November 2000 in The Hague, Netherlands. It is vital to the success of the Protocol that effective verification and compliance systems are agreed by the deadline to allow ratification and entry into force to proceed, and to provide experience with new systems before the start of the first commitment period.

The purpose of this chapter is to describe the verification regime that has evolved under the UNFCCC and to indicate how this is developing to meet the new obligations on parties contained in the Kyoto Protocol.

Verification under the Convention

Given that the Convention aims to prepare parties for future emissions reduction commitments, its verification and compliance systems are geared towards monitoring and facilitating parties' implementation of the agreement, rather than enforcing compliance. Nevertheless, processes and institutions have evolved that will provide a solid basis for more stringent verification under the Protocol.

Verification is based on self-reporting by parties. All states are required to submit to the Conference of the Parties, via the Secretariat, a national communication consisting of an inventory of GHG emissions and removals, and a general description of steps taken or envisaged by the party to implement their commitments under the Convention. Annex I states also have to provide a detailed description of the policies and measures they have adopted and an estimate of the effects that these will have on their emissions.

Annex I parties were required to make their first communication within six months of the Convention's entry into force in 1994.[7] A second communication was due on 15 April 1997—on 15 April 1998 for countries with so-called economies in transition.[8] The third communication is due on 30 November 2001.[9] In addition, Annex I parties have been required since 1996 to submit national inventories on an annual basis.[10]

In common with other multilateral environmental agreements, reporting under the Convention has often been late and incomplete. Only nine parties provided their second national communications on time.[11] By January 2000, however, 35 countries had satisfied this commitment, leaving only six to report.[12] These are all countries with economies in transition, which have had particular reporting difficulties owing to the collapse of their institutional structures in the 1990s. Likewise, only five Annex I parties met the deadline of 15 April 1999 for their annual GHG inventory—22 had reported by October 1999.[13]

Non-Annex I parties were required to submit their first national communication within three years of the Convention's entry into force for that country, although the least developed states were allowed to make their communication at their discretion. To date, 26 national communications have been received from non-

Annex I states, and 113 have yet to report.[14] According to the Convention, Annex I parties should bear the full cost of non-Annex I party reporting. While funding is formally arranged through the Global Environment Facility, developing countries also receive financial and technical support via alternative bilateral and multilateral channels, such as the US Country Study Program and the UN Institute for Training and Research (UNITAR).[15] However, there appear to be unresolved problems relating to the provision of such assistance. At the Fifth Conference of the Parties, the developing countries called for the provision of adequate financial resources, technical assistance and capacity building to help them collect data and to identify national emissions factors.[16]

In fact, reporting under the Convention is difficult for all parties, given that GHG emissions come from a large number of sources, most of which are not under government control. This makes it hard for parties to monitor emissions and to predict the impact of measures taken to reduce them. It would be impossible to measure directly emissions, at least from the many sources that are small, mobile or diffuse. Inventories are thus based on estimates calculated by multiplying activity data (for example the quantity of a certain type of automobile) by emissions factors (the volume of gas emitted by that car). Guidelines for preparing GHG inventories were published by the IPCC in 1995 and revised in 1996. All parties must compile their inventory according to these guidelines or a comparable national method.[17]

By adopting guidelines for preparation and reporting, the Convention attempts to ensure that all parties produce comparable inventories. But this is not easy, given that each country has a different institutional structure from which to collect data. Consequently, IPCC guidelines provide two or three alternative methods that range in complexity. States are encouraged to use the most sophisticated procedures and local data wherever possible, although simple methods and default emissions factors are provided. This system improves the accuracy of inventories but reduces transparency, especially when parties do not describe the method they are using. Moreover, it is reasonably accurate for carbon dioxide emissions from fossil fuel burning, but even the most sophisticated methods produce highly uncertain estimates for other emissions. The IPCC suggests a default uncertainty value of 10 percent for carbon dioxide emissions from the energy sector. Uncertainties of more than 60 percent are suggested for other sources and gases.[18] This could be a problem in the Protocol, since the uncertainties are larger than the required emissions cuts.[19]

Given that verification under the Convention rests on self-reporting, preliminary systems have evolved for reviewing the quality of information supplied by the parties. The Convention's Secretariat, based in Bonn, Germany, produces 'compilation and synthesis reports' for the Conference of the Parties and the Subsidiary Body for Implementation. These reports summarise the content of national communications, including GHG inventories.[20] The Secretariat also reports on the information contained in annual GHG inventories.[21] These reports serve to assess overall progress in meeting the aims of the Convention. The Secretariat does not attempt to check the data in national communications and inventories, but it does highlight late, incomplete or inconsistent reporting.

In addition, the parties have developed an 'in-depth review' procedure, co-ordinated by the Secretariat, to cover all aspects of national communications.[22] The objective is to:

> review in a facilitative, non-confrontational, open and transparent manner, the information contained in the communications from Annex I parties to ensure that the Conference of the Parties has accurate, consistent and relevant information at its disposal to assist it in carrying out its responsibilities.

The review is carried out by a team selected by the Secretariat from experts nominated by parties and inter-governmental organisations (IGOs). They assess national communications for accurate policy information and examine the transparency and methodology of the inventory. They conduct country visits to clarify aspects requiring further investigation, although (again) they verify neither the accuracy of the activity data and emissions factors, nor the overall verity of the inventory. A report is produced for each in-depth review and submitted to the Subsidiary Body for Implementation and the Subsidiary Body for Scientific and Technical Advice.

These review procedures identify problems in implementation by individual parties, but there is no system for responding to non-compliance. To date the Conference of the Parties and the Subsidiary Body for Implementation have only considered the performance of the parties as a whole in implementing the Convention. Article 13 provides for the establishment of a Multilateral Consultative Process (MCP), which parties can use to help resolve implementation problems. The terms of reference for the MCP were agreed in June 1998 and envisage an advisory function on technical and financial issues and on problems relating to compiling and communicating information.[23] However, the rules for determining

the composition of the standing body, which was to be the core of the process, have not been agreed. As a result, the MCP is not yet operational.

Although there is no formal system for dealing with non-compliance, the wide availability of progress reports makes informal public debate on national performance possible. Non-governmental organisations (NGOs) and IGOs have made great use of this documentation and frequently publish papers on the performance of individual countries.[24]

Additional verification needs under the Protocol

The Convention's existing processes and institutions will form the basis of a verification system for the Kyoto Protocol. These will need to be strengthened, though, so that compliance with new commitments under the Protocol—notably binding emission reduction and limitation commitments for Annex I parties outlined in Article 3—may be verified. A number of new procedures and institutions will be required to deal successfully with the following:

- provision of timely GHG inventories of the highest possible quality;
- tracking changes in the assigned amount held by each party;
- verifying inventory and assigned amount data;
- verifying that emissions reductions claimed under the mechanisms meet agreed criteria; and
- assessing compliance and dealing with non-compliance.

In theory these new systems and institutions will not have to be in place until the start of the first commitment period in 2008. But it makes sense to start 'learning by doing' immediately, and, besides, there is a provision in the Protocol for parties to show 'demonstrable progress' by 2005. Moreover, the CDM can start operating any time from 2000.

Provision of timely GHG inventories of the highest possible quality

Since self-reporting of inventories will continue to be the basis of the verification regime, capable national systems for estimating emissions and removals of GHGs are vital. Parties have agreed that inventories should be accurate, consistent, comparable, complete and transparent. Accordingly, Article 5.1 states that national systems for estimating emissions (and removals by sinks) must be in place by 2007 and that guidelines will be defined. Because every party has a different institutional

structure and approach to inventory compilation, these guidelines will not be prescriptive. But states have noted that 'common elements will be specified which are considered necessary to produce a high quality inventory, regardless of the approach or methodology used'.[25] These elements are likely to include both institutional and technical details.

It has been suggested that a good national monitoring system will consist of sound technical functions, management processes and institutional frameworks.[26] The former includes methods for data collection, handling and reporting and choice of emission factors. The management process covers documentation and planning, quality assurance and control procedures, as well as organisation and staffing—which should all be implemented so as to minimise the risk of error and inconsistencies in performing technical functions. Efficient management standards already exist and these could be adapted for emissions inventories.[27] The institutional framework should be clearly defined in order to improve the quality of monitoring activities and to establish an efficient management process.

The IPCC National Greenhouse Gas Inventories Programme is preparing a report on *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*—to be completed in mid-2000. (Good practice refers to the way in which the inventory is compiled and managed.) The report is likely to include advice on the choice of method, emission factors, activity data and quantifying uncertainties, and quality assurance/control procedures. The aim is to ensure that, whatever method is chosen to calculate emissions, uncertainties and bias are minimised, and the inventory is transparent. This will ensure that inventory estimates are of the best quality for assessing compliance.[28] At some point the guidance will probably be incorporated into guidelines for national systems and reporting.

With regard to reporting, Article 7 of the Protocol confirms that annual inventories and national communications submitted under the Convention will be the basis for verification of the Protocol. Parties to the Protocol, though, must incorporate in these submissions the 'necessary supplemental information' to permit compliance to be assessed. This will include information on assigned amounts and use of the mechanisms covered in the following sections of this chapter.

Parties have already begun strengthening reporting guidelines under the Convention in anticipation of the needs of the Protocol. In 1999, the Fifth Conference of the Parties adopted new guidelines for Annex I states reporting both annual inventories and national communications.[29] The objective is to improve reporting

and facilitate effective review of the information. Parties are still required to use IPCC guidelines to estimate emissions, but inventories must now be reported using a Common Reporting Format (CRF). Inventories must be filed in both hard and electronic form, along with a national report containing all inventories back to the base year, plus supporting background information. The report must also be published on the Internet or in hard copy.[30] The CRF aims to enhance the transparency, comparability, consistency, accuracy and completeness of inventories. The CRP will make it easier for the Secretariat and others to identify missing or inconsistent entries and to compare activity data and emissions factors among parties. These guidelines will be used on a trial basis between 2000 and 2002, although revisions may be made at the Seventh Conference of the Parties in 2001.

Similarly, the new guidelines for reporting Annex I national communications outline mandatory elements and the format in which data should be reported.[31] Parties will use these guidelines to compile their third national communication, due in 2001.

Parties have also started to tackle the problem of poor reporting by developing countries and states with economies in transition. The Fifth Conference of the Parties urged Annex II nations—essentially member states of the Paris-based Organization for Economic Cooperation and Development (OECD) states in 1992—to assist countries with economies in transition with technical aspects of preparing national communications. As a first step, Switzerland and UNITAR hosted a workshop in Geneva in late 1999 to discuss these nations' special needs.[32] With regard to developing states, the Fifth Conference of the Parties decided to establish a consultative group of experts on non-Annex I national communications, which will meet twice in 2000. The group will help identify non-Annex I parties' technical and financial needs, discern the difficulties they face, and facilitate the preparation of their national communications.

Tracking changes in the assigned amount held by each party

Assigned amounts provide the standard against which compliance with emissions reductions and limitation commitments will be assessed. A vital task over the next few years will be calculating, reporting and reviewing assigned amounts using base year data.

Article 3 states that parties can use human induced land-use change and forestry (LUCF) activities to meet their emissions reduction obligations. Parties have yet to

agree exactly which activities will be included and how they will be added to, or subtracted from, assigned amounts. This will be a crucial decision for the Sixth Conference of the Parties, as it will determine actual targets for Annex I states.

Once assigned amounts are calculated, systems will be needed at the national and international level to track changes due to transfers and acquisitions under the Kyoto mechanisms and to modifications in LUCF activities. The parties need to agree how to undertake 'accounting of assigned amounts'.[33] National registries will be required to account for transfers and acquisitions between parties, as well as transfers involving registered private entities that are taking part in the mechanisms. This will allow states to account for their own assigned amount and to report this alongside inventory data.[34] An international system could also be introduced to allow cross-checking of national information, which could work by linking national electronic registries via the Internet.[35] While this would provide publicly accessible, near real-time accounting of assigned amounts, it would be dependent on compatibility between national systems. Alternatively, an international registry system could be developed.

Verifying inventory and assigned amount data

Article 8 of the Protocol provides for a strengthened review process, consisting of annual assessments of national inventories and assigned amount data by expert teams, and a review of the less frequently submitted national communications. The aim is to 'provide a thorough and comprehensive technical assessment of all aspects of the implementation by a party of the Protocol'.

Article 8 gives expert review teams and the Secretariat critical roles in verifying the Protocol. Expert review teams will be obliged to report to the Conference of the Parties to the Convention, serving as the Meeting of the Parties to the Protocol (COP/MOP),[36] on each party's implementation of its obligations, identifying 'problems in, and factors influencing, the fulfilment of commitments'. The Secretariat is specifically tasked with listing the 'questions of implementation' raised by the expert reports for further consideration by the COP/MOP. These provisions will give the review a clear focus and ensure that the relevant bodies discuss problems. A potentially important component of the review is the 'adjustment process' outlined in Article 5.2. This states that, if inventories are not completed according to the 1996 IPCC guidelines, then appropriate adjustments may be applied. Parties need to decide on a number of issues relating to this

provision. For example, who decides whether adjustments are called for, how they are to be made and if they are appealable. In addition, it is unclear whether adjustment will save parties from being in non-compliance with Articles 5 and 7.

A major problem will be how best to use the limited time available for each review to sift through the huge volume of information that will be presented by each state. A second problem will be ensuring consistency in reviews, given that the same experts will not be able to assess all parties.

At the Fifth Conference of the Parties, guidelines were adopted for the review of Annex I states' inventories in anticipation of the Protocol.[37] They will be used for a trial period (2000–02) alongside the new reporting guidelines. National communication review guidelines also need to be developed.

According to the new guidelines, inventory review will comprise three stages: initial check; synthesis and assessment; and expert review of individual inventories.

The initial check will be performed by the Secretariat and will determine if the inventory is complete and in the correct format. The results will be posted on the UNFCCC website. The Secretariat will also carry out, in two stages, synthesis and assessment. The first stage will consist of compiling and comparing information across parties. In the second stage, the Secretariat, with the help of experts, will compare the data with previous years' submissions and, where feasible, with independent information. They will also examine states' use of good practice guidance and national self-verification or independent review in preparing their inventories. The aim is to highlight issues for further investigation by the expert review teams. The results of the synthesis and assessment will also be published on the UNFCCC website. Finally, the expert review teams will engage in a detailed examination of procedures and institutional arrangements used in preparation of inventories. Their report will be published by the UNFCCC in hard and electronic format. During the trial period, the teams will test three operating styles: desk studies and correspondence; a meeting in one location; and country visits.

Verifying that emissions reductions claimed under the mechanisms meet agreed criteria

To be credible, the CDM and JI projects, as well as the private entities that are participating in emissions trading, should be subject to rigorous procedures to verify that they produce real emissions reductions. Articles 6, 12 and 17 all state, therefore, that the parties must agree on verification procedures in the mechanisms. Systems will also be required to check that parties satisfy any additional rules.

A new type of verification regime looks likely to evolve under the mechanisms, with much of the responsibility devolved to operational entities, such as private sector consultants, NGOs, or government agencies. In emissions trading, for example, independent auditors may be responsible for verifying emissions inventories and certifying permits as valid.[38] Parties need to think about how this might work. Businesses interested in emissions trading have already started to consider how to monitor and verify their GHG inventories. For instance, BP–Amoco has commissioned an independent audit and assessment of its greenhouse gas accounting and reporting systems to support its internal emissions trading scheme.[39] BP–Amoco is also part of a larger partnership between NGOs and the private sector, which is aimed at developing an international protocol for measuring and reporting GHG emissions from business.[40]

Under the CDM and JI, an initial estimate of emissions reductions will probably be made as part of a project approval process. During the lifetime of the project, actual emissions should be monitored and reported. *Ex-post* verification will need to be conducted by an independent body, leading to certification of emission reductions (possibly by another entity). Verification and certification would probably take place annually.

A baseline scenario is required to measure and verify additional emissions reductions under a CDM or JI project.[41] This is a quantitative projection of emissions that would have occurred in the absence of the project. A key issue facing parties is how to establish this baseline. Under the experimental Activities Implemented Jointly phase, a new 'project specific' baseline has been created for each programme. This allows the developer to choose what externalities to include in the baseline scenario, and what value to allocate to them. Although this can allow the baseline to be tailored to individual circumstances, it also means that developers can inflate the baseline to generate a greater number of emissions reduction credits—a procedure known as 'gaming'. Project-specific baselines can also be hard to verify if reporting is not transparent.

Parties could limit gaming by providing clear rules on how to choose the assumptions in the baseline calculation. Furthermore, parties could insist on the use of standardised (benchmarked) input data. Default emissions values can be used for projects with broadly the same characteristics, operating under similar circumstances. The default value might be based on current practice in the host country, or, ideally, international best practice. It is unclear whether this approach provides

a less accurate baseline, but it does reduce the possibility of gaming and offers a standard for verifying baselines.[42]

Whatever methods are chosen, parties need to ensure that the baselines are transparent. Parameters and methods must be referenced and traceable, and a third party should be able to reconstruct the baseline. This might be enforced by implementing some kind of good practice guidance, such as that being developed by the IPCC for inventories.

Assessing compliance and dealing with non-compliance

Under the Convention, the multilateral consultative process should function in an advisory manner in order to deal with implementation problems. But parties agree that binding commitments in the Protocol demand a more supervisory approach to compliance.

Article 18 marks the need to create further procedures and mechanisms to determine and address non-compliance. No additional details are given, except that states must establish a list of consequences in the event of non-compliance, and that any procedures and mechanisms that entail binding ramifications must be adopted through an amendment to the Protocol. The latter is a potentially serious problem, since any amendment would have to be ratified by the parties.

A working group is currently considering what form this compliance procedure might take. One potential model—favoured by many parties in the run-up to Kyoto—is the Montreal Protocol's compliance system.[43] Certainly, the indications are that the two systems will have much in common. Parties agree that the compliance system should take a facilitative approach to non-compliance, given the uncertainties and difficulties they face in implementing the Protocol. But there is also a general consensus that provision should be made for an enforcement approach. It is still unclear, though, how these two functions will work. Some parties are suggesting that enforcement and facilitative approaches could be applied sequentially, with a facilitative approach during the commitment period. After the parties' final inventories and assigned amounts have been submitted and reviewed, states in non-compliance could have a 'grace period' to move into compliance—using the trading system, for example. An enforcement approach might then be applied to parties not in compliance. Other states have suggested that enforcement and facilitative approaches should be applied in parallel, either by two separate bodies or by different 'branches' of the same body.

Current recommendations for the list of consequences reflect both of these potential approaches and range from facilitating assistance to financial penalties. Much depends on the system's coverage, whether it deals solely with compliance with emissions reduction commitments or with implementation of all obligations under the Protocol. A key issue is whether the compliance body should be responsible for assessing parties' eligibility to take part in the mechanisms. This could depend on states being in compliance with their other commitments, especially those relating to monitoring and to reporting emissions and assigned amount transfers.

In any case, the question arises as to the relationship between the multilateral consultative process operating under the Convention and the Protocol's non-compliance procedure. Article 16 of the Protocol states that parties should consider the application of the MCP to the Protocol.

One other matter concerns who will be able to initiate non-compliance procedures. The Secretariat and the expert review teams are potential candidates: since they will be assessing the information submitted by parties they are likely to be in a good position to suspect, or even know, which ones are having compliance problems. This would follow the examples of the Montreal Protocol and the 1994 Second Sulphur Protocol of the Convention on Long-Range Transboundary Air Pollution. It would also be logical, as the Secretariat is already responsible for listing problems of implementation (identified in the review process) for consideration by the COP/MOP. Other non-state actors could, in effect, also trigger the procedure by communicating information to the Secretariat.[44] Parties may also have the right to initiate the system, although some states are suggesting that this should be screened in some way, or that only the COP/MOP should be able to trigger it.[45]

Conclusion

Given the large number and variety of sources of GHG emissions and the uncertainty with which they can be estimated, building a strong verification regime for the Kyoto Protocol represents a considerable challenge. Parties to the Climate Convention have put in place a number of building blocks for a verification system, including reporting and review mechanisms. The process is highly transparent, with national communications, reviews and reports being freely available on the UNFCCC website. But the current system is inadequate to meet the verification needs of the Protocol.

As the start of the first commitment period (in 2008) moves closer, the verification system will need to shift emphasis from a review of parties' overall progress to assessing individual state compliance. Eventually, the non-compliance body developed under Article 18 will control this. Significant progress was made in this respect at the Fifth Conference of the Parties, with the adoption of guidelines both for reporting Annex I parties' inventories and national communications and for the review of inventories. Further guidelines will be required for reporting assigned amount information, including transfers and acquisitions under Kyoto mechanisms and changes in carbon stores in the LUCF sector, as well as for the review process, including the method of applying adjustments to inventories, and how to review national communications.

Clearly, verifying the Kyoto Protocol is going to be a mammoth task, requiring significant resources. Parties have responded to this issue by emphasising the importance of self-verification and quality assurance/control mechanisms in national systems. The potential role of private sector consultants and auditors is also under discussion. Despite these possibilities the Secretariat's and the expert review teams' workloads will be heavy. A key question over coming years will be whether the current framework for verification can cope, and, if not, what alternative models should be considered.

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Endnotes

[1] The IPCC was set up in 1988 by the United Nations Environment Programme and the World Meteorological Organization to review the state of scientific knowledge on climate change.
[2] See Michael Grubb with Christiaan Vrolijk and Duncan Brack, *The Kyoto Protocol: A Guide and Assessment,* The Royal Institute of International Affairs, London, 1999, pp. 3–5, and Sebastian Oberthur and Hermann Ott, *The Kyoto Protocol: International Climate Policy for the 21st Century,* Ecologic, Berlin, 1999, pp. 3–10.
[3] It was formally adopted in New York a few weeks later.
[4] Although Annex I parties were encouraged to return emissions to 1990 levels by 2000.
[5] It is possible to remove greenhouse gases from the atmosphere into so-called sinks or reservoirs. These include components of natural ecosystems, such as plants and soils, and oceans and geological structures.
[6] For example, the US has an emissions reduction commitment of 93 percent of 1990 levels. This quantity multiplied by five will be its assigned amount for 2008–12.
[7] Convention Article 12.5.
[8] Decision 9/CP.2 in FCCC/CP/1996/15/Add.1, p. 16. According to the Convention, countries with economies in transition are: Belarus; Bulgaria; Czech Republic; Estonia; Hungary; Latvia; Lithuania; Poland; Romania; Russian Federation; Slovakia; Slovenia; and Ukraine.
[9] FCCC/CP/1998/16/Add.1, p. 47.
[10] Decision 9/CP.2 in CP/1996/15/Add.1, p. 15.
[11] FCCC/CP/1998/11, p. 3.
[12] United Nations Convention for Climate Change, Bonn, www.unfccc.org.de.
[13] FCCC/SBI/1999/12, p. 5.
[14] United Nations Convention for Climate Change, Bonn, www.unfccc.org.de.
[15] FCCC/SBI/1999/11, p. 19.
[16] *Earth Negotiations Bulletin,* vol. 12, no. 123, 8 November 1999.
[17] Decision 4/CP.1 in FCCC/CP/1995/7/Add.1, p. 15.
[18] Table AI-1, from the revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reporting Instruction, p. AI.4.
[19] This problem has been compounded by the basket approach, as this requires all gases to be converted into 'carbon dioxide equivalents'. The global warming potentials, which are used to convert emissions to a carbon dioxide standard, are themselves uncertain.
[20] For example, FCCC/CP/1998/11/Add.1 and FCCC/SBI/1999/11.
[21] For example, FCCC/SBI/1999/5.
[22] Decision 2/CP.1 in FCCC/CP/1995/7/Add.1, p. 9.
[23] FCCC/AGI3/1998/2 and Annex 2.
[24] For instance, Climate Action Network has produced a series of 'Independent NGO Evaluations of National Plans for Climate Change Mitigation'. The International Energy Agency and the Organization for Economic Cooperation and Development have produced surveys of 'Climate Change Policy Initiatives'.
[25] FCCC/SBSTA/1999/L.14, p. 4.
[26] Stephane Willems, *Key Features of Domestic Monitoring Systems under the Kyoto Protocol,* Organization for Economic Cooperation and Development, Paris, 1999, p. 4.
[27] Such as International Standards Organization management systems.
[28] Sal Emmanueal and Thomas Martinsen, IPCC special event, Fifth Conference of the Parties to the UNFCCC, October 1999.
[29] Decisions 3/CP.5 and 4/CP.5 in FCCC/CP/1999/6 Add.1, pp. 6–10.
[30] FCCC/SBSTA/1999/L.5, p. 12.
[31] FCCC/SBSTA/1999/CRP.4.
[32] FCCC/SBSTA/1999/CRP.4, p. 1.
[33] Article 7.3 of the Kyoto Protocol.
[34] Willems, p. 3.
[35] US and New Zealand presentation at the meeting of UNFCCC subsidiary bodies, June 1999, Bonn.

[36] This will be the Protocol's governing body.
[37] FCCC/CP/1999/L.11/Add.1.
[38] Ged Jones, *Creating an efficient certification and verification framework,* Lloyds Register Industry Division, London, 1999, p. 6.
[39] BP–Amoco Press Release, *BP Amoco Commissions Independent Audit and Verification of GHG emissions,* 25 June 1997.
[40] World Resources Institute Press Release, *Group Announces Collaboration to Build an Internationally Accepted Approach for Measuring and Reporting Business GHG,* 11 June 1999.
[41] Articles 6 and 12 demand that emissions reductions are *additional* to any that would have occurred in the absence of the project.
[42] Jane Ellis and Martina Bosi, *Options for Project Emission Baselines,* Information Paper, OECD and IAE, Paris, October 1999, pp. 35–43.
[43] Oberthur and Ott, p. 217.
[44] Oberthur and Ott, p. 221.
[45] Jake Werkesman, personal communication with the author.

peace accords

II

Monitoring and verifying the military aspects of peace accords

Jane Boulden

In a 1995 report to the United Nations (UN) on verification, a group of experts pointed out that 'it is only in recent years that verification *per se* has been recognized as a normal part of peace and security operations'.[1] Five years later that statement still rings true. Relatively little research on the role of verification in peace operations has been conducted, even though such procedures have played an increasingly prominent role in high profile UN missions.

The purpose of this chapter is to survey both the verification techniques and mechanisms used to monitor the military aspects of peace accords, and the changing context in which these instruments are being used. The chapter takes UN peacekeeping operations as its starting point, beginning with the establishment of the UN Truce Supervision Organization (UNTSO) in 1948.[2]

Annex 1 (see pp. 283–288) provides a chronological listing of the operations examined for this chapter. While most of these were UN-authorised, verification missions are also undertaken by organisations or states outside UN processes. The fact that there are relatively few examples demonstrates the extent to which some form of UN involvement has become a key element in the implementation of peace agreements. Moreover, not every example has a direct link to a peace accord in a formal sense: a number of operations are associated with straightforward cease-fires and measures introduced and monitored in anticipation of a peace deal. The basic criterion used to select the cases is a connection to a peace agreement or cease-fire arrangement.

Peace accords can include a variety of military measures:

- a cease-fire;
- troop withdrawals from specified areas;

- cantonment of forces;
- demilitarisation of certain areas;
- demobilisation of armed units from warring factions and/or government;
- reductions in arms and equipment; and
- reintegration of troops into a new or existing armed force.

The accord might comprise only a cease-fire, a combination of a cease-fire and some other initiatives, or all of the above in conjunction with political elements, such as election monitoring and government transitions. Verification involves the use of observers to monitor and, in some cases, to supervise and oversee these processes in a framework tailored to the political, geographic and military situation. Verification is increasingly concerned not just with monitoring troops and weaponry, but also with the cantonment, demobilisation, and re-integration of official and unofficial armed groups, as well as the collection, storage, destruction, and/or decommissioning of weapons. This has placed an additional heavy burden on verification personnel and procedures. In some instances, such as the peace-keeping operations in Bosnia-Herzegovina and Somalia, these aspects of the mandate have been particularly contentious and have led to the use of force.

The changing context

One of the clearest trends in the period being studied is the change in nature of the mission. From 1948–89 the main and sometimes only purpose of an operation was to monitor an agreed cease-fire. With the end of the Cold War, though, many missions became responsible for a multitude of different military tasks, derived from detailed and complex peace accords.

The characterisation of the earlier period obscures some of the nuances. Not all cease-fires were created equal: in some cases, the mission was also involved in overseeing the withdrawal of troops or the establishment of buffer zones. Depending on the solidity of the cease-fire, extensive liaison activities were sometimes required. The presence (since 1978) of the UN Interim Force in Lebanon (UNIFIL), for example, did not deter Israel from invading the country in June 1982.[3] The 1960–64 UN Operation in the Congo (ONUC) was also a significant exception to the nature and experiences of UN missions in this period.[4] Nonetheless, it is fair to say that verification of the military aspects of peace accords during the Cold War was primarily concerned with monitoring cease-fires and troop withdrawals.

A second characteristic of most Cold War operations was their limited connection to the political processes of negotiating and implementing peace agreements or cease-fires. The general pattern was that the cease-fire or peace accord would be put in place, and the UN would then be asked to supervise it. Where the cease-fire was intended to pave the way for a more comprehensive peace deal or political resolution, those negotiations and efforts occurred quite separately from the monitoring operation. For instance, the talks between Egypt and Israel, which occurred during the deployment (1973–79) of the Second UN Emergency Force (UNEF II), took place under the aegis of the United States, rather than of the UN. In addition, the UN Peacekeeping Force in Cyprus (UNFICYP) has been present on the island since 1964, while unsuccessful efforts have been made, under UN and non-UN auspices, to resolve the conflict.[5]

Post-Cold War peace accords

Peace operations, and the verification tasks associated with them, underwent a distinct change after the end of the Cold War. The extension of superpower rivalry into regional wars was abruptly terminated, making possible the resolution of some of these conflicts. This development was coupled with willingness on the part of the US and the then Soviet Union to involve the UN more actively and comprehensively in conflict situations.

Some missions continued to have the straightforward monitoring of cease-fires as their principal function.[6] However, the verification tasks assigned to new peace operations—beginning with the UN Transition Assistance Group (UNTAG) in Namibia (1989–90) and the UN Observer Group in Central America (ONUCA) (1989–92)—expanded, as did the complexity and scope of their mandates. In both these cases, as well as with the UN Angola Verification Mission (UNAVEM) (1989–97) and the UN Transitional Authority in Cambodia (UNTAC) (1992–93), verification responsibilities went well beyond monitoring a cease-fire to include assessing and assisting with the demobilisation and disarmament of troops. Furthermore, these operations, with the exception of ONUCA, which dealt with a group of countries, were concerned with single nations emerging from internal conflict. Verification functions were thus part of the same peace agreements that dealt with all aspects of societies in transition, including the election and installation of a new government.

As peace processes became more integrated, the UN became increasingly involved in all related tasks, ranging from assisting with the negotiation of accords and

overseeing their implementation, to post-conflict peace-building. The detailed negotiations provided opportunities to refine the verification provisions of peace agreements before they were finalised. In the case of Mozambique, for example, UN military observers provided technical advice on the cease-fire monitoring aspects of the peace deal while it was still being debated, and technical teams offered additional input as the negotiations neared conclusion.[7] This arrangement helped to ensure that the agreement contained conditions that were verifiable and manageable within the envisaged timeframe, and contributed, at least in theory, towards getting the operation underway faster once an accord was signed.

The use of force

Another significant change in the international community's approach to peace accords has been its willingness to use force. The UN Protection Force (UNPROFOR) in Bosnia (1992–95) and the second UN Operation in Somalia (UNOSOM II) (1993–95) were authorised under Chapter VII of the UN Charter, and were permitted to use force beyond self-defence to fulfil their mandates. In both cases, an agreed peace deal was not in place when the operations began, and force was used in response to violations of UN Security Council resolutions and of the military aspects of informal agreements reached with the parties.[8] By contrast, the UN Transitional Authority in Eastern Slavonia, Baranja and Western Sirmium (UNTAES) (1996–98), the NATO-led Implementation Force (IFOR) in Bosnia (1995–96), and its successor, the Stablization Force (SFOR)—established under Chapter VII of the UN Charter—were given responsibility for the implementation of full-scale negotiated peace accords. Although force was authorised beyond self-defence, it was never used by UNTAES and IFOR, and, to date, has not been used by SFOR.

For those verifying the implementation of an agreement, the use of force complicates the monitoring environment. This is especially true of peacekeeping operations that are impartial in nature, but which have been authorised to use force beyond self-defence.[9] During the UNOSOM II mission, for instance, peacekeepers had the task of monitoring the arms situation and carrying out coercive disarmament measures, as well as facilitating political reconciliation. With UNOSOM given the additional responsibility of arresting individuals who had carried out attacks on peacekeepers, and the deployment of American troops outside UN command, the situation became extremely complex for the monitors and for local parties. UNOSOM II was terminated in 1995 without achieving its objectives.

Difficult issues are raised by the involvement of observers in operations that may require the use of force by peacekeepers, or in areas where conflict is continuing or is imminent. For example, Bosnian Serb troops paralysed the UNPROFOR operation by holding UN observers hostage in retaliation for the use of force against them.[10] And while the UN Assistance Mission for Rwanda (UNAMIR) (1993–96) was able to confirm that the situation was escalating to the level of genocide, it was not mandated to take measures to stop it, including the confiscation of arms or the use of force.

Not only does the use of force complicate the role of military observers, but they may themselves come under attack. This has happened with greater frequency over the past 10 years, and is primarily related to the Security Council's willingness to authorise operations where the consent of the parties is uncertain or where it could later be withdrawn. In these situations the parties to the conflict may decide to risk the consequences and attack the peacekeepers if they believe that the outside presence is hindering the achievement of their goals.

Not only must verifiers carry out their tasks in complex and difficult political situations, but their undertakings may also be directly connected to controversies over the use of force. The success of the entire mission may rest on their accomplishments. Unarmed military personnel can act as military observers in some instances, but in more sensitive cases there is a requirement for armed observers.

There are so many factors affecting the successful implementation of a mandate in which the use of force beyond self-defence is permitted that it is impossible to draw a conclusion about what connection, if any, there might be between success and failure and the role of verification. The important point for the monitoring and verification of peace agreements is that not only are the requirements and tasks of post-Cold War operations becoming more complex, but also that they are taking place in very different circumstances.

Techniques and mechanisms

Despite the shifts that have occurred in the nature and context of operations, the techniques and mechanisms used to verify the military aspects of peace accords have remained remarkably consistent. One example of change is the expansion of techniques involving air forces. For instance, the UN imposed, in 1992, a ban on military flights over Bosnia-Herzegovina and delegated the task of monitoring (and later enforcing) the restriction to NATO.

Similarly, air surveillance continues to make a vital contribution to monitoring and implementing the various restrictions on Iraq. Naval forces have also played critical roles in both of these operations, particularly in imposing arms embargoes and sanctions regimes.[11] Air and naval forces' expanded involvement in monitoring tasks reflects the increased complexity of both the operational environment and missions in the post-Cold War world.

Observers

The military observer is central to all the operations examined in this chapter, no matter how basic or how elaborate the mission, or how difficult the verification task. The physical presence of a third party can be a powerful factor in conflict amelioration: observers are able to monitor, record, and report parties' actions and interpret those activities in the broader context of the situation. The presence of observers also symbolises the commitment of the international community, gives even greater gravity to violations, and can halt or deter future acts. In Rwanda, the mere presence of unarmed workers from the International Committee of the Red Cross stopped some members of the *Interahamwe* from continuing their genocidal activities in the immediate vicinity.

Technology

While technological progress has provided new ways to carry out various verification tasks, there has not been any significant technological development that has altered the fundamental nature of the monitoring process. The equipment being used in monitoring operations has been upgraded and improved, and some operations have incorporated technology that minimises the level of intrusiveness, such as unmanned ground-based sensors.[12] The role of the observer, however, remains critical, and the basic techniques used to monitor buffer zones, demilitarisation, and the control of arms, remain the same.

In future, though, technological developments may make it possible to supplement, and, in some cases, to replace, the military observer with highly capable, 24-hour means of observation. Improvements in speed and information technology (IT), combined with progress in aerial and space surveillance, may allow, in the near term, development of more capable and less intrusive means of mechanical (rather than human) monitoring. The British army, for instance, is developing a multi-function electronic sensor that detects movement, vibration, magnetic

fields and sound. This may replace human sentries in some situations, including monitoring of dangerous frontiers or cease-fire lines when the required personnel are unavailable.[13] Similarly, technological advancements may make possible remote surveillance of weapon storage areas, production facilities, and other military sites. There have also been dramatic improvements in the ability of IT to synergise data from these and other sources in order to establish a comprehensive picture of events on the ground.

In recent years, access to the Global Positioning System (GPS) operated by the US military has become widely available and has been used for a variety of tasks. The GPS gives peacekeepers the capacity to determine the exact location of cease-fire and territorial boundaries, as well as their own locations when on patrol or based in remote areas. They are able to communicate this information with other peacekeepers and their headquarters.

In post-conflict situations, one task often given to peacekeepers is to detect, identify, monitor and/or carry out the destruction of anti-personnel landmines and other unexploded ordnance. A number of recent technological developments mean that peacekeepers will be more certain that areas have been de-mined, and they will be able to conduct mine-clearing with much greater efficiency and safety.[14]

Multilayered verification packages

A basic 'package' of mechanisms and procedures for monitoring and verifying the implementation of peace agreements has been established for some time and continues to provide the basic framework for operations. Each of the different mechanisms has a specific verification purpose, but draws from and supports the other instruments. In the peace operations examined in this chapter, this multi-layered package includes:

- observers;
- information provided by the parties (baseline data);
- inspections to confirm the accuracy of the information (baseline inspections);
- data provided by outside parties;
- inspections;
- patrols and observation to ensure the maintenance of cease-fires and/or agreed troop levels or positions;
- aerial surveillance; and
- a joint commission process.

When an agreement involves the separation of forces, buffer zones are often created from which troops may be gradually withdrawn over specified periods. Similarly, cantonment sites are used when fighters are being demobilised or disarmed. And, depending on the terms of the agreement, a dual-key arms storage system is sometimes used, to which both the parties and mission personnel have access.

Space does not permit a detailed discussion of each of these mechanisms. For present purposes, the important point to note is that these verification instruments, or some combination of them, have been in use since the UN began undertaking peace operations more than 50 years ago.

Joint commissions

Roughly defined, a joint commission is an organisation involving representatives of the parties to a peace accord and an official from the UN or another third party who acts as chair. The commission is a forum for parties to raise concerns about implementation and for monitoring the progress of the peace operation. It is generally, although not always, established under the peace deal.

Joint commissions—often used in operations during the Cold War—have become almost a matter of course in the 1990s. In part this may be a reflection of the increasing complexity and scale of the operations: the larger and more intricate the mission, the stronger the requirement for a forum that serves as a general overseer. In multifaceted operations, sub-commissions often supplement the joint commission. In Angola and Mozambique, for instance, sub-commissions were responsible for monitoring the cease-fires. In Cambodia, a Military Mixed Working Group, comprising military representatives of all the parties, permitted the UN to liaise with them collectively regarding the monitoring and implementation of various military aspects of the peace agreement.

The role of information

It almost goes without saying that the thread tying together the various layers of a verification package is information. Data provided by the parties, confirmed by inspection and monitoring, and supplemented by information from outside organisations and/or states, plays a crucial role in the verification process. As operations have become more intricate, this data has increased in complexity and volume.

At the same time, verification teams' information needs have also expanded, raising a difficult issue for the UN. The efficiency and effectiveness of its missions

would certainly be enhanced if they could collect and analyse information about a situation both before and during the operation. But UN member states harbour an inherent cautiousness and resistance to the idea of providing the organisation with anything resembling the intelligence capabilities that they themselves possess.[15] For many member states the thought of the UN compiling information on them comes too close to international government and intrusion into sovereign internal affairs. As long as this resistance remains (and there is no reason to think it will change) verification tasks will continue to start from scratch each time an operation begins. However, many peace missions, such as ONUC and UNTAC, found intelligence so vital that they began their own unofficial operations. Individual troop contingents have often provided, or have been supplied with, their own intelligence data.

Regional organisations and other actors

A recent trend, which was evident primarily in the former Yugoslavia, is the involvement of regional organisations in the verification process. In 1991, for instance, the European Community Monitoring Mission (ECMM) was established to oversee an agreed cease-fire between Croatia, Slovenia and the former Yugoslavia. This mission later undertook joint monitoring tasks with UNPROFOR in Bosnia. Similarly, in 1998, the Organisation for Security and Co-operation in Europe (OSCE) set up a verification mission to monitor the situation in Kosovo.[16] Both of these operations were established in connection with agreements reached outside the UN, although the UN did eventually authorise its own missions in the region.

The other example of this pattern is NATO's implementation (under a UN mandate and in association with other states) of the 1995 Dayton Peace Accord through IFOR and then SFOR.[17] All of these cases, though, relate to the conflicts in the former Yugoslavia, and, as such, the trend may be very specific. One of the advantages of using a regional organisation like NATO was that it could provide, at relatively short notice, well-equipped and technologically advanced multinational forces. In addition, the Alliance could draw on considerable intelligence assets that were otherwise unavailable to the UN.

A related and even more recent trend is the growing involvement of regional organisations or other groups in overseeing cease-fires and associated measures or peace accords in their region. This is done in combination with a UN operation, which monitors the organisation or group as it carries out its verification tasks. The monitoring of the regional peacekeepers provides reassurance about the conduct

of the operation, since there is a possibility that members of a regional organisation might have their own interests to advance in a particular conflict. For example, the responsibilities of the UN Mission of Observers in Tajikistan (UNMOT)—set up in 1994—include cease-fire monitoring, chairing the Joint Commission, and overseeing the role of peacekeepers from the Commonwealth of Independent States (CIS). And the UN Observer Mission in Liberia (UNOMIL) (1993–97) involved working with the Economic Community of West African States' Monitoring Group (ECOMOG) to implement the 1993 Cotonou Peace Agreement.

Groups or organisations completely outside of the UN framework have also verified peace accords. But there are relatively few examples, a testament to the important role of the UN in implementing peace agreements. The ones that do exist include:

- the Multinational Force and Observers (MFO) in the Sinai (1982–)
- the Commonwealth Observation Force in Zimbabwe (1979)
- the Military Observer Mission Ecuador–Peru (MOMEP) (1995–99)
- the Peace Monitoring Group in Bougainville (1997–)
- the International Force for East Timor (INTERFET) (1999).[18]

Characteristically, they have occurred when one of the major or regional powers has had an interest in the situation. The examples are so different in their political contexts, however, that it is difficult to draw any conclusions about whether this implies anything regarding the advantages or disadvantages of choosing a verification and monitoring process outside the UN framework.

Summary and conclusions

The discussion has focused on two general characteristics associated with monitoring the military aspects of peace accords:

- the procedures involved; and
- the context in which they are conducted.

The end of the Cold War resulted in a definite change in the context of these operations, and the UN became more deeply engaged in all aspects of peace processes. By contrast, the verification mechanisms remained surprisingly constant. While some of the procedures and instruments have been expanded or adapted to deal with differing circumstances, and greater use is being made of technology, the

basic framework—from which those implementing and verifying an accord can choose—has stood the test of time.

This overview suggests a number of issues for further study and consideration. First, although technology has yet to result in revolutionary changes to the basic framework, it may contribute to making procedures more efficient and/or effective. For example, the increasing availability of commercial satellite imagery at reasonable prices is one way in which technology might be used to assist verification. Similarly, aerial surveillance technology is also readily available and can provide valuable monitoring information. Given widespread concern about costs and the difficulties of obtaining troop contributions from UN member states, it is surprising that more effort has not been made to use technology to supplement and, in some instances, replace observers. This trend may alter, though, as more of these technologies become widely available.

Second, some of the post-Cold War changes raise questions about the role of observers in the new environment. In particular, the greater use of monitors in situations in which force might be used (either by the mission itself or by the parties to the conflict) raises the question of whether the advantages gained by the observers' presence still outweigh the potential downsides and dangers. The effect of the greater use of force on the role of observers is an issue for further study.

Third, it is inherent in the nature of these operations that they begin from scratch each time one is created. This means that there is a limited transfer—from one operation to another—of experience and lessons learned. As missions have increased in complexity, and other organisations have become involved, the need and the possibilities for developing some form of centralised body that can be drawn on by each mission becomes more compelling.

At the process level, one possibility is the development of verification protocols and packages of mechanisms designed for different situations.[19] Another is to establish standard training procedures for troops and other personnel who are likely to be used as military observers. The UN is the most obvious candidate to undertake this work, but there is no reason why some other organisation or group of countries could not initiate it.

A natural offshoot is the concept of a centralised agency to deal with information relating to verification, although such an idea will inevitably raise traditional fears about 'intelligence gathering' by the UN. Such an agency could, for example, collect and interpret data from sources outside the mission and from other organisations

involved in the operation. The agency could act as a point of liaison with the Situation Centre at UN headquarters, New York, and as a centre for a lessons-learned process on verification. This could contribute to the improvement of future missions and the development of standard verification protocols or methodologies.

Another problem resulting from the *ad hoc* nature of peace operations is that it is often impossible to deploy a force as quickly as required by the peace accord. The connection between the speed of response (or lack of it) once an agreement is in place and the eventual success or failure of the accord is an issue needing further research. A preliminary analysis suggests that having an operation on the ground as soon as possible is better than a later response. To some extent, the pattern of UN involvement in the negotiation of peace accords is a positive step in overcoming this delay, but this does not guarantee that a mission will be created or that it will be dispatched in a timely manner. Furthermore, the operation will not necessarily have the required troops, equipment or personnel with appropriate skills.

The fact that the basic process of verifying peace accords has remained constant, at least in its essentials, while the context has changed significantly, points to the durability of the verification framework and to the central role that verification plays in peace processes. A cease-fire and the military aspects of peace accords are at the root of a commitment by the parties to a conflict to end the fighting. Verification of compliance with these measures confirms the commitment and may help build confidence. Verification, therefore, is not only critical to day-to-day implementation, but also has the potential to contribute to positive change in the long term. This is what makes the lack of study on this issue such an anomaly. As we enter the post–post-Cold War era, it is important that the international community deals with the issues raised in this chapter, recognises the importance of the verification process to peace accords, and works to ensure that verification is supported and implemented as effectively and efficiently as possible.

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Endnotes

[1] *Verification in All its Aspects, Including the Role of the United Nations in the Field of Verification*, Report of the Secretary-General, UN document S/50/377, 22 September 1995, paragraph 157.

[2] Of course, verification of the military aspects of peace accords predates the creation of the UN.

[3] For an overview of the UNIFIL operation, see Mona Ghali, 'United Nations Interim Force in Lebanon: 1978–Present', in William J. Durch (ed.), *The Evolution of UN Peacekeeping*, St. Martin's Press, New York, 1993, pp. 181–205.

[4] For a good overview of the Congo experience, see Brian Urquhart, *Hammarskjöld*, W.W. Norton and Co., New York, 1994, and Catherine Hoskyns, *The Congo Since Independence, January 1960 to December 1961*, Oxford University Press, Oxford, 1965.

[5] A peace accord reached by Egypt and Israel in 1979, under US auspices, eventually brought an end to UNEF II.

[6] The UN Good Offices Mission in Afghanistan and Pakistan (UNGOMAP), the UN Iran–Iraq Military Observer Group (UNIIMOG), and the first UN Angola Verification Mission (UNAVEM I) all had the monitoring of cease-fire arrangements and the withdrawal of troops as core functions.

[7] United Nations, *The United Nations and Mozambique, 1992–1995*, New York, 1995, pp. 18–19.

[8] For good overviews, see Clement Adibe, *Managing Arms in Peace Processes: Somalia*, UNIDIR, Geneva, 1995, and Barbara Ekwall-Uebelhart and Andrei Raevsky, *Managing Arms in Peace Processes: Croatia and Bosnia-Herzegovina*, UNIDIR, Geneva, 1996.

[9] These missions are often called peace enforcement operations.

[10] For a good discussion of the dilemmas raised by this problem, see Michael Wesley, 'Blue Berets or Blindfolds? Peacekeeping and the Hostage Effect', *International Peacekeeping*, vol. 2, no. 4, winter 1995, pp. 457–482.

[11] See, for example, Eric Grove, 'Navies in Peacekeeping and Enforcement: The British Experience in the Adriatic Sea', *International Peacekeeping*, vol. 1, no. 4, winter 1994, pp. 462–470, and Jeremy Ginifer, 'The UN at Sea? The New Relevance of Maritime Operations', *International Peacekeeping*, vol. 1, no. 3, autumn 1994, pp. 320–335. For an overview of NATO's naval role in and around Bosnia, see 'NATO's Role in Peacekeeping, Maritime Operations', *NATO Handbook*, Brussels, 1999, available on-line at www.nato.int.

[12] For example, verification of the Sinai agreements involves unmanned ground sensors. See, for example, Brian S. Mandell, *The Sinai Experience: Lessons in Multimethod Arms Control Verification and Risk Management*, Arms Control Verification Studies, number 3, Department of External Affairs, Ottawa, 1987. Also see the outline of various technological options for monitoring functions found at the Co-operative Monitoring Center website at www.cmc.sandia.gov.

[13] See 'Science and Technology Scan', *Trust & Verify*, VERTIC, London, April 1999, p. 9.

[14] Some of the recent technological developments in this field are summarised in VERTIC's *Trust & Verify*. See: 'Chinese and Belgian Mine Detection', *Trust & Verify*, September 1999, p. 9; 'Israeli–Swedish Team Develops Explosive Sniffer', *Trust & Verify*, July 1999, p. 5; 'Science and Technology Scan', *Trust & Verify*, April 1999, p. 9.

[15] The Office for Research and Collection of Information (ORCI), which was established by UN Secretary-General Perez de Cuellar, was very unpopular with UN member states because of the implication that it would be involved in intelligence gathering. The ORCI was disbanded by Secretary-General Boutros Boutros-Ghali when he took office.

[16] For more information on this mission see the OSCE website at www.osce.org.

[17] Good information about the nature of the IFOR and SFOR mandates and the implementation process can be found on the NATO website at www.nato.int and on the links listed there.

[18] See annex I for more details. MOMEP involved Argentina, Brazil, Chile and the US, and ran from 1995–99. The Peace Monitoring Group in Bougainville involves Australia, Fiji, New Zealand and Vanuatu.

[19] This proposal was put forward by the UN group of experts. See *Verification in all its Aspects*, paragraph 279.

12

Evolution of police monitoring in peace operations

J. Matthew Vaccaro

Contemporary peace operations are often conducted in failed states or in those emerging from civil conflict. In these environments, the local criminal justice system has often been largely destroyed or has become otherwise ineffective as a result of widespread corruption among its constituent parts and/or their involvement in the war. This problem is exemplified by the state of indigenous police forces at the beginning of recent peace operations. In Somalia, for instance, the police were inoperative: they left their posts when a central government failed to emerge after President Siad Barre was deposed in 1991. In Haiti, the police were integrated into the armed forces and used by the ruling junta to repress the population. When the multinational peacekeeping force arrived in September 1994 and broke the regime's stranglehold, police officers stopped doing their jobs and assumed a defensive posture, fearing that ordinary citizens would seek retribution. In Bosnia-Herzegovina, where police forces had been segregated along ethnic lines and had participated in the sectarian conflict, the police attempted to continue the fighting through intimidation and thuggery throughout the tenure of the United Nations Protection Force (unprofor) (1992–95). In the ethnically polarised Kosovo conflict, the police were a primary player in the 'ethnic cleansing' and were forced to leave the province as part of the settlement granting access to North Atlantic Treaty Organization (nato) troops and the establishment of a United Nations (un) administration. Furthermore, in each of these situations the other components of the criminal justice system—the courts, prisons and, in a less tangible way, the laws of state—were also absent, ineffective or unjust.

A country's physical condition is most likely to prevent efforts to resuscitate its criminal justice system. At best, national infrastructure will be in disrepair. Roads, ports and communication systems may be unusable and housing and office stock

in the principal cities may have been ravaged by the war. Government services and public utilities may be almost non-existent. The (probably nascent) administration may have no capacity to collect taxes or other forms of revenue and may be dependent on the support of international donors. Police vehicles, weapons, uniforms and office materials are likely to have been stolen or destroyed during the fighting—although they may have been inadequate even before the conflict. Police stations may have been bombed out, burned down or ransacked, and the courthouse may have no electricity—or a sporadic supply—and no running water. If jails and prisons are still occupied, they may be centres of malnutrition and disease. Usable copies of the legal code may be unavailable in the country.

In addition, the post-war psychological condition of a society complicates and hinders the rebuilding of the indigenous police and justice system. In the majority of cases, the conflict has had a devastating effect on the society. Public trust, the cohesive element that allows people to place society above self, has often been destroyed. This must be recovered, so that new public institutions, based on co-operation with the public rather than repression, can be established. Usually there is increased toleration of violence as a justified method of interaction. This is made worse by the proliferation of light weapons throughout society and the familiarity that individuals acquire in using them. As former combatants are demobilised—often with poor prospects for earning a living and with little respect for the rule of law—crime often increases rapidly and turns violent.[1]

Because of the need for an indigenous criminal justice system, and the law and order challenges inherent in a post-conflict society, the development of local police forces and their monitoring by international police observers have become critical parts of peace operations. This chapter discusses the evolution of police monitoring and law enforcement in peace missions, beginning with the early experiences of the 1960s, and then an examination of the contemporary era. Finally, the chapter offers a speculative assessment of what the future might hold for the international community and police monitoring and reform.

The early era

The UN initially deployed few peacekeeping operations that required it to become involved in recipient states' internal affairs, including their criminal justice systems. The controversial United Nations Operation in the Congo (ONUC), which took place between 1960 and 1964, following the Congo's sudden achievement of

independence from Belgium, was the UN's first large-scale mission and its first experience of deploying civilian police officers as part of a peacekeeping mission. The operation—conducted in what would now be referred to as a failed state—sought to reinforce what was left of the indigenous police force with a small contingent of civilian police officers from Ghana. A 400-person police contingent from Nigeria was later added—the UN did not control this contingent, but, instead, it operated under an agreement between the world body, the Congo and Nigeria. The UN police, and, subsequently, UN-affiliated police, worked side-by-side with their Congolese counterparts to provide basic policing. In this sense, they were supplementing rather than monitoring local units.[2]

The UN's second experience of deploying civilian police officers was in Southeast Asia. The organisation administered the western half of the island of New Guinea for eight months in 1962–63, as control of the territory was transferred from the Netherlands to Indonesia. The UN intended to rely on indigenous police forces, but it found the leadership to be inadequate, especially after the Dutch cadre made a hasty exodus. To ameliorate the problem, the UN appointed a British commander and filled the remaining leadership gap with police officers from the Philippines. In this instance, the oversight functions of the Philippines' cadre presaged the monitoring role that would emerge in future. The fundamental goal of monitoring would be to improve the behaviour and performance of indigenous police units. However, this operation was too short to develop fully the concept.[3]

The UN's third experience with the police came on a Mediterranean island. In December 1963, ethnic tensions between Greek and Turkish Cypriots erupted in violent, sporadic street fighting. A truce resulted in UN troops and international police officers being dispatched to Cyprus in 1964 in order to prevent a recurrence of the fighting and to contribute to the maintenance of law and order. The UN deployed 173 police officers in five contingents to oversee and liaise with the Cypriot police, to conduct guard and checkpoint duties, and to help resolve grassroots disputes between the two communities. The civilian police had a psychologically soothing effect: a participant in the operation said that they became the host population's 'father-confessor and confidant in one person'.[4]

The term CIVPOL was coined from the UN Peacekeeping Force in Cyprus (UNFICYP) to refer to international civilian police officers serving in a UN peace mission. It was here that the method of monitoring and mentoring by walking the beat with local police officers took shape. The Force assumed a more traditional

interposition posture following the Turkish invasion of the island in 1974—only a small CIVPOL contingent remained after 1974.

During the 1970s and most of the 1980s the UN initiated few new operations because the Security Council could not reach agreement on most matters. As a result, a long period elapsed between the initial forays into police matters and the start of the recent era. But some of the issues that the UN confronted during the 1960s (such as indigenous police units that had to be monitored to deter bad behaviour and poorly trained officers with a weak or partial leadership) are the same as those facing the organisation today, as it attempts to help countries recover from civil war or failed government.

The contemporary era

The contemporary era of peace operations, dealing principally with intra-state conflicts, engendered anew the requirement to help rebuild or reform indigenous criminal justice systems. From January 1989–August 2000, the UN launched peace-keeping operations in 21 different locations, of which 14 have involved CIVPOL in some capacity. These missions (listed in chronological order) took place in Namibia, Angola, El Salvador, Western Sahara, Cambodia, former Yugoslavia, Somalia, Mozambique, Haiti, Rwanda, Guatemala, Central African Republic, East Timor, and Sierra Leone. From 1992–97, the average number of UN CIVPOL deployed monthly was 2,345. The advent, in 1999, of the UN administrations in Kosovo and East Timor increased dramatically the requirements for CIVPOL. As of September 2000, there were 7,194 CIVPOL participating in eight UN peace missions.

The first operation of this era to have a police role was the UN Transition Assistance Group (UNTAG). The mission was launched in 1989 to assist and monitor the transition of South West Africa (now Namibia) from South African control to independence. The UN deployed 1,500 civilian police officers as part of the peace-keeping effort. The CIVPOL in UNTAG were responsible for monitoring the indigenous public safety forces: the South African-controlled South West Africa Police. Unlike more recent operations the indigenous police force in Namibia was fully intact. However, it was feared that South Africa, as one of the parties to the peace accords, might try to influence the police to behave as their proxy once other South African elements had left the country. The presence of the CIVPOL monitors effectively mitigated any unduly partisan police behaviour.[5]

If UN police-related activities were relatively simple at the beginning of this

period, within 10 years they had become highly complex, as situations demanded greater levels of involvement by the international community. There are now four broad tasks related to the indigenous criminal justice system, which must be accomplished by a mixture of military and civilian peacekeepers and local actors:

- provision of basic law enforcement and public order for an interim period;
- reconstitution of indigenous police forces;
- monitoring and mentoring of local police units; and
- re-establishing and reforming the judicial and penal systems, as well as the legal code.

The first three tasks are concerned with policing and the indigenous police, while the fourth deals with the remaining parts of the criminal justice system. The necessity of this latter task is obvious: without detention facilities, police cannot arrest suspects; without seated judges, cases cannot go to trial; and without functioning prisons, sentences cannot be served.

The amount of effort required for these four tasks is inversely related to the capabilities of the indigenous police force: the more effective the host country's system, the less need for external assistance. If the indigenous system were not completely destroyed or corrupted during the conflict, for example, then the host state may be able to maintain basic public order with little or no help from peacekeepers. Alternatively, if the police are not present, but the government agencies that normally control them (such as a ministry of interior and municipal administrations) are functioning, they may be able to reconstitute a force with little outside assistance. International monitors and mentors, though, are almost always needed, regardless of whether the old police force is intact or a new force has just been formed. In both situations, the police need outside monitoring and mentoring to help them behave as true public servants and to win the people's confidence. The cases of Haiti and Kosovo illuminate the breadth of these overall tasks.

Haiti

An *ad hoc* US-led multinational peacekeeping force was deployed to Haiti in September 1994 to oversee and enforce the transition of power from coup leaders to the elected administration and to help it develop the basic institutions of democratic government. After six months the UN assumed leadership of the mission. The international community's effort to restore and reform Haiti's policing capacity

has been significant and, as of mid-2000, is continuing. As stated earlier, the Haitian police had been part of the military structure that had staged the coup. Since they had been highly repressive, serving to keep the élite in power, rather than responding to public needs, the police feared popular retribution and largely faded from public view when international military forces arrived. Their fears soon proved well founded, as violence between the former oppressed and oppressors reached intolerable levels. The multinational force changed its aloof posture towards Haitian-on-Haitian violence, occupied the streets to stop the fighting and looting, and re-established basic public order—the first CIVPOL task enumerated above.

Because the multinational military force was loath to retain its activist role in maintaining public order or to go further and undertake actual law enforcement, the second task was accomplished with a two-prong strategy: the immediate creation of an interim Haitian police service to deal with crimes that went beyond basic public order duties; and the longer term development of a mostly new, bottom-up Haitian police force.

As a result, the Interim Public Security Force (IPSF) and a new civilian-controlled Haitian National Police (HNP) service were formed. The IPSF was composed of former members of the Haitian armed forces, who were carefully vetted for past misdemeanours, and pro-government returned refugees, who had fled the country during the political and economic troubles that followed the coup. The term 'vetting' has come to refer to a selection process that thoroughly assesses an individual's qualifications and potential disqualifications for police duty in a post-conflict society. Anyone found guilty or widely accused of strong partisan activity, ethnocentricity or of disregarding basic human rights will probably be unable to garner public confidence as an impartial servant of the people. These applicants must be weeded out during the vetting phase. Some method should be used to gather the views of the population. If the previous system was corrupt or biased, the assessment will likely disqualify a large number of the more experienced applicants, causing the police force, initially, to be less effective. There is a delicate balance between recruiting untainted and experienced individuals, and forming a force that can win public trust. Of course, the balance depends on the situation. The goal is to prove to the people that, in responding to their needs, the system will be effective and fair.

The interim police officers were deployed alongside International Police Monitors (IPMS), who were the same as UN CIVPOL, except that they were under the control

of the multinational force commander and carried side-arms—both controversial deviations from UN practice. Furthermore, the role to be played by the IPMs was more robust than the UN norm, which allows only monitoring and limited mentoring of indigenous police. The IPMs were allowed to enforce Haitian law when no Haitian police were available. They could use force to prevent loss of life and disruption to the security environment. In essence the IPMs were asked to accomplish the monitoring task, as well as conducting some law enforcement. When the UN assumed control of the peacekeeping operation, though, the IPMs' title reverted to the traditional CIVPOL, but the more activist role was maintained. However, command arrangements were adjusted to the UN standard: the CIVPOL component was made immediately subordinate to the highest-ranking UN civilian in Haiti, the Special Representative of the UN Secretary-General, rather than to the UN military commander.

Meanwhile, the HNP was being formed, trained and deployed through a combination of loosely co-ordinated bilateral and multilateral efforts. The US established a Haitian police academy, which was largely staffed by American, Canadian and French trainers. Later, an additional site in the US was used temporarily to increase training capacity. As new police recruits graduated, they were put to work under the watchful eye of UN CIVPOL staff, who took on a larger mentoring role to follow up the recruits' initial training. The military peacekeepers went to great lengths to work in conjunction with the indigenous police–CIVPOL teams. This whole process of collaboration was relatively effective. In just 13 months, more than 5,200 Haitians were vetted, hired, given basic training and put on the beat. A much longer programme to develop supervisory and other specialised HNP personnel and to create organisational methods of accountability, such as an Inspector-General's office, has also been underway since the first year of the operation.

Throughout the first three years of peacekeeping in Haiti, the military peacekeepers had a visible presence and were capable of responding to civil disturbances or other events that might endanger UN personnel. This gave important leverage to the CIVPOL as they engaged in psychological brinkmanship at the tactical level in order to encourage reform of the indigenous system. The military was withdrawn in December 1997, however, because its other tasks were completed and the risk of disturbance was minimal. A 'self-protection unit', a small civilian paramilitary body, was deployed to provide emergency backup to the CIVPOL, replicating on a smaller scale the psychological, and, it is to be hoped, real, benefits of the previous

military contingent. This marked the UN's first use of a civilian paramilitary element and civilian police officers in the absence of a military peacekeeping contingent.

In Haiti, the internationally-sponsored improvements in the judicial system (the fourth task of CIVPOL) have had little positive effect. The military and, later, the US Agency for International Development and the US Department of Justice have provided much training and some direct assistance in managing judicial cases. Nonetheless, the system remains largely corrupt and backlogged. Part of the problem is that attempts are being made to reform the tainted old system, whereas the police force was restructured mostly with a clean slate. Living conditions within the penal system, though, are much improved from those of 1994. In fact, the severity of the earlier conditions rallied the involvement of the military, CIVPOL, the new Haitian government and non-governmental organisations.

The weak and corrupt judicial system in Haiti has stymied effective criminal justice, as an increasing number of suspects are arrested by the improved police force and must wait in jails for long periods before seeing a magistrate. This bottleneck poses significant psychological difficulties for the civilian population. By not bringing the accused before magistrates in a timely fashion, innocent people will be incarcerated for unreasonable lengths of time, while trials and pronouncements of guilt for real criminals will be deferred. The common citizen—especially one who has endured the trauma of the old repressive police service—cannot feel safe in an environment where unsubstantiated allegations and scraps of collaborating circumstantial evidence result in suspects being locked up for long periods without an opportunity to clear their name. The absence of due process impinges on the public's ability to trust their new government. To break these psychological impediments, a reformed justice system will have to be perceived as fair.

Kosovo

In June 1999, five years after the launch of the Haiti operation, a robust military force under NATO command was deployed to Kosovo, as part of the settlement ending the Alliance's bombing campaign against the Federal Republic of Yugoslavia (FRY). The UN was given overall responsibility for administering the province and for establishing the UN Interim Administration Mission in Kosovo (UNMIK). The operation was comprised of four functional 'pillars': humanitarian assistance; civil administration; economic reconstruction; and institution building. These pillars were operated by the UN High Commissioner for Refugees (UNHCR), the

UN Secretariat, the European Union (EU), and the Organisation for Security and Co-operation in Europe (OSCE), respectively. The settlement required all FRY troops and police to depart Kosovo, which was accomplished during the first days of NATO's deployment and well before any of the civilian entities were able to establish much of a field presence. For an interim period, therefore, the Kosovo Force (KFOR)—as the NATO mission was called—assumed responsibility for criminal justice matters, including maintenance of public order, basic policing, judicial affairs and penal detention.

In administering the province, UNMIK was given complete responsibility for conducting law enforcement and the administration of justice (operation of the courts and the penal system). This was the most robust law enforcement mandate ever given to a UN mission, exceeding by far the authority to conduct limited law enforcement in the case of Haiti. (In 1999, the UN would be given a similar, robust level of law enforcement responsibility in East Timor.) UNMIK established an international police force, comprising regular police, border police and special paramilitary police units (as used first in Haiti). Overall, the police service was to number 4,718 persons, but, as of August 2000, less than 4,000 were in the field, allowing only rudimentary law enforcement to be performed and placing significant demands on KFOR to maintain its involvement in policing matters.

Development of a new 4,000-strong indigenous police force is the responsibility of a sub-section of the UNMIK police, which is under the direction of the Deputy Commissioner for Planning and Development. The nascent force is termed the Kosovo Police Service (KPS). The OSCE, in its institution-building role, is operating the KPS School at Vucitrn in Kosovo. Thus far, two classes have graduated—173 on 16 October 1999 and 176 on 19 February 2000. The third class is currently underway. After graduation the officers are assigned to the UNMIK police unit and receive field training. Once this is completed, they serve alongside the international police under UNMIK's command. Hence, UNMIK police commanders will initially supervise and control the activities of the new police. The plan is to cede increasing responsibility to the indigenous police force, while gradually switching the international police from law enforcement duties to a supervisory and cadre role, and, subsequently, to traditional CIVPOL monitoring and mentoring functions. Ultimately, they will be withdrawn altogether.

The fourth general task listed above has been attempted in Kosovo perhaps more than in any other peace operation. This level of effort was based on necessity:

when the UN administration arrived in the province there were neither functioning courts nor legal detention centres, and there was widespread rejection of the FRY legal code. UNMIK has appointed over 300 indigenous judges and prosecutors, and international legal personnel have been deployed to supplement the new local officials. The latter are paid salaries by the UN administration. Meanwhile, the judicial facilities are under repair and essential equipment (such as computers, fax machines, other office supplies and metal detectors) is being procured and donated. International personnel are also providing technical assistance and advice in setting up new procedures for the judicial system. UNMIK police and, in some cases, NATO forces are operating detention centres for persons awaiting adjudication of their cases and serving sentences. With regard to the legal code, UNMIK ruled that, in addition to its decrees, the criminal justice system would use the code that was in force in Kosovo before the province was stripped of its autonomy in 1989.

The future

The future is unlikely to involve the accomplishment of a wide range of additional new tasks in the criminal justice sector during peace operations. The interim administrations in Kosovo and East Timor—where the UN is responsible for top-to-bottom law enforcement and for the creation of completely new indigenous systems—have probably demonstrated the extent of international engagement in this area, as suggested in the four categories discussed above. What is needed now, and most likely in the future, are improvements in these areas.

CIVPOL, whether serving as monitors and mentors of indigenous police, or actually conducting policing duties themselves, need a common set of standards and level of training. A typical CIVPOL component of a UN mission is comprised of officers from 10–30 countries, each with their own practices and procedures. It is not surprising that CIVPOL fail to act coherently. Each national contingent and individual brings with them a particular view of acceptable behaviour. When policing or monitoring indigenous police these national and/or personal norms inform the manner of policing and what the CIVPOL allow the indigenous police to do. At best the absence of common standards makes mentorship confusing for the indigenous police, and, at worst, helps the new police learn or retain bad habits. The sheer scale of CIVPOL missions in the Balkans and in East Timor is causing the UN and its member states to develop mission-specific standards, which appear poised to become UN-wide guidelines. What is needed next is a system to

provide comprehensive training to existing and potential CIVPOL so that they can be held accountable to such standards. Another problem related to CIVPOL performance is that some CIVPOL are unmotivated and end up doing little or simply ignoring behavioural standards. United Nations' missions and CIVPOL contingents need leaders who can coax all mission members into acting diligently, often in difficult and dangerous environments. These leaders also require the authority to repatriate poor performers.

Language poses another significant and two-fold challenge for CIVPOL operations. First, proficiency in the mission language—which is used for command and control in the peacekeeping operation, and which is usually English or French—is important for efficient performance. CIVPOL who misunderstand their supervisors' directives or commands will likely appear to be poor performers, whether they are or not. It is not surprising that poor proficiency in the mission language further complicates leadership and conduct within the operation.

The second challenge is the ability to communicate with the local populace and the indigenous police. Whether it be Albanian, Creole or Tetun, CIVPOL who speak the indigenous language are more likely to be effective monitors and mentors. Unfortunately, most CIVPOL will not speak the indigenous dialect and must rely on interpreters to bridge the gap—a system that has many shortcomings.

As alluded to earlier, the supply of CIVPOL and special civilian police units has emerged as a problem because of the sudden increase in requirements for civilian police in peace operations. This shortage is likely to continue in the near future. Indeed, it may become worse as the prevalence of CIVPOL in peacekeeping missions continues to rise. Furthermore, a broader range of civilian police experts is now required in peace operations. Whereas in earlier times only 'beat cops' were involved, missions now need immigration police, customs police, and forensic and organised-crime investigators. Many of these specialists are already in short supply in contributing states—a situation which will result in shortages in the field.

The future will also entail a greater emphasis on the speedy development of interim police forces (as in Haiti), as the complexities and difficulties in having international police perform law enforcement tasks are realised. The extent of UN responsibility for policing in Kosovo and East Timor will likely lead to retrenchment among potential contributing states as the international police prove unable to provide the desired degree of basic policing. Relying instead on interim police forces will require improvements in quick vetting and basic training for interim

police, as well as enhancements in the way new police are provided with uniforms and other equipment. Because interim police are more likely to be drawn from the ranks of former security elements, they are more likely to be partial and heavy-handed. Effective CIVPOL monitoring is vital while any interim force is being used. Another way to improve an interim force's performance would be to seed it with an international cadre of police supervisors, so that the international community could lead the interim force, rather than simply monitoring and mentoring it. Finally, the future will certainly involve the continued development of the international community's means for rebuilding judicial and penal aspects of criminal justice systems.

Conclusion

A reasonably effective criminal justice system is a necessary, albeit insufficient, condition for a society to achieve and to sustain durable peace. It is through such a system that a society regulates and resolves internal conflicts in an orderly fashion. In a society that has attained durable peace, the criminal justice system acts as a mechanism for relieving pressure: the law is the means through which wrongs are righted and injustices are corrected. By and large, citizens resort to the police, courts and law, as opposed to vigilante justice or other forms of violent dispute resolution. The absence of an effective criminal justice system leads to instability. If the macro objective of a peace operation is to help a society return to durable peace, then the peacekeepers—military or civilian—in concert with whatever is left of the host state, face a significant challenge in rebuilding or reforming each component of the criminal justice system. The recovery of the basic indigenous capacity to enforce the laws of the land is essential for a country to make progress towards lasting peace. One of the most important jobs for civilian and military peacekeepers is to press steadily and to coax this aspect of recovery, which is likely to be a slow and stuttering process. Nurturing the criminal justice system constitutes a vital transitional phase for a country on the road from chaotic conflict to sensible self-governance.

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Endnotes

[1] See, for example, Kimberly A. Maynard, 'Rebuilding Community: Psychological Healing, Reintegration, and Reconciliation at the Grassroots Level', in Krishna Kumar (ed.), *Rebuilding Societies After Civil War: Critical Roles for International Assistance,* Lynne Rienner Publishers, Boulder, Colorado, 1997; *Washington Post,* 'Postwar Deprivation Breeds Violent Crime in Kosovo', 12 March 2000, p. A25.

[2] Ernest W. Lefever, *Crisis in the Congo: A United Nations Force in Action,* Brookings Institution, Washington, DC, 1965.

[3] Quoted in Robert Oakley, Michael Dziedzic and Eliot Goldberg (eds.), *Policing the New World Disorder: Peace Operations and Public Security,* National Defense University Press, Washington, DC, 1998, p. 31–32.

[4] Oakley, Dziedzic and Goldberg, p. 18.

[5] William J. Durch (ed.), *The Evolution of UN Peacekeeping: Case Studies and Comparative Analysis,* St. Martin's Press, New York, 1993, p. 360 and 371.

verification and compliance tools and mechanisms

13

Remote monitoring from space: the resolution revolution

Bhupendra Jasani

While the first successful launch of a reconnaissance satellite and the recovery of its photographic payload was conducted by the US in August 1960, the potential use of artificial earth orbiting satellites for remote monitoring purposes was recognised as early as 1946.[1] By 1955, considerable details about such spacecraft had been worked out, and the US air force had submitted technical requirements to various industrial firms.

A number of factors contributed to this development. First, it was possible to monitor a large area of the earth quickly and repeatedly with satellites. Coverage was improved by at least a factor of seven compared to aircraft, the traditional means of reconnaissance. A modern aircraft, such as the US SR71, flying at an altitude of some 25 kilometres (km), and at a speed of one km/second (km/sec), is capable of filming slightly more than 250,000 square km of the earth's surface in one hour.[2] A satellite like the French SPOT or the Indian IRS-1C or IRS-1D, travelling at around seven km/sec, and at an altitude of 800 km, can observe about 1,750,000 square km of the earth's surface in the same period. A satellite carrying a sensor with a one-metre resolution, such as the US Ikonos-2, could cover about 277,000 square km in one hour, almost the same as an aircraft. Second, it was not necessary to gain permission from the states over which satellites passed. This was established *de facto,* when the former Soviet Union launched its first satellite, Sputnik 1, on 4 October 1957, and no country objected to its overflights. Third, a satellite orbits at an altitude of at least 150 km—well beyond national airspace—and is unmanned. As a result, humans are not exposed to retaliation from an adversary, unlike reconnaissance aircraft pilots.

These kinds of considerations gave significant impetus to the development of different types of military satellites in general and observation satellites in particular.

In fact military reconnaissance (optical) satellites have sensors with a resolution nearly 10 times better than the one-metre resolution of the current generation of commercial remote sensing satellites.

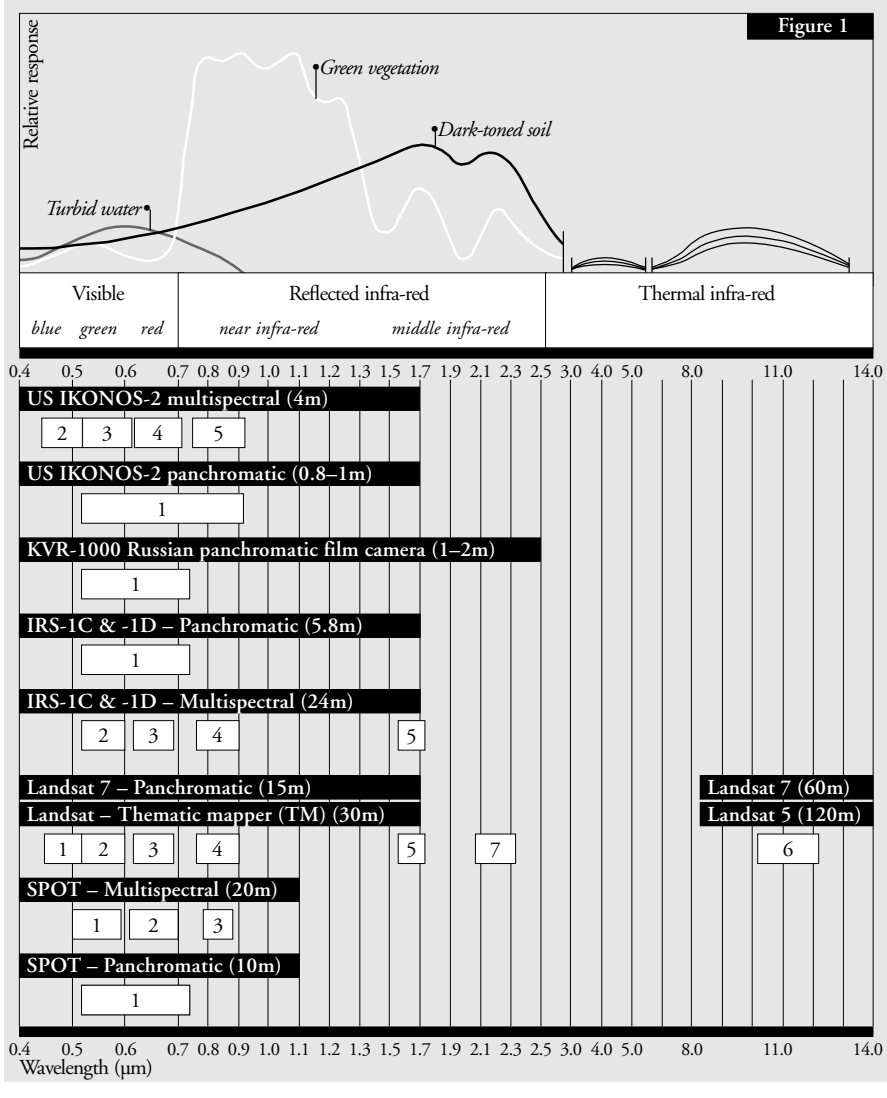
Observation satellites carry optical and radar sensors on board that are sensitive to electromagnetic (EM) radiation with wavelengths between 0.4 micro-metres (μm) and some tens of centimetres (see figure 1 on opposite page). In order to assess whether there has been a revolution in resolution, therefore, one needs to examine briefly what is meant by the term. An imaging sensor is characterised by a number of technical parameters, such as spectral, radiometric and spatial resolution. Only spectral and spatial resolutions are considered in this chapter.

Spectral resolution

A human eye can see light in wavelengths between 0.38 (deep blue) and 0.71 μm (red). Wavelengths beyond 0.71 μm move into the infrared (IR), which is invisible to the human eye. Reflected IR extends to two μm, and, beyond this, longer wavelength IR energy is sensed as heat. This spectrum extends from three μm to about 14 μm (see figure 1). The spectral resolution is the wavelength interval that is picked up by a detector. Usually the response of a detector to light is not sharply defined, but, as the wavelength increases, it rises to a maximum and then decreases (see figure 2a overleaf). Spectral resolution or bandwidth is then defined as the wavelength interval recorded at 50 percent of the peak response rate—0.10 μm in figure 2a, for instance. Consequently, the narrower the distribution curve or bandwidth, the better the resolution of a sensor.

Optical images can be divided into panchromatic, multi-spectral, hyper-spectral or ultra-spectral data. Bandwidth and the number of spectral bands distinguish between these categories. A panchromatic image, for example, is one in which data is acquired over a wide range of wavelengths in a single spectral band (figure 2a). In a multi-spectral sensor, data are collected simultaneously in at least three but no more than 10 regions of the EM spectrum with broad bandwidth (see figure 2b). Examples include the US Landsat, French SPOT and Indian IRS-1C satellites (see figure 1). A hyper-spectral sensor has a narrow bandwidth and several hundred spectral bands (figure 2c). The first such system was the US LewisSat, which orbited on 22 August 1997, with 384 spectral bands in the range of 0.4–2.5 μm and a spectral resolution of between five and 6.25 nano-metres. Unfortunately, contact with the spacecraft was lost by 27 August. However, a US company, Orbimage,

is planning to launch a satellite with a hyper-spectral sensor in 2000. OrbView-4 is expected to have one-metre panchromatic, four-metre multi-spectral and four-metre hyper-spectral sensors on board. The latter will have 200 channels with a spectral range of 0.4–2.5 μm. Ultra-spectral sensors (see figure 2d) are still at the research and development stage, although they are expected to have a very narrow bandwidth and thousands of spectral bands.



Spatial resolution

The spatial resolving capability—generally referred to as resolution—is the sensor's ability to record small details. How small details or objects are discerned is complicated, since it depends on the spatial resolution capacity of the sensor and on characteristics of the scene, such as object shape and size, and contrast between the object and its surroundings. The resolution capacity or the resolving power of the sensor may be defined in a number of ways: for example, the smallest distance between two identical objects at the point at which they can be resolved as two objects. Such a definition is applied to a photographic image. In the case of an electro-optical device, this resolution may be defined as the area on the ground represented by each sensor cell or pixel. The smaller the pixel, the smaller the area, and, therefore, the finer the resolution. This area is often referred to as the instantaneous field of view (IFOV) or ground sampling distance. These two concepts can be related by a simple mathematical relationship. Under ideal conditions the IFOV is about half the resolution of a photographic image of the same scene.

In the case of a radar sensor—synthetic aperture radar (SAR)—the resolution depends on the length of the antenna. An SAR is a side looking radar with a relatively short antenna, which can be made to behave like a long antenna with a narrow beam. The longer the antenna, the better the resolution. But for space-based radar, there is a limit to the size of an antenna that can be carried in orbit. A long antenna can be synthesised by taking advantage of the satellite's motion in its orbit. Signals received by the short antenna as it moves through a series of positions along the flight path are combined to produce effectively a long antenna. In a radar image, brighter features mean that a large fraction of the radar energy was reflected back to the antenna, while dark features indicate that the antenna received little energy. For a particular wavelength, a number of factors influence the intensity of this so-called 'back-scatter' radiation. These include: the size of the object; the object's moisture content; polarisation of the beam; and the radar beam's angle of incidence. If an object is the same size or larger than the wavelength of the radar beam, it will produce a bright signal in the image. An object that is smaller than the wavelength will appear dark in the image.

Military reconnaissance satellites

At present only four countries have military reconnaissance satellites: China, France, Russia, and the US. Very little is officially known about their capabilities, but it

is possible to make assessments based on leaked images from such satellites and, more recently, on data declassified by Russia and the US. Table 1 (overleaf)[3] summarises the development of US military reconnaissance satellites, measured in terms of spatial resolution. It can be seen that, over some 17 years, resolution of US military reconnaissance satellites has improved by at least a factor of 90. The French satellite, Helios 1, is reported to have a resolution of about one metre.

Some of the images from the US Key Hole (KH) series of satellites have appeared on the Internet, such as one of the Minerallye Vod airfield in the former Soviet Union (see figure 3). A US reconnaissance satellite (KH-4) with a resolution of between three and eight metres acquired this image.[4] From 1990, Russia started to commercialise some of the degraded data from its military photographic reconnaissance satellites. Figure 4 shows an image over an airfield in China, acquired by a Russian satellite using a KVR-1000 sensor (two-metre resolution). In figures 3 and 4, close ups of aircraft parked on the apron are enlarged and shown in the insets. Analogous details suggest that the images have similar resolutions.

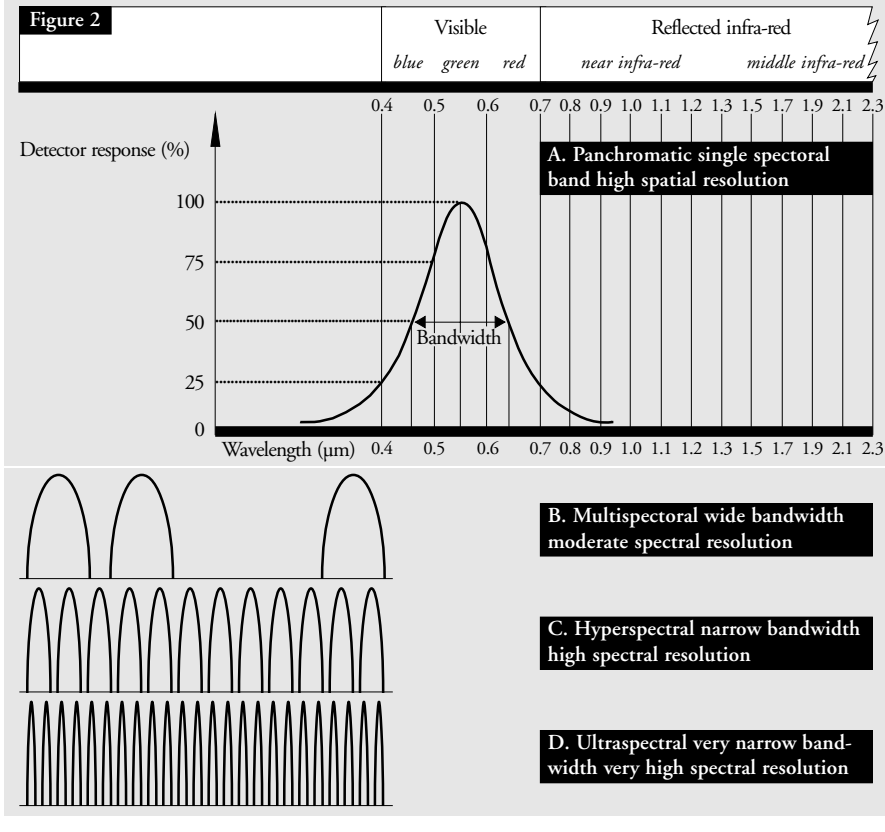


Table 1 Resolution of US Key Hole satellites

SATELLITE	PERIOD OF OPERATION	RESOLUTION (M)
KH 1–4	1959–1963	8–13
KH 4A	1959–1963	~3
KH 4B	1967–1972	~2
KH 6	1963	~2
KH 7	1963–1984	~0.5
KH 8	1963–1984	~0.15
KH 9	1971–1984	0.3–0.6
KH 11–12	1976–	~0.15

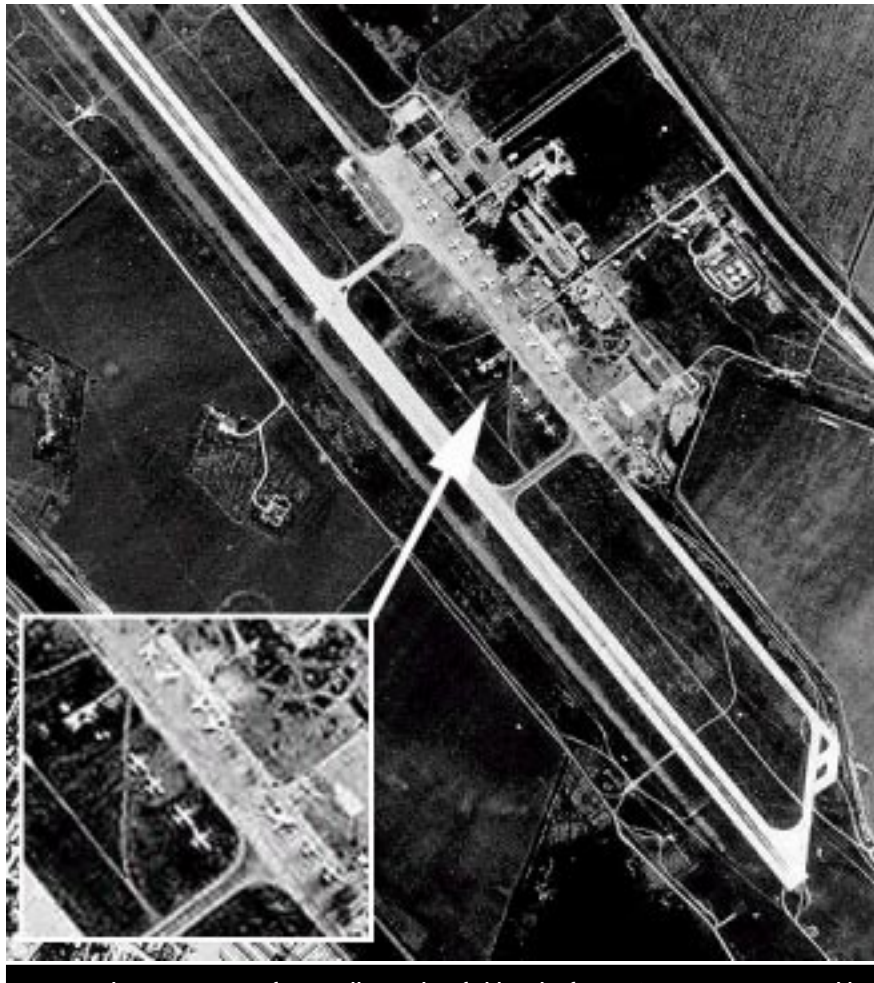
Civil remote sensing satellite

Commercially available remote sensing satellites now have capabilities similar to the military models of the 1970s. At present there are a number of countries launching and operating their own civil remote sensing satellites. The US has had such a programme since 1972—it launched Landsat-1, with a resolution of 79m, on 23 July. Six more Landsat satellites have been launched subsequently; only Landsat-6 did not achieve an orbit. Landsat-5 (launched on 1 March 1984) and Landsat-7 (launched on 15 April 1999) are both generating data in orbit. Landsat-5 and Landsat-7 have resolutions of 30m in the visible and IR bands, while the resolutions of the thermal band (band 6) are 120m and 60m respectively. In addition, Landsat-7 has a panchromatic band with a resolution of 15m.

The situation changed dramatically when US President Bill Clinton issued Presidential Decision Directive 23 (PDD-23) on 10 March 1994.[5] Under this Directive, private companies were encouraged to build and orbit satellites with high-resolution sensors, with a view to commercialising the data. But there are some conditions attached: 'The licensee will be required to maintain a record of all satellite tasking for the previous year and to allow the US Geological Survey (USGS) access to this record'. Moreover, 'During periods when national security or international obligations and/or foreign policies may be compromised, as defined by the Secretary of Defense or the Secretary of State, respectively, the Secretary of Commerce may,

after consultation with the appropriate agency(ies), require the licensee to limit data collection and/or distribution by the system to the extent necessitated by the given situation'.

The US had already passed a law under which: 'No department or agency of the Federal Government may license the collection or dissemination by any non-Federal entity of satellite imagery with respect to Israel, or to any other country or geographic area designated by the President for this purpose, unless such imagery is no more detailed or precise than satellite imagery of the country or geographic area concerned that is routinely available from commercial sources'.[6]



Source: SPOT Image

Figure 3 shows an image of Minerallye Vod Airfield in the former Soviet Union acquired by the US KH–4 satellite (resolution between 3 and 8m).

Beside the US and Russia, Canada, France, India and Japan also sell imagery from their civil remote sensing satellites. An example of an image acquired by the French SPOT satellite (10m) is shown in figure 5. This shows a US strategic bomber base, where the possible deployment of B-52s can just about be detected on the

Source: SPOT Image

Figure 4 (above) A Russian satellite photograph of a Chinese air base (resolution is 2m). Figure 5 (below) shows an image of the US Ellsworth Air Force Base, acquired by the French SPOT satellite at 10m resolution. B-52s can be seen at A and a nuclear weapons storage site at B.

Source: SPOT Image

Source: Space Imaging

Figure 6 shows part of the Washington airport. The US Ikonos-2 satellite acquired this image at a resolution of one metre.

apron at A. A possible nuclear weapons storage area can also be seen at B. Figure 6 shows an image acquired by the US Ikonos-2 satellite over Washington. At this resolution, considerable details can be made out at the airport. Several types of aircraft can be seen, which could be identified, for example, with the help of *Jane's World Aircraft Recognition Handbook*.[7] Some current and future civil satellites are summarised in table 2 (overleaf).

It can be seen that, since the launch of Landsat-1, the resolution of sensors on civil remote sensing satellites has improved by a factor of about 80. As a result of Japan's concerns about North Korea's nuclear and missile programmes, it has decided to develop and launch a high-resolution (one metre) satellite, known as the Information Gathering Satellite.[8] The next generation of Indian remote sensing satellites is expected to have resolutions of 2.5m and one metre. Spectral coverage and spatial resolutions of some of the current satellites are shown in figure 1.

Table 2 shows that, apart from several optical satellites, there are a number of radar satellites in orbit today. While generating near photographic images, they carry SAR sensors that can be used day and night and in adverse weather conditions. It can be seen that the resolution of this type of sensor has also improved significantly since the launch of the first SAR sensor on the US Seasat satellite (resolution 25m) in June 1978. By contrast, the Canadian RadarSat in fine-beam mode has a resolution of around nine metres.

Table 2 Commercial remote sensing satellites

Country Satellite	First launch	Resolution in pixel size (m) panchromatic	 multi-spectral	 thermal/IR
OPTICAL				
Brazil/China				
Zi Yuan CBERS I & II	1999–2001	20		
CBERS III & IV	–	5	10	40–80
France				
SPOT-4	1998	10	10	
SPOT-5	2002	2.5		
India				
IRS-IC,-ID	1995, 1997	5.8	25	
IRS-P5	1999–2000	2.5		
Israel				
Eros-A	1999	1		
Japan				
ALOS	2003	2.5	10	
Russia				
Resurs-F series	1989–98	2		
US				
KH-1 to 4	06/1959–12/1963	7.6		
KH-4A	08/1963–10/1969	2.7		
KH-4B	09/1967–05/1972	1.8		
Landsat-5	1984		30	120
Landsat-7	1999		15	60
Ikonos-1 did not achieve orbit, -2	1999	0.8–1	3–5	
Quickbird-1,-2	1999	0.8	4	
Orbview-3	2000	1–2	4	
Orbview-4		1–2	4/hyperspectral 8	
Earlybird-1	1997	3	15	
RADAR				
ESA				
ERS-1, and -2	1991 & 1995	25		
Japan				
JERS-1	1992	18		
Canada				
Radarsat	1995	9–100		
Russia				
Almaz-1B	1998	4–15		
US				
SIR-C	1994	8–30		

Some novel applications

Multi-spectral images in the near IR, as well as mid-, short- and long-wave IR, can be used to identify features, such as disturbed soil and vegetation, which may not be visible to the human eye. A sensor sensitive to long-wave IR can detect radiation emitted from heated buildings and discharged warm water that has been used to cool industrial plants, like nuclear facilities.[9] In the latter, there is a possibility of using a radar sensor to monitor the warm water plume from nuclear reactors.[10] In addition, a thermal IR sensor could detect buried structures if they generate heat.

Hyper- and ultra-spectral sensors could be used to detect subtle spectral differences in signatures that are too narrow to be discerned using simple three-band multi-spectral data. Moreover, such sensors could potentially identify specific materials, as well as components of aerosols, gas plumes and effluents. These may well find application in monitoring environmental and arms control accords, such as the 1992 Chemical Weapons Convention (CWC).

Such fine spectral resolution would enable exploitation of the unique spectral signatures that all objects have. If underground facilities have been constructed, for instance, stressed vegetation that grows on earth-covered bunkers could be distinguished from normal vegetation, since root growth, drainage and soil conditions are different. Furthermore, new high-resolution, commercially available images can be useful for, *inter alia,* cartographers, city planners and farmers, as well as for managing disasters like earthquakes, widespread human rights abuses and the mass movement of populations.

Legal and institutional issues

From the above survey it can be seen that the high quality of openly available images permits them to be used in a wide variety of ways. Yet, while they provide benefits, they also pose a serious challenge. For example data from remote sensing can also be used for weapons targeting purposes. Should controls be established over the distribution of high-resolution, commercially available satellite imagery?

To some extent this problem is dealt with by the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (the Outer Space Treaty). Under Article VI, for instance, the 'States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the Moon and other celestial bodies, whether such activities are carried on by governmental agencies or

by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty'.[11] The thrust of the Outer Space Treaty is the preservation of space for peaceful purposes. The use of very high-resolution commercial satellite images for military reasons may not be regarded as a peaceful activity.

The first proposal to regulate specifically remote sensing activities from outer space was by Argentina in 1970. As a result, the Committee on the Peaceful Uses of Outer Space (COPUOS) recommended that the issue be placed on the agenda of the Legal Subcommittee: this was done in 1971.[12] Concerns were expressed, particularly by developing countries, about issues like national sovereignty, prior consent, and control by the observed state over the distribution of data acquired above its territory. However, the Soviet Union and the United States had been using reconnaissance satellites, orbiting between some 150–350 km, to observe most of the globe for years. As far as the international community is concerned, it was surprising that, by 1986, claims that satellite images were a sovereign national resource had dissipated and the Principles Relating to Remote Sensing of the Earth from Outer Space (Remote Sensing Principles) had been adopted by the UN General Assembly.[13]

Surprisingly the concerns were about resources and not national security. As far as it is known, the only state to have objected to satellite reconnaissance on the grounds of national security was Israel. This occurred in 1994, when a US firm called Eyeglass—later renamed Orbimage—was planning to establish a ground station in Saudi Arabia to receive very high-resolution images from its commercial satellites over the Middle East. In May 1995, Orbimage agreed not to collect image data over Israel. Tel Aviv also asked Washington to help protect it from satellite monitoring. Consequently, the US exercised its right to control shutter—when to take or not to take images— as envisaged in its 1992 Remote Sensing Act.[14]

The first high-resolution satellite data commercially released by Russia were from its military satellites and were in the form of photographic films. These were degraded to about 1–1.5m photographic resolution and then digitised. The digital data have a two-metre resolution (pixel size). The former could be compared directly with the US Ikonos-2 data, which have a one-metre resolution. As mentioned above, the Russian photographic product with 1.5m resolution is equivalent to a pixel resolution of about 0.8–1m. Ikonos quality data have thus been available from Russia since 1990.

Observations from space form a vital element of American and Russian national technical means (NTM) of verifying compliance with bilateral agreements. Not all nations have access to such capabilities, however, even though they are parties to several important multilateral arms control treaties. In this regard, neither the US nor Russia appears willing to share widely either the technology or the information obtained by NTM. The US provided limited access to satellite imagery, though, to the International Atomic Energy Agency (IAEA) and to the UN Special Commission (UNSCOM) on Iraq. The new commercially available data will clearly give impetus to multinational technical means (MTM) of verification.

In 1973[15] and 1978, France[16] proposed the creation of an International Satellite Monitoring Agency (ISMA), which would use remote sensing from outer space to verify arms control treaties and to monitor armed conflicts. A UN expert group studied the concept and its report was published in 1981.[17] As a result of resolution 43/81B, passed by the UN General Assembly in 1988, the role of the UN in the field of verification was examined by a Group of Governmental Experts, which concluded that the UN should seriously consider the multilateral aspects of verification.[18] Unfortunately, nothing came of these proposals.

The complexity of political problems associated with the creation and operation of an international system led some observers to propose the establishment of a Regional Satellite Monitoring Agency (RSMA).[19] The Western European Union set up the first RSMA in Madrid, Spain, in 1990; it was declared operational in 1991. It has been recommended that other RSMAs be established in Latin America, the Middle East, South Asia and East Asia. In all of these regions there is a need for such an agency and space capabilities exist. In 1999, Argentina proposed to the UN the establishment of legal principles to govern commercial activities concerned with outer space.[20] Presumably, such measures could also deal with remote sensing by satellites. If this were the case, then it is important that special consideration be given to monitoring arms control treaties, to establishing confidence-building measures and to assisting crisis prevention efforts.

Conclusion

This chapter has attempted to examine one aspect of verification capabilities: remote sensing by satellites. If improvements in resolution were to be taken as a measure of progress, then, over the past 25 years, this aspect has changed by a factor of almost 100. The first US remote sensing satellite, Landsat-1, had a resolution of

about 80m. Now the US has launched a commercial satellite with a resolution of nearly 0.8m. A revolution in resolution of sensors on board civil remote sensing satellites has, therefore, taken place, giving rise to new applications. Among these are the monitoring of multilateral arms control treaties, including the 1970 Nuclear Non-Proliferation Treaty (NPT), the CWC and the 1996 Comprehensive Nuclear Test Ban Treaty (CTBT).[21] Although the CTBT is not yet in force, observations from space, serving as an additional element of verification to those already envisaged, could enhance its effectiveness.

There is some reluctance to use satellites for verification of multilateral arms control agreements. Nor are satellites being used multilaterally to monitor crisis areas in order to prevent escalation into armed conflict. States generally associate satellites with NTM. It is not widely appreciated that commercial satellites could also be very useful—with the added advantage that data are available to anyone.

While most nations still do not possess their own NTM, the concept of an international verification agency is gaining some recognition, with observation from space forming a critical element. Not only have the capabilities of civil remote sensing satellites improved dramatically, but the number of states launching and operating such satellites of their own is also growing. This must give the concept of a multinational technical means of verification considerable impetus. Even the idea proposed by France in 1978 of having an international satellite monitoring agency under the UN may not be unreasonable now.

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14

The information revolution and verification

Andrew Rathmell

There is little new about the problematic interplay between technology and verification. Ever since the monitoring of arms control and disarmament agreements became of interest the verification community has had to adapt to technological change. On the one hand, regimes have had to be devised to cope with the latest weapon systems, and, on the other, modern technology has made possible new verification mechanisms.

The current wave of innovation is no different. Developments in information and communication technology (ICT) are driving transformations in the economic, political and military spheres. Powered by the forces of global capital, this trend is unstoppable, although its direction can to some extent be guided. The challenge for the verification community is to exploit the benefits of the information revolution, rather than allow it to create a whole new set of problems.

This chapter provides an overview of the most important effects that the information revolution has had on verification, and explores some of the dividends that progress in ICT could bring. It also considers a number of issues that will have to be addressed if verification is to keep pace with technology.

Advances in information technology (IT) and its convergence with sophisticated communications systems are ushering in what has been labelled an 'information age' or 'knowledge age'. It is argued that contemporary societies, led by the West, are being reshaped into 'knowledge societies'. The concept of the information age demonstrates the evolution from industrial-age manufacturing, through service-based production, to an information economy. The idea of a knowledge society reflects the perception that information is no longer just *a* resource, like capital, labour and land, but that it is increasingly *the* resource.[1]

There is widespread scepticism about the extent, pace and consequences of this information revolution. Some observers argue that the Internet economy has failed

to have a deep impact, even in the US. Others contend that the level of technological change that was achieved in the first half of the twentieth century had more far reaching social, political and economic ramifications than the digital revolution of recent decades.[2]

This chapter remains agnostic about the extent and implications of the information revolution. Nonetheless, it is indisputable that the digital revolution of the 1980s and 1990s, along with associated commercial and political developments, has had a major impact on one aspect of international security that is of particular relevance to verification: intelligence.

Intelligence can be defined as 'refined, analysed and assessed information'. It is important to stress that intelligence is about providing actionable data to decision-makers to help them understand a certain situation. Although covert sources and methods are often emphasised, these should not be at the core of the activity—they are tools that may add value to more openly collected documentation.

Intelligence is at the heart of verification. Confidence- and security-building measures (CSBMs) are about enhancing transparency between potential adversaries, and arms control regimes are reliant on mutually acceptable and reliable compliance mechanisms, which are underpinned by trusted data. In the past, certain organisations, such as the International Atomic Energy Agency (IAEA) and the United Nations (UN), have shied away from the concept. But, today, they are increasingly coming to accept that intelligence is central to their success and credibility.

The information revolution, which is defined to include associated commercial and political changes, has an impact on intelligence in two broad areas. First, the digitisation of data, along with increases in processing power, communication bandwidth, and the production of sophisticated software, has made it possible to filter, collate, store, retrieve, manipulate and disseminate information more effectively and faster than ever before.

These advances were summed up in 1995 by the US Central Intelligence Agency (CIA)'s then Deputy Director for Intelligence, John Gannon:[3]

> . . . in the mid-1980s, the analyst *communicated* within CIA by pneumatic tube; thousands of separate, unrelated *files* were maintained at Headquarters; the mainframe and 'dumb' terminals were the 'latest' in *technology*; a *megabyte* was a lot of information; and most analysts saw *computer expertise* as a speciality in others' hands. In 2006 every analyst will be adept in the use of his/her own

> *interactive terminal* combining telephone, computer, and television; worldnet will provide *instant communications* throughout the . . . [intelligence community] and consumer world; *encryption* will be unbreakable and fast; all information will be *digitized;* and a *terabyte* will be the norm for storage and retrieval of information.

Second, the combination of new technologies (like the Internet), the commercialisation of previously classified technology (including very high-resolution satellite imagery) and political change (such as the proliferation of news outlets in the former Soviet Union) has led to an exponential increase in the amount of data available from 'open sources'. Institutions like the media and academia have always been used by defence and foreign affairs intelligence agencies. However, the division between 'white' (open) and 'black' (closed, proprietary or classified) information was previously seen by the Western intelligence community as approximately an 80:20 split. This ratio may now be 90:6:4 between 'white', 'black', and 'grey' information.[4] There is no doubt that vital added value is provided by 'black' sources, such as the UK–US Signals Intelligence (SIGINT) network, the Secret Intelligence Service, or the Human Intelligence assets of the CIA. Nonetheless, it is remarkable how many of the intelligence requirements of most government departments can be filled in whole, or in part, by open sources.

Implications for verification

The implications of these developments for verification can usefully be discussed in the context of the traditional intelligence process, as used by most defence and national intelligence organisations. This process is based on a model for the development of intelligence or actionable knowledge, which starts with the structured identification of a consumer's needs, recognition of information gaps and the formulation of a collection plan. The documentation is then analysed before it is distributed to the consumer, providing the opportunity for further refinement of the information requirements.

The process is often constructed as a cycle, involving the following steps:

- planning and direction;
- collection;
- processing;
- production and analysis;

- assessment; and
- dissemination.

For now, it is helpful to focus on the effect that the information revolution has had on the second, third, fourth and sixth phases of the cycle. Planning and direction have been less affected by the information revolution so they will not be discussed in this chapter. And assessment remains at root a cognitive activity that is least affected by technological change.

Collection

The most obvious impact of the information revolution is on the collection of data for verification of arms control and disarmament regimes and export controls, as well as for use as CSBMs. Open sources—available commercially or sometimes at no cost—now provide much of the information that is needed to monitor both the intentions and capabilities of states and sub-state groups that are either party to a regime or are of concern to the international community.[5]

A proliferation of news sources and electronic discussion channels gives access to large amounts of data on the politics, policies and deliberations of all but the most closed regimes and tightly centralised sub-state bodies. The interpretation of information on the intentions and world views of governments and other organisations remains as difficult an analytical task as ever, although the open source revolution has at least provided the mass of documentation for analysts to work on. It is important, of course, not to focus exclusively on the 'new' sources and channels enabled by ICT. A lot of this data will be available from 'traditional' sources, such as scholars, journalists, activists and business travellers. However, the communications revolution, the political opening up of much of the world and economic globalisation have combined to increase the amount and quality of information that 'traditional' human sources can provide.

Meanwhile, very high-resolution commercial satellite imagery (CSI) can be used to monitor physical observables, like troop deployments, border violations and the construction of industrial facilities needed for production of weapons of mass destruction (WMD). The availability of CSI also results from technological change (the miniaturisation of satellites and sensors, improvements and cost reductions in interpretation software, and better dissemination channels) and geopolitical and economic developments (the commercialisation of the Russian military-industrial complex and US government support for the marketing of its surveillance

technologies). The outcome is that anybody with the necessary financial and organisational resources can obtain imagery intelligence which approaches the quality enjoyed by the superpowers in the 1970s.[6]

Information from commercial databases and specialist news services can be used to assess shipping movements and trade flows in regard to export controls or sanctions monitoring. Similar sources can be used to examine the activities of potential front companies and efforts to violate sanction regimes.

At the same time, tracking the movements of individuals is becoming much easier. An increasing number of everyday tasks leave 'digital footprints' that are being exploited by commercial marketers and intelligence organisations. Efforts to 'modernise' government—which most advanced countries are engaged in—will have the effect (notwithstanding data protection legislation) of giving intelligence organisations far more comprehensive pictures of the activities of citizens without recourse to clandestine methods, such as physical or electronic surveillance. This has dramatic ramifications for the monitoring of people and of small groups that are of concern, for instance, in relation to arms proliferation.

Processing, production and analysis

Analysis is at the root of the intelligence process. It is the activity most vulnerable to human error and least subject to technological 'fixes'. The majority of intelligence 'failures' are due to the foundering either of analysis or of understanding by decision-makers, rather than to a breakdown in collection.[7] For any organisation engaged in processing and analysing data for verification, it is ultimately the quality and mindset of its analysts, combined with the analyst–consumer interface, that determine success or failure.

Nonetheless, the information revolution is having a significant impact on this part of the intelligence process. For the purposes of this chapter, the most important consequence is the convergence of cheap and massive processing power with advanced software, enabling huge volumes of data to be filtered, collated, mined and interpreted. The point is not to replace human analysts, but to assist them with speedily explicating large amounts of information in order to extract patterns of activity that are of interest to decision-makers.

This capability is advancing rapidly in the commercial world. Retail businesses, including supermarkets, have invested heavily in 'data warehouses' that store gigabytes of customer information. This is analysed by data mining technologies, which

identify, for instance, fraudulent credit card use or food purchasing trends. Similar technologies are being developed and applied by law enforcement agencies to profile criminal behaviour. And part of the 'joined-up' system of government in countries like the UK is the effort to combine data sets on citizens—held by government agencies—so that individual behaviour can be tracked and monitored. The objective is to provide better services for people and to prevent criminal actions.

Developments in processing and analytical technologies are at least as important for verification as changes in open sources. Intelligent technologies allow the mass of data provided by the open source revolution to be exploited effectively. Without automated instruments, human analysts would be unable to filter, collate, store, mine and analyse this deluge of information. Furthermore, the production of advanced software tools makes analytical capabilities much more widely available. Whereas in the recent past it was only specialist public sector organisations, such as the US National Security Agency, the UK Government Communications Headquarters and the Australian Defence Signals Directorate that had access to these technologies, they are now routinely employed by small- and medium-sized enterprises and local law enforcement agencies. Given the rate and pace of change in IT, the effectiveness and ease of use of such tools are likely to increase rapidly.

Dissemination

Presentation and dissemination are an often overlooked part of the intelligence process. However, Western agencies have had to pay more attention to these issues. Intelligence staff at the North Atlantic Treaty Organization (NATO), for instance, often complain that their political decision-makers act on Cable News Network (CNN)'s unanalysed and hastily distributed data, rather than waiting for more considered assessments from the formal intelligence process.

To facilitate the speedy dissemination of well-presented intelligence products, the US intelligence community has responded by taking the lead in exploiting new technologies, such as the Internet Protocol, Hyper Text Mark-up Language (HTML) and video conferencing.[8] The aim is to get analysed work to consumers faster, and to enable consumers to interact with analysts and to arrive jointly at conclusions systematically, supported by an audited reasoning process. In addition, new technologies are being used to display data in a range of formats, text and images, that facilitate understanding and new ways of considering problems.

While these technologies and approaches should make established state intelligence organisations more effective, the point is that they involve commercial off-the-shelf systems. Indeed, many of the tools and techniques now being employed have their origins in the entertainment industry or the financial sector, and, as a result, are available to everyone. Some non-governmental groups, including political and environmental activists, have, in fact, made more effective use of communication and dissemination technologies than have government organisations.[9] This has a significant effect on verification by empowering a range of actors, such as the media, activists, and inter-governmental bodies and non-governmental organisations (NGOs), and by allowing them to construct robust and responsive regional and global information networks.

Strategic implications

The information revolution is having major ramifications on the sourcing, processing and dissemination of intelligence for those bodies undertaking monitoring and verification. For major governments with established intelligence bureaucracies, one can conclude that these trends will make verification easier.[10] However, the information revolution has some more interesting strategic implications that will affect verification. The most significant of these are the effects on the information power differential and on the role of third parties.

Information power has been broadly described as the sum of a country's resources that it can use to mould the global information environment, just as military power shapes the physical space. Some strategists argue that the information age plays to the strengths of the US and that the country will have a global advantage in terms of 'hard' military and 'soft' information power.[11] Similarly, in specific regions, states that have the appropriate social, educational, political, and technological foundations are likely to be better placed to exploit the information revolution, and thereby strengthen their information dominance over rivals. In the Middle East, for instance, this may apply to Israel, which has the societal infrastructure to exploit IT, and, therefore, to enhance its information edge over its Arab neighbours.

This may well be one trend, but there is a countervailing paradigm of perhaps greater significance. The rise of open sources and the diffusion through globalised commercial channels of ICT for gathering, analysing, and disseminating intelligence have put powerful intelligence capabilities into the hands of even NGOs and technologically backward and impoverished countries. This will go a long way towards

countering the information imbalances between parties to CSBMs or arms control treaties, and make it much easier for all sides to an agreement to gather, analyse and share data equitably.

There could be three specific outcomes to this trend. First, all parties to an accord can have access to the intelligence capabilities that were previously monopolised by the superpowers or regional hegemons. This is likely to have an impact on the willingness of states to enter into agreements and the structure of the verification regime that is put in place.

Second, the increased role of open sources of information and commercially available processing tools should make it easier for countries to share data. National intelligence agencies that are reliant on their own sources and methods will always be reluctant to share documentation and intelligence. But CSBMs and arms control regimes rely on transparency and information sharing; squaring this circle has been a vital but tricky part of past CSBM and arms control processes. The information revolution eases this problem. For instance, an increasingly popular concept is that of regional conflict prevention, involving crisis monitoring centres. In the mid-1990s, the Association of South-East Asian Nations (ASEAN) Regional Forum mooted the concept and it also emerged during the Middle East arms control and regional security talks.[12]

But this concept has been hindered by credibility problems. Quite simply, states that do not yet trust one another are loath to allow such a facility to have access to sensitive sources and methods. Increasingly, however, centres could rely exclusively on open sources, assisted by advanced processing and knowledge management techniques. They would be able to produce unclassified intelligence on military deployments, doctrines and budgets, for example, that would underpin global or regional CSBMs and arms control regimes. As important, staff seconded to such centres would have the opportunity both to work with erstwhile enemies in a relatively open atmosphere and to achieve a common understanding of their operational environment.

Third, and perhaps most significantly, the information revolution could transform the role of outside parties in verifying the implementation of peace accords, and, in some respects, arms control regimes. Generally, peace agreements have been verified by states parties, often with the help of a small number of outside countries, notably the US. This was the case, for instance, with the Israel–Egypt Separation of Forces Agreement of January 1974. With global arms control measures,

such as the 1968 Nuclear Non-Proliferation Treaty(NPT), it has also been certain leading states that have sometimes supported verification with national intelligence. Overwhelmingly, the international community has relied on the US—the only country with the global monitoring resources needed for the job.

The information revolution changes this situation. While the American intelligence community will continue to have capabilities unmatched by other states or by the commercial sector, an increasing number of verification tasks can be carried out using open sources and methods. Consequently, the capability to assess agreements is proliferating along with the technology. Since 1995, the Western European Union (EU) has operated a satellite centre that primarily uses CSI to assist with monitoring the 1990 Conventional Armed Forces in Europe (CFE) Treaty. The IAEA is beginning to fuse a range of open sources to enable it to detect proactively violations of the NPT. Research centres are showing an increasing capability to track weapons of mass destruction (WMD) developments across the world, and NGOs, such as the transnational Forum on Early Warning and Response, are exploiting open sources and communication networks to help predict humanitarian crises. And companies like the US-based Open Source Solutions and Stratfor offer a routine political and military monitoring service.

The result is that future arms control and CSBM regimes will be able to call on a much wider range of outside parties to assist with verification. The US will still have a role to play, but agencies like the IAEA and the Organization for the Prohibition of Chemical Weapons (OPCW) will be able to do much more themselves. In addition, other state actors (such as the EU), non-state actors (like research institutes and activist networks), companies and media outlets will be able to contribute to verification.

Challenges

The information revolution not only makes verification easier, but, in certain respects, it poses new problems. Three of the most significant are:

- encryption;
- technology diffusion; and
- electronic attack capabilities.

The debate over encryption policy is a well-worn one in Western societies. Towards the end of 1999 the US government seemed to have acknowledged that it was

fighting a losing battle in seeking to control the export of encryption software. Its more liberal approach parallels that of other states.[13] Nonetheless Western intelligence agencies are still grappling with the likely loss of one of their most useful sources: signals intelligence from intercepted communications.

Encryption poses a similar problem for CSBMs and arms control verification. Western intelligence agencies that help to monitor such regimes rely heavily on SIGINT, tapping into global civilian, military and government voice and data links. Although they have the computing power to crack most encryption codes in time, the widespread availability of encryption to governments, citizens and sub-state groups will make their job much harder, more time consuming and more resource intensive. The proliferation of strong encryption thus makes it harder for national signals intelligence agencies to assist with verification.

The problem presented by encryption is a subset of a wider issue raised by the diffusion of ICT in the global market. Through the so-called Revolution in Military Affairs, developments in ICT are enabling the US and some of its allies to become more powerful in conventional military terms. No other state will be able to match the mobile and lethal force that the US will deploy under its Joint Vision 2010 blueprint for network-centric warfare.[14] But states and sub-state groups will be able to exploit niche technologies like WMD, allowing them to pack a powerful punch. Another concern is that small states and sub-state groups may exploit freely available commercial information and communication technologies in order to utilise limited resources against their larger opponents.

These technologies range from mobile, secure, satellite communications, through intelligence gathering and mission planning tools, to precision-guided munitions. If networked, media-savvy groups or state organisations take advantage of this combination of technologies they could pose serious military threats to status quo powers.[15] Russia has faced a precursor to this problem with the Chechen rebels, and the US with Osama bin Laden. In verification terms, this raises difficult questions about the nature of dual-use technologies and the convergence of military and civilian technologies and applications.

These difficulties are brought into sharp focus in the emerging debate over information warfare (IW). This is a broad concept, but a particularly problematic aspect is that of electronic attack or, more specifically, Computer Network Attack (CNA). The latter involves the use of computers to launch a logical strike on terminals via digital networks and telecommunication links. Assaults may result in the

denial of services or the compromising of data integrity and confidentiality. Although long used as a tool of espionage and to some extent integrated into battlefield electronic warfare, CNA is becoming of greater concern to countries and businesses that are ever more reliant on networked information systems and the Internet. A number of states have followed the US lead in identifying logical threats to their increasingly interconnected and interdependent Critical National Infrastructure (CNI) as major security concerns.[16]

These fears have led to a debate over how best to characterise and deal with the danger. The approach currently favoured by the US and its allies, which are investing in offensive IW techniques, is to treat it as a criminal or terrorist problem. They are pushing for enhanced international co-operation in order to put in place the legal, technical and policing measures necessary to ensure that all countries work together to protect their CNI and the global information infrastructure.

An opposite perspective has emerged from states that feel threatened by the possibility of offensive IW by the West. Russia has championed this approach and has proposed that the UN treats IW as a military issue in the General Assembly's First Committee and discusses outlawing it. This involves viewing CNA as military technology, and thus devising laws of armed conflict and, possibly, arms control measures to restrict its proliferation and use.

There is growing pressure from within Western militaries to exploit their advantages in this field.[17] This is likely to energise other members of the international community to push for controls and to consider ways of limiting this new capability. Paradoxically, the problem is that any conceivable regime to restrict the use or possession of IW poses tremendous challenges for verification. The tools and skills needed to conduct CNA are not only inherently dual-use, but they are also virtually impossible to monitor in a globalised, digital economy.

Conclusion

The information revolution should be a boon to verification. At heart, verification is about transparency and information sharing, which are both facilitated by progress in ICT. The latter gives advanced governments far greater capabilities to track and assess national and international developments. Meanwhile, the proliferation of these technologies diffuses monitoring capabilities widely across the international system. The environment in which today's arms control and CSBM agreements were forged was characterised by the uneven distribution and concentration of

data in key states. In the information age, data resources will be much more broadly dispersed. Instead of relying on a handful of great powers, arms control and disarmament regimes can be checked by a network of official and unofficial actors with extensive collection, analytical and distribution capabilities.

This will have a significant impact on the identity and role of third parties, and on proposals for regional or global monitoring and information-sharing mechanisms. If the capability to check agreements is widespread and can largely rely on open sources and methods, then the dynamics of arms control regimes will change. International agencies, such as the IAEA and the OPCW, will gain in power and autonomy. As multinational organisations gradually lose their fear of 'intelligence' and develop in-house intelligence structures, they will be able to exploit the information revolution to collect, process and analyse vast amounts of open source data on potential non-compliance. This will allow these institutions to verify compliance much more effectively, and will make them less reliant on intelligence from national technical means, which can be politically difficult to use. At the same time, private interests, like media organisations, research centres and NGOs, will play a greater role. Even small and technologically backward states will be able to contribute to verification, rather than relying exclusively on allies, such as the US.

But technological developments will also pose challenges for existing and future verification regimes. Encryption will make the work of intelligence agencies harder, and the diffusion of niche dual-use technologies that can be exploited asymmetrically by small groups and weak states raises complex monitoring issues. The latter is particularly evident in relation to IW, which presents both a conceptual and an implementation problem for the verification community. Conceptually, decisions need to be made about whether to treat this new military capability as an arms control or criminal matter. In terms of implementation, if it is seen as a question of military technology, then there will be tremendous problems in devising a monitoring regime to check development or the use of illicit capabilities.

Technology poses the same dilemma it always has for verification: how to harness the benefits while minimising the downsides. A particular problem with the contemporary 'technology rush' is that societal concepts and institutions tend to fall behind the emergence of new technology. This lag is likely to be especially large in the context of the international community, which rarely acts quickly in any case. As technology moves further ahead of international policy-makers, it will probably

take some time for the dividends to be harnessed. Meanwhile the downsides will be left to worsen.

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15

Compliance mechanisms for disarmament treaties

A. Walter Dorn and Douglas S. Scott

The main goal of treaty verification is to determine and, hence, to promote the compliance of parties. There are also a variety of other means and mechanisms—some of them provided for in treaties themselves—to prevent parties from violating their commitments and to permit action to be taken in the event of non-compliance. These include an array of possible incentives (carrots) and disincentives (sticks). This chapter examines the compliance instruments used to support multilateral arms control and disarmament treaties, especially those of global scope. A summary of such compliance provisions is provided in the table. By studying the treaty provisions, along with state motivation and behaviour, and possible additional international actions, it is hoped that better compliance mechanisms can be developed.

What makes nations comply with treaties they have signed? There is no world police force to monitor, let alone enforce, compliance with international standards. Nonetheless, it remains true that most states comply with most of the agreements they have signed most of the time.

A sense of national honour provides the basis for treaty compliance, although sometimes it is a rather shaky foundation. To a greater or lesser extent, states, like individuals, feel obliged to live up to their commitments.[1] In international law, this sense of duty is epitomised by the Latin edict *pacta sunt servanda* (treaties must be respected). In the 1925 Geneva Protocol—the first modern multilateral disarmament treaty—the only compliance mechanism invoked in the text is the sense of national honour. The Protocol states that it is 'a part of International Law, binding alike the conscience and the practice of nations'.

There have been very few occasions since the end of the Second World War when nations have openly violated disarmament treaties to which they are a

party. Even when North Korea was refusing access to inspectors from the International Atomic Energy Agency (IAEA), and thus contravening its obligations under the 1968 Nuclear Non-Proliferation Treaty (NPT), it was careful to put forward a series of excuses and claimed to be in full compliance. The explanations were generally invalid, but not once did this isolationist state declare that it was ignoring or ceasing to abide by the NPT. In recent times, the most frequent examples of flagrant treaty violations involve Iraq, although Baghdad offers excuses and claims to be acting lawfully.[2]

Verification of compliance

The practice of self-justification by suspected violators highlights the need for an impartial forum to make judgements about whether states are truly in compliance. Catching and pursuing a nation that is cheating on a treaty requires that an authoritative and respected body first make an objective determination of non-compliance. The alternative is always weaker: unilateral determinations, usually by unfriendly countries. A fundamental compliance mechanism is, therefore, international verification. Even when there are no immediate suspicions of treaty violations impartial verification can help to increase confidence. This wise approach is embodied in the Russian proverb 'trust but verify'.

States must have faith in the technical and managerial capabilities of the international verification organisation (IVO) or any other body that carries out the monitoring. In addition, verification procedures should be non-discriminatory. A problem often arises in IVOs about how to focus energy, resources and attention on suspected states without being labelled discriminatory. The solution requires that an IVO conduct 'baseline' inspections[3] of relevant sites, facilities, weaponry and/or materials in all states parties impartially and equally. When it has gained credible evidence of a violation, however, it should carry out special, in-depth investigations and inspections of the suspected country.

Usually IVOs rely on the regular submission of declarations and reports by parties on their own activities. For several disarmament treaties, such as the NPT and the 1992 Chemical Weapons Convention (CWC), these are followed by inspections to verify the information. But such basic inspections are not always sufficient to detect non-compliance, particularly when they do not identify facilities or activities improperly omitted from the declaration. Obviously Israel had confidence in neither the limited reports submitted by Iraq to the IAEA nor the Agency's subsequent

inspections when the Israeli air force bombed the Osiraq reactor in 1981. In that case Israeli doubts were well founded, although its unilateral actions remain questionable under international law. After the 1990–91 Gulf War, inspections by the UN Special Commission (UNSCOM)— created by the Security Council in 1991 to monitor and assist with the destruction, removal or rendering harmless of Iraq's weapons of mass destruction (WMD) —revealed that the country had a nuclear weapons programme, which it had managed to hide from the IAEA. The Agency's safeguards regime did include searches of undeclared sites, and, thus, made it possible for Iraq to acquire and store some 400 tonnes of undeclared uranium.[4]

In response to the failure in Iraq, IAEA Director-General Hans Blix argued that the Agency must receive all relevant information in the possession of member states, even if it involves sharing sensitive satellite intelligence. Although he was not able to create a new unit in the IAEA for this purpose, the US provided increased intelligence information both to the Agency in the case of North Korea, and, later, to UNSCOM. Consequently, special inspections and more intrusive procedures can be initiated by the organisation when necessary.[5]

There remains a great deal of resistance among some countries, notably the US, to giving international bodies the right to make a determination of compliance or non-compliance. During the CWC negotiations, the US insisted that decisions 'as to whether a Party is complying' should not be put to a vote in the treaty administering body, the Organization for the Prohibition of Chemical Weapons (OPCW).[6] The final text, though, provides that the Conference of the States Parties (CSP) of the OPCW shall 'review compliance with this convention' (Article VIII, paragraph 20).[7] Still the US maintained that, while compliance matters may be discussed, the final decision rests with each individual state. Despite such a view, it is highly likely that the responsible organs under the CWC—the Executive Council and/or the CSP—will make decisions on non-compliance and that these will be taken as legally authoritative.

The Comprehensive Nuclear Test Ban Treaty Organization (CTBTO) and the proposed Organization for the Prohibition of Biological Weapons (OPBW) will follow the same OPCW precedent. The OPCW itself is built on the IAEA precedent.[8] An existing example of an international body passing judgement on a disarmament treaty is provided by the IAEA governing body's resolutions of 1991 and 1993, declaring that Iraq and North Korea respectively were in violation of their safeguards agreements, and, hence, the NPT (which incorporates the safeguards agreements by

reference).[9] The IAEA Statute explicitly provides such authority to decide on non-compliance: 'The Board shall call upon the recipient State or States to remedy forthwith any non-compliance which *it finds to have occurred*' (emphasis added).[10]

The organisation must also have a means of publicising its decisions regarding compliance. The international media, for instance, closely followed the work of UNSCOM, which led to increased international attention and understanding, even though the reporting was often biased, inaccurate, incomplete and sensationalist. Unfortunately more attention was not paid to the UN Secretary-General's investigations of Iraq's non-compliance in the mid-1980s, when it used chemical weapons against Iran and its own people, in disregard of its obligations under the 1925 Geneva Protocol.

In addition, civil society is increasingly finding an appreciated role for itself in disarmament verification. For instance, Landmine Monitor—a consortium of non-governmental organisations (NGOs)—has begun to issue annual reports on the status of the 1997 Landmine Convention. The organisation helps to fill a vacuum in the treaty regime, which does not have an administering body, although it does authorise the UN Secretary-General to carry out a number of transparency and confidence-building tasks and to assist states parties in the event of another party's suspected non-compliance.[11] Landmine Monitor is a civil society effort 'to hold governments accountable to their obligations'. Being an NGO consortium, it is less constrained by diplomatic restrictions. Its reports provide a frank, overall assessment of the global status of the Convention, as well as specific commendations and criticisms of certain governments. *Landmine Monitor Report 1999* specifically named three countries as treaty violators.[12] Despite shortcomings in the scope, depth and consistency of the information, the report offers refreshing input into disarmament discussions and evaluations. In the area of international humanitarian law (which includes some treaties within the disarmament field, such as the 1980 Certain Conventional Weapons Convention), there is a long and constructive history of NGO assessment of compliance.[13]

Objective verification—a *sine qua non* of an effective compliance system—may not be sufficient to deter breaches.[14] In the mid-1980s, for instance, the UN Secretary-General verified Iraqi violations of the 1925 Geneva Protocol. While it can be argued that nothing short of military force could have stopped the Iraqi regime, international pressure at a much earlier stage would have been wise and entirely warranted at a time when Iraq was being armed by the major powers.[15]

Pressure on states parties can be of various sorts, most easily categorised as 'carrots' and 'sticks'. These are the incentives for compliance and disincentives for non-compliance that can be applied by the international community. Treaties that include provisions for such measures become more robust. It is, therefore, worthwhile to examine in detail the range of benefits and penalties that can be incorporated into treaties during negotiations or applied more randomly afterwards to increase the motivation for compliance.

Benefits

Nations may derive long-term general benefits from disarmament treaties. By joining a treaty regime they contribute to the establishment and development of international standards of behaviour, creating a safer environment for themselves and others. The presence of order and standards in international affairs is essential for the national security, economy and internal functioning of states. Treaties help to build sustainable security. For instance the CWC, which establishes a global norm against the production and stockpiling of chemical weapons, is a concrete step toward removing the risk of chemical attack. Countries will feel less threatened and more secure because of the Convention. Similarly, the 1963 Partial Test Ban Treaty (PTBT) removed the threat of radioactive fallout in the atmosphere from nuclear weapon tests—to the relief of states and citizens everywhere. In this general category of benefits, all states, including non-parties, gain as members of the international community.

Furthermore, direct and specific advantages usually accrue from being a party to a treaty. The CWC provides that a party being attacked by chemical weapons may receive assistance from the international community in order to defend itself against the assault (including gas masks and detection equipment). It also allows for the easing of restrictions on trade in sensitive chemicals among parties and a right to participate in the 'fullest possible exchange of chemicals, equipment and scientific and technological information' relating to chemistry.[16] The 1997 Inter-American Treaty on the Illicit Manufacturing and Trafficking in Firearms (Inter-American Treaty) promotes, among parties, scientific and technical information exchanges useful to law enforcement, co-operation in tracing firearms, as well as training programmes, technical help and mutual legal assistance. The Landmine Convention also encourages assistance to parties for mine clearance, stockpile destruction and victim care and rehabilitation. Although the actual degree of help

is determined by states at a later stage, a state party might miss out on considerable opportunities if it decided to violate or withdraw from the treaty.

Other specific benefits may not be in the text of the agreement but may be developed after the treaty is negotiated. To encourage support and compliance with the NPT among states without nuclear weapons, for instance, some nuclear powers have provided them with negative and/or positive security assurances. These amount to promises not to threaten them with nuclear weapons and to come to their assistance in the case of such a threat or attack. Still non-nuclear weapon states are seeking broader and clearer affirmation of such pledges, as well as accelerated nuclear disarmament.

Penalties

The removal of treaty benefits can be considered a form of penalty. Several disarmament agreements stipulate that non-complying states will lose their 'rights and privileges'. For example, states parties to the NPT gain increased access to nuclear technology; by violating the accord they risk those advantages. In June 1994 the IAEA actually suspended its non-medical assistance to North Korea, when Pyongyang insisted on continuing its nuclear refuelling campaign (including the movement of an unspecified amount of weapons-grade plutonium) without the required inspections. The CWC contains provision for the suspension of a party's 'rights and privileges', which could possibly include the following:

- the right to the fullest possible exchange and trade in chemicals;
- the right to vote and to have nationals appointed to the OPCW;
- the right to receive information from the Organization;
- the right to prohibit undesirable persons from serving on inspection teams; and
- the right to call for a challenge inspection or to limit the number of inspections on its territory.

The right to be a member of the Organization, though, cannot be taken away: it is guaranteed by the Convention, as long as a state remains a party.

The response to North Korean violations of the NPT highlights an extensive list of other potential penalties, although they were not actually applied in this case.[17] In 1994 the US threatened Pyongyang with the following sanctions: a mandatory arms embargo; a halt to UN aid; a ban on financial transactions (including important remittances from North Korean nationals living in Japan—a substantial

source of income); a reduction in the size of North Korean foreign missions; and a cut in the number of North Korean staff working for international organisations.

Washington accelerated military exercises with South Korea and even deployed a battle group to the Sea of Japan. The first result was an agreement by North Korea to freeze its nuclear activities in return for direct negotiations with the US. In the end the carrot was used instead of the stick—a very large carrot, indeed. On behalf of a consortium of nations the US offered massive incentives to North Korea—including two new nuclear power plants, thousands of tonnes of oil and other materials—all in return for an immediate freeze on its nuclear activities and a promise to dismantle its plutonium extraction facilities.

The post-Cold War 'unfreezing' of the Security Council has allowed the application of sanctions to become an important and frequently used form of penalty to redress non-compliance. Sanctions may be military (arms embargoes), economic (boycotts), financial (freezing of foreign accounts), transport-related (a ban on flights to the nation's territory or the creation of no-fly zones), sports/cultural (refusal to permit interaction) and other non-co-operative measures (suspension of research and development). A multi-billion dollar 'stick' was used against Iraq in the form of the ban on oil exports, pending the complete and final destruction of its WMD. The combined carrot and stick approach was used later when, although the sanctions remained in effect, Iraq was permitted under the UN 'Oil for Food' programme to sell certain quantities of oil in exchange for humanitarian supplies.[18]

In many cases the application of sanctions has been shown to be deficient in a number of ways. The UN Secretary-General highlighted some problems: the 'imprecision and mutability' of sanctions as currently practised by the Security Council, given that millions of people may be made to suffer for the actions of a few; the lack of 'objective criteria for determining that their purpose has been achieved'; and the need to protect innocent victims and to compensate neighbouring states or the economic partners of targeted countries.

The Secretary-General also proposed the development of a mechanism in the UN Secretariat to assess the effects of sanctions before and during their application in order to 'fine tune' them.[19] Other observers have suggested that, if human ingenuity can produce 'smart' bombs to locate small targets, then it should be able to devise 'smart' sanctions for maximum effectiveness and minimum collateral damage. Since 1998 the UN's Charter Committee has been working on guidelines to apply to future sanctions regimes imposed by the Security Council.[20]

Multilateral arms control and disarmament treaties: major prohibitions and compliance provisions

1920s

Geneva Protocol, 1925

- use in war of chemical and bacteriological weapons.
- ♦ no compliance provisions.

1950s

Antarctic Treaty, 1959

- any measure of a military nature and any testing of weapons in Antarctica.
- ♦ parties to exert pressure to ensure compliance; consultation among parties; referral of disputes to ICJ by mutual consent.

1960s

Partial Test Ban Treaty, 1963

- nuclear weapons testing in the atmosphere, outer space and/or underwater.
- ♦ no compliance provisions.

Outer Space Treaty, 1967

- nuclear weapons or any other WMD in outer space; military use of celestial bodies.
- ♦ consultation among parties; incentives for compliance: information sharing.

Nuclear Non-Proliferation Treaty, 1968

- non-nuclear weapon states must not manufacture or acquire nuclear weapons; nuclear weapon states cannot help others to acquire nuclear weapons.
- ♦ incentives include peaceful nuclear cooperation; IAEA used for verification and promotion of compliance; IAEA Statute provides that its Board may: request a party to remedy non-compliance; refer violations to UN Security Council and General Assembly; impose specific penalties, such as curtailment or suspension of assistance, return of materials and suspension of privileges and rights.

1970s

Sea Bed Treaty, 1971

- placement of WMD on seabed.
- ♦ consultation and co-operation to ensure compliance; lodging complaint with UN Security Council.

Biological Weapons Convention, 1972

- development, production, stockpiling, transfer and use of biological weapons and means of delivery.
- ♦ domestic implementation measures, if considered necessary; consultation and co-operation among parties; lodging of complaint with UN Security Council; incentives: assistance to victims.

Environmental Modification (ENMOD) Treaty, 1977

- military or hostile use of the environment.
- ♦ domestic implementation measures to prevent violations, if considered necessary; consultation among parties to solve problems; convening of Consultative Committee of Experts for fact-finding; lodging complaint with Security Council; incentives: exchange of information on ENMOD for peaceful purposes; assistance to victims harmed by violations.

Moon Treaty, 1979

- placement of WMD in orbit or around the Moon; bans establishment of military bases and testing of weapons on the Moon.
- ♦ consultations among parties; peaceful settlement of disputes by method of parties' choosing, including assistance of UN Secretary-General.

1980s

Certain Conventional Weapons Treaty, 1980

- four protocols banning: use of weapons dispersing non-detectable fragments; certain types of landmines and booby traps; use of incendiary weapons; and use of blinding lasers.
- ♦ publicity about treaty; consultation and co-operation between parties.

1990s

Chemical Weapons Convention, 1992

- development, production, stockpiling, transfer and use of chemical weapons.
- ♦ national penal legislation against violators must be enacted; National Authority to be established for liaison; OPCW created to 'ensure the implementation' of the treaty and to promote compliance; consultation and co-operation among parties, including clarification of ambiguous situations, and use of group of experts for fact-finding; peaceful settlement of disputes, including referral to ICJ; OPCW may request that a party take measures to redress a situation in a specific period; OPCW may restrict or suspend a party's rights and privileges; OPCW may recommend collective measures to states parties, including sanctions; OPCW may ask for advisory opinion from ICJ; referral of serious violations to UN General Assembly and Security Council; incentives: assistance and protection against attack, including dispatch of emergency aid; economic and technological benefits, including fullest possible exchange in chemistry, removal of trade and other restrictions.

Comprehensive Nuclear Test Ban Treaty, 1996

- nuclear tests and other nuclear explosions in all environments.
- ♦ national implementation measures, including 'any necessary measures' to prohibit violations; National Authorities created for liaison; Comprehensive Nuclear Test Ban Treaty Organization (CTBTO) created to ensure implementation of Treaty, including verification; consultation and co-operation among parties to clarify and resolve issues of concern; CTBTO to assist in clarifying matters; CTBTO may request that a state party take measures to redress situation within a specified time; CTBTO may suspend parties' rights and privileges; CTBTO may recommend to states parties collective measures, including sanctions; CTBTO may ask for advisory opinion from ICJ; referral of non-compliance to the UN; peaceful settlement of disputes, including consultation, and referral to ICJ by mutual consent.

Landmines Convention (Ottawa Treaty), 1997

- use, stockpiling, production and transfer of anti-personnel landmines.
- ♦ parties to take all appropriate legal, administrative and other national measures, including the imposition of penal sanctions, to prevent and suppress violations; consultation and co-operation; a concerned party may submit request for clarification; special meeting of states parties may request a party to take measures to address compliance issue within a specified period; UN Secretary-General may exercise good offices; fact-finding provisions; incentives: fullest possible exchange of equipment, material and information; assistance for mine victims and mine awareness programmes; help with mine clearance and destruction.

notes

• major prohibitions ♦ compliance provisions for treaty (review amendment and withdrawal excluded)

Very few treaties in the disarmament field—or in any other area of international law for that matter—provide for specific penalties for non-compliance.[21] Nations, especially the major powers, have been reluctant to codify international responses and would prefer the flexibility to respond on a case-by-case basis. Most of the treaties provide for recourse to the UN Security Council, an action that may not strike fear in the hearts of leaders of non-complying states. In particular, the UN Security Council is virtually useless in the face of non-compliance by one of its veto-carrying permanent members or by any state that is under their protection. The Security Council has already been criticised for its failure to act on the Soviet Union's violations of the 1972 Biological Weapons Convention (BWC), although it is obvious that it could not have imposed penalties or censured the country given its veto status.[22]

Principles of response

If the world is to move closer to the global rule of law, the range of responses to non-compliance needs to be guided by universally recognised principles of justice, especially impartiality, proportionality and automaticity. Impartiality requires that all parties be considered equal before the law and be accorded the same type of treatment. But in the politically charged environment of the international community, impartial action is all too often disregarded. Those nations with superior economic, military or political power are treated differently in political fora. What is needed is a legal approach with, for instance, provisions for mandatory recourse to judicial bodies like the International Court of Justice (ICJ).

There is resistance to this idea, though, as was demonstrated by the nuclear powers' opposition to an ICJ review of the legality of nuclear weapons.[23] Few disarmament treaties oblige parties to bring unresolved disputes to the ICJ, but several, such as the 1959 Antarctic Treaty, the 1967 Treaty of Tlatelolco and the CWC, recommend referral if all parties consent to it.[24] The CWC also provides that the OPCW may seek an advisory opinion from the ICJ.

The other two fundamental principles are proportionality (punishment is proportional to the crime) and automaticity (application of penalties as soon as non-compliance has been determined). But, again, these principles are often disregarded in practice. When Iraq violated the Geneva Protocol by using chemical weapons against Iran, there was no automatic response (except criticism) and no penalties were imposed.[25] By contrast, some observers contend that there was a lack of

proportionality in the case of the devastating sanctions and isolation measures imposed on Iraq in 1991.

A fourth principle of increasing importance is 'individuality' or individual accountability. It can be argued that international penalties can never be fair or satisfactory until individuals or small groups, as opposed to nations, are made the object of punishment. Shifting from national to individual responsibility would mean that leaders are held personally accountable for the behaviour of their countries and those under their command. There is a long way to go on this matter, but some powerful precedents are being developed in the human rights field, including:

- the war crimes tribunals created for the former Yugoslavia and Rwanda;
- the detention in the UK in 1999–2000 of former Chilean President Augusto Pinochet on charges of human rights abuses; and
- the adoption of the 1998 Statute for an International Criminal Court.

National legislation

There is an easier way to introduce the notion of individual accountability directly into the treaty implementation process: by including a provision that requires states parties to pass domestic legislation prohibiting their citizens from violating the terms of the accord and penalising them if they do so. The BWC includes vague wording along these lines, requesting each state party 'in accordance with its constitutional processes, [to] take any necessary measures to prohibit and prevent the development' of biological weapons within its territory or under its jurisdiction or control. Despite the absence of a specific provision in the Convention some states (such as Australia, the Netherlands and the US) have passed penal legislation, while others (like Canada) have deemed it unnecessary. The CWC goes much further, and, for the first time in the history of arms control, specifically requires that 'each State Party shall . . . enact penal legislation'.[26] Such legislation must 'prohibit natural and legal persons anywhere on its territory or in other places under its jurisdiction . . . from undertaking any activity that a State Party to the Convention is prohibited from undertaking by this Convention' (Article VII, Paragraph 1).

The type of punishment handed out to violators is left to states to legislate and put into practice. But they must inform the OPCW about their legislation. In BWC review conferences, states have been requested to deposit copies of their legislation with the UN. Future treaties could provide for an assessment of national legislation—a mechanism that already exists in some international trade,

investment and labour agreements. And a well-developed regime, such as that overseen by the International Labour Organization (ILO), could even require modifications to legislation and, possibly, review and overturn national judicial decisions.

One obvious limitation of domestic penal legislation is that an independent judiciary is needed for it to be of true value. In some states, which may also be the most likely to engage in treaty non-compliance, the legal system would be unlikely to pronounce judgement against the wishes of the state, much less enforce international law or even its own decisions. But, even in these states, the requirement for penal legislation may have some effect, if only to embarrass the judiciary or to raise concerns in the minds of current leaders about decisions that may come to haunt them.[27] One possible disincentive to making domestic legislation mandatory under a treaty is that the added burden of passing new laws might cause some states to delay ratification, since the adoption of such legislation may be required before ratification can take place. Despite the difficulties, though, this more complex process is something that should be welcomed.

Other mechanisms

Objective verification, incentives and penalties, as well as domestic implementation provisions (especially penal legislation), should be regarded as fundamental mechanisms to promote compliance. Other perhaps less important instruments and procedures will be briefly discussed. However, the following is by no means exhaustive.

Dispute settlement mechanisms

Minor disagreements over the interpretation or implementation of a treaty are to be expected among parties. If they are not dealt with, tensions can escalate, encouraging non-compliant behaviour and even threatening the integrity of the treaty regime itself. Many agreements thus encourage or oblige states to follow certain mechanisms for the peaceful settlement of disputes. The first step often cited in treaties is consultation. The Antarctic Treaty commits states involved in disagreements over treaty interpretation 'to consult among themselves with a view to having the dispute resolved by negotiation, inquiry, mediation, conciliation, arbitration, judicial settlement or other peaceful means of their own choice' (Article XI, Paragraph 1). A resolution method that is specifically named in many disarmament treaties is referral by mutual consent to the ICJ. While no multilateral disarmament treaty has yet provided for mandatory recourse to the ICJ,[28] several treaty-administer-

ing organisations are entitled to apply to the body for an advisory opinion, even if one or more of the parties objects.[29] They may also apply pressure to conflicting parties to bring disputes to the Court. Under the IAEA Standard Safeguards Agreement,[30] however, a party to a dispute may submit the matter to an arbitration tribunal without the consent of the other disputant. Its decision is binding.

The CWC provides the most developed and detailed mechanisms for consultation, provisions that were subsequently copied in the 1996 Comprehensive Nuclear Test Ban Treaty (CTBT).[31] Both treaties stipulate that parties should 'make every effort to clarify and resolve [disputes], through exchange of information and consultations among themselves'. If a suspicious state requests clarification about a compliance issue, the suspected state is obliged to respond within ten and two days for the CWC and CTBT, respectively. In order to increase the pressure on the suspected state party, the requesting state can ask the treaty organisation (the executive councils) to demand clarification within 24 or 48 hours for the CWC and CTBT, respectively. If the response is not sufficient, the treaty organisation can form an expert group to study the compliance problem.

Graduated measures

Once non-compliance is suspected, there is usually a process of graduated exposure: consultation with the suspected party; formal recommendations from an expert group or governing body; possible demands for inspections; demands for remedial action with a stipulated deadline; increased public exposure; referral to the UN Security Council; condemnation in national and international fora; and collective measures or other arrangements to address non-compliance (for example, the North Korea–US bilateral agreement of 1994).

In most of the treaties signed since 1967, these measures are provided for in outline only. Similar provisions appear likely to be adopted in the verification protocol to the BWC. Among the collective actions that can be suggested by the respective treaty-administering organisations are sanctions. Although, unlike decisions of the Security Council, these measures can only be in the form of recommendations to states parties and must not involve the use of military force, they could still be quite powerful if undertaken voluntarily and collectively. More in-depth academic analysis of these instruments and their application could be useful, especially an examination of the provisions and precedents in other areas of international law. In labour conventions and the ILO, for example, certain high-

level government officials may be called to appear at ILO headquarters in Geneva, Switzerland, to explain their country's behaviour to an international audience, including state representatives and members of the business community.[32]

Domestic implementing agency

Several treaties provide that each party must establish or designate a government agency to be responsible for overseeing compliance and liaising with the IVO. Consequently, a constituency within the government is created that, formally at least, is committed to upholding the agreement and promoting its smooth operation. Such a National Authority, as it is called in the CWC and CTBT, can also be expected to help facilitate inspections and become involved in the licensing process (of dual-use chemicals, for example). There is a danger that a National Authority may be used to support non-compliance and to help a state evade detection, but international treaty-administering organisations should be able to gain enough experience over time to know if trust is warranted. If necessary an obstructive National Authority could be exposed and the nation reprimanded.

Amendment and review provisions

To deal with possible dissatisfaction among states parties, which might lead to non-compliance or withdrawal, there should be a mechanism for amendment and for treaty review conferences where complaints can be voiced and constructive measures adopted. BWC review conferences are held every five years and have helped to advance transparency and confidence-building initiatives. The PTBT Amendment Conference of 1991 and the NPT review/extension conference of 1995 both allowed the majority of states dissatisfied with the status quo to press the nuclear weapon states for more progressive nuclear disarmament.

Withdrawal clauses

Provisions for withdrawal are often included in treaties and may provide some benefits. First, they may serve as an incentive for nations to sign a treaty since they would not feel trapped indefinitely, especially if they can pull out when their 'supreme national interests' are jeopardised. Second, there may be restraints on withdrawal that enhance compliance at critical moments. For instance, the NPT has a three-month time lag between the declaration of withdrawal and the date it takes effect. This provision provided valuable time for the international community to exert pressure on North Korea to prevent its withdrawal.[33]

Learning from other areas of international law

Other branches of international law have also developed useful new mechanisms for compliance. International humanitarian law, human rights law, and trade/labour/investment law offer novel instruments and procedures for consideration in the negotiations of future disarmament treaties. Peace agreements, both between states and between warring factions within states, also offer innovative approaches. There are many possible types of treaty provisions to consider, including: individual accountability; measures to accommodate and obligate non-state actors; binding dispute settlement mechanisms (especially in trade agreements); methods of arbitration and adjudication; means to protect 'whistle-blowers'; retaliation rights (such as retaliation in kind);[34] methods of imposing financial penalties; liability for compensation; confiscation of materials (as in the laws of contraband); court challenges initiated by NGOs and other civil society actors (to apply pressure and provide exposure);[35] and strengthened links to domestic enforcement mechanisms.

As mentioned above, one of the most powerful means of promoting treaty compliance is to harness the target state's own law enforcement mechanisms. This approach was developed to a high level of sophistication in the 1993 Side Agreements under the 1992 North American Free Trade Agreement (NAFTA) between Canada, Mexico and the US. These agreements, which involve the same parties as NAFTA, deal with environment and labour matters.[36] A special mechanism involving judicial enforcement was inserted at Ottawa's request and applies only in cases where the non-compliant party is Canada. In other instances the agreement allows the injured party to apply penalty tariffs.

After proving to a panel of experts that it has been affected by Canada's illegal behaviour, the injured party is entitled to register the panel's decision with the Federal Court of Canada (FCC). At that point the decision takes effect automatically as a judgment of the Court and is treated like any other court order. In effect, the injured party has a mandatory injunction against the Canadian government, requiring it to take the remedial steps contained in the panel decision. In the unlikely event of the Canadian government failing to comply, the injured party is entitled to apply to the FCC for remedies in aid of execution, such as seizure of assets, or, conceivably, in a serious case, imprisonment of the responsible official.

This important example and the previous list show that there are many new and potentially fruitful avenues for study in comparative international treaty law. The field of 'compliance methodology' in disarmament, as well as in inter-

national law in general, is quite a new discipline.[37] In the past, much more attention has been paid to verification than to the means of ensuring compliance and of responding to violations. With additional research, more creative provisions might be inserted into future disarmament treaties and measures might be taken to uphold current agreements.

Conclusion

Compliance mechanisms in disarmament accords have gradually become more sophisticated in the twentieth century. From the primitive provision of the 1925 Geneva Protocol to the complex mechanisms of the CWC, great strides have been made to increase verification capabilities, to list the rewards for compliance and penalties for non-compliance, and to incorporate many other compliance initiatives.

In the twenty-first century the international community will have many opportunities to make treaties more robust with the inclusion of novel and evolving compliance mechanisms. In this way, one can hope that international law will gradually acquire the force of national legislation and be more strictly monitored, enforced and obeyed. Treaty compliance mechanisms are building blocks for a safer future. If nations are to carry out deep reductions in their weaponry and move towards their stated goal of 'general and complete disarmament under strict and effective control', then even more progressive instruments will need to be devised.

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Endnotes

[1] Fortunately this commitment to treaty adherence extends to agreements signed by previous governments on behalf of the state, even if the leaders of the current administration were opposed to the signing of the treaty.
[2] Iraq has violated the 1925 Geneva Protocol, its IAEA safeguards agreement, the NPT and its 1991 agreement to abide by UN Security Council resolution 687, which calls for the elimination of all Iraqi weapons of mass destruction. The disarmament requirements of that resolution were formally accepted by the Iraqi parliament, and, consequently, they constitute a disarmament agreement. See 'Letter dated 10 April 1991 from the Permanent Representative of Iraq to the President of the Security Council Transmitting the National Assembly Decision of 6 April 1991 Concerning Acceptance of Security Council Resolution 687 (1991)', UN document S/22480, 11 April 1991.
[3] Treaties typically require parties to submit initial declarations about treaty-related facilities or activities, which may then be subject to baseline verification.
[4] Leslie Thomas, *IAEA Bulletin*, 34(1992), p. 21.
[5] See statement by IAEA Director-General Hans Blix in *Hearings before the Committee on Foreign Relations,* 102nd Congress, First Session (S. Hrg. 102–422), 17 and 23 October 1991, US Government Printing Office, Washington, DC. The idea of establishing a new information/intelligence unit within the IAEA Secretariat met substantial opposition from member states, and, as a result, was shelved. The current approach is to handle sensitive information within the Director-General's own office.
[6] 'The report of a fact-finding inquiry should not be put to a vote, nor should any decision be taken as to whether a Party is complying with the provisions of the Convention', footnote in the US draft convention submitted to the Conference on Disarmament in 1995, UN document CD/500, Annex I.A.5. This wording appeared in every version of the Rolling Text after the US submission (including CD/1116 of 20 January 1992, Article VIII, paragraph 20(d), footnote 2) up until the eve of the Convention's final draft being adopted.
[7] Under the CWC the Executive Council 'shall consider . . . concerns regarding compliance, and cases of non-compliance, and, as appropriate, inform States Parties and bring the issue or matter to the attention of the Conference' (Article VIII, paragraph 35).
[8] A comparison of these two institutions can be found in Walter Dorn and Ann Rolya, 'The OPCW and the IAEA: A Comparative Overview', *IAEA Bulletin,* 3/193, p. 44.
[9] The IAEA Board of Governors declared Iraq to be in non-compliance with its safeguards agreement on 18 July 1991. This was based on a report (GOV/2530) by Director-General Hans Blix, which presented the same conclusion. In a similar manner the Board determined North Korea to be in non-compliance on 1 April 1993 (GOV/2645).
[10] See Article XII.C. The same Article of the Statute also gives inspectors such a right: 'The [IAEA] inspectors shall report any non-compliance [with a safeguards agreement] to the Director General who shall thereupon transmit the report to the Board of Governors'.
[11] For a summary of the compliance provisions in the Landmine Convention, see *Compliance Matters: the Newsletter of the Markland Group*, no. 5, located at www.hwcn.org.
[12] The three reported violators were Angola, Guinea Bissau and Senegal, all of which were involved in civil wars. Landmine Monitor Core Group (ed.), *Landmine Monitor Report 1999: Towards a Mine-Free World,* Human Rights Watch, Washington, DC, 1999. The report can be found at www.icbl.org.
[13] In the case of the 1949 Geneva Conventions and the 1977 Additional Protocols, verification and implementation tasks for the International Committee of the Red Cross (ICRC) are included in the treaties themselves. Human rights NGOs, like Amnesty International, and, more recently, Human Rights Watch, have long played an important role in exposing government non-compliance with their human rights obligations.
[14] The 16 Principles of Verification adopted by the UN General Assembly first demonstrated the new international consensus on the requirement for verification of disarmament treaties. See *Official Records of the General Assembly, Fifteenth Special Session, Supplement No. 3* (A/S-15/3), paragraph 60 (paragraph 6, section I of the quoted text). Reproduced in *Trust & Verify*, no. 90, VERTIC, London, March 2000, p. 10.
[15] In 1984 and 1985, when Iraq was found by the UN Secretary-General and the Security Council to have used chemical weapons and, therefore, to have violated the 1925 Geneva Protocol, there were no serious efforts to

punish the country. At the time Baghdad was considered to be an 'ally of the West' in the front against Islamic Iran.

[16] Article XI, paragraph 2(b) of the CWC.

[17] A detailed case study of the international community's efforts to secure North Korean compliance with the NPT is presented in Walter Dorn and Andrew Fulton, 'Securing Compliance with Disarmament Treaties: Carrots, Sticks and the Case of North Korea', *Global Governance,* no. 3, 1997, p. 17.

[18] The UN's 'Oil for Food' programme allowed Iraq to sell oil in such a way that the revenue could be used to buy humanitarian supplies. This scheme, while it might look like a specific incentive, was not in fact used for that purpose. The benefits were not made conditional on Iraqi co-operation and were not used as a reward. Iraqi co-operation was neither tied to the initiation of the scheme, nor was there any link in either of the two instances when its scope was dramatically expanded. (Resolution 1153 of 20 February 1998 increased the maximum value of oil permitted for export under the scheme from $2 billion to $5.25bn. Resolution 1284 of 17 December 1999 removed the ceiling altogether.)

[19] UN Secretary-General, 'Supplement to an Agenda for Peace: Position Paper of the Secretary-General on the Occasion of the Fiftieth Anniversary of the United Nations', UN document S/1995/1, 3 January 1995.

[20] For an account of the Charter Committee's efforts, see 'Improving UN Sanctions', *Compliance Matters: the Newsletter of the Markland Group*, no. 9, April 1999. Available at www.hwcn.org.

[21] The IAEA Statute and the CWC are treaties where some penalties are specifically listed, including loss of rights and privileges. The IAEA Statute provides for 'direct curtailment or suspension of assistance being provided by the Agency or by a member, and call[s] for the return of materials and equipment made available to the recipient member or group of members'.

[22] Milton Leitenberg, 'Biological Weapons, International Sanctions and Proliferation', *Asian Perspective,* vol. 21, no.3, winter 1997, p. 7.

[23] The resulting opinion stated that, *inter alia*, nuclear weapons use was generally contrary to international law and the nuclear weapon states had an obligation to pursue negotiations to achieve nuclear disarmament.

[24] This right to ICJ adjudication is available to disputing parties under Article 36(1) of the ICJ Statute, even if clauses are not present in the treaty.

[25] To his (very rare) credit US Senator Jesse Helms proposed, in 1985, that the US automatically impose sanctions on any state caught using chemical weapons. In 1988, the then French President, Francois Mitterrand, recommended that the UN similarly impose an international embargo on 'products, technologies, and . . . weapons' against any such state. See *Washington Post,* 30 September 1988, p. A21.

[26] Notable precedents for mandatory penal legislation are to be found in the 1948 Genocide Convention, the 1949 Geneva Conventions and the 1985 Torture Convention. The 1919 ILO Constitution also requires its members to pass certain legislation.

[27] In some states (for example, common-law countries like Canada) legislation is not binding on government officials unless it contains a clause that specifies that the legislation is 'binding on the Crown'.

[28] The Treaty of Tlatelolco comes closest to mandatory referrals to the ICJ. Article 24 states that: 'Unless the parties concerned agree on another mode of peaceful settlement, any question or dispute concerning the interpretation or application of this Treaty which is not settled *shall be referred* to the International Court of Justice *with the prior consent* of the parties to the controversy' (emphasis added).

[29] The CWC (Article XIV) and CTBT (Article VI).

[30] The Structure and Content of Agreements between the Agency and States Required in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons, IAEA, INFCIRC.153, paragraph 22.

[31] The CTBT has yet to enter into force; the CWC entered into force on 29 April 1997.

[32] The ILO procedure that has developed over the years can be summarised as follows: each state must file reports with the ILO detailing the legislation it has passed and other implementation measures that have been adopted; copies of these reports are distributed to the country's employers' and workers' organisations to give them an opportunity to file comments; the reports, together with the comments of NGOs, are analysed and evaluated by the Committee of Experts on the Application of Conventions and Recommendations (sometimes called the 'Committee of Experts' or the 'Application Committee'); the Committee prepares a report that is sent to the government for comment; the Committee sometimes engages in a dialogue by correspondence. On certain

points the country may be asked to defend itself at a meeting of the ILO General Conference; the report then goes to the Tripartite Conference Committee, which may invite the country to send representatives to Geneva for discussions; in some cases, the ILO Director-General, with the consent of the country, sends a representative to visit the state to discuss reasons why it is failing to comply; finally the Tripartite Committee's report is prepared and presented to the General Conference's plenary session. The recalcitrant country may be asked to appear at the general debate to explain its failure to comply; if compliance efforts fail, the Governing Board may refer the matter to the ICJ 'for decision'. From 1964 the Committee of Experts examined thousands of cases in which measures were taken to bring national legislation and practice into conformity with a ratified convention. See *International Labour Standards*, pamphlet issued by the ILO, Geneva, 1981, p. 26.

[33] North Korea suspended its notice of withdrawal one day before it was due to take effect.

[34] The 1985 Treaty of Rarotonga is the only disarmament accord that comes close to giving parties a kind of 'retaliatory' right (in this case to withdraw). Article 13 states that: '. . . in the event of a violation by any Party of a provision of this Treaty essential to the achievement of the objectives of the Treaty or of the spirit of the Treaty, every other Party shall have the right to withdraw from the Treaty'. Providing rights to retaliate or for 'reciprocal non-compliance' runs a great risk of unravelling a treaty regime.

[35] Many means have been applied successfully by NGOs to promote compliance with national and international obligations, including watchdogs, citizen inspections, lobbying, action in the legal sphere (suing governments), voluntary economic boycotts, civil disobedience and 'direct action' against industrial or government facilities.

[36] For example, see North American Agreement on Environmental Cooperation, Annex 36A, 'Canadian Domestic Enforcement and Collection'.

[37] Three important pioneering references are: Serge Sur (ed.), *Disarmament and Arms Limitation Obligations: Problems of Compliance and Enforcement*, United Nations Institute for Disarmament Research (UNIDIR), Geneva and Dartmouth, Aldershot, 1994; Abram Chayes and Antonia Handler Chayes, *The New Sovereignty: Compliance with International Regulatory Agreement*, Harvard University Press, Cambridge, 1995; Canadian Council on International Law and the Markland Group, *Treaty Compliance: Some Concerns and Remedies*, Kluwer Law International, London, 1998.

16

Intelligence in arms control and disarmament

Tim McCarthy

The complexity of the post-Cold War arms control and disarmament environment imposes exceedingly difficult demands on international verification bodies.[1] These demands arise from a fundamental requirement to assess quantitatively and qualitatively information provided to the verifier—a task complicated in recent years by increased pressures on resources and a highly dynamic political milieu. Despite these obstacles, international organisations have generally proven adept at appraising the correctness of data. More pronounced difficulties arise, however, in the attempt to assess the completeness of information—cases where governments may be acting in bad faith and where declarations are incomplete or deceptive.

Since international organisations act under a number of legal and political constraints, their ability to solve this (well-recognised) problem is ultimately limited. In the breach, verifiers can, and have, exploited the information gathering and analytical techniques available only to sovereign governments, or, more specifically, to their national intelligence agencies.

Finding the appropriate type and degree of contact between national intelligence and multilateral arms control and disarmament organisations is a continuing and controversial issue.[2] Debate over the efficacy of this relationship centres on the profound 'credibility' dilemma that any international body faces when it accepts, refuses or does not act on intelligence. On the one hand, the use of national information strengthens the organisation's capabilities, allowing it to pursue its mandate more rigorously. On the other hand, the extent to which an international organisation accepts or relies on 'subjective' state intelligence may decrease its legitimacy as an objective agent of verification and may call into question its credibility and standing as a truly international body.[3]

The state providing intelligence faces its own predicaments. As a rule, intelligence organisations are reluctant to release information to bodies outside their national authority. Oft-repeated fears of disclosing 'source and methods' are one of a series of potential risks in providing classified data. But the information may only be actionable, or even provable, through the agency of an international verification body, most typically via an on-site inspection. In this regard cost–benefit calculations on the release of intelligence are just as daunting for the provider as they are for the receiver in deciding whether to accept or to use it.

This chapter explores the inherent dilemmas raised between national intelligence bodies and international organisations involved in arms control and disarmament, and analyses the role intelligence plays in international verification. The first section provides brief case histories of three organisations—the UN Special Commission (UNSCOM) on Iraq, the International Atomic Energy Agency (IAEA) and the Organization for the Prohibition of Chemical Weapons (OPCW)—in order to understand their experiences with intelligence agencies and information. This section also examines efforts within these bodies to analyse substantial amounts of internally and externally generated data that, in effect, create their own organic 'intelligence' capability. The second section surveys the approaches and guidelines that underlie the provision of intelligence by the US, the most important actor in terms of this issue. The results will serve as a model for future comparisons of other intelligence providers' policies. The last section reviews several, perhaps less publicised, areas, where the use of intelligence can most benefit an international verification body, and looks to the future of the complex relationship between international organisations and intelligence providers.

The UN Special Commission

In its 1991 resolution creating UNSCOM, the Security Council implicitly recognised that the new inspectorate would require classified intelligence and information from member states to fulfil its mandate. Resolution 687 gave UNSCOM the authority to designate sites for inspection beyond those declared by Iraq.[4] Information as to the location of those undeclared sites—particularly at the outset when the Commission had no corporate expertise—could only come from national governments and their respective intelligence agencies. From this rather humble beginning, UNSCOM's acquisition and consumption of intelligence grew to levels unmatched by any previous international organisation. Iraqi recalcitrance and the relative lack

of bureaucratic or legal obstacles helped to drive the unusual degree of contact between inspectors and intelligence agencies.

To a large degree, operational goals determined UNSCOM's interaction with secret services and its use of intelligence information on a specific issue.[5] For example, intelligence data did not fuel the majority of inspections to verify Iraqi declarations, a more traditional arms control and disarmament exercise. Of course UNSCOM did receive 'tips' in this regard, and member states did provide routine reconnaissance briefings. But internal analysis and planning produced most of these verification leads. National information, however, did play heavily in the search for hidden weapon sites and undeclared information, as well as in the investigation of Iraq's 'concealment mechanism'—its systematic effort to hide weapons, documents and equipment from inspectors. Indeed intelligence was an integral, even inseparable, part of this latter pursuit.[6]

The Commission pursued the acquisition of intelligence and national information through a variety of means; the type of data received reflected this multifaceted approach. Member states provided inspectors with the reconnaissance briefings and *ad hoc* tips on, for example, illegal procurement activities, such as Iraq's covert purchase of Russian inertial instruments and test equipment. Lower-grade tactical intelligence—on security conditions in Baghdad, for instance—was available once the team assembled for its mission. The bulk of intelligence, though, arrived following a specific request from the Special Commission. Supporting governments produced, *inter alia,* estimates of remaining weapon capabilities, technical evaluations of equipment, site assessments, or decryption services. In an interesting twist to the international organisation–nation state relationship, UNSCOM often provided member governments with detailed information on illegal procurement endeavours that had occurred within their borders. In supplying the data, UNSCOM sought an investigation into the activities, and, in turn, expected to be briefed on the results.[7]

Despite its reliance on intelligence for certain undertakings, UNSCOM never became a captive instrument of the providers of information for two key reasons. First, the Special Commission pursued a deliberate policy of seeking information from many countries that, according to former Chairman Rolf Ekéus, did not necessarily talk to one another or were willing to have their contributions known.[8] Second, and most important, UNSCOM's expertise on Iraq's weapon programmes, along with the information gathered through its missions in Iraq, eventually outpaced the expertise and data held by any one country. The Information Assess-

ment Unit—the Commission's analytical and operational arm—effectively organised inspection and other data and focused assessment efforts. As a result, UNSCOM analysts knew more about the Iraqis than anyone else did. These developments led to a subtle shift in the terms of trade regarding the provision of intelligence: UNSCOM not only had to rely relatively less on a particular country's intelligence to mount an operation, but inspectors were also able to obtain more raw data to evaluate on their own terms.

Ultimately the often tightly coupled relationship between UNSCOM and several intelligence bodies led to severe criticism of the organisation and contributed, in no small part, to its demise. But the inspectorate's extraordinary pursuit and use of intelligence can only be understood within the context of Iraq's long-running efforts to thwart UNSCOM's mandate, and the inability of the Security Council to deliver a consistent, meaningful message to Iraq in response to its intransigence. Faced with incomplete declarations and lack of international political will, inspectors pushed hard on concealment and other investigations to uncover both remaining proscribed items and to force Iraq either to accept inspection of sensitive sites or explicitly to refuse access. Clear denial of access, it was hoped, would politically damage Baghdad and awaken the Security Council to on-the-ground realities in the country. Given the sophistication of Iraq's deception techniques, data to support effectively these investigations had to come from intelligence organisations.

The International Atomic Energy Agency

Before the passage of resolution 687 in 1991, the IAEA in Vienna had little meaningful access to intelligence from its member states, nor an organisational capability to receive and assess such information.[9] However, the Agency's new nuclear disarmament mandate in Iraq brought with it an obvious requirement to exploit national intelligence data. Meanwhile, revelations about the Agency's supposed failures in Iraq, and its subsequent pursuit of a more robust safeguards regime, resulted in member states providing expanded intelligence on countries other than Iraq, and the creation of new analytical approaches within the Agency for examining a number of data sources.

The IAEA created an Action Team, a new body under the Director-General, to conduct inspections in Iraq. It drew some of its experts from the Department of Safeguards, but it was never a formal part of the Department. Intelligence agencies were apparently wary of providing information directly to Vienna at the onset of

inspections. The language of resolution 687, which gave UNSCOM authority to designate undeclared nuclear sites for inspection (and implicitly to receive intelligence towards that end), in part reflected this unease. In the event, supporting governments initially sent information to the Special Commission, which, in turn, provided targets for the first UNSCOM–IAEA teams sent to undeclared nuclear sites. Indeed the Action Team did not have full access to defector information that triggered early nuclear inspections. But it appears that, after several inspections were completed, some intelligence was flowing directly to the Action Team without the UNSCOM filter. By the end of 1993, the Agency began receiving U-2 reconnaissance briefings in a manner similar to those provided to UNSCOM, although not on a systematic basis. Thereafter it appears that member states continued to provide information to the nuclear inspectors, based on specific requests from the Action Team and on an *ad hoc* basis.

The information sharing relationship between UNSCOM and the Action Team did not always reflect the relatively well ordered Action Team–intelligence relationship. While the two bodies continued to work together throughout the inspection process, the Team felt that the Commission never granted Vienna full access to the considerable intelligence data in its possession. This was especially true for valuable data regarding Iraq's concealment activities in the nuclear area. From UNSCOM's perspective, the sensitive nature of the information demanded strict compartmentalisation, even if it meant keeping relevant data from nuclear inspectors.

By the end of 1991, IAEA Director-General Hans Blix began to seek broader access to intelligence to enhance the safeguards regime. At first he wanted to create an office in the Agency to receive and assess this type of information. The Board of Governors did not support this approach, so, instead, Blix informally named a senior aide in his own office to whom intelligence should be given and with whom responsibility rested for making initial evaluations.[10] These officials have included Pierre Villaros, a French national, and, later, David Sinden, a Canadian. A small group of senior IAEA officials assisted Villaros and Sinden in the evaluation process.

As this informal structure took shape, governments (especially the US) began to provide the Agency with intelligence on countries other than Iraq. For example, it appears that the US provided intelligence briefings and/or information derived from national technical means (NTM) related to:

- Iran in early 1992, late 1993 and, perhaps, in early 1996 and 1997;[11]
- South Africa in mid-1992; and

- the Democratic People's Republic of Korea (DPRK) in early 1992, early 1993, late 1994 and late 1998.[12]

It also appears that Blix, along with senior aides, received some of these briefings at the US Embassy in Vienna. Intelligence provision concerning the DPRK resulted in an extraordinary Board of Governors meeting on 22 February 1993, where the US displayed satellite photos of North Korea's undeclared waste processing sites and a decoy facility.[13] Agency officials say they did not provide any formal feedback to, or engage in data exchanges with, the US intelligence agencies.

To enhance significantly the effectiveness of safeguards—pertaining, in particular, to the completeness of data—the Agency is pursuing a variety of measures that extend well beyond access to intelligence, including environmental sampling, expanded state declarations and increased physical access to declared and undeclared sites.[14] Evaluating data collected through these efforts is an integral element of the effectiveness of enhanced safeguards, and the IAEA has created new management structures and processes to improve analysis of information. State Evaluation Reports, produced by country officers in the Operations Division of the Safeguards Department, are at the heart of the now three-year-old system. Assessments are derived from several sources:

- state declared information (such as design information and operating records);
- safeguards verification information (for example, inspection data and analysis, sampling, and inspector observations); and
- other IAEA and 'open source' information (such as internal IAEA databases, technical co-operation reports and public media).

The Safeguards Department integrates these data, checking for consistencies across a spectrum of evaluation points.

The new Information Review Committee, comprising Division Directors and a Co-ordinator from the Office of the Deputy Director-General for Safeguards, assesses these evaluations and develops consensus recommendations for follow-up activities. For example, the assessment might point to a declaration inconsistency that could require discussions with a member state or additional inspections. The Committee reports these recommendations to the Deputy Director-General for Safeguards, with the results ultimately contributing to conclusions in the Agency's annual Safeguards Implementation Report. This process allows the IAEA to judge better the correctness and completeness of state declarations.[15] Future iterations of

the evaluation system will incorporate commercial satellite imagery, visualisation software, and geographical information systems.

Organization for the Prohibition of Chemical Weapons

The Chemical Weapons Convention (CWC), which was opened for signature in January 1993, and the implementation guidelines approved by the Conference of States Parties (CSP) define in detail how information—state declarations and inspection and other data—will be handled, processed, used and released by the OPCW. The Convention and the CSP have similarly elaborated criteria for determining timing and frequency of inspections of treaty relevant sites, which, in turn, provide the basis for the OPCW's internal analyses. In sharp contrast to UNSCOM, and to a lesser extent the IAEA, the Technical Secretariat and the Director-General are more constrained in their potential dealings with intelligence bodies and in the development of analytical methodologies.

While neither the CWC nor its implementation documents explicitly refer to 'intelligence', it is clear that the OPCW may receive intelligence in pursuit of its mandate. Indeed there appear to be several plausible scenarios under which states might provide intelligence data to the Organization:

- by initiating a challenge inspection;
- by providing a designated observer with more detailed data during a challenge inspection;[16]
- by supporting investigations of alleged use of chemical weapons (CW);[17]
- by initiating and supporting investigation of an OPCW employee for breach of confidentiality;[18] and
- by requesting assistance and protection against use or the threat of use of CW.[19]

In addition, it appears that, in conversations with Director-General José Bustani or, prior to that, with the Executive Secretary of the Preparatory Commission, Ian Kenyon, member delegations informally provided 'information' on the CW activities of other countries. Pakistan, for instance, expressed specific concern regarding India's programme in meetings with Kenyon. The degree of detail of the information is unclear. Regardless of how or where states transmit information, the OPCW will benefit from having a large number of staff who either have intelligence backgrounds or who are familiar with intelligence issues, and who meet frequently with state party delegations comprised of foreign and defence officials.[20]

A CWC challenge inspection will surely generate political controversy. It is useful to examine in detail, therefore, how challenge inspections might involve intelligence sharing and the factors that will determine the scope and detail of information a state party provides. Surprisingly, the former US Arms Control and Disarmament Agency concluded that information defined by the CWC as being necessary for initiating a challenge inspection does not require intelligence data.[21] But the Conference of States Parties approved an illustrative list of data that would fulfil a state's obligation to supply 'appropriate information on the basis of which a concern has arisen' over non-compliance. For example, the list suggests provision of detailed information on the nature of suspected non-compliance, the period of such activities and the specific chemical signatures emanating from a facility.[22] It is difficult to imagine that this could come from anywhere other than an intelligence source.

Clearly it is in the interest of the party requesting a challenge inspection both to provide enough information so that the chances of discovering non-compliance are high and to increase the political burden on an inspected state party if, and when, it refuses to allow a thorough inspection.[23] These powerful motivations might force a state to convey more detailed, all-source data, as it takes the calculated risk of a challenge inspection proposal. Certain OPCW policies might also inspire confidence among intelligence agencies that their data will be (relatively) secure, leading to the provision of more detailed information. For instance the OPCW's elaborate Policy on Confidentiality incorporates stringent penalties for unauthorised disclosure of sensitive information,[24] and the organisation has consistently focused on developing a 'security culture', even during the PrepCom process.[25] Finally, in addition to the formal requirements for information provision leading to a challenge, the requesting state may engage 'in further exchanges of information' with the Director-General on the matter.[26] This provision may allow the state to gauge the level of information the Director-General views as appropriate or to convince him further of the validity of the information provided.

Of course, a number of factors might also dissuade a state party from intelligence sharing. First, the CWC text calls for due regard to be paid to selecting team members for challenge missions 'on as wide a geographical basis as possible'.[27] If a state does not trust a national on a team, it will be more reluctant to provide data (or more detailed data once the team is in the field) for fear of misuse. Second, a potential information supplier may be reluctant to do so given a possible (although politically unlikely) determination by the Executive Council that a state has abused the right

to request a challenge inspection—a finding that carries financial and organisational penalties. The CSP proposed several indicators of an abusive request, including negative determinations on the authenticity or reliability of information provided.[28] Clearly the practice of intelligence makes ensuring reliability of information a difficult proposition, and, based on the UNSCOM experience, on-site inspections often reveal that intelligence data was 'false'. Third, the inspected state party can demand copies of team notebooks, increasing the risk of an unintentional disclosure of sensitive information. Finally, the inspected state can reject a designated observer, potentially robbing the team, therefore, of its ability to communicate with the information source in the field and undermining inspection effectiveness.

In the absence of state-provided intelligence or a challenge inspection request, the OPCW generates its inspection planning through an internal analytical process. The CWC, its verification annexes, and a number of conference decisions establish guidelines for this process. These guidelines are far too complex to discuss in detail in this chapter, but, in general, the Convention provides, *inter alia,* a legal obligation for the timing of most initial inspections, development of facility agreements for some sites, and a limit to the number of inspections at declared facilities. Decisions taken by the CSP elaborate and refine these legal requirements. Thereafter, in most cases, the Technical Secretariat determines the number and intensity of inspections based on facility 'risk assessments', the criteria for which are, again, often detailed in the Convention or in CSP decisions. For example, the Convention notes that inspectors shall assess the facility's 'risk to the object and purpose of the convention' posed by the chemicals produced at a so-called Schedule 2 site, and the characteristics and activities of the site.[29]

The Chemical Demilitarisation and Industrial branches in the OPCW's Verification Division are jointly responsible for performing risk assessments of the relevant facilities, and, therefore, comprise the chief analytical arm for OPCW operations. Once site declarations are processed, the two branches use this data for inspection planning, which began in earnest one year after the Convention's entry into force in April 1997. The OPCW also uses software tools and its information management system for inspection planning.[30] It is not clear if intelligence provided by a member state will be fed into this information management system, thereby allowing inspectors to use the data as part of its standard assessment process. Alternatively the OPCW might opt to follow a more informal structure for intelligence assessment similar to the IAEA.

The US approach

In the decade following the 1991 Gulf War, the US has gone from having, at best, an inconsistent intelligence relationship with international organisations to being the most important provider of such information to international verification bodies and regimes. A brief history of these events indicates that the growth in information sharing has not taken place smoothly, as the intelligence community and even Congress have shown greater reluctance to release data than policymakers. Sharp disagreement over control of, and access to, information has also characterised the relationship between American providers and international receivers of intelligence. Other countries seem likely to mirror these dynamics. This review also offers, via the debate over CWC ratification and the resolution forwarding the Senate's consent, a unique public insight into how the intelligence sharing process works.

Early UNSCOM inspections established a precedent for the US to provide intelligence. The administration of President George Bush, intelligence officials, and congressional committees worked to establish the ground rules and to fund the effort, which extended beyond data transfers to include the establishment of a liaison centre in Bahrain. These arrangements—facilitated by the presence of US nationals on UNSCOM inspection teams and in senior UNSCOM positions—proved to be extremely effective. The information flow was timely enough to lead to several highly successful inspections (particularly, although not exclusively, in the nuclear area) which demonstrated Iraqi non-compliance with its disarmament obligations. At the same time, US intelligence agencies surely benefited from discussions with inspectors regarding UN requirements to identify additional sites. Release of information to non-US team members, control of certain collection efforts, and access to raw data were a few of the continuing problems between US intelligence and UNSCOM, although the overall relationship was surprisingly smooth. These problems, however, came into sharper focus as UNSCOM employed more intrusive inspection techniques and the stakes for American military involvement in Iraq rose.[31]

This precedent paved the way for the US to expand intelligence sharing beyond UNSCOM. As noted earlier, US intelligence flowed to the IAEA Action Team, just as Washington supplied other information to the IAEA in pursuit of its broader safeguards mandate. In the case of intelligence related to North Korea, the scope and detail of information grew rather slowly. In part this was because US analysts wanted access to IAEA data (operating records for DPRK reactors and test results from foreign laboratories) in exchange for American information. Although the

IAEA did not oblige, Washington ultimately concluded that it was important to provide its knowledge without reciprocity. When lower level CIA analysts balked at providing satellite photos to the Board of Governors, they were overruled first by then CIA Director Robert Gates and later by the Clinton administration.[32]

This trend toward increased information provision hit a critical snag in February 1995, when US officials discovered several boxes of classified US documents left in a vacant UN office in Somalia.[33] The discovery and subsequent controversy reinforced congressional efforts to limit data exchanges with international organisations, culminating in an unsuccessful Senate attempt to restrict intelligence sharing with the UN, through a variety of measures.[34] The backlash from the Somalia episode affected even UNSCOM, as weapon inspectors experienced a temporary interruption in the receipt of intelligence until the case was resolved.

During debate and analysis over CWC ratification, the question of intelligence provision and the relationship between international inspection regimes and US intelligence efforts were once again brought into sharp relief. Both the Clinton administration and the intelligence community noted that the CWC would be a net plus in unilateral US attempts to detect potential chemical threats. National Intelligence Estimates and other analyses concluded that, overall, state declarations and the inspection regime would: improve the ability of intelligence to obtain data regarding CW programmes; give access to useful information otherwise unobtainable; and add another tool to the intelligence collection kit.[35] The intelligence community made this argument in spite of the recognition that state parties would largely be prevented from access to raw inspection data, and that employee secrecy provisions forbade the US government from seeking special information from American nationals employed at the OPCW.[36]

While the Senate noted and concurred with these judgements, it sought to enact stringent rules and safeguards related to potential US provision of classified data to the OPCW. In approving the ratification of the CWC, the Senate attached 28 conditions to its resolution, one of which dealt specifically with the required process for intelligence sharing. The spirit of the condition, and its language, was derived from earlier Senate attempts to restrict intelligence following the Somalia case. The process enumerated in the resolution reflects the approach that US intelligence now apparently takes with all international organisations, including the IAEA and UNSCOM's successor, the UN Monitoring, Verification and Inspection Commission (UNMOVIC). In brief, the Senate declared that the US may not provide

information to the OPCW until the President establishes that: mechanisms for its protection (within the OPCW) are in place; OPCW staff can protect it and security procedures will be enforced; unauthorised disclosure will result in only minimal damage to American national security; and no matter how thoroughly sanitised, the information and its provision must have inter-agency US intelligence community approval. However, the Director of Central Intelligence can find that it is in 'the vital national security interests of the United States' to release the information. If he does so, the above conditions may be waived, although such waivers must be reported in detail to the appropriate congressional committees.[37] Thus far, and despite strenuous efforts by government personnel, agreement has not been reached with the OPCW on handling US classified data and, as a result, no information has been provided.

Conclusion

The foregoing analysis highlights a number of areas where international disarmament bodies have used intelligence to expand their verification capabilities. It indicates that the provision of intelligence to international disarmament organisations is a now a well established practice, although it remains politically sensitive.

In terms of future developments, it is useful to identify relatively unexploited opportunities.[38] One possibility is the use of intelligence in identifying denial and deception (D&D) operations. States seeking to hide weapon capabilities will employ D&D techniques, but international organisations are generally ill-prepared to uncover and understand them. National intelligence has a unique role to play in this respect.[39] Moreover, a cover-up (D&D in practice) often yields more signatures than the hidden or proscribed activity itself. Thus, the unmasking of a cover-up may be the first step towards revealing non-compliant behaviour; the ability to do so will be an important tool for international organisations.

Another option involves the training of international inspectors by intelligence agencies. This relatively value-neutral mission would prepare and educate inspectors and international analysts, allowing them to pursue more effectively their tasks. Training courses might include interview techniques, observation skills or recognition of denial and deception signatures. A third possibility is a systematic request by international organisations to intelligence agencies to provide broader analyses on subjects of concern. Analyses would extend beyond the 'smoking gun' tip to include, for example, proliferation scenarios for a particular country, 'lessons learned'

studies of prior proliferation cases, economic assessments, or broader country overviews. These reports do not have to be based on highly sensitive information; they would simply provide international analysts (such as the IAEA's country officers) with additional sources of data that they might reject or accept.

International arms control and disarmament bodies are likely to continue efforts to promote intelligence provision, but this will not extend to 'co-operation' or systematic exchanges of data with member states. These and future organisations also seem likely to adopt strict confidentiality policies—like those of the OPCW—which would be designed to increase intelligence providers' trust in the organisation. Compartmentalisation of data will be more acceptable, as the realities of handling sensitive information become more engrained in the international disarmament culture. Internal analytical capabilities will also be enhanced—especially through the exploitation of open and grey source data—as organisations adapt to, and integrate, developments in the information revolution.[40] Indeed, access to high-resolution commercial satellite imagery will likely have a profound impact not only on how organisations make assessments, but also on their relationships with intelligence agencies.[41] No longer will the IAEA, for instance, have to rely on governments for quality imagery of a particular site (although it might still lack interpretative expertise). Finally, international organisations will promote cross-fertilisation to compare systematically their experiences with intelligence and data analysis. It seems doubtful, however, that this cross-fertilisation will involve information sharing, at least in the short term.

While intelligence provision may be an accepted practice, several issues—which will determine the future relationship between intelligence agencies and verification bodies and the political acceptance of the relationship—remain unresolved. In the final analysis, the critical issue is to determine the most appropriate and effective use of intelligence, which, at the same time, ensures that international bodies continue to be, and continue to be perceived as, objective, independent actors. The answer to that question will reflect the notion that, while dilemmas in the relationship are inherent and potentially troubling, they are manageable.

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Endnotes

[1] Unless stated otherwise, information for this study is derived from interviews and correspondence with former and current officials who serve(d) in international agencies, governments, or in both. These sources wish to remain anonymous.

[2] This paper defines 'intelligence' and its linguistic derivatives, such as 'national information', as the secret collection and analysis of confidential data by a state. Although this definition conveys a process, the paper focuses on the output of that process: the secret information or analysis itself.

[3] For an example of this view, see Brahma Chellaney, 'Arms Control: The Role of the IAEA and UNSCOM', in Muthiah Alagappa and Takashi Inoguchi (eds.), *International Security Management and the United Nations*, United Nations University Press, Tokyo, 1999, pp. 375–393.

[4] United Nations Security Council, S/RES/687 (1991), 8 April 1991, Section C, paragraph 9(b)(i). Of note, the resolution also gave this 'designation authority' to UNSCOM for nuclear sites, with inspections to be carried out jointly by the IAEA and UNSCOM.

[5] The type and character of the personal relationships between particular inspectors and intelligence providers also facilitated (or hindered) information flows. The greater the degree of trust, the more willing an intelligence agency was to release information to inspectors.

[6] See Barton Gellman's two-part series, 'Shell Games: The Hunt for Iraq's Forbidden Weapons', *Washington Post*, 11–12 October 1998. Available at www.washingtonpost.com.

[7] These efforts achieved uneven results. Several governments did, in fact, provide information and went as far as inviting UN experts to their countries for more detailed discussions. Others simply refused to respond.

[8] Gellman.

[9] According to the former head of the IAEA Action Team, Maurizio Zifferero, the Agency had no access to intelligence before resolution 687. See Maurizio Zifferero, 'Iraq and the UN Security Council Resolution 687: A New Approach to Verification', in James Brown (ed.), *New Horizons and Challenges in Arms Control and Verification*, VU University Press, Amsterdam, 1994, p. 222. Other sources dispute this account. Author interview.

[10] In February 1992, the Board formally approved Blix's efforts to make intelligence available to the Agency.

[11] Pierre Villaros participated in the Agency's February 1992 and November 1993 'visits' to several undeclared sites in Iran. He also took part in the Blix mission to North Korea in May 1992. Before these trips, US intelligence apparently briefed Villaros on American information related to these countries.

[12] Undoubtedly, the US provided additional briefings/data not included above. Moreover, other member states, such as France and the UK, also supplied intelligence data.

[13] See R. Jeffrey Smith, 'North Korea and the Bomb: High-Tech Hide and Seek', *Washington Post*, 27 April 1993, at www.washingtonpost.com. This article indicates that the US provided degraded satellite photos, although other very reliable sources note that the photos were not degraded. Author interview.

[14] Generally grouped under the Strengthened Safeguards System. See chapter by David Fischer in this volume.

[15] 'Strengthening the Effectiveness and Improving the Efficiency of the Safeguards System', IAEA General Conference, GC(42)/12, 16 September 1998, paragraph 3, at www.iaea.org. 'Report of the Director General to the Conference', IAEA General Conference, GC(42)/22, 17 September 1998, paragraph 19(a), at www.iaea.org.

[16] Chemical Weapons Convention, Verification Annex, part X, paragraph 54.

[17] Initiated under Article IX or X of the CWC.

[18] 'OPCW Policy on Confidentiality', OPCW Conference of the States Parties, First Session, C-I/Dec. 13, 16 May 1997, part IX, paragraph 3.1(b) and 3.3, at www.opcw.org.

[19] Article X, paragraph 9 of the CWC.

[20] It is not clear if any member state has provided information of an intelligence nature to the new disarmament body; nor is it clear if any state has established formal or informal mechanisms for the transfer of such data. This is certainly the case for the US government.

[21] US Arms Control and Disarmament Agency, 'Answers to Questions [related to the CWC]', in *US Capability to Monitor Compliance with the Chemical Weapons Convention*, US Senate, Select Committee on Intelligence, 103rd Congress, Report 103–90, US Government Printing Office, Washington, DC, 30 September 1994, Appendix B, p. 109.

[22] 'Notification Formats in Challenge Inspection . . .', OPCW Conference of the States Parties, First Session, C-I/Dec. 44, 16 May 1997, p. 15, at www.opcw.org.
[23] Douglas J. MacEachin, 'Routine and Challenge: Two Pillars of Verification', *CBW Conventions Bulletin*, issue no. 39, March 1998, p. 2.
[24] The policy is enumerated in 'Guidelines for Release of Classified Information . . .', OPCW Conference of the States Parties, First Session, C-I/Dec. 13, 16 May 1997, at www.opcw.org. Admittedly, the policy appears aimed at the unauthorised release of commercially sensitive or state declared information, although the same rules and procedures would certainly apply for intelligence data.
[25] See, for example, Preparatory Commission for the OPCW, *Report of the Executive Secretary*, PC-XII/II, 7 December 1995, paragraphs I.II–I.I3, at www.opcw.org.
[26] OPCW, 'Notification Formats in Challenge Inspection', paragraph I(f)(III).
[27] Verification Annex, part X, paragraph A(I), of the CWC.
[28] 'Illustrative List of Objective Indicators . . .', OPCW Conference of the States Parties, First Session, C-I, Dec. 45, 16 May 1995, pp. I–2, at www.opcw.org.
[29] CWC, Verification Annex, part VII, paragraph 18. The Conference further elaborated on these criteria in the OPCW, 'Assessment of the Risk Posed By a Schedule 2 Facility', Conference of the States Parties, First Session, C-I/Dec. 32, 16 May 1997, at www.opcw.org.
[30] In its decision to adopt the architecture for the information management system, the Preparatory Commission noted that the system must support the OPCW's verification activities by providing the means to store, access and analyse data provided through declarations or gathered through inspection '*or by other means*'. Preparatory Commission for the OPCW, *Report of the Preparatory Commission*, PC-3/II, 2 July 1993, paragraph I.2. (emphasis added)
[31] For a review of the high stakes disagreement involving US intelligence and UNSCOM, see Seymour M. Hersh, 'Saddam's Best Friend,' *New Yorker*, 5 April 1999, pp. 32–41.
[32] See Smith.
[33] R. Jeffrey Smith and Julia Preston, 'US Probes Security for Somalia Files', *Washington Post,* 12 March 1995, at www.washingtonpost.com.
[34] See *Report on the Foreign Relations Revitalization Act of 1995*, US Senate, Committee on Foreign Relations, 104th Congress, Report 104–95, US Government Printing Office, Washington, DC, p. 75 and pp. 223–225.
[35] *US Capability to Monitor Compliance with the Chemical Weapons Convention*, p. 37 and p. 81.
[36] *US Capability to Monitor Compliance with the Chemical Weapons Convention*, p. 59.
[37] The condition's full text is in *To Advise and Consent to the Ratification of the Chemical Weapons Convention, Subject to Certain Conditions, S. Res. 75*, US Senate, 105th Congress, First Session, 24 April 1997, pp. 7–14, at www.thomas.loc.gov.
[38] Some efforts have been undertaken in all of the following areas, but they should be expanded.
[39] Timothy V. McCarthy, *UN Verification and Strategic Denial and Deception: Iraq and Beyond*, Colloquium on Strategic Denial and Deception, Georgetown University, Washington, DC, 10 July 1999.
[40] See chapter by Andrew Rathmell in this volume.
[41] See chapter by Bhupendra Jasani in this volume.

17

Societal verification: wave of the future?

Dieter Deiseroth

Societal verification has been discussed for decades under different names, like 'citizens' reporting', 'inspection by the people' and 'social monitoring'. Although there is no agreed legal definition, societal verification connotes the involvement of civil society in monitoring national compliance with, and overall implementation of, international treaties or agreements. One important element is citizens' reporting of violations or attempted violations of agreements by their own government or others in their own country. This encompasses the monitoring of implementation of national legislation or regulations designed to facilitate treaty compliance. A more recent development is civil society monitoring of global compliance with international agreements. In contrast to official verification organisations employing professional experts, societal verification may involve the whole of society or groups within it.

Whistleblowing is a specific type of citizens' reporting. It relies on violations or attempted violations of an international accord being detected directly by employees, such as scientists and technologists, working in relevant industries.[1] Compared with normal citizens, employees are in a special situation because they owe their employer a certain loyalty and, by law, are normally not allowed to disclose internal or confidential information. Whistleblowers, therefore, need protection if they make a disclosure in good faith and on the basis of reliable evidence.

Societal verification may be applied to a wide variety of international agreements (and corresponding national regulations), including those pertaining to the environment, human rights, trade, labour, arms control and disarmament. But the requirements for, and problems of, societal verification in these areas are different. As a result, it is hard to develop a general model of societal verification and its implementation. To begin with, there are discrete actors to be monitored, including:

- commercial and non-commercial companies;
- government departments and agencies;
- various parts of the 'military/industrial complex';
- public and private laboratories;
- public and private research and development centres;
- police and security forces;
- national governments; and
- international organisations.

There are also diverse aggregations of interest, influence and power to be handled. Consequently, the implementation of societal verification in disparate areas requires different types of coalition-building and separate forms of regulation and organisation. Varying degrees of transparency and assorted types of whistleblower protection are also necessary.

A short history of societal verification

The first concepts of societal verification were products of the Cold War, when scientists advocated arms control, disarmament and transparency as alternatives to the danger of nuclear deterrence. In the late 1950s, Lewis Bohn[2] and Seymour Melman[3] proposed the idea of 'Inspection by the people'. Their belief was that, in addition to monitoring by the official inspectorate of an international disarmament agreement, it would be useful to have an informal network based on public involvement. This could reinforce the work of the inspectorate and help undercut evasion efforts. Since illicit production of banned weapons would require substantial organisations and production systems the chances were that someone would eventually 'blow the whistle'.

Bohn and Melman argued that disarmament agreements should make it an explicit obligation of citizens to report violations to the international inspectorate. Members of the inspectorate would have the chance to participate in the work of universities and similar institutions of the host country. Additionally, special agreements to guarantee the security of those who co-operated with the inspectorate should be reached (such as facilitating political asylum and temporary local security). Lewis Bohn called specifically for a provision in arms control agreements requiring all participating governments to make it a crime to violate provisions of the accord or to keep secret from the international verification agency any information about such a contravention.[4] These provisions should be publicised by each government

and failure to support them by such publicity (or in other ways) would be a major violation of the treaty.

In the early 1960s, Grenville Clark and Louis Sohn mentioned the concept of 'inspection by the people' in their classic book, *World Peace Through World Law*.[5] They proposed a revision of the UN Charter to establish a UN Inspection Service. An Annex dealing with citizens' reporting would read:[6]

> . . . Any person having any information concerning any violation of this Annex or any law or regulation enacted thereunder shall immediately report all such information to the United Nations Inspection Service. The General Assembly shall enact regulations governing the granting of rewards to persons supplying the Inspection Service with such information, and the provision of asylum to them and their families . . . No nation shall penalise directly or indirectly any person or public or private organisation supplying information to the United Nations with respect to any violation of this Annex . . ..

Leo Szilard[7] considered the concept of 'inspection by the people' in his quixotic story *The Voice of the Dolphins,* published in 1961. He incorporated elements of the proposals of Bohn and Melman and suggested an award of one million dollars, tax free, to be paid by the government accused of a violation. This would be returnable if the information later turned out to be incorrect.

These early concepts of 'inspection by the people' had a double function. First, they were clearly aimed at reducing opposition to arms control and general and complete disarmament by showing that it was possible to verify such agreements through non-official means. Second, they tried to show that, from a democratic point of view, security matters were too important to leave to politicians and military commanders and their staffs alone. These concepts were raised in public debate and were, in turn, influenced by it. They also reflected the technological possibilities of the period. Proponents had to defend themselves against the criticism that 'inspection by the people' would increase the danger of espionage and that such ideas were utopian, since the countries on the other side of the 'Iron Curtain' would never comply with them.

In the 1990s, Joseph Rotblat, in particular, took up these old ideas and applied them to the concept of a treaty on the complete elimination of nuclear weapons.[8] He suggested that the duty of the citizen to supply information about any violation should be an integral part of the accord. Disclosing data about sensitive national

security matters to an international body in regard to a treaty violation would, therefore, no longer be considered a crime or an act of treason, but be sanctioned by domestic law. Rotblat pointed out that apart from relying on their *ad hoc* observations, scientists and technologists could establish organisations to act as compliance watchdogs, monitoring the activities of individuals likely to become involved in an illegal project. Such monitoring could be done, without appearing to spy on one's colleagues, by keeping a register of scientists and technologists and noting changes in their place of work or pattern of publications (or their absence). Other signs of attempted clandestine activities would include: the commencement of new projects at academic institutions without proper justification; the recruitment of young scientists and engineers in numbers not warranted by the declared purpose of the project; or the large-scale procurement of certain types of apparatus, materials and equipment.

All establishments dealing with nuclear facilities, such as those processing and storing spent fuel elements from nuclear reactors or enrichment plants, should be subject not only to monitoring by the International Atomic Energy Agency (IAEA), but also by watchdog organisations.[9]

Challenges facing societal verification

There is a widespread view that in non-democratic countries with little respect for individual human liberties and rights, citizens' reporting and whistleblowing are likely to be ineffective. Yet, reporting by civil rights groups and other non-governmental organisations (like Amnesty International, Human Rights Watch and the Bellona Foundation[10]) has for many years played an important role in strengthening compliance with international agreements even in non-democratic states, especially in the areas of human rights and the environment. Amnesty International's reports are an important resource for anyone monitoring state behaviour with respect to human rights. Even in a non-democratic system, a government cannot be absolutely sure that persons with knowledge of clandestine activities will not transmit the information to the international community. Examples include the son-in-law of Iraqi President Saddam Hussein, General Hussein Kamal Hassan, who, in 1991, disclosed Iraq's calutron purchases and other clandestine nuclear and biological weapon activities, first to the US, and, later, to the UN Special Commission (UNSCOM).[11] Another case is that of Russian chemist Vil Mirzajanow, who reported on the secret chemical weapon activities of the former Soviet Union.[12]

A treaty for which societal verification could be particularly powerful is the 1972 Biological Weapons Convention (BWC). Although the BWC bans the acquisition and use of biological weapons, it does not prohibit scientists from conducting research on substances that, although useful for peaceful purposes, are also potentially relevant to the development of biological weapons.[13] Indeed, it is difficult to draw an exact line between research and development of biological and toxin weapons and activities with peaceful motives. There is little doubt that a small group of people, even in government, could produce biological weapons without being detected.[14] Citizens' reporting and, especially, whistleblowing could have an important role to play, as demonstrated by Russian defector Kanathan Alibekow (alias Ken Alibek[15]), who, in 1992, revealed the existence of Biopreparat, the network of clandestine Russian biological weapon research centres.[16]

The same is true for the arms trade and exports of embargoed 'dual use' technology. Illicit transfers of nuclear, chemical and additional materials to Iraq from the UK and other countries between 1980 and 1990, in violation of the UN arms embargo, are illustrative. In one case, an employee of the British company, Matrix Churchill, wrote to the UK Foreign Secretary warning that equipment was being exported illegally to Iraq. Although his letter was ignored by civil servants for a number of years, it was ultimately the fear that he would contact the press that caused the UK Deputy Prime Minister to reveal that the government had been aware of the exports.[17]

Whistleblowers like Alibekow and Mirzajanow are part of a long tradition. One of the most famous examples is that of the German Nobel Peace Prize Laureate, Carl von Ossietzky, a journalist and writer in the 1920s and 1930s. In his periodical *Die Weltbühne,*[18] he disclosed secret military co-operation between the German army and the Soviet authorities, which violated the international agreements concerning disarmament measures in the 1919 Versailles Peace Treaty. He was convicted of treason and espionage and imprisoned.[19]

Some observers assert that societal verification smacks too much of the mythical 'Big Brother' society, wherein citizens watch each other and the state watches citizens. Societal verification, however, aims, by definition and design, for openness and the free flow of ideas. It can substantially extend the information base of official verification efforts and contribute to the protection of democratic rights.

One of the most difficult aspects of societal verification and its special form of whistleblowing is that it implies disloyalty, the stigma of spying on one's

colleagues. The tension between an organisation's concern to control its own affairs and the public's interest in knowing of developments which violate international agreements is often mirrored in a tension of loyalties among its professional employees. Professionals working in large organisations often make early assessments of the adverse impact of science and technology on society. But such organisations are generally eager to avoid the 'premature' disclosure of concerns that may later be unsubstantiated. Management often sees dissenting employees as challenging the legitimacy of its authority, while whistleblowing is viewed as a challenge to the credibility of the organisation as a whole. Dissent may, therefore, cause confrontation between the individual expert and management. For many employees this is too intimidating a prospect. The stigma of disloyalty would be reduced, however, if these activities were protected and positively sanctioned by international and domestic law.

The suppression of professional dissent can itself have damaging effects on an organisation by straining the loyalty, morale and creativity of employees and the credibility and reputation of the organisation. Dissent is often an early sign of problems that may escalate into serious and expensive crises if not dealt with early and effectively.

First steps towards societal verification

In recent years several encouraging steps have been taken in the direction of societal verification at the international and national levels, but much remains to be done.

Societal verification provisions of the Model Nuclear Weapons Convention

In 1997, an international consortium of lawyers, scientists and disarmament specialists—co-ordinated by the US Lawyers' Committee on Nuclear Policy—drafted a Model Nuclear Weapons Convention (Model NWC).[20] At the request of Costa Rica, it was circulated as a UN document. Article VIIB states that 'persons shall report any violation of this Convention to the Verification Agency established by the Convention'. This responsibility takes precedence over any obligation not to disclose information that may exist under national security laws or employment contracts. Data received by the Agency will be held in confidence, except to the extent necessary for investigative purposes, until formal charges are lodged.

Article VIIC deals with both intrastate and interstate protection. It proposes the following intra-state provisions:

- 'Any person reporting a suspected violation of this Convention, either by a person or a State, shall be guaranteed full civil and political rights including the right to liberty and security of person';
- states parties 'shall take all necessary steps to ensure that no person reporting a suspected violation of this Convention shall have any rights diminished or privileges withdrawn as a result';
- any individual who, in good faith, 'provides the Agency or a National Authority with information regarding a known or suspected violation of this Convention cannot be arrested, prosecuted or tried on account thereof';
- 'It shall be an unlawful employment practice for an employer to discriminate against any employee or applicant for employment because such person has opposed any practice as a suspected violation of this Convention, reported such violation to the Agency or a National Authority, or testified, assisted, or participated in any manner in an investigation or proceeding under this Convention'; and
- 'Any person against whom a national decision is rendered on account of information furnished by such person to the Agency about a suspected violation of this Convention may appeal such decision to the Agency within . . . months of being notified of such decision. The decision of the Agency in the matter shall be final.'

The interstate section includes a provision that, 'any person reporting a violation of this Convention to the Agency shall be afforded protection by the Agency and by all States Parties, including, in the case of natural persons, the right of asylum in all other States Parties if their safety or security is endangered in the State Party in which they permanently reside'.

Other provisions state that the Executive Council established by the Convention 'may decide to award monetary compensation to persons providing important information to the Agency concerning violations of this Convention'. In addition, 'Any person who voluntarily admits to the Agency having committed a violation of this Convention, prior to the receipt by the Agency of information concerning such violation from another source, may be exempt from punishment. In deciding whether to grant such exemption, the Agency shall consider the gravity of the violation involved as well as whether its consequences have not yet occurred or can be reversed as a result of the admission made'.

Civil society 'second track' monitoring: Landmine Monitor

The 1997 Landmine Convention does not have a standing verification mechanism.[21] In September 1998, however, non-governmental organisations (NGOs) involved in the International Campaign to Ban Landmines (ICBL) set up Landmine Monitor, a civil society-based reporting network for monitoring state compliance.[22] For many years, NGOs and research centres, like the Stockholm International Peace Research Institute (SIPRI), have monitored compliance with international treaties informally and individually. But Landmine Monitor is the first attempt to create a systematic, global non-governmental monitoring network. Although Landmine Monitor has no official status under the treaty, its reports cover every aspect of implementation and compliance by all countries, as well as thematic issues. The first report was presented to the First Meeting of States Parties in Maputo, Mozambique, in May 1999, while the second was presented to the Second Meeting of States Parties in Geneva, Switzerland, in September 2000.[23]

US whistleblower protection

The Federal Whistleblower Protection Act (5 USC sec. 1201), which became effective on 9 July 1989, gives federal employees protection by forbidding government agencies from acting against any employee for declining to engage in illegal activity.[24] The Act also covers activities banned by international (self-executing[25]) treaties to which the US is a party. Under Article VI of the US Constitution, a treaty that has been adopted with the consent of two-thirds of the Senate and does not require legislation to implement its provisions domestically, automatically becomes national law. The Act must be seen in the light of the US Government Employees' Code of Ethics, which states that it is the duty of any person in government service to:

> 'Put loyalty to the highest moral principles and to country above loyalty to persons, party or Government department' and 'Uphold the Constitution, laws, and regulations of the United States and of all governments therein and never be a party to their evasion'.

The Whistleblower Protection Act did not always live up to its promise. The principal reason was the lack of sufficient evidence connecting the employee's whistleblowing and reprisals by employers.[26] A 1993 survey found that, by a 60–23 margin, federal employees did not believe their rights would be protected. The rate of retaliation by superiors for whistleblowing was 37 percent; 45 percent reported

that acting on their rights landed them in more trouble.[27] Agencies and agency bodies responsible for the Act's implementation were unwilling to enforce it.

The Act was amended in 1994, offering significant improvements.[28] Federal employees covered by collective bargaining agreements now receive state-of-the-art administrative law protection through arbitration hearings. They can seek immediate relief through legal action to stop temporarily the adverse personnel action and can sue managers who attempt reprisals. Employees can prove the connection between whistleblowing and reprisal simply by demonstrating, for instance, a short time lapse between the whistleblowing and the employee's next performance appraisal. The whistleblower will only have to prove that dissent was a contributing factor in the job action; once this is established, the burden of proof shifts to the agency to prove by 'clear and convincing evidence' that it would have taken the same action anyway on independent grounds. In addition, the amendments require the Merit Systems Protection Board to refer managers for disciplinary investigations whenever there is a finding that reprisal was a contributing factor in action taken against personnel.

In contrast to the US federal public sector, there is no comprehensive law that prohibits employers in the private sector from retaliating against whistleblowers. But some states have adopted common law remedies under the 'public policy exception to the termination at will doctrine'. Today, 42 states and the District of Columbia offer protection to employees who suffer discrimination for blowing the whistle on an issue of importance to the public, such as health or safety. But there are no general or specific provisions that protect whistleblowers who make disclosures concerning breaches of an international treaty.

Russia: a right of disclosure?

In recent years there have been many prosecutions of Russian whistleblowers accused of divulging state secrets or even treason or espionage by handing over real or potential state secrets to the public and/or foreign organisations. Examples include the cases of Alexandr Nikitin[29]and Grigorij Pescov.[30]

The Russian Federal Law on State Secrets (no. 5485-1), adopted on 21 July 1993, provides in Article 5 a 'List of information considered as state secrets'. This list was significantly expanded by an amendment adopted on 9 October 1997. It mainly includes military-related information, such as the contents of strategic or operational plans, plans for the Russian armed forces and details of the production of nuclear

and other special armaments. Nevertheless, Article 7, which was not significantly changed on 9 October 1997, expressly determines a category of information that cannot be kept secret: 'information on extraordinary events and catastrophes that threaten the safety and health of the population, and the consequences of such events'. The same applies to 'information on the ecological situation'. It is still not clear if, and how, the Russian authorities, especially the criminal and administrative courts, will handle these provisions, which contain elements necessary for the protection of whistleblowers. It will be of great interest to observe further developments in this area in Russia.

The UK Public Interest Disclosure Act

The UK Public Interest Disclosure Act, which came into force on 2 July 1999, protects employees from dismissal and victimisation if they make a 'qualifying disclosure'.[31] The legislation applies to people at work raising genuine concerns about crime, illegality, miscarriage of justice, danger to health and safety or the environment and the covering up of any of these matters. It applies whether or not the information is confidential and extends to malpractice occurring outside the UK (§43B section 2).

A whistleblower who feels victimised can bring a claim before an employment tribunal for compensation; additionally, if the employee is sacked, he or she may apply for an interim order to keep their job. 'Gagging' clauses in employment contracts and severance agreements are void insofar as they conflict with the Act.

The Act makes provision for the following five types of disclosure:

- internal disclosures—made in good faith, to a manager or the employer, if the whistleblower has reasonable suspicion that malpractice has occurred, is occurring or is likely to occur;
- disclosures in government-appointed bodies—if employees report their concerns in good faith directly to the sponsoring department, rather than to their employer;
- regulatory disclosures—made in good faith to regulatory bodies specified under the Act, such as the Health and Safety Executive, Inland Revenue, Customs and Excise, and the Financial Services Authority, if the whistleblower reasonably believes that the information and any allegation in it are substantially true;
- wider disclosures—for instance to the police, the media, Members of Parliament, pressure groups, and non-prescribed regulators. These disclosures are protected, if, in addition to the tests for regulatory disclosures, they are reasonable in the

circumstances. But they are not protected if made for personal gain. Furthermore, one of the following tests must be met: the whistleblower reasonably believed that they would be victimised if they raised the matter internally or with a prescribed regulator; they reasonably believed that a cover-up was likely and there was no prescribed regulator; or they had already raised the matter internally or with a prescribed regulator;

- disclosures in exceptionally serious matters—a disclosure will be protected if the concern is exceptionally serious, if it meets the test for regulatory disclosures, and if it is not made for personal gain. The disclosure must also be reasonable, having particular regard for the identity of the person it was made to.

Employees who, for instance, warn a Member of Parliament or the media that munitions are likely to be exported in violation of an arms embargo or an international agreement incorporated into the law of the land, would be able to seek the Act's protection under its 'wider disclosure' or 'disclosure of an exceptionally serious nature' provisions. Only in those cases where a whistleblower was or would have been guilty of breaching the Official Secrets Act or of another secrecy offence by making an external disclosure would the Public Interest Disclosure Act's protection not apply. Overall, though, by setting out a relatively clear framework for raising genuine concerns about crime and illegality and by guaranteeing legal protection to employees who raise such issues, the Act could be an important step in creating a culture favourable to societal verification in the UK.

France: civil society involvement in implementation of Landmine Convention

In France, one example of officially sanctioned citizens' reporting is NGO involvement in the process of implementing the Landmine Convention. The French Act concerning the Abolition of Anti-Personnel Landmines establishes in Article 9 a National Committee to participate in monitoring implementation of the country's obligations under the treaty.[32] Membership of the Committee, besides representatives of the French government and Parliament, will include NGO representatives. Article 10 of the Act states that the National Committee will provide for effective implementation of the Convention and the international activities of the French Republic concerning de-mining and help for victims of anti-personnel landmines. The French government is obliged to report annually to Parliament on the implementation of the Act. While these provisions provide for only limited participation by representatives of civil society in a public body involved in a

verification process, the French initiative can be seen as a significant precedent in making societal verification more acceptable and likely.

Future possibilities

To make social verification more likely, the following steps would be helpful:

- the legal right of all citizens and citizen groups to engage in societal verification needs to be guaranteed by each international agreement and by the legal system of each state party;
- explicit legal protection against discrimination and criminal prosecution should be established for all (natural and legal) persons reporting violations or attempted violations of an international agreement;
- the right to raise funds for citizens' verification purposes, within and outside the country, must be guaranteed so that citizen groups obtain financial resources for their work; and
- regulations concerning freedom of information and openness in science should be promulgated.

Freedom of information means that records in the possession of public agencies and departments of the executive branch are accessible to citizens. Those seeking information should no longer be required to prove that they are entitled to obtain the data and have a special need for it. Instead, the 'need to know' standard must be replaced by a 'right to know' doctrine. The government or head of the relevant public agency must be required to justify the legally protected need for secrecy (for instance, properly classified documents, internal personal rules and practices, confidential business data, internal government communications, personal privacy and law enforcement). But it should be established, by law, that international and domestic legislation must not protect illegal 'state secrets'. Information on violations of international or domestic law by state officials cannot be kept confidential.

Whistleblowing

Since any serious attempt to violate an international treaty or corresponding national legislation would require the involvement of technologists, scientists and other employees, societal verification is nearly impossible without special protection for those who 'blow the whistle'. Possible initiatives to achieve this include:

- legal protection against discrimination and criminal prosecution for whistle-

blowers should be established by international treaties and domestic law. Due process protection for dissenting employees should be established by state legislation. It should include the right of all professionals and employees to inform, in good faith, appropriate bodies, or, if necessary, the public, of plans, projects and measures in their workplace or outside their workplace which violate national or international law or principles of professional ethics, and to refuse to work on such projects;

- exemption from punishment in case of self-disclosure (revelation of one's own involvement in forbidden activities) should be guaranteed; and
- international and domestic law should guarantee that a whistleblower can rely on legal protection in foreign countries in case of discrimination or criminalisation by their own state (that is, the right to asylum).

To encourage citizens to 'blow the whistle' as an important element of societal verification, it would also be necessary to establish loyalty to a much larger group than one's own organisation and nation. Universal loyalty to humankind must be developed and strengthened, an important task for the education system and mass media. The responsibility of scientists, technologists and other employees could be developed through training to identify activities that may be prohibited or ethically questionable. Scientists in universities and academies could develop special programmes and curricula for teaching and learning, such as: awareness of ethical problems in research and development; ethically responsible behaviour as a professional and employee; and management of ethical conflicts. It could become an obligatory part of student examinations to scrutinise the possible ethical consequences of scientific and technological proposals, inventions and developments.

Organisations and enterprises could develop due process procedures for dealing with dissent and dissenters in a fair and responsive manner. Initiatives could include: devising a Code of Ethics and Professional Conduct which guarantees that nobody is discriminated against or sanctioned if they make a protected disclosure to a specified internal or external person or body; appointing an ombudsman within the organisation (concerned with ethical behaviour); and establishing a hotline for complaints (anonymous or otherwise).

Additionally, organisations of scientists, technologists and other employees could support and encourage potential and actual whistleblowers, and monitor the activities of individuals and groups likely to become involved in projects contravening international accords, domestic law or standards of professional ethics. They could:

develop a Model Code of Ethics and Professional Conduct for their membership; publicise appropriate whistleblower cases and ethical conflicts; publish details of the cases and names of employers who have discriminated against responsible professionals or other ethical employees; offer professional advice in actual conflicts; organise acts of solidarity with whistleblowers; establish ethical support funds; award whistleblowers; and lobby for better legal protection of whistleblowers.

As to the international arena, an amendment to the UN Charter, as proposed by Clark and Sohn, would only be feasible in exceptional historical circumstances, which have not yet arrived. The idea of including protective clauses for citizens' reporting and whistleblowing in international treaties should prove easier, although it will still be difficult for citizens' groups and other NGOs to achieve.

The technological revolution, meanwhile, especially in the field of communication systems, like the Internet, will facilitate societal verification. But the Internet and other technologies will not remove the need for legislative protection. Employees and other citizens who whistleblow in good faith must still be protected against all forms of pressure, discrimination and retaliation in their workplace and personal and professional environment, and against criminal prosecution by their authorities.

It will likely take many years to establish effective measures of societal verification in international agreements, because there seems to be little enthusiasm among political decision-makers to develop such tools. Nevertheless, the need for societal verification will increase nationally and internationally. Growing national and international networks of public interest groups,[33] lawyers, legislators, journalists and former whistleblowers are available to assist employees in disclosing irregularities. The movement is also achieving success in its drive to force accountability on governments and industries, since they are coming to see whistleblowers as useful bell-wethers of emerging problems. In many countries, whistleblower protection, conforming largely to the UK and US models, will probably continue to be enacted within the next few years. Because of the significant contributions that citizens' reporting and whistleblowing can make, such developments should be encouraged.

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Endnotes

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[4] Lewis Bohn, 'Non-Physical Inspection Techniques', in Donald G. Brennan (ed.), *Arms Control, Disarmament, and National Security,* Braziller, New York, 1961.

[5] Greenville Clark and Louis Sohn (eds.), *World Peace Through World Law*, Harvard University Press, Cambridge Massachusetts, 2nd ed., 1962, p. 264.

[6] Clark and Sohn, p. 267.

[7] Leo Szilard, *The Voice of Dolphins,* Simon and Schuster, New York, 1961. In 1946, Szilard organised a campaign of scientists against a US government plan (May–Johnson Bill) to subject all nuclear research to a special agency.

[8] Rotblat, p. 107.

[9] Rotblat, p. 114.

[10] For instance, see the case of Alexander Nikitin, former captain of the Soviet navy, who reported on the Russian Northern Fleet and the sources of radioactive contamination in 1995 and 1996. See his study, *Sources of Radioactive Pollution in the Murmansk and Archangelsk Regions,* and his special Bellona Report.

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[12] See Vil Mirzayanow, 'It's time to release my mentor', speech to the 'Democracy, Human Rights and Mordechai Vanunu' international conference, Tel Aviv, Israel, 14–15 October 1996 (unpublished). For further information, see 'A poisoned policy', *Moscow News Weekly*, no. 39/1992, s. 9; Frank von Hippel, 'Russian Whistleblower Faces Jail', *Bulletin of the Atomic Scientists*, March 1993, p. 7*; New Times International*, 45/1992, p. 22; Reiner Braun, Angeklagt wegen 'Geheimnisverrats', in *Wissenschaft und Frieden,* 1/1994, pp. 71–72.

[13] See the chapter by Robert J. Mathews in this volume.

[14] See Wolfgang Fischer (Research Centre Jülich), 'Learning from Other Regimes: Social Monitoring as a Contribution to Effective Safeguards?', in *Proceedings of the Seminar on Modern Verification Regimes: Similarities, Synergies and Challenges*, Helsinki, 12–14 May 1998, p. 119.

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[17] Guy Dehn, 'Project Whistleblowing—The UK experience', working paper, Public Concern at Work, London, 2000, p. 14.

[18] Published on 12 March 1931 in the *Weltbühne* ('Windiges aus der deutschen Luftfahrt').

[19] For further information, see Ingo Müller, Der Weltbühnenprozeß von 1931, in Carl von Ossietzky, p. 227. *Tage im Gefängnis. Luchterhand Literatur Verlag,* Darmstadt, 1988, p. 13.

[20] UN Document A/C.1/52/7, 17 November 1997. For additional information, see *Security and Survival: The Case for a Nuclear Weapons Convention*, International Association of Lawyers Against Nuclear Arms/International Network of Engineers and Scientists Against Proliferation/International Physicians for the Prevention of Nuclear War, Cambridge, Massachusetts, 1999. The Model NWC can be downloaded from www.ippnw.org.

[21] The Treaty does, however, require annual reports by states parties on their compliance and outlines the means by which compliance problems could be resolved; these annual reports are published by the UN Secretariat. Additionally, the Treaty provides for annual meetings of states parties to assess its effectiveness.

[22] See Trevor Findlay, 'Landmine Monitor: Pioneering 'Track Two' Verification', *Trust & Verify,* no. 83, November 1998, p. 1.

[23] The 1999 and 2000 Landmine Monitor reports may be found at www.icbl.org.

[24] See Tom Devine, *The Whistleblower's Survival Guide*, Government Accountability Project, Washington, DC, 1997, p. 124. More information on the Government Accountability Project and links to other resources on whistleblowing can be found at www.whistleblower.org.

[25] A self-executing treaty becomes internal law in the US immediately upon entry into force internationally; non-self-executing treaties require legislation to implement them domestically. For further information, see Thomas Buergenthal and Harold Maier, Public International Law, second edition, West Publishing Company, St. Paul, Minnesotta, 1990, p. 204.

[26] See General Accounting Office, 'Determining Whether Reprisal Occurred Remains Difficult', GGD-93-3, 27 October 1992, Washington, DC, cited in Gerald Caiden and Judith Truelson, 'An Update on Strengthening the Protection of Whistleblowers', *Australian Journal of Public Administration,* vol. 53, 1994, p. 575.

[27] See Devine, p. 128; Caiden and Truelson, p. 579.

[28] See Devine, p. 129; Dieter Deiseroth, *Berufsethische Verantwortung in der Forschung. Möglichkeiten und Grenzen des Rechts,* LIT-Verlag, Münster, 1997, pp. 233 ff.

[29] Alexandr Nikitin (St. Petersburg), a former Soviet navy captain, has been prosecuted for high treason and divulging state secrets. He contributed to various studies and publications on potential risks of radioactive pollution in the Murmansk and Archangelsk regions. For further information, see Dieter Deiseroth and Dietmar Göttling (eds.), *Der Fall Nikitin/The Nikitin Case,* G.Emde-Verlag, Pittenhart, 2000.

[30] Grigory Pasko, a Russian naval officer and military journalist ('Bojewaja Wachta'), sent controversial reports to Japanese television and newspapers, accusing the Russian navy of spilling nuclear waste into the Sea of Japan. He was arrested in 1997 on his return from Japan and charged with selling state secrets abroad. See *Die Zeit,* no. 8, 1999, p. 33.

[31] For further information, see Public Concern at Work (ed.), *Current Law Statutes. Public Interest Disclosure Act 1998*. Annotations by Guy Dehn, Legal Information Resources, Sweet & Maxwell, London, 1999.

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[33] One example is the International Network of Whistleblower Protection Organizations. For further information, see www.whistleblower.org.

annex

Peace operations worldwide, 1948–2000 military tasks, techniques and mechanisms

• military tasks ♦ techniques and mechanisms

1940s

UN Truce Supervision Organization (UNTSO) 1948–
- truce supervision, then supervision of Armistice Agreements.
- ♦ military observers; mediator deals with complaints; observers assigned to armed groups on both sides.

UN Military Observer Group in India and Pakistan (UNMOGIP) 1949–
- monitor cease-fire.
- ♦ military observers.

1950s

International Commission for Supervision and Control (ICSC) 1954
- oversee and report on implementation.
- ♦ multinational commission established for Cambodia, Laos and Vietnam.

UN Emergency Force I (UNEF I) 1956–67
- monitor cease-fire and withdrawal of forces.
- ♦ military observers; aerial reconnaissance; observation posts; patrols.

UN Observer Group in Lebanon (UNOGIL) 1958
- ensure no infiltration of personnel and supplies across borders.
- ♦ observers; observation posts; regular patrols; aerial reconnaissance; evaluation team to analyse and co-ordinate information.

1960s

UN Operation in the Congo (ONUC) 1960–64
- restore law and order; oversee withdrawal of foreign troops; prevent civil war.
- ♦ support local armed forces in restoring order; oversee withdrawal of foreign troops; use of force to round up foreign troops; observation posts, patrols.

UN Yemen Observation Mission (UNYOM) 1963–64
- monitor disengagement of forces.
- ♦ military observers, check points; ground and air patrols; liaison with forces.

UN Peacekeeping Force in Cyprus (UNFICYP) 1964–
- prevent recurrence of fighting; help establish law and order.
- ♦ supervise cease-fire and maintain buffer zone; military observers, patrols; observation posts; since 1974, inspection of cease-fire lines.

Mission of the Representative of the Secretary-General in the Dominican Republic (DOMREP) 1965–66
- observe and report on cease-fire.
- ♦ military observers.

1970s

UN Emergency Force II (UNEF II) 1973–79
- supervise cease-fire and return of forces to previous positions; ensure maintenance of agreed limits on forces and arms.
- ♦ military observers; observation posts, check points; buffer zones for re-deployments; patrols, air patrols; bi-weekly inspections.

International Commission of Control and Supervision in Vietnam 1973
- oversee cease-fire and withdrawal of foreign troops.
- ♦ multinational commission to monitor and investigate violations.

UN Disengagement Observer Force (UNDOF) 1974–
- maintain and supervise cease-fire; supervise re-deployment of forces; establish buffer zone as per formal Israel–Syria agreement.
- ♦ military observers; observation posts; check points; buffer zones; liaison with parties; fortnightly inspections.

Sinai Field Mission (SFM) 1974–82
- US to monitor buffer zones and operation of Egyptian and Israeli surveillance stations, and to undertake aerial reconnaissance in conjunction with UNEF; after 1979 inspection of Egyptian military installations in interim buffer zone.
- ♦ observers; watch stations; tasks contracted out to private companies; liaison officers check Israeli and Egyptian surveillance stations; aerial reconnaissance.

UN Interim Force in Lebanon (UNIFIL) 1978–
- confirm withdrawal of Israeli forces; restore peace and security; prevent infiltration in zone of operation.
- ♦ military observers, check points (working with Lebanese gendarmes), observation posts, patrols.

Commonwealth Monitoring Force (Rhodesia/Zimbabwe) 1979
- comprehensive peace settlement; cease-fire monitoring; separation of forces; demilitarisation.
- ♦ containment procedures; cease-fire commission.

1980s

Multilateral Force and Observers (MFO) 1982–
- take over from SFM (see above).
- ♦ in general, same as for SFM.

UN Good Offices Mission in Afghanistan and Pakistan (UNGOMAP) 1988–90
- monitor peace accord concluded under UN auspices.
- ♦ military observers, observation posts; inspections of garrisons; investigation of complaints; meetings with parties to discuss compliance with obligations.

UN Iran–Iraq Military Observer Group (UNIIMOG) 1988–91
- verify and supervise cease-fire and troop withdrawal.
- ♦ military observers; mobile patrols by vehicle, helicopter, boat, mule and foot.

UN Angola Verification Mission I (UNAVEM I) 1989–91
- verify redeployment and withdrawal of Cuban troops.
- ♦ military observers; mobile teams for *ad hoc* inspections; Joint Commission for liaison and co-ordination.

UN Angola Verification Mission II (UNAVEM II) 1991–93
- verify compliance with peace accords reached by the parties; verify that the parties are carrying out the monitoring of the cease-fire adequately.
- ♦ military observers; observation posts, mobile patrols (including by helicopter); Joint Political Military Commission and subsidiary committees.

UN Transitional Assistance Group (UNTAG) 1989–90
- oversee reduction and withdrawal of South African troops from Namibia.
- ♦ military observers; Joint Commission; assembly points for turning in arms; monitoring of bases where troops are confined; permanent border check points.

UN Observer Group in Central America (ONUCA) 1989–92
- verify security aspects of Esquipulas II Agreement (1990); monitor cease-fire and demobilisation of troops in Nicaragua.
- ♦ mobile military observer teams. Spot checks and *ad hoc* inspections; based in verification centres close to sensitive areas.

1990s

UN Observer Mission in El Salvador (ONUSAL) 1991–95
- monitor verification with agreement to end civil war in El Salvador; includes verification of cease-fire and separation of forces, plus changes in armed forces.
- ♦ military observers; monitor troops in designated locations; verify weapons inventories.

UN Iraq–Kuwait Observer Mission (UNIKOM) 1991–
- monitor demilitarised zone and waterway.
- ♦ military observers; observation posts; mobile patrols on cleared tracks; air patrols; visual observation only, no imaging or radar technology.

UN Mission for the Referendum in Western Sahara (MINURSO) 1991–
- monitor cease-fire; verify reduction of troops and confinement of certain troops to specified locations.
- ♦ military observers; observation posts, mobile patrols; helicopter patrols for supplementary and short-notice inspections.

UN Advance Mission in Cambodia (UNAMIC) 1991–93
- monitor cease-fire; advance mission for UNTAC.
- ♦ military observers, liaison officers.

European Community Monitoring Mission (ECMM) 1991–95
- cease-fire monitoring; later, joint monitoring of no-fly zone with UNPROFOR (see below).
- ♦ observers; later, joint monitoring of cease-fire and withdrawal of heavy weapons with UNPROFOR; inspections of departing and arriving aircraft at designated airports.

UN Transitional Authority in Cambodia (UNTAC) 1992–93
- to oversee implementation of Agreements on a Comprehensive Political Settlement; supervision of cease-fire; verify withdrawal of forces; oversee cantonment, disarmament and demobilisation of forces; weapons control, including verifying end of outside assistance.
- ♦ military observers, mobile monitoring teams, air and marine patrols; border checkpoints; cantonment sites.

UN Protection Force (UNPROFOR) 1992–95
- monitor cease-fire; ensure delivery of humanitarian aid. Croatia: establish and monitor UN

protected areas (UNPAs). Bosnia: security at airport; humanitarian protection; no-fly zone; border observation; and safe areas.
- ♦ UNPAs: checkpoints, intensive patrols by land and air; check complaints of violations (cordon and search operations). Krajina: establish buffer zone, weapons under dual-lock storage. Bosnia: military observers, collect weapons and oversee demilitarisation, set up and monitor heavy weapon exclusion zones. Maritime monitoring of arms embargo under NATO auspices.

UN Observer Mission in Mozambique (ONUMOZ) 1992–94
- oversee implementation of peace agreement; cease-fire, separation of forces, demobilisation, collection, storage and destruction of weapons, withdrawal of foreign forces, and disbanding of private military groups.
- ♦ military observers; Supervisory and Monitoring Commission; two sub-commissions; assembly areas for pre- and post-demobilisation monitoring; inspections of declared and undeclared sites.

UN Observer Mission Uganda–Rwanda (UNOMUR) 1993–94
- border monitoring to ensure that no military goods or other military assistance is crossing frontier.
- ♦ military observers.

UN Assistance Mission for Rwanda (UNAMIR) 1993–96
- initially to implement Arusha Peace Agreement; establish secure environment; monitor cease-fire; later expanded to include protection of civilians, intermediary role between warring factions.
- ♦ military observers.

UN Operation in Somalia I (UNOSOM I) 1992–93
- monitor cease-fire; security for humanitarian aid.
- ♦ military observers.

UN Operation in Somalia II (UNOSOM II) 1993–95
- cease-fire monitoring; establish secure environment; control of heavy weapons and seizure of small arms; secure ports and airports; protect UN personnel.
- ♦ military personnel; cantonment and storage of heavy weapons.

UN Observer Mission in Georgia (UNOMIG) 1993–
- verify compliance with cease-fire; monitor implementation of peace accord; observe CIS peace-keepers; monitor security zone, weapon storage areas, troop withdrawals; investigate violations.
- ♦ military observers; patrols, including use of helicopters.

UN Observer Mission in Liberia (UNOMIL) 1993–97
- monitor implementation of peace accord to verify impartial application by ECOMOG and ECOWAS, including cease-fire, encampment and disarmament of troops, demobilisation, arms embargo. 1995 mandate expansion: monitor borders for movement of arms; assemble and disarm combatants.
- ♦ military observers; Joint Cease-fire Monitoring Committee; checkpoints.

UN Mission in Haiti (UNMIH) 1993–96
- establish security and oversee modernisation of armed forces.
- ♦ military observers.

UN Aouzou Strip Observer Group (UNASOG) 1994
- oversee withdrawal of Libyan forces as specified in International Court of Justice decision.
- ♦ military observers.

UN Mission of Observers in Tajikistan (UNMOT) 1994–
- agreements between the two sides; support agreements and operation of Joint Commission, including investigation of cease-fire complaints and liaison with CIS peacekeepers.
- ♦ military observers; UNMOT chaired Joint Commission.

UN Angola Verification Mission III (UNAVEM III) 1995–97
- monitor and verify cease-fire, assembly of troops and demobilisation, disarmament, formation of new armed forces.
- ♦ military observers; Joint Commission framework.

UN Confidence Restoration Operation in Croatia (UNCRO) 1995–96
- monitor cease-fire; control, monitor and report on flow of military personnel and equipment across borders; monitor demilitarisation of Prevlaka peninsula.
- ♦ military observers; patrols.

Military Observer Mission Ecuador–Peru (MOMEP) 1995–99
- by agreement.
- ♦ verify cease-fire; military observers.

Implementation Force (IFOR) 1996
Stabilization Force (SFOR) 1996–
- verify compliance with cease-fire, withdrawal of forces from zone of separation, collection of heavy weapons, demobilisation, arms control and confidence-building measures.
- ♦ NATO and UN member state troops; patrols; cantonment sites; notifications and inspections; Joint Military Commission with IFOR as chair.

UN Transitional Administration for Eastern Slavonia, Baranja and Western Sirmium (UNTAES) 1996–98
- monitor return of refugees; demilitarisation, maintain general security, assist in implementation.
- ♦ military observers and troops.

UN Mission of Observers in Prevlaka (UNMOP) 1996–
- continuation of UNPROFOR tasks; monitoring demilitarisation.
- ♦ military observers.

Peace Monitoring Group (Bougainville) 1997–
- by agreement.
- ♦ monitor cease-fire and then agreement; military observers.

UN Mission in the Central African Republic (MINURCA) 1998–2000
- maintain security; supervise control and storage of weapons and disarmament.
- ♦ military observers.

UN Organization Mission in the Democratic Republic of Congo (MONUC) 1999–
- monitor cease-fire agreement.
- ♦ military liaison officers; Joint Military Commission.

UN Mission of Observation in Sierra Leone (UNOMSIL) 1998–99
- monitor military and security situation, disarmament and demobilisation.
- ♦ military observers.

UN Mission in Sierra Leone (UNAMSIL) 1999–
- take over from UNOMSIL; oversee implementation of agreement; disarmament, demobilisation and re-integration of troops.

- ♦ military observers and troops; Joint Monitoring Commission.

Irish peace process
- provision for decommissioning of all paramilitary arms within two years after referendum.
- ♦ Independent International Commission on Decommissioning.

Kosovo Verification Mission 1998–99
- verify compliance with provisions of UN Security Council resolution and cease-fire.
- ♦ observers; NATO-led aerial reconnaissance.

Kosovo Force (KFOR) 1999–
- deter renewed hostilities; maintain and enforce cease-fire; oversee withdrawal of Yugoslav troops and demilitarisation of Kosovo Liberation Army; border monitoring.
- ♦ NATO-led military troops; Joint Implementation Committee.

Source

William J. Durch (ed.), *UN Peacekeeping, American Policy, and the Uncivil Wars of the 1990s*, St. Martin's Press, New York, 1996; William J. Durch (ed.), *The Evolution of UN Peacekeeping*, St. Martin's Press, New York, 1993; Trevor Findlay, *Cambodia, The Legacy and Lessons of UNTAC*, Oxford University Press, Oxford, 1995; United Nations, *The Blue Helmets*, 3rd ed., New York, 1996; United Nations, Blue Book Series: vol. V, *The United Nations and Mozambique, 1992–1995*; United Nations, Blue Book Series: vol. VIII, *The United Nations and Somalia, 1992–1996;* United Nations, Blue Book Series: vol. IX, *The United Nations and the Iraq–Kuwait Conflict, 1990–1996*; UNIDIR, Disarmament and Conflict Resolution Project, Managing Arms in Peace Processes Series, Geneva, 1995 (all volumes).