

A Standing United Nations Verification Body: Necessary and Feasible

TREVOR FINDLAY

WMDC

THE WEAPONS OF
MASS DESTRUCTION
COMMISSION

www.wmdcommission.org

This paper has been commissioned by the Weapons of Mass Destruction Commission. Its purpose is to function as food-for-thought for the work of the Commission. The Commission is not responsible for views expressed in this paper.

Weapons of Mass Destruction Commission (WMDC)

The WMDC is an independent international commission initiated by the Swedish Government on a proposal from the United Nations. Its task is to present proposals aimed at the greatest possible reduction of the dangers of weapons of mass destruction, including both short-term and long-term approaches and both non-proliferation and disarmament aspects. The Commission will issue its report in early 2006.

The commissioners serve in their personal capacity. The Commission is supported by a Secretariat based in Stockholm, Sweden.

Members of the Weapons of Mass Destruction Commission

Hans Blix, Chairman (Sweden)
Dewi Fortuna Anwar (Indonesia)
Alexei G Arbatov (Russian Federation)
Marcos de Azambuja (Brazil)
Alyson Bailes (United Kingdom)
Jayantha Dhanapala (Sri Lanka)
Gareth Evans (Australia)
Patricia Lewis (Ireland)
Masashi Nishihara (Japan)
William J. Perry (United States of America)
Vasantha Raghavan (India)
Cheikh Sylla (Senegal)
Prince El Hassan bin Talal (Jordan)
Pan, Zhenqiang (China)

Secretary-General of the Commission

Henrik Salander (Sweden)

Weapons of Mass Destruction Commission
Postal address: SE-103 33 Stockholm, Sweden
Visitors' address: Regeringsgatan 30–32
E-mail: secretariat@wmdcommission.org
Website: www.wmdcommission.org

**A Standing United Nations Verification Body:
Necessary and Feasible**

Trevor Findlay

Canadian Centre for Treaty Compliance

December 2005

Foreword

This study, carried out in cooperation with the Verification Research, Training and Information Centre (VERTIC) in London, examines the options for establishing a standing United Nations (UN) monitoring, verification and inspection body to deal with so-called weapons of mass destruction (WMD). It has been prepared as a contribution to the debate on the future of the United Nations Monitoring, Verification and Inspection Commission (UNMOVIC). The Commission on Weapons of Mass Destruction, based in Stockholm, Sweden, requested the study. It and the government of New Zealand generously provided funding.

I am grateful for the invaluable contribution of Rita Grossman-Vermaas, who did much of the background research for the study. I am indebted as well to Foreign Affairs Canada, former inspectors and other personnel of the United Nations Special Commission on Iraq (UNSCOM), former and current UNMOVIC inspectors and personnel, and government and other experts for sharing their views and experiences. This final edition of the report has benefited greatly from the many suggestions offered on an interim version presented at a workshop at the UN Secretariat in New York on 10 May 2005.

The opinions expressed in this report are, however, those of the author and do not necessarily represent the views of the Commission on Weapons of Mass Destruction, the governments of Canada and New Zealand, or any of those who provided advice and assistance.

Trevor Findlay

Associate Professor, NPSIA
Director, Canadian Centre for Treaty Compliance

November 2005

Contents

Foreword
Contents
Acronyms
Introduction

Part A: Rationale, roles and approaches

Rationale for a new standing body

Increasing international concern about WMD non-compliance
No international body with a holistic approach to WMD
Gaps in existing WMD regimes
Lack of universality and ease of withdrawal
Verification and monitoring lacunae
Dealing with the hard cases
The non-state actor challenge
Avoiding wasting the UNMOVIC legacy
A deterrent effect?

Mandate, role and nature of a standing UN verification body

Authorization, governance and establishment
Size and capabilities: the core + virtuality + surge model
Adopting, adapting and developing the UNMOVIC inheritance
Costs and funding
Conclusion

Part B: The UNMOVIC inheritance

Trained and experienced personnel

Roster of inspectors
Training

Information systems

Operating procedures and formats
Detection/inspection and other equipment
Satellite imagery analysis
Multidisciplinary inspections
Laboratories and sampling
Experience in export/import monitoring
Air transport and aerial surveillance
Communications

Annexes

Annex 1: Specialized inspection equipment provided to UNMOVIC inspectors (1 December 2002-15 March 2003)

Annex 2: Advanced inspection technologies used by UNMOVIC

Annex 3: Composition of roster of trained inspectors as of May 2003

Annex 4: UNMOVIC training

Annex 5: UNMOVIC's network of laboratories

Acronyms

BOMVIC	Baghdad Ongoing Monitoring, Verification and Inspection Centre
BW	Biological weapons
BWC	Biological and Toxin Weapons Convention
CBW	Chemical and biological weapons
CIA	Central Intelligence Agency (US)
CTBT	Comprehensive Nuclear Test Ban Treaty
CTBTO	Comprehensive Nuclear Test Ban Treaty Organization
CW	Chemical weapons
CWC	Chemical Weapons Convention
DPKO	Department of Peacekeeping Operations
IAEA	International Atomic Energy Agency
ICJ	International Court of Justice
INMARSAT	International maritime satellite (company)
INVO	Iraq Nuclear Verification Office
ISG	Iraq Survey Group
IT	Information technology
NBC	Nuclear/biological/chemical
NPT	Nuclear Non-Proliferation Treaty
NTM	National technical means
OMV	Ongoing Monitoring and Verification
OPCW	Organisation for the Prohibition of Chemical Weapons
OSI	On-site inspection
R-OMV	Reinforced Ongoing Monitoring and Verification
UAV	Unmanned aerial vehicle
UK	United Kingdom
UN	United Nations
UNDDA	United Nations Department for Disarmament Affairs
UNDP	United Nations Development Programme
UNGA	United Nations General Assembly
UNIDIR	United Nations Institute for Disarmament Research
UNMOVIC	United Nations Monitoring, Verification and Inspection Commission
UNSC	United Nations Security Council
UNSCOM	United Nations Special Commission (on Iraq)
US	United States
VHF	Very high frequency
WHO	World Health Organization
WMD	Weapon of mass destruction

Introduction

This study examines the options for establishing a standing United Nations (UN) monitoring, verification and inspection body to deal with weapons of mass destruction (WMD).¹ It draws considerably on the experience of the United Nations Monitoring, Verification and Inspection Commission (UNMOVIC), which was mandated to handle the single case of Iraq, but which could in theory devolve at least some of its extant capacities and capabilities to a new, standing organization.

In considering the idea of a permanent, UN verification body to tackle WMD, it is important to establish whether there is a real need for such an entity and to identify the precise role it might play. While UNMOVIC did a creditable job in difficult circumstances in Iraq, and since the withdrawal of its inspectors in March 2003 has been doing invaluable work in documenting and analyzing the Iraq case, it would be wrong to seek UNMOVIC's prolongation in order, in some sense, to reward it. It would be equally misguided to indulge in 'knee-jerk' multilateralism, supporting UNMOVIC's continuation simply because it is a fine example of what the international community can do, through the UN, when it is determined to act collectively against a common threat. Nor would it be responsible to advocate maintaining an expensive organization on the off chance that one day it might face a rerun of Iraq.

If anything should be learned from the most recent proliferation crises, notably those of Iran, Iraq, Libya and North Korea, it is that each is in at least some respects unique and thus requires its own combination of approaches. Like military forces that must avoid the temptation to prepare to fight the last war, so WMD strategy should avoid drawing inspiration solely from the most recent case.

In contemplating whether there should be a standing UN WMD verification body this study will therefore seek answers to the following questions:

- Is there a need for such an organization?
- What might its role be?
- If there is a need, what would be the most effective and cost efficient way of proceeding?
- To what extent could a new organization draw on the existing capacities of the UN system, including those of UNMOVIC?
- What model might be best adopted in setting up such a body?

Part A of the study examines the rationale and possible framework for a standing UN WMD body, while Part B details the legacy of UNMOVIC and how its extant experience and capacities might be drawn on and adapted in creating a new body.

PART A: RATIONALE, ROLES AND APPROACHES

Rationale for a new standing body

There are several reasons why a standing body is needed within the UN system to deal with WMD issues.

Increasing international concern about WMD compliance

The UN, particularly the United Nations Security Council (UNSC), has repeatedly declared WMD proliferation to be a threat to international peace and security. A statement by the President of the UNSC on behalf of its members as early as January 1992 declared that, ‘The proliferation of all weapons of mass destruction constitutes a threat to international peace and security’.² Another presidential statement in February 1995 reaffirmed this, pronouncing that ‘appropriate measures will be taken in this respect in particular where international treaties provide for recourse to the Council when their provisions are violated’.³

The UN has also increasingly expressed concern that non-state actors may acquire and use WMD, a threat that the existing WMD regimes have traditionally been poorly equipped to address. Furthermore, the Security Council has established the principle that all states have obligations to prevent proliferation and use of WMD, regardless of whether they are parties to particular treaties or not. In April 2004 the UNSC adopted resolution 1540, obliging UN member states to take effective steps to stop non-state actors obtaining WMD and requiring states to report annually to a monitoring committee on their compliance with the resolution.⁴ Resolution 1540 is binding on all UN members, whether they are signatories, parties or non-parties to the major treaties focused on WMD: the 1968 Nuclear Non-Proliferation Treaty (NPT); the 1972 Biological and Toxin Weapons Convention (BWC); and the 1993 Chemical Weapons Convention (CWC).

For its part, the United Nations General Assembly (UNGA), in April 2005, adopted by consensus an International Convention for the Suppression of Acts of Nuclear Terrorism,⁵ which bans the use or threat of use of a nuclear weapon or radiological device by terrorists and obliges states to cooperate in prosecuting individuals accused of such crimes. The treaty, which was opened for signature in September 2005, enjoins states parties to cooperate with the UN Secretary-General, the International Atomic Energy Agency (IAEA) and other relevant international organizations in its implementation.

This legislative activity by the UN, combined with long-standing international legal prohibitions relating to chemical and biological weapons (CBW), dating as far back as the end of the nineteenth century, arguably makes WMD treaties tantamount to, if not in reality, customary international law, enforceable by the UNSC.⁶ If this is the case,

the Security Council would be well advised to have all of the tools necessary for the job at its disposal, including standing inspection and verification capabilities.

No international body with a holistic approach to WMD

Despite the importance that the UN attaches to the WMD issue, there is no technical body in the UN system mandated to concern itself with all types of WMD and their delivery systems.⁷ No standing UN body currently has an overview of all WMD issues, keeps a watch on their interrelationships or is able to provide integrated technical and other advice and assistance. Nor does any permanent UN body have the capacity to assist the UNSC comprehensively in discerning a WMD violation in which more than one type is involved, in verifying compliance with UNSC demands that all WMD-related activity by a particular state cease, or in coordinating a multidisciplinary verification operation.

One reason why an integrated approach is necessary is that historically a country determined to acquire one type of WMD has almost invariably sought other types as well.⁸ Iraq, Libya and South Africa are all recent cases in point. While WMD programs may be completely separated into nuclear/biological/chemical (NBC) streams, or alternatively, integrated to varying degrees, any investigative body seeking to understand such programs needs to have the ability to determine the degree of integration in any particular instance. From an in-country verification perspective, inspections in Iraq have demonstrated the enormous synergistic value of having a multidisciplinary verification approach and capacity rather than several separate, discipline-specific modes of operation.

Governments and regional organizations have increasingly established mechanisms to ensure such an integrated approach to WMD.⁹ The UN itself is edging towards this, most notably the Security Council in adopting resolution 1540 covering all types of WMD.

Gaps in existing multilateral WMD regimes

International verification mechanisms clearly already exist in regard to nuclear weapons, in the form of the IAEA and the nascent Comprehensive Nuclear Test Ban Treaty Organization (CTBTO), and in relation to chemical weapons (CW), in the form of the Organisation for the Prohibition of Chemical Weapons (OPCW). One imperative in considering filling the gaps in UN capabilities is therefore to avoid doing anything that might be perceived as challenging the authority of the existing organizations under their respective mandates. Each is, by and large, functioning well and contributing incalculably to making the world safer from nuclear and chemical weapons respectively. Yet each of them has the following lacunae in their mandates, as well as operational limitations.

Lack of universality of the relevant treaties

Not every eligible country is a party to, or even a signatory of, the treaties that the existing multilateral organizations verify compliance with:

- the NPT and nuclear weapon-free zone accords in the case of the IAEA;
- the 1996 Comprehensive Nuclear Test Ban Treaty (CTBT) in the case of the CTBTO; and
- the CWC in the case of the OPCW.

The CTBT has, of course, not entered into force, although its verification system is in large measure in place and a significant number of states have both signed and ratified the accord.

Ease of withdrawal from treaty regimes

Non-compliant parties or those contemplating non-compliance may, under current practice, legally withdraw from treaty membership on several months' notice, as North Korea has done vis-à-vis the NPT and Iran is now hinting it might do. This, paradoxically, puts them out of reach of the relevant verification organization at the very time it is most needed. Moves are being made in the case of the NPT to impose penalties on states that withdraw from the treaty. This would involve denying them the benefits of their previous treaty membership, such as insisting that nuclear materials and technology supplied under safeguards be returned to the provider. If such states also withdraw from the IAEA membership, it is difficult to see how the agency could impose its will on them. With a standing verification body at its disposal the UNSC would be able to deal more readily with states that fall outside or pull out of existing treaty regimes.

Verification and monitoring lacunae

Competent though the existing multilateral verification bodies are in what they do, there are gaps in their verification and monitoring coverage, mostly because of the way that their associated treaties have been drafted. Unlike the two verification bodies set up to deal with Iraq, the United Nations Special Commission on Iraq (UNSCOM) and UNMOVIC, which were mandated and equipped to take a holistic view of WMD capabilities and follow leads wherever they led, the standing verification agencies are not in a position officially to assess WMD indicators that fall beyond their mandates.

The IAEA The IAEA is not charged with verifying compliance with all aspects of the NPT. Its assigned preoccupation is with monitoring and verifying fissionable material—its diversion from declared peaceful uses or its illicit production—as well as the facilities associated with fissionable material production and use. Since the terrorist attacks on the US on 11 September 2001, the agency has begun devoting itself more attentively to nuclear safety and security. However, it does not concern itself with research on, and the development and testing of, an actual nuclear warhead, or with the production of the non-nuclear components of such devices, even though this would constitute a violation of the NPT. The IAEA thus conducts no inspections of research facilities that might be engaged in investigating or testing the non-nuclear components of a nuclear device. Nor does it pay attention to the means of delivery of nuclear weapons, even though it might be obvious that a state was developing ballistic missiles solely for the delivery of such armaments.

The most effective solution would be to give the IAEA the authority to concern itself with these matters, at least in the case of the non-nuclear components of nuclear weapons. Yet there is likely to be resistance among its member states to expanding the reach of verification in this way. Even if they are amenable, it will take time to effect any changes. This leaves the UNSC and its own monitoring and verification resources as the most plausible alternative, if only as an interim solution.

As discussed further below, the case of nuclear delivery systems, such as ballistic missiles, is especially problematic, since they may be used not only for nuclear weapons but also for chemical and biological ones. Even if the IAEA does eventually concern itself with such matters, it would appear preferable for a UN entity to have an overview of the WMD delivery system problem.

The CTBTO The CTBT bans nuclear tests in all environments and has an impressive verification and compliance system to match. But it does not ban preparations to conduct a test, including digging a test shaft or carrying out non-nuclear explosive tests (such as so-called sub-criticals or conventional triggers for fission devices). Consequently, these are none of the CTBTO's official verification business. In the past, such preparations have been 'dealt with' (to the extent that they have been) informally and unilaterally by concerned UNSC members, most notably the United States in the cases of Brazil, India, Pakistan and South Africa.

It seems injudicious, however, to leave such major telltale steps towards acquiring a nuclear capability beyond the purview of standing multilateral verification and compliance measures. Again, the ideal solution would be to expand the mandate and capacities of the CTBTO. Yet resistance by states to, in effect, amending a treaty, especially one like the CTBT that has not even entered into force, is likely to be staunch.

Nuclear weapon-free zone organizations The verification and compliance arrangements for nuclear weapon-free zones, which now cover most of the globe, are minimalist. Dependent entirely on the IAEA for verification of nuclear materials, their own response mechanisms mostly consist of the convening of some sort of committee if a non-compliance issue arises. Such a committee would inevitably be bereft of actual verification experience and would have to rely on external assistance. If the case is serious and pressing, it is most likely that the UNSC will be approached. Currently the Security Council lacks the means to respond immediately, other than seeking the help of the IAEA and/or CTBTO and then only if the matter falls within their competencies. As illustrated already, this may not be the case, especially if the compliance question relates to the suspected presence of actual nuclear devices in, or their transit through, the zone in question.

Missiles Although there is no multilateral treaty banning or restricting delivery systems that may be used for WMD—notably ballistic or cruise missiles or unmanned aerial vehicles (UAVs)—there is growing recognition that such capabilities, when combined with the possible or actual development of WMD, can pose a significant threat to

international peace and security. North Korea's potential ability to marry nuclear weapons with a rudimentary but still impressive ballistic missile capacity demonstrates the point. Recognition of this reality is demonstrated by the emergence of the 1987 Missile Technology Control Regime (MTCR), the 2002 International (Hague) Code of Conduct and the 2003 Proliferation Security Initiative (PSI).

The OPCW could, it is true, investigate alleged production of missiles for CW use under its challenge inspection procedure, but there would have to be strong *a priori* evidence of a CW link before its Executive Council would authorize such an undertaking. Even if an investigation were allowed to proceed, the organization would have to obtain outside expertise on missiles to assist it. As previously indicated, the IAEA would be hard-pressed to obtain consent from its Board of Governors to conduct a special inspection related to nuclear-capable ballistic missiles. In addition, there is no organization mandated to concern itself with verifying biological weapons (BW)-related delivery systems, no matter how grave the threat or convincing the allegation.

Thus, currently there is no international body, except UNMOVIC, with in-house expertise capable of conducting monitoring and verification in respect of WMD delivery systems, either generally or of a particular type. If the UNSC decides that a case is a threat to international peace and security, it has nowhere to go.

Biological weapons The greatest gap in WMD verification is the lack of a treaty-mandated verification system for BW. Negotiations on a protocol to the BWC that would have produced such a regime collapsed in 2001–02 and at present appear to have no chance of resumption.¹⁰

There is, at least theoretically, a fact-finding mechanism that may be used by either the UNGA, the UNSC or the UN Secretary-General to investigate alleged use of biological (and chemical) weapons. However, it has not been utilized since 1992 (in Mozambique). When it has been employed, it has experienced considerable operational difficulties due to its dearth of readily available funding, staff and resources and unsteady political support.¹¹ Its findings have often been inconclusive or unconvincing and hence politically difficult to pursue.

The mechanism currently consists of an outdated list of experts who, in theory, may be called on for hastily assembled missions. There is also rudimentary guidance, produced by a UN expert group, on how their mission should be carried out. Unlike UNMOVIC, it has no standing equipment, support staff or trained corps of inspectors.¹²

Essentially, then, the Security Council has no real capacity to investigate credible allegations that the BWC has been violated. The OPCW would certainly be called on to probe alleged use of CW, and may even be coaxed into scrutinizing a case where it was not clear from the outset whether chemical or biological weapons (or both) had been used, since some overlap between the two is acknowledged in the CWC. However, it would not be able to investigate solely an alleged BW attack, as its member states

would almost certainly oppose such a pre-emptive expansion of its mandate. In any event, it would not have in-house capacity to carry out such inspections.

Dealing with the hard cases

While it is to be hoped that the existing verification organizations would be able at least to handle all cases of non-compliance in their respective fields, including the most serious, even this may not always be possible. The cases of Iraq and North Korea, for instance, have exceeded the capability of the IAEA alone to resolve (through no fault of its own), and Iran might yet do the same. Indeed the relevant treaties, either explicitly or implicitly, provide for the possibility of referring the hardest cases to the UNSC.

Yet the Security Council, whose ‘added value’ is its ability to make enforceable demands under Chapter 7 of the UN Charter, currently has no standing, independent means of clarifying or resolving non-compliance concerns forwarded to it by external bodies. At this time, its only recourse in seeking clarification or further verification is to refer the task back to the bodies themselves. It can, naturally, set up an ad hoc arrangement, ranging from one-off fact-finding missions (as it has done vis-à-vis allegations of gross human rights violations or troubled peacekeeping missions) to a verification exercise on the scale of UNMOVIC. But such missions, however modest, take time to organize, especially the funding aspects, leaving a compliance controversy to fester. It also smacks of amateurism. The UNSC should know from its bitter experience of UN peacekeeping operations, which are, like UNMOVIC, subsidiary entities of the Security Council, that improvisation courts disaster.

A further consideration is that both the IAEA and OPCW have expanding responsibilities as a result of the new WMD threats perceived since 11 September 2001 and due to the organizations’ increased verification responsibilities generally. Neither entity has spare or ‘surge’ capacity or excess funding to respond to an urgent request from the UNSC to deal with a major WMD proliferation case. Even in the case of Iraq, UNSCOM and UNMOVIC found it necessary to reimburse the IAEA for its in-country verification work, since the agency itself had no funds for that purpose, and provided common services for its activity in the country. This support will not be available in future ad hoc cases unless a standing capacity is established or a makeshift arrangement is created at the time.

One argument that may be made against setting up additional UN verification capacity is that duplication is endemic in the world body and should be avoided at all costs. Yet in an area so vital to international security as WMD, it would seem prudent to have some form of verification capacity available at the UN Secretariat in addition to that on offer elsewhere. Just as safety systems have built-in redundancies and bridges are over-engineered because of the importance of saving human lives, a verification backup would seem only sensible given what is at stake.

The non-state actor challenge

The threat of non-state actors, in particular terrorists, acquiring WMD, whether by wresting them from the control of states or attempting to research, develop and produce

them themselves, is apparently high. Yet no single part of the UN system, apart from the UNSC itself, is charged with comprehensively attending to this issue.

States parties to WMD treaties are legally responsible for the activities of non-state actors on their territory and several treaties require states parties to take specific action in this regard, including the adoption of national implementation legislation. The standing verification organizations would presumably help their member states deal with a WMD threat due to non-state actor activity. However, given the gaps in treaty coverage identified above and the fact that non-state actors operate across and through the borders of sovereign states, it would seem logical for a UN body, preferably one available to the Security Council, to prepare itself to conduct inspection and verification in relation to non-state actor activities that threaten international peace and security.

Avoiding wasting the UNMOVIC legacy

It is always unwise to prolong the life of an organization when the original requirement for it no longer exists. Considering the needs of the UN in the WMD arena, though, it would be foolhardy to ignore the substantial, generic capacities generated by the Iraq experience that now reside at UN headquarters in the form of UNMOVIC.¹³

The UN, in a relatively short period, has acquired proven expertise and capacity with respect to inspecting, monitoring, verifying and dismantling all types of WMD, as well as their associated delivery systems. It has also developed expertise in assessing research, development and production activities and the role of dual-use components. UNSCOM and UNMOVIC proved, somewhat unexpectedly, that a UN body could plan, organize and rapidly deploy a verification operation in the most difficult physical terrain and conditions and in the most difficult political circumstances—that of enforced, contested disarmament. UNMOVIC, in partnership with the IAEA, also demonstrated that a UN body could use information to great effect, including that from national technical means (NTM)¹⁴ and open sources, while successfully protecting confidentiality where necessary.

UNMOVIC still exists, pending a decision by the UNSC about its future. Leaving aside the question of whether UNMOVIC will ever be permitted to complete its mission in Iraq, it would seem imprudent for the international community to let it be abolished or waste away. Having invested an enormous amount of effort and funding in the organization, a way could surely be found to preserve and nurture its capacities, both human and material, and its institutional memory. UNMOVIC's College of Commissioners has itself drawn attention to 'the experience gained by and available within UNMOVIC and the usefulness of those assets being maintained for the benefit of non-proliferation in the future'.¹⁵ In its March 2005 report entitled *Universal Compliance: A Strategy for Nuclear Security*, the Carnegie Endowment for International Peace concluded that a permanent inspection capability 'could provide institutional memory, international expertise, and invaluable, readily deployable capabilities at low cost' and 'ease the burden on the United States'¹⁶—presumably as well as on other states. On 16 June 2005, the German Bundestag became the first legislature to pronounce itself on the future of UNMOVIC when it adopted a resolution

calling on the country's government to 'work in the framework of the United Nations and in close cooperation with European partners towards the establishment of a UN verification centre'.¹⁷ The government was urged in this context to 'advocate the maintenance of UNMOVIC's expertise and the utilization of synergistic effects within the United Nations system'. France, Sweden and other European Union member states, as well as Canada and Japan, have expressed support for finding some way to preserve the capabilities of UNMOVIC.

A deterrent effect?

Quite apart from the practical advantages of having a standing UN verification capability for WMD, the existence of such a body might be seen to have a deterrent effect. The calculations of actual or potential violators are likely, at the very least, to be made more complicated by knowing that the UN has verification capabilities ready to deploy at relatively short notice. The violator would not be able to count on having a long gestation period characterized by lengthy negotiations with the governing body of a treaty verification organization, during which it might try to accelerate its WMD programs or hide them. The Security Council could act directly and promptly.

The mandate, role and nature of a standing UN verification body

Leaving aside for the moment the extant capacities of UNMOVIC (considered in Part B), what should a future UN WMD verification body ideally be mandated to do? The following are some obvious possibilities:

- keep a general watch on WMD and related developments worldwide, becoming a repository and clearing-house within the UN system for information on, and analysis of, WMD issues;
- maintain generic data-gathering, data-processing and analytical capacities for all types of WMD;
- stay abreast of developments and conduct training in verification modalities, techniques and technologies;
- provide routine and emergency briefings to the UN Secretary-General and Security Council;
- oversee expert studies on WMD issues at the request of the Secretary-General or Security Council;
- be available to UN member states in an educational and capacity-building role; and
- maintain and develop a capability to undertake, at short notice, inspection, monitoring and verification operations.

If it were to become a true UN clearing-house on all WMD matters it should also be mandated to:

- provide expert advice and assistance to ad hoc UNSC committees established to monitor compliance with resolutions concerning WMD¹⁸—alternatively it could replace such bodies, avoiding the need to establish them each time a resolution is adopted; and

- receive, collate and process WMD implementation and compliance reports that lack an institutional home (for example, those submitted by NPT states parties¹⁹) or that currently are underutilized (for instance, the confidence-building declarations made under the BWC to the United Nations Department for Disarmament Affairs (UNDDA) in the UN Secretariat, which lacks the capacity and authority to make use of them).

The body's inspection and verification capabilities could be used for a wide variety of purposes, including fact-finding missions, on-site inspections (OSIs) and ongoing monitoring and verification operations. Depending on their type, missions could last from a few days to months or even years. In any event, a standing body should not be restricted to the complex, multi-purpose, multi-year verification exercise typified by the Iraq case: this, it is hoped, will be a rare occurrence.

Among the possible scenarios that might trigger the use of standing inspection capabilities are the following:

- where a state wishes to demonstrate its innocence with respect to non-compliance allegations and invites a verification exercise to take place on its territory;
- where a state suspects that illicit WMD activities have taken place on its territory without its knowledge, either by foreign states or non-state actors and it needs assistance in proving and dealing with this threat;
- where suspected WMD use has occurred and confirmation is urgently required (a type of global WMD forensics service);
- where a state that is not a party to a relevant WMD treaty has been accused of non-compliance but refuses to accept verification by the IAEA and/or OPCW;
- where a particular situation demands a combination of verifiers, such as nuclear and missile inspectors, or chemical and biological inspectors, who cannot be supplied by one existing organization alone; and
- where a state voluntarily renounces previous WMD activities and wishes to obtain internationally credible verification in all WMD areas (as Libya has recently done).

A standing WMD body would, above all, provide the UN and its member states with a range of options for dealing with the WMD issue in its many dimensions and manifestations. Its capacities would be permanently available and designed to be quickly scaled up for more extensive missions. It could be tasked for specific duties by the UN Secretary-General if he or she is requested to do so by the UNGA or the UNSC, or on his or her own authority under the UN Charter.

The new body could certainly absorb the current mechanism available to the Secretary-General for investigating alleged CW or BW use. However, in the case of the existing multilateral treaty verification organizations, its role would be to supplement, not supplant them. It would be required by its charter to cooperate closely with them,²⁰ and

they should be represented as observers at meetings of the new organization's governing body (and vice versa), as the IAEA and OPCW currently are at meetings of UNMOVIC's College of Commissioners. The UN already has cooperation agreements with the CTBTO, IAEA and OPCW, which would permit them all to work closely with a new UN inspection agency: all are already committed to providing the Security Council with information and assistance if requested to do so in the furtherance of international peace and security.²¹ The OPCW's agreement specifically enjoins it to cooperate with, and to put its resources at the disposal of, the UN Secretary-General in cases where the alleged use of chemical weapons involves a state not party to the CWC or in a territory not controlled by a CWC state party.²²

UNMOVIC has set the desired standard of cooperation by establishing close working relationships with the IAEA and OPCW at both the senior and working levels. Although there had been tensions between the IAEA and UNSCOM, these had been resolved by the time UNMOVIC took over the Iraq brief. UNMOVIC's Executive Chairman regularly held talks and consultations with the heads of both the IAEA and the OPCW and made joint appearances before the UNSC with the IAEA Director General. A model of cooperation between a standing UN verification body and the multilateral treaty verification agencies is therefore well established and should be easily replicated. Should a BW treaty verification organization ever emerge, it could enter into a similar relationship. Barbara Hatch-Rosenberg has suggested that it might also be desirable for a future UN inspection body to conclude an agreement with the World Health Organization (WHO) to supply it with information on unusual health emergencies and alert it whenever questions arise as to their cause.²³ This is especially important as WHO may be reluctant on its own to investigate 'unnatural causes' of disease resulting from a possible CBW attack.

Just as the proposed new body should not supplant existing organizations, it should also not be a surrogate for a UN information-gathering and analysis unit. Successive UN Secretaries-General have supported such a unit but influential member states have routinely opposed it because it would be tantamount to a UN intelligence agency.²⁴ The mandate of the proposed WMD body would be restricted to WMD compliance matters. It would only use open-source information, with the exception of material provided by a UN member state. It would only focus on a particular state's activities or provide briefings on a particular issue at the express request of the UNSC or the Secretary-General. And it would only conduct detailed investigations, including on-site activity, into any particular member state at the request of the Secretary-General or the Security Council.

An UNMOVIC by any other name?

While the United Nations Monitoring, Verification and Inspection Commission is a suitably unspecific and anodyne name, it would be wise not to adopt this as the name of a new body, given its association with the Iraq case and given that the potential role of a new body would be broader and more flexible. Since the three elements of UNMOVIC's name are a good description of its actual role, it would, however, be useful to have these in any title eventually selected.

An idea that seems worth considering is that of regionally-based inspection teams. Organized and trained under the aegis of a regional organization or a leading regional state,²⁵ these teams could more readily convene for training, briefing and exercises than a global inspectorate could. Their equipment could also be pre-positioned regionally. In addition, they would be closer to an incident within their region and would be more likely to have the necessary linguistic skills and cultural familiarization that can be so important in in-country activities.

Authorization, governance and establishment

The type of body envisaged would most easily be established by the UNSC as one of its subsidiary bodies, as with UNSCOM and UNMOVIC. This could be most readily and neatly done when the Security Council eventually considers the fate of UNMOVIC. Staff, equipment, other property and resources could simply be transferred to the new agency. Seeking a UNGA resolution to establish it would take longer, require financial authorization by the relevant General Assembly committees and would presumably encounter the usual political and bureaucratic obstacles that all new initiatives seem to do in the UN system.

In terms of governance, the UNSCOM/UNMOVIC model seems effective. The new body could be governed by the equivalent of a College of Commissioners, appointed by the Security Council, on the recommendation of the Secretary-General. It would offer policy and strategic guidance to the organization. An Executive Chairman or Director-General, also appointed by the UNSC on the recommendation of the UN Secretary-General, could head the new body.

There have been suggestions that at least some of UNMOVIC's extant capabilities be vested in a unit in UNDDA rather than in a separate organization, partly because it would give the department a more substantive role than it has had to date. Doing so could, however, constrain the autonomy and possibly the effectiveness of verification and inspection work:

- it would mean that questions regarding the size, composition and funding of the unit would be put before the General Assembly's budgetary committees; and
- it would enmesh the unit in the politics and staffing challenges of the existing department, the smallest and least well-funded in the Secretariat.

It would appear preferable to secure proper recognition and funding for UNDDA as a worthwhile project in its own right, rather than using the UN's inspection needs as a surrogate.

An even more compelling argument against vesting a new inspection capacity in UNDDA is that the particular scientific, technical and operational skills that an inspection body requires are different to those found in a policy-making department. An operational, technical body would likely wish, for instance, to have a more fluid arrangement for staff contracts than the permanent positions characteristic of the UN Secretariat. It also needs to have a rapid-response mentality and capacity, something that the UN Department of Peacekeeping Operations (DPKO), despite years of effort, is still struggling to achieve.

On balance, it would seem better to follow the UNMOVIC model, which is serviced as if it were part of the UN Secretariat, but with the relatively autonomous status of a subsidiary body of the Security Council.

With respect to staffing, the new body would be advised to follow the UNMOVIC model rather than the UNSCOM one.²⁶ Staff should, as a rule, not be on loan from governments, but be UN employees subject to Article 100 of the UN Charter. This requires that they neither seek nor receive instructions from any government and that member states do not try to influence them in the discharge of their responsibilities. Staff would also be required to respect strict rules of confidentiality. Furthermore, they would be recruited with the aim of achieving the highest standards of efficiency, competence and integrity, in accordance with Article 101 of the UN Charter, but taking into account the need for the broadest possible degree of geographical and gender balance. In addition to its permanent staff, short-term paid consultants could be hired for particular jobs, as UNMOVIC did to meet its specialized information technology (IT) needs. The rostered inspectors would be contracted as UN employees for the duration of their in-country mission and service at UN headquarters, as has been UNMOVIC's practice.

Size and capabilities: the core plus virtuality plus surge model

The size and capabilities of a standing UN verification body are probably the most critical variables of all in determining likely political and practical support for such an idea. Retaining an organization the size of UNMOVIC, with its capacities intact, would appear to be ideal. However, from soundings taken and research conducted so far, it seems unlikely that there would be sufficient political and financial support for this approach.

An alternative would be the 'core plus virtuality plus surge' model. This would entail a core standing capability at UN headquarters in New York, equipped with essential competencies, which would be supplemented by 'virtual', pre-arranged capacities that could be called on at short notice, especially in the event of a field mission being required. Ideally, a further 'surge' capacity could be available to permit a field mission

to expand rapidly should a particularly vexing, and potentially long-lasting non-compliance case arise.

The core establishment could be of varying size and capacity, although there would probably be a minimum number of key staff required to make the concept viable. The latter should ideally be qualified and equipped to:

- collect and analyze a wide range of information, on a multidisciplinary basis, including from open sources, state declarations, overhead imagery and NTM;
- maintain and develop the monitoring and verification tools inherited from UNMOVIC, including databases, analytical tools, protocols, handbooks, agreements and training manuals;
- track emerging developments in monitoring and verification modalities, technology and techniques;
- monitor WMD-related arms embargoes, including imports and exports relating to dual-use equipment and materials;
- maintain and develop the capacities of the agency, in particular a trained rostered inspectorate, analytical laboratories and inspection equipment; and
- plan, organize and support, and where necessary act as the vanguard for, fact-finding missions and verification operations.

Presumably, a future UN verification body would not need as many CW experts as UNMOVIC, now that the OPCW is better established and more able to cooperate as an equal partner than it was at the time of UNSCOM's creation (which was seemingly the original reason it was not called on to conduct inspections in Iraq). Nor would it need to duplicate the expertise of the IAEA, but rather work closely with it. Yet, if it is to cover all types of WMD, a standing body would need to maintain a core of experts of all relevant types, with perhaps nuclear and chemical weapons experts on secondment from the IAEA and OPCW respectively.²⁷ Its BW and missile expertise would be particularly important, as this is not replicated elsewhere in the multilateral system. The body would obviously need administrative and technical support staff, as well as personnel to plan and manage training courses and field exercises.

The 'virtual' capacities required by a standing body, in the sense of those not available at UN headquarters but readily available and on call elsewhere, are also variable, but could comprise:

- a roster of inspectors who would be located in their home countries but continuously trained and available on short-notice for missions abroad;
- pre-arranged additional support staff;
- pre-positioned, maintained and constantly upgraded equipment;
- a network of contracted, approved analytical laboratories;
- pre-contracted air transport; and
- a pre-arranged medical unit to accompany a field mission.

Adapting and developing the UNMOVIC inheritance

One way of deciding what capacities a new standing body might require and how such capacities might be readily obtained and developed is to examine the UNMOVIC inheritance. There is little awareness among the general public, and even among governments, of the richness of this legacy. It includes the following key elements:

- a corps of experienced verification personnel, including a trained inspectorate, uniquely well-versed in multidisciplinary OSIs and other forms of in-country activity;
- a dedicated, custom-made information system, including databases and analytical tools, again with unique multidisciplinary characteristics;
- standard operating procedures and formats for monitoring, verification and inspection, as well as weapon and associated material destruction activities;
- training programs;
- a network of analytical laboratories;
- advanced detection, inspection and monitoring technology;
- experience in receiving, handling, using and protecting confidential information; and
- experience and protocols in respect of import and export control regimes.

Part B of this study provides details on all of these elements and how they might be utilized and adapted to suit a new verification body. Much of the capability is generic and would be useable without modification.

One way of estimating the size of the new body and the capacities that the standing core would need in order to remain viable is to determine what might be done ‘virtually’, what might be pre-arranged and pre-positioned and what might be provided through agreements with governments, companies and other international organizations. This could be combined with a modular approach: depending on the political and financial support that eventuates, various capabilities might be added or subtracted. Additional capacities could be added at a future date, although the existing capacities of UNMOVIC may be difficult and more expensive to reconstitute quickly if abandoned altogether at this stage.

Probably the smallest possible body consistent with the requirements of effectiveness and efficiency would comprise eight persons. The following personnel would be essential:

- a Director, who would be the Chief Executive Scientist, in charge of policy and management, oversee day-to-day operations and act as chief spokesperson;
- one nuclear analyst, preferably with past experience of the nuclear industry and nuclear verification by the IAEA;
- one chemical analyst, with experience of running a laboratory related to chemical weapons and/or biological agents;

- two biological officers (more expertise is required in this field given the lack of a BW verification agency);
- one delivery system and logistics officer, who would be primarily responsible for the area of delivery systems; he/she could also double as a logistics and communications expert for missions, including ensuring maintenance of equipment;
- one health and safety officer to maintain and conduct training in safety equipment, analytical instruments for hazard detection and decontamination; and
- an administrative support officer responsible for secretarial services, human resources, logistics, travel and general administration.

Each of the technical experts would be responsible for:

- preparing and conducting missions;
- organizing and participating in the training of the rostered inspectors;
- keeping abreast of new technological developments in their field in terms of both substance and monitoring and verification; and
- conducting research where necessary.

Costs and funding

The costs of establishing a new standing UN verification body, drawing on UNMOVIC's capacities, would depend on the size, intended use and the technical and other expectations of such a mechanism. UNMOVIC spent what was necessary to get the job done in the brief time it had inspectors in Iraq. It also had access to essentially unlimited funds, a situation unlikely to be repeated. A realistic costing of the funding requirements of a future body would need to be based on a different model. Preserving and maintaining UNMOVIC's current capacities would, however, amortize the initial establishment costs and avoid the need for large start-up funding in future.

The annual cost of maintaining UNMOVIC at its present level is a relatively modest US\$12 million. This compares to US\$80 million for the 2002–03 financial year in which it conducted three months of inspections in Iraq, although this also included start-up costs. Further indication of the scale of funding that might be required is provided by the annual cost of commercial satellite imagery purchased by UNMOVIC (US\$250,000) and the cost of each month-long UNMOVIC training course (also US\$250,000).

The annual cost of the minimalist, eight-person core body described above would be approximately US\$2 million. This assumes that other sources would cover the following:

- office space and infrastructure (including IT) would be supplied free by the UN (if a trust fund was set up to support the body, as suggested below, the UN traditionally takes 13.5 per cent for administrative overheads);

- maintenance of a screening laboratory would be provided free by a UN member state;
- external laboratories would be contracted on a fee-for-service basis so that costs would only be incurred during actual field missions;
- UNMOVIC's physical assets, such as inspection and laboratory equipment would be inherited by the new body; and
- a medical support unit and NBC decontamination unit for missions would be contributed free by a UN member state.

In addition to staff salaries and benefits and day-to-day running costs, the budget should include the costs of training. The costs of UNMOVIC training courses are relatively low, as individual states have volunteered to host them at their facilities at their expense. Most of UNMOVIC's costs (some 97 per cent) pertain to participants' travel and daily subsistence allowances.²⁸ It is suggested that a new standing body run approximately three annual training courses for up to 15 rostered inspectors (smaller than the average under UNMOVIC), with several staff members attending. Each one-week course, including travel and accommodation and per diems for trainees, would cost approximately US\$100,000.

Table 1
Estimated costs of a core WMD unit at UN headquarters

Annual budget for core body	US\$
Salaries and benefits for eight staff at an average of US\$200,000 each	1,600,000
Training for rostered inspectors (three one-week courses per year at \$100,000 each)	300,000
Office costs, stationery, minor equipment, travel (not related to training or missions)	100,000
TOTAL	\$2,000,000

The average cost of inspections themselves is difficult to calculate based on the UNMOVIC experience, given the wide variation in the duration of, and the number of personnel and equipment involved in, each inspection and the fact that UNMOVIC tended to spend what was necessary due to political pressures to achieve quick results. It is estimated, however, that one week of in-country activities involving 10 inspectors (some from headquarters and some from the roster) would cost approximately US\$200,000. (Apart from those who are employed as permanent UNMOVIC staff, rostered inspectors are not paid to be on the list, or for participating in training courses, but only when deployed on inspection missions.²⁹)

Table 2
Estimated costs of in-country verification activities per week

	US\$

Payment for five rostered experts (at an average salary rate of US\$100,000 per year)	10,000
Airfares	30,000
Transport of equipment	5,000
Local transport	15,000
Accommodation, meals and allowances (10 people for 10 days, including travel days, at \$250 per day per person)	25,000
Contracted services (such as imagery acquisition and analysis, radar, interpreters and translations)	55,000
Analytical costs (screening laboratory consumables, cost of outside laboratories)	60,000
TOTAL	\$200,000

If an endowment fund were established to cover the costs of field operations, it would simply be necessary to have enough funds to cover a variety of contingencies, without detailed, essentially incalculable, advance estimates of the cost of inspections. An operations contingency fund of US\$1–2 million is thus proposed to pay for fact-finding, verification or other missions. If states request an investigation for their own purposes, they should be required to meet a substantial part of the costs. Funding for in-country activity aimed at capacity-building could be sought from development assistance funds or regional organizations.

Regular assessed contributions by states is of course the normal UN model for funding UN activities, but this may be hard to obtain support for and would embroil the funding of a new body in UNGA’s budgetary process. Independent funding would be preferable to maintain the relative independence of the operation. It is unlikely, though, that funding of the type represented by the Iraq escrow account,³⁰ which funded UNMOVIC, will become available. By the same token, it would be inadvisable to return to the UNSCOM model of voluntary contributions, in cash and in-kind, at the whim of governments.

One, admittedly revolutionary, idea is that the UNSC should pay. The Security Council has special responsibility for international peace and security, as well as the privilege of being able to influence the course of international events through its decisions. The five permanent members in particular stand to reap great benefits from having a permanent verification tool at the UNSC’s disposal, not least since each wields a veto that ensures that it will never be used against them. Moreover, for the first time in the history of the UN, the permanent five are all flourishing economically (even Russia has large cash reserves) and can afford to bear a special financial burden. The non-permanent members could pay a lesser, biennial amount. There could be heavy discounts for least developed country members.

An additional funding source could be voluntary contributions by states to an endowment fund. If this were large enough it could provide regular funding for the agency’s operations. Grants from non-governmental sources, including philanthropic foundations could supplement it. Precedents exist, such as the Nuclear Threat Initiative, which has contributed funding to the IAEA, and the Turner Foundation, which has contributed to an array of UN activities. The disadvantage of such funding is that it

relieves states of the obligation to pay for the mechanisms that are urgently needed to improve their collective security.

It would also be advisable to establish an emergency operations fund, which would permit urgent fact-finding and other verification missions to be carried out, or at least launched, as rapidly as possible. At least initially, an endowment fund could be geared towards meeting only these needs.

Conclusion

There would appear to be a strong case—in logic and bearing in mind the desirability of preserving hard-won existing capabilities—for a standing UN WMD verification body. It could draw on the experience and capabilities of UNSCOM and UNMOVIC, while being sufficiently new as to disassociate itself from the specific and controversial case of Iraq. Such a body would extend the range of tools and options available to the international community to tackle the threat of WMD, including from non-state actors, as well as expand the frontiers of inspection, monitoring and verification.

If it does not prove possible to attract the necessary political and financial support required to preserve all of UNMOVIC's extant capacities, one can envisage a slimmed down, largely virtual verification mechanism that relies on a small core staff, a well maintained and regularly updated list of experts, vital equipment that can be deployed at short notice, strong supportive links to other verification organizations and continuous planning and training exercises. Clearly, this would have neither the capabilities nor the deterrent value of the full-scale model, but it could nonetheless be useful in its own right, as well as serving as a base from which a more sophisticated mechanism could evolve. Now, when the danger is so apparent, is the time for a bold initiative in this respect.

PART B: THE UNMOVIC INHERITANCE

This section of the study and its accompanying annexes, complements the first part by outlining the elements of UNMOVIC's experience and capacities that might be drawn on in designing a new standing UN verification body.

Trained and experienced personnel

UNMOVIC's greatest legacy is its human capital. Together with UNSCOM it has produced an unprecedented corps of trained and experienced verification personnel—an invaluable asset owned by the international community that should not be squandered. At its maximum, in May 2003, UNMOVIC had a full-time professional staff of weapons experts and others at its New York headquarters of 76. These individuals represented 31 nationalities, underlining the international nature of the enterprise.³¹ Since then the staff has been reduced to a minimum number commensurate with maintaining an ability to react operationally at the direction of the Security Council. By October 2005, UNMOVIC still had an establishment of 61, including 46 professionals, representing 24 nationalities.³²

Roster of inspectors

UNMOVIC's rostered inspectorate, at its zenith, in May 2003, comprised 354 inspectors (from 55 countries) (see Annex 1).³³ As of July 2005, UNMOVIC still had 383 trained inspectors on its roster, drawn from 55 states, of which 33 are working at headquarters.³⁴ Of these, 103 are biological experts, 130 are chemical experts and 87 are missile experts. Approximately 50 per cent of the rostered staff has spent time in Iraq, for periods ranging from days to months.

In addition to the continuing training courses, rostered inspectors are kept informed of UNMOVIC activities through its reports, occasional newsletters and its website. The fact that despite all the uncertainties, so many are willing to remain on the list and be available for inspections augurs well for a future virtual system.³⁵

Even more people were trained as inspectors than appeared on UNMOVIC's roster. In addition, an estimated 3,000 inspectors provided by member states served with UNMOVIC's predecessor, UNSCOM, during its eight-year existence, indicating that there is a vast pool of talent and experience available for a standing verification body. Finally, due to its seven-year tenure rule, the OPCW is shedding experienced inspectors and other experienced CW verification staff members who would presumably also be available for a roster system. UNMOVIC had no difficulty finding candidates for its initial training courses: it received 1,500 requests, interviewed 800 people worldwide and selected 400.³⁶

A new body could obviously inherit the current roster of inspectors as it is. It would though have to maintain and update the roster on a continuous basis. One difficulty with the Secretary-General's lists of inspectors for the CBW use mechanism and for fact-finding missions under the 1997 Mine Ban Treaty or Ottawa Convention is that they rapidly become outdated and are not subject to quality control. Those rostered are

not required to go on training courses or obtain certification to ensure that they possess and/or retain their inspector skills. As with UNMOVIC, new personnel should not be added to the list until they have undertaken training courses organized by the new body (see the section below on training). The CTBTO, IAEA and OPCW could be asked to nominate candidates for the roster in their particular areas of competence.³⁷ If so, it will be important to maintain the proper mixture of experts to ensure maximum effectiveness. In UNMOVIC's case, it could have used more fermenter experts and biological process engineers.

Cost-free experts provided by member states would only be used in special circumstances, such as when insufficient rostered personnel in a particular field were available at short notice and only with the express approval of the head of the organization, as was the procedure for UNMOVIC. In UNMOVIC's case, New Zealand supplied medical and communications staff for operations in Iraq, while Switzerland provided labour to refurbish the offices of the Baghdad Ongoing Monitoring, Verification and Inspection Centre (BOMVIC).

There had been scepticism in some quarters at the outset of the UNMOVIC mission about whether a roster system would actually be made to work. It was believed to be improbable that rostered personnel would be willing to leave their home positions at short notice to be deployed on difficult and potentially dangerous missions.³⁸ In the event, the call-up rate exceeded 90 per cent. This bodes well for a future regime based on a roster system.

Readiness, besides availability, is also an issue. In its report of May 2003, UNMOVIC estimated that the activation of its roster of inspectors would take four weeks from the time a decision was made to resume operations in Iraq.³⁹ Doubtless, it would take no less this amount of time for any new agency to activate at least some parts of its inspectorate, depending on the circumstances, such as the degree of advance warning that an inspection situation was pending and the location of, and conditions in, the country, region or site to be inspected. As of August 2003, those on UNMOVIC's roster had 'largely indicated their continuing interest and availability to serve', seemingly specifically in Iraq, but potentially elsewhere.⁴⁰

In addition to its rostered inspectorate, UNMOVIC was able to count on being able to use about 30 members of its headquarters staff, mainly from its Operations and Analysis Divisions, to form the core of its first inspection teams. (Later, inspectors from the roster could, if necessary, replace them.) Using these personnel as an advance guard, UNMOVIC estimated that it would be ready to start the 'necessary activities' (presumably as opposed to full-scale inspections) within two weeks of a decision on resumption of deployment to Iraq.⁴¹ While a future UN verification body would probably not have the same number of headquarters staff to replicate this, it should at least be able to field readily some headquarters personnel with inspection experience. Furthermore, it would probably be able to rely on the CTBTO, IAEA and OPCW to provide inspectors in their respective fields at least temporarily to ensure rapid deployment.⁴²

Inspectors are not the only personnel involved in OSIs and other in-country activities. A new body would also need to make provision for support staff, technical personnel and interpreters and translators (although these are readily available in the UN pool⁴³). It would be useful to pre-contract such staff to avoid the situation faced by UN peacekeeping operations, which often struggle to attract competent administrative and technical staff at short notice. Issues like health coverage and accident and life insurance also need to be pre-arranged for both civilian and military personnel to ensure that such details do not deter them from taking part in in-country activities in dangerous and stressful locales.

Training

UNMOVIC developed unique expertise in training international personnel to perform inspection, monitoring and verification activities in respect of WMD, in particular biological and chemical weapons and missiles. Its multidisciplinary training, covering NBC, missiles and other weaponry and delivery systems, as appropriate, is an inimitable contribution to the multilateral arms control and disarmament process, which should be retained and developed.

To carry out its training programs, UNMOVIC: created its own curricula, study materials, manuals, handbooks and videos; developed a unique set of training exercises, tutorials and drills to enhance inspector skills; identified and adapted facilities worldwide for training activities, including mock inspections, practical exercises and familiarization visits; and established administrative, logistical and supporting infrastructure for training purposes.⁴⁴ In addition to technical courses, trainees were also provided with cultural courses, including on the history, economy, politics and society of Iraq,⁴⁵ to underscore the importance of appreciating national sensitivities. See Annex 2 for further details of UNMOVIC's training programs, which are continuing.⁴⁶

Training would be a key device for keeping a 'virtual' inspectorate ready for action. Training programs should continue to be both multidisciplinary, replicating the useful precedent set by UNMOVIC, and discipline-specific. UNMOVIC has also run specialized courses on logistics and support roles, which it would also be useful to replicate. A new body, however, would have to initiate a new basic training course that was not focused on Iraq.

While the IAEA and OPCW could be charged with training in their respective areas, the new body would need to organize training in the BW field and in the spheres of dual-use technologies and delivery systems, including missiles, and in respect of any conventional weaponry issues considered necessary. All training should include field exercises in various environments and cover operational health and safety, the rights and responsibilities of inspectors (including the provisions of the 1961 Vienna Convention on Diplomatic Relations), UN rules and regulations and human rights matters. As with UNMOVIC, UN member states could host training programs.⁴⁷ In fact, with the controversial Iraq case out of the way, a larger number of UN member states are more likely to be willing to help train UN inspectors. Even if they did not

wish to run courses on behalf of the new body, the IAEA and OPCW should be involved in training courses that they might find useful.⁴⁸

It has been estimated that refresher courses for trained rostered inspectors would have to be conducted at least once a year and preferably every six months (in fact since February 2003 UNMOVIC training has focused exclusively on its existing cadre of inspectors rather than on new ones). Such training should involve bringing inspectors together in one location (collective training) to permit familiarization or re-familiarization with each other and with equipment and techniques, including safety procedures, protective clothing and decontamination equipment. Simulations and mock inspection exercises would be a vital part of such refresher courses. In addition to imparting the technicalities of inspections, such courses, if held by various countries with different climatic and other conditions, would allow participants to test and develop their acclimatization skills and the adaptability of their hardware to different environments.

Apart from training courses, the corps of inspectors could be kept informed and could engage in consultations via a dedicated electronic network and through postings on the agency's website. This could occur in a manner similar to the CTBTO's electronic network of experts.⁴⁹ Prior to deployment on an actual mission, briefings would need to be given on the specifics of the mission mandate and the country or countries of concern, including political and cultural aspects.

Since there is no verification organization for the BWC, the new body could perform an invaluable service for the international community by continuing to carry out specialist training courses vis-à-vis BW verification. UNMOVIC conducted several courses covering biological dual-use items, practical skills and technology for OSIs in both the chemical and biological fields and the operation and management of relevant remote monitoring systems.⁵⁰ The same importance should be attached to the continuation and development of training with regard to missile inspections.

UNMOVIC information systems

UNMOVIC quickly realized from the outset that in order to analyze and draw conclusions from UNSCOM's eight years of work and to prepare for future inspections in Iraq, a much more dynamic IT system was required. It also recognized that much of the data provided by Iraq, as well as that collected by UNSCOM, was sensitive or proprietary information that required careful handling and secure storage.

UNMOVIC thus developed an integrated data management system to try to optimize the use of constantly evolving IT in order to facilitate data retrieval, analysis, interpretation and reporting.⁵¹ The system has secure, stand-alone, local area and wide area networks. It also uses encryption between computers and networks. The system consists of five main sub-systems designed to work closely together:⁵²

- intranet, archives and search engine;
- site, inspection and declaration system;

- Geographic Information System;
- analytical tools; and
- an underlying information and communication technology infrastructure.

To enhance the role of multidisciplinary inspections and assessments, the system has been equipped with the capacity to permit previously unavailable cross-disciplinary analyses. The Geographic Information System,⁵³ meanwhile, allows images to be geo-referenced to digitalized maps and to the standard databases. In addition, the system employs analytical tools used by law enforcement agencies to spot relationships between seemingly unrelated data elements.⁵⁴

UNMOVIC's database has also been linked to that of the IAEA. This was especially important for information relevant to the Joint Unit set up by the two organizations to implement the export/import monitoring mechanism for Iraq. A wide-area link and associated communications infrastructure was established between New York and Vienna to facilitate cooperation between UNMOVIC and the IAEA on the restricted goods review list (items that Iraq was banned or constrained from obtaining), as well as to permit rapid exchange of information, such as imagery and inspections reports on Iraqi sites subject to monitoring.⁵⁵ Such links should be maintained to allow similar joint monitoring in future. The CTBTO and OPCW could be similarly connected to any new body's IT systems.

UNMOVIC also developed procedures for receiving, handling, using and protecting sensitive, confidential information from governments, which it used in pursuit of its mandate. By February 2003, approximately one dozen countries had provided information of 'potential' relevance, much of which was utilized in conducting inspections.⁵⁶

UNMOVIC took advantage of the burgeoning availability of open-source material, especially during the period when OSIs in Iraq were not possible. Such open-source information included newspapers, academic journals and other published material, as well as television and radio broadcasts. UNMOVIC commissioned independent studies of open-source information from the Monterey Institute of International Studies and a French research institute (the latter emphasizing French, European and Middle East sources and languages).⁵⁷ Supportive governments also supplied UNMOVIC with useful open-source information.

The point of a new organization taking over this information system would not be to pursue the Iraq case, of course, but to maintain and expand the generic capacities it represents and to develop them for future cases. A new body should use the Iraq experience to help prepare generic strategies, protocols and techniques for future verification tasks. The inherited material should provide valuable insights into:

- the routes and means by which a state might seek to acquire illicit weaponry, including the procurement networks for dual-use technologies and key personnel;

- the nature of deception and denial campaigns that might be mounted by a state subject to scrutiny by the UN; and
- the effectiveness or otherwise of particular monitoring and verification techniques and technologies.

It should enable a new body to develop further verification concepts devised by UNSCOM, UNMOVIC and the IAEA, such as UNSCOM's Ongoing Monitoring and Verification (OMV) and Reinforced Ongoing Monitoring and Verification (R-OMV), along with the multidisciplinary approach adopted by UNMOVIC in both its operations and training.

Operating procedures and formats

In addition to standard UN rules and regulations, UNMOVIC devised particular operating procedures, guidelines and policy documents for the special circumstances surrounding multilateral verification in a hostile environment. These set valuable precedents for such exercises in future and a new UN verification body could draw on them.

UNMOVIC Handbook

The Handbook provides comprehensive practical guidance on inspection and other operational issues.⁵⁸ It is a work in progress, issued in cumulative draft form since February 2001, taking into account experience as it occurs. As well as guiding UNMOVIC operations in the field, it served as a reference during the talks between UNMOVIC, the IAEA and Iraq on the practical arrangements for the resumption of inspections in Iraq. Such talks are always necessary no matter how compulsory or 'no notice' a particular verification mission might be.⁵⁹ Handbook material has also been utilized in training courses.

Part I of the Handbook covers all aspects of UNMOVIC operations and activities, including inspection and reinforced monitoring, aerial surveillance, transportation, accommodation, UNMOVIC's rights and responsibilities, relations with the media and Iraq's obligations. Part II contains discipline-specific procedures as well as policy documents, including those on sampling and analysis of chemical and biological weapon agents, sampling of solid propellants and their ingredients, the tagging of missiles and the disposition of prohibited or unidentified dual-use items. Part III reproduces the texts of relevant governing resolutions and related legal instruments.

The Handbook sets out the procedures to be followed by staff in various weapons disciplines and provides common formats for field reporting. Codes of conduct for personnel and their responsibilities are covered, along with the corresponding duties, rights and obligations of the host state. Criteria for the classification of inspection sites and facilities are also included, as are common formats for reporting the results of on-site inspections. Later additions to the Handbook include incident and accident response procedures, air operations and management of confidentiality and security.

UNMOVIC Administrative Manual

Issued in November 2001, the manual is a compilation of administrative rules and procedures covering, inter alia, communications and records, personnel matters and management of confidentiality. UNMOVIC also compiled a glossary of terms and definitions, aimed at achieving consistency and standardization in oral and written reporting⁶⁰ and streamlined electronic declaration forms to permit the inspected state to report more effectively and efficiently.

The Compendium

Perhaps most important of all is the famed Compendium, currently being finalized by UNMOVIC at the request of its College of Commissioners. This document will be a comprehensive record of the knowledge and experience gained by UNMOVIC and UNSCOM.⁶¹ It will include as full an account as possible of the extent and nature of Iraq's program for acquiring WMD, including financing, staffing, management, governance and procurement activities. It will examine the origins of Iraq's programs, including the political and security environment that led to their establishment. Uniquely, it will identify the 'multidisciplinary nodes' of Iraq's WMD enterprise. According to UNMOVIC, while Iraq followed the same general routes as other countries, it did engage in some 'unique methods and activities', which should be studied to inform future nonproliferation and counterproliferation strategies.⁶²

The 'lessons learned' aspect of the Compendium will explore specific signatures and indicators of WMD-related activities, seek to identify relevant facilities and consider how the detection of those signs can be applied to future monitoring. Also appraised will be how Iraq attempted to hide the true purpose of some of its procurement activities. Along with the reports of the IAEA's Iraq Nuclear Verification Office (INVO), which conducted nuclear inspections in Iraq, and those of the Iraq Survey Group (ISG),⁶³ the Australia/UK/US inspection effort undertaken after the Coalition invasion of the country in April 2003, the Compendium should prove invaluable in charting the course that future inspectorates might follow in relation to monitoring, verification and inspection. It will provide an unprecedented 'roadmap' for identifying and codifying the guiding principles resulting from experience of inspections and related activity gained in Iraq over the past 15 years.

As of November 2005, UNMOVIC was continuing its work on the Compendium.⁶⁴ In addition to refining a first draft, it has produced an extensive draft summary, providing a general, unclassified description of Iraq's proscribed program and emphasizing the lessons learned by UN inspectors. An extract containing the biological section of the summary was appended to UNMOVIC's 30 August 2005 report to the UNSC.⁶⁵

Detection/inspection and other equipment

UNMOVIC adopted and gained experience in using advanced technologies for both detection and inspection. These were in addition to the nuclear-related technologies deployed by the IAEA. Annex 3 contains a list of the equipment provided to UNMOVIC inspectors. As well as portable chemical and biological detectors for *in situ* direct determination of traces of chemical and biological agents, UNMOVIC inspectors

had at their disposal advanced geophysical equipment for searching for hidden structures and storage spaces that could be used to hide precursors, agents or WMD, laboratories or production facilities. Of special interest were hidden spaces near or under large buildings, such as factories, hospitals and military installations. To increase effectiveness, combinations of techniques were employed, depending on the site. Among the technologies deployed were ground-penetrating radar, electromagnetic induction soil mapping, computer and server forensics, remote drilling and sampling systems for munitions.⁶⁶

UNMOVIC's experience was that private technology companies were willing to provide equipment, re-agents, sampling procedures, genetic analysis processes and other technology to the organization in order to field-test their products as well as to gain publicity and prestige from working with the United Nations. UNMOVIC in turn was able to demonstrate the requisite confidentiality to encourage companies to collaborate with it. This was particularly true in the biological area. A standing body would have to provide guarantees of commercial confidentiality to supportive companies.

Much of UNMOVIC's equipment remained intact after the Coalition invasion of Iraq and a significant amount of it remains stored at the UNMOVIC field office at Larnaca International Airport in Cyprus.⁶⁷ Some hardware has been returned to New York or sent elsewhere for use in familiarization and refresher training.⁶⁸ In the short term, this equipment would be available for use by a new body. It would however need continuous maintenance to be ready at short notice and would eventually become outdated and obsolete and have to be replaced.

It would also be useful to maintain a generic, basic equipment package, including health and safety kit like NBC masks and suits and decontamination hardware, to facilitate rapid deployment of inspectors. This basic package could also be employed for training purposes, in particular to inculcate a common safety 'philosophy' among UN inspectors, who inevitably have differing backgrounds and training. Standardized apparatus is essential if multinational teams are to have confidence in the safety and security of field operations where contact with hazardous materials is possible. There would need to be constant review and upgrading, as necessary, of such equipment.

The UN maintains stores of basic hardware for field operations at an airbase in Brindisi, Italy. While normally used for UN peacekeeping operations, it could be made available to a future UN inspection mission and flown into the area of operations at short notice. A UN agency already on the ground could be engaged to handle the arrival of such equipment. A useful model is also to be found in the CTBTO's agreement with the United Nations Development Programme (UNDP), which often acts as the coordinating body for UN activities in particular developing countries. Under this agreement, UNDP undertakes to provide operational support services in a cost-efficient and timely way. These include obtaining customs clearance for the import of supplies and equipment, arranging temporary storage, assisting with protocol and legal issues and the

procurement of local supplies, arranging for licences for software and communications equipment and making travel and transport arrangements.⁶⁹

If governments are to be expected to provide equipment for verification field missions, it is preferable that plans be firmed up in advance, along the lines of the standby arrangements for UN peacekeeping operations. One reason why UNMOVIC was able to procure helicopters so quickly after the decision was made to deploy to Iraq was that negotiations with supplier countries had been concluded in advance.

Satellite imagery analysis

UNMOVIC has successfully developed an independent capacity for gathering, assessing and using satellite imagery, combined with geographic information systems, as part of inspection planning and information management and analysis. This has been facilitated by rapid technological advances in software and by the increasing availability and affordability of commercial satellite imagery since the first inspection regime was established under UNSCOM. Images have thus been purchased under contract from commercial companies, as well as being received from member states, giving UNMOVIC greater autonomy and flexibility.

Commercial imagery now has a resolution of at least 0.60 metres, compared with 10 metres in 1991, when UNSCOM was set up, and one metre when UNMOVIC was created. Timely delivery of commercial imagery has enhanced inspector reaction times, proving especially useful for:

- determining the status of a site, its layout and dimensions and the possible function of particular structures;
- monitoring infrastructure changes over time at sites of interest; and
- putting together line diagrams of sites for inspection purposes.

UNMOVIC has also cooperated continuously with the IAEA in this area, including exchanging imagery.⁷⁰ It has also shared its remote sensing expertise with the United Nations Geographic Information Working Group for possible wider application by other UN bodies,⁷¹ and has specifically assisted DPKO in mapping borders.

UNMOVIC currently retains two full-time professional imagery analysts, which would also be the minimum requirement for a new verification body. It would also be essential to have standing contracts with commercial image providers, such as SpaceImaging, to allow ready access to both generic and country-specific images.

Multidisciplinary inspections

As recommended by the 1999 Amorim panel,⁷² a unique multidisciplinary approach was adopted for UNMOVIC field operations. Inspection teams consisting of experts with different scientific backgrounds permitted more effective inspections to be conducted at sites with multiple or suspected multiple activities. This led to a more complete understanding of such sites, especially with regard to procurement, contracts and relationships that might exist with other agencies, companies and national and foreign suppliers.

UNMOVIC performed multidisciplinary inspections at many different types of location,⁷³ but with an emphasis on: central customs offices, engineering companies and military nuclear, biological and chemical defence facilities; military vehicle design and manufacturing plants; presidential palaces; and private homes. Inspection of ammunition storage areas was an important part of the work of multidisciplinary teams throughout the inspection period, as it was never clear what type of weaponry might be discovered at such sites. According to UNMOVIC, ‘Munitions experts, utilising both visual recognition techniques and appropriate detectors, conducted in-depth searches of munitions production, storage and disposal areas, which resulted in the detection of (empty) munitions that might have gone unnoticed if the searches had relied solely or primarily on technical means to detect toxic or infectious material’.⁷⁴

The incident that most graphically (and embarrassingly) illustrated the need for multidisciplinary inspections occurred in 1996 when UNMOVIC inspectors re-examined munitions fragments scrutinized in 1992 and found them to be for BW purposes, not CW, as the Iraqis had claimed.⁷⁵ No samples had been taken for analysis until after Iraq admitted to the weaponization of BW agents. In addition, dozens of empty R-400 bombs produced for BW reasons had been destroyed under the supervision of UN CW inspectors as early as October 1991. At that time, the inspectors had not understood or appreciated the significance of specific BW-related features and markings, notably black strips and the different internal coating of some of the bombs.

Laboratories and sampling

UNMOVIC developed a three-tiered analysis protocol for chemical, biological and missile propellant samples. Trained personnel collected the samples, using strict chain-of-custody rules to maintain sample integrity. Such samples were collected to help discern a chemical’s true identity, acquire evidence of proscribed activities and verify the industrial or research activities associated with the samples taken. In the first stage, samples were checked on-site for immediate hazards, using military and industrial safety monitors, in order to determine sample handling procedures and to prioritize analysis. The second stage involved screening at laboratories at BOMVIC. If this evaluation produced ambiguous results, or the results required further verification, samples were sent to at least two external laboratories under contract with UNMOVIC, giving the organization a credible, disinterested means of validating inspection findings. Using those procedures, UNMOVIC claimed that it was able to detect ‘the widest possible spectrum of chemical and biological weapons-related compounds long after any possible agents had been present on site’.⁷⁶

To provide laboratory services, UNMOVIC established a network of qualified institutions throughout the world. Laboratories that met its requirements were awarded a one-year fee-for-service contract. UNMOVIC has renewed contracts that were scheduled to expire in 2004 and has made contact with new laboratories to maintain a maximum state of readiness.⁷⁷ See Annex 4 for details of the current laboratory network, which comprises 11 facilities contracted to provide services until 2006.⁷⁸

UNMOVIC has begun discussions with the Austrian government on the latter's offer to establish an Equipment Maintenance and Training Laboratory at its facility at Seibersdorf near Vienna. This would enhance UNMOVIC's capabilities for early response and for screening and analysis.

Experience in export/import monitoring

UNMOVIC established, maintained and constantly revised and refined lists of items, materials and technologies subject to the export/import monitoring regime imposed on Iraq.⁷⁹ It used them to verify the presence or absence or use of such items in Iraq. The role of UNMOVIC was widened beyond WMD by Security Council resolution 1409 (2002), which charged it with evaluation of applications by Iraq to use the Oil-for-Food escrow account for military commodities or products included in the goods review list.⁸⁰

A new UN body could draw on the generic experience and the protocols and systems developed by UNMOVIC. These could be readily applied to new cases, providing a template for the types of items that need to be monitored and information on how this might be done. UNMOVIC also produced a handbook and a website containing the relevant documents to assist governments in implementing the export/import mechanism.⁸¹

UNMOVIC interacted with many governments in the export control area, particularly in finding practical solutions to such matters as defining material as dual use and finding the appropriate balance between nonproliferation goals and legitimate commerce.⁸² Such experience could be invaluable to a new agency that had the monitoring of UN arms embargoes and sanctions related to WMD as part of its mandate.

Air transport and aerial surveillance

UNMOVIC air operations were carried out by one L-100 aircraft and eight helicopters, with a total of 57 air staff. These operations were covered by contracts with four different companies registered in Canada, Russia, South Africa and the UK. While the crews were not in the employment of the UN, the rest of the air staff was.⁸³

From 17 February 2003, UNMOVIC also had access to a high-altitude U-2 aircraft, flown on missions on its behalf by the United States Air Force.⁸⁴ A Mirage-IV medium-altitude aircraft, flown on behalf of UNMOVIC by the French Air Force, undertook its first mission on 23 February 2003. The two aircraft provided several different types of imagery. Both were able to supply digital imagery to UNMOVIC in New York, sometimes within a few hours of the flights taking place.

Aerial surveillance in support of ground operations and monitoring of activities at distant sites was carried out after operational procedures and security in the no-fly zones over Iraq was agreed with the US and the Iraqi authorities.⁸⁵ A Bell-212 helicopter equipped for the acquisition of aerial imagery and for night flights was used for surveillance. Hardware consisted of a cockpit-installed infrared system plus a

standard video camera. This was also used to identify, through direct observation, new sites to be inspected. UNMOVIC was discussing the use of a Russian AN-30 surveillance aircraft, used by Russia under the 1992 Open Skies Treaty, and German UAVs to supplement its capabilities but arrangements could not be finalized before its operations in Iraq ended.

As UNMOVIC noted when commenting on its ability to redeploy to Iraq after the war, fixed-wing aircraft can be obtained on ‘fairly short notice’, while helicopters might take longer to procure (as was the case in 2002).⁸⁶ This difficulty might be overcome through long-term standing commercial contracts for short-notice supply of helicopters or through a standby arrangement similar to that used by DPKO for national ‘in principle’ pledges for UN peacekeeping operations.

Communications

UNMOVIC inspectors were provided with state-of-the-art telecommunications systems to permit clear and secure voice transmission from within the mission area. The network was completely independent of the Iraqi public network, which is a requirement for credible verification and fact-finding exercises. The system, both for voice and data, had built-in redundancy and capacity for expansion, achieved by routing connections via two different satellite carriers. The inspectors used International maritime satellite (INMARSAT) and Thuraya satellite phones. The Thuraya system was used to establish communications in the field, while that of INMARSAT was used during field operations and as a backup for UNMOVIC’s regional offices. Each inspector was also provided with a very high frequency (VHF) radio with a range extending some 80 kilometres from the capital. Long-range high frequency stations were installed in BOMVIC, the regional office in Mosul and the office in Larnaca, as well as at the Al Rasheed airbase.⁸⁷

Conclusion

UNMOVIC has produced a cadre of trained and experienced personnel, well-practised procedures and techniques and proven technology that would be invaluable in establishing a permanent, standing UN verification body to deal with WMD issues. Some of these capacities, such as the refinement of on-site inspection practices and the compilation of manuals and compendiums, represent a permanent contribution to the art of verification that will be available to the United Nations and other international organizations. Hence, no new body would be forced to start from scratch, as UNSCOM had to do. Other capabilities, however, such as the UNMOVIC inspectorate, which was at the height of its powers in 2003, are more transitory.

Various aspects of UNMOVIC’s legacy would undoubtedly need to be adapted to suit the different requirements of a standing body, and there would be a need for continuous maintenance and development of some inherited capacities, such as technology. Nonetheless, it would be infinitely better if all of UNMOVIC’s extant capacities were utilized immediately and made the basis of a new organization. It would therefore be both prudent and cost-effective for the Security Council to decide sooner rather than

later to harvest these capabilities on behalf of a new body before they dissipate or atrophy.

Annex 1

Composition of the roster of trained inspectors as of May 2003

<i>Country</i>	<i>Headquarters (HQ)-based</i>	<i>Non-HQ-based inspectors^b</i>
<i>Total</i>	<i>inspectors^a</i>	
Algeria		4
Argentina	1	13
Australia	2	21
Austria	2	11
Bangladesh		7
Belarus		3
Belgium		3
Brazil	1	3
Bulgaria		1
Burkina Faso		1
Cambodia		1
Canada		4
Chile	1	3
China	3	9
Croatia		2
Denmark		1
Ethiopia		7
Finland	1	9
France	5	30
Germany		10
Greece	1	1
Hungary		5
Ireland		2
Italy		4
Japan	2	1
Jordan		6
Kenya		1
Lebanon		1
Mexico		2
Morocco		1
Nepal		3
Netherlands	1	1
New Zealand		1
Nigeria		2
Norway		5
Peru		3

Poland	2	4	6
Qatar		1	1
Republic of Korea		9	9
<i>Country</i>	<i>Headquarters-based</i>	<i>Non-HQ-based inspectors^b</i>	
<i>Total</i>	<i>inspectors^a</i>		
Republic of Moldova		1	1
Romania	2	12	14
Russian Federation	3	20	23
Serbia and Montenegro		1	1
Slovakia	1	7	8
Spain		1	1
Sweden	1	5	6
Switzerland		2	2
Thailand		5	5
Tunisia		1	1
Turkey		4	4
Ukraine	1	6	7
United Kingdom	3	11	14
United States	7	39	46
Zambia		4	4
Zimbabwe		1	1
Total (55 countries)	40	314	354

^a 28 served in Iraq with UNSCOM/UNMOVIC.

^b 106 served in Iraq with UNMOVIC.

Source 'Thirteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission in accordance with paragraph 12 of Security Council resolution 1284 (1999)', Annex to UN document S/2003/580, 30 May 2003, Appendix II.

Annex 2

UNMOVIC training

UNMOVIC began training its inspectors in July 2000. As of October 2005 it had conducted over 30 training courses, including seven basic and 11 advanced.

Basic training

The aim of the basic training courses was to provide future inspectors with an understanding of the UNMOVIC mandate, its ongoing and anticipated activities and monitoring/inspection concepts, procedures and basic tools, as well as an overview of Iraq's proscribed weapons programs and dual-use capabilities. On completion of a basic course, the trainee was included on the UNMOVIC roster of inspectors and deemed available to serve in Iraq or at UNMOVIC headquarters.

Seven basic training courses were held from July 2000 to April 2003. Around 380 persons from 59 countries completed the courses.

Follow-up training

The objective of these courses is to upgrade the preparedness of rostered personnel for inspection activities in Iraq. There are two types of follow-up training courses: advanced and enhanced.

Advanced courses seek to develop practical skills to conduct OSIs. Eleven advanced courses were held from May 2001 to May 2005.

Enhanced courses seek to develop inspectors' capabilities to monitor dual-use facilities or technologies. Eight enhanced courses were held from May 2002 to May 2005.

Multidisciplinary training

Multidisciplinary courses remain an ongoing aspect of UNMOVIC training. Four have been held so far. The first, in March 2003, on inspection and monitoring of dual-use production equipment in the biological and chemical realms, was attended by 13 participants from nine countries. The second was conducted in May 2004, with 22 participants from 14 countries; the IAEA was also in attendance. This was the first course that sought to develop the capabilities of multidisciplinary teams to carry out inspections and to conduct inspection data integration and analysis on a multidisciplinary and cross-disciplinary basis. A third course took place in May 2005 with 16 participants from 13 countries. Its goal was to enhance the capabilities of multidisciplinary teams to carry out inspections of sites not previously inspected. The most recent course took place in Sarnia and Toronto, Canada, in October 2005. Designed to familiarize inspectors in the chemical and missile fields with the petroleum and petrochemical industries, it was organized in conjunction with the Canadian Centre for Treaty Compliance at Carleton University in Ottawa, Canada.

Other training

UNMOVIC has also run a series of specialized courses and seminars. These included training on topics such as:

- the operation of state-of-the-art identification instruments for BW agents;
- certification for the shipment of hazardous materials (required for the delivery of samples to analytical laboratories worldwide);
- DNA-based analysis as a potential verification tool; and
- the oil and petrochemical industries.

These courses also sought to enhance technical knowledge and the practical skills needed to monitor biological production facilities and to improve understanding of the infrastructure, equipment and materials that could be involved in small-scale production of chemical and biological warfare agents.

Sources Personal communication with UNMOVIC; quarterly reports on the activities of the United Nations Monitoring, Verification and Inspection Commission submitted in accordance with paragraph 12 of Security Council resolution 1284 (1999).

Annex 3

Specialized inspection equipment provided to UNMOVIC inspectors (1 December 2002–15 March 2003)

- 35,000 tamperproof tags and seals for tagging equipment.
- 10 Enhanced Chemical Agent Monitors.
- 10 Toxic Industrial Materials Detectors.
- 10 chemical agent monitors.
- Nuclear, biological and chemical protection suits and respirators.
- Personal dosimeters with readers.
- Portable radiometers.
- Five Self-Contained Breathing Apparatus Level A suits for operating in a highly toxic environment.
- One complete portable chemical laboratory with requisite laboratory supplies and equipment capable of operating in a high-temperature environment.
- Ground-penetrating radars.
- One portable gas chromatograph/mass spectrometer.
- Three laboratory gas chromatographs/mass spectrometers (including 2 units rehabilitated from UNSCOM laboratory) with two Flame Photometry Detectors.
- Two Capillary Zone Electrophoresis instruments with ultra-violet-visible detectors.
- 12 ultrasonic pulse echo detectors to screen the inside of warheads.
- Equipment for sampling warheads (MONIKA-type).
- Four x-ray fluorescence-based alloy analyzers.
- Biological detection and screening equipment, based on both genetic and immunologic methods.
- Two portable attenuated total reflectance infrared spectroscopy instruments.
- Nine customized sampling kits with re-supply equipment sufficient to handle up to 200 samples.
- Chemical agent decontamination equipment.
- Oxygen meters.

Adapted from 'Twelfth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)', Annex to UN document S/2003/232, 28 February 2003, para. 21; personal communication with UNMOVIC.

Annex 4
UNMOVIC's network of laboratories

<i>Laboratory</i>	<i>Analysis duties</i>
ABC Schutz, (WIS)Munster/Oertze, Germany	Biological
Centre for Applied Microbiology and Research, Porton Down, United Kingdom	Biological
Centre de Recherche du Service de Santé des Armées, La Tronche, France	Biological
Centre des Etudes du Bouchet (CEB), Vert le Petit, France	Chemical and biological
Chemical Defence Laboratory, Beijing, China	Chemical
Defence Science and Technology Laboratory, Porton Down, United Kingdom	Chemical
Finnish Verification Institute (VERIFIN), Helsinki, Finland	Chemical
GosNIIOKht, Moscow, Russia	Chemical
Laboratorium Spietz, Switzerland	Chemical
Swedish Defence Research Agency (FOI), Umea, Sweden	Chemical and biological
TNO-Prins Maurits Laboratory, Rijswijk, Netherlands	Chemical and biological

Sources 'Sixteenth quarterly report on the activities of the United Nations Monitoring, Verification and Inspection Commission in accordance with paragraph 12 of Security Council resolution 1284 (1999)', Annex to UN document S/2004/160, 27 February 2004, Appendix II, p. 15; personal communication with UNMOVIC.

Annex 5

Advanced inspection technologies used by UNMOVIC

Ground-penetrating radar

Ground-penetrating radar surveys detect disturbances in the pattern of high-frequency electromagnetic waves in the ground caused by hidden structures, such as buried pipes and materials, hidden shafts and different porosity and soil densities. The technology is quick and easy to use, providing visual data in real time, which is important for on-the-spot decisions about whether or not to excavate. The depth capability of the system is up to 15–20 metres, depending on the frequency of the antenna used.

Electromagnetic induction soil change mapping

Electromagnetic induction responds to changes in the electrical resistivity of the ground. It is useful for mapping changes in the thickness of overlying material, indicating suspicious areas where local soil has been replaced by more resistive material, such as concealed structures.

Computer and server forensics

Information on hard disks and servers at inspected facilities and government offices may help to identify the kind of activities being undertaken at such locations and connections with suppliers of materials or services. It may also include documents pertaining to projects, organizational structures, finances and personnel. UNMOVIC used specific software and hardware to seek such information, and three experts in computer forensics were part of the multidisciplinary support team deployed in Iraq.

Remote drilling and sampling systems for munitions

Such systems allow inspectors to drill safely into a munition, extract a sample of the liquid contents and, when appropriate, drain the contents for subsequent destruction. UNMOVIC successfully used them to sample old 155-millimetre artillery shells containing mustard gas and biological materials from excavated R-400 bombs.

Source ‘Thirteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2003/580, 30 May 2003, paras. 54–57.

¹ For the purposes of this study, weapons of mass destruction will be considered to be nuclear, radiological, chemical and biological, along with their associated delivery systems.

² ‘Note by the President of the Security Council’, Security Council document S/23500, 31 January 1992.

³ ‘Statement by the President of the Security Council’, UN document S/PRST/1995/9, 22 February 1995.

⁴ UN Security Council resolution 1540, 28 April 2004.

⁵ See ‘International Convention for the Suppression of Acts of Nuclear Terrorism, Report of the Ad Hoc Committee established by General Assembly resolution 51/210 of 17 December 1996’, UN document A/59/766, 4 April 2005.

⁶ The nuclear weapons issue is somewhat different due to recognition by the NPT of the legality of such weapons in the possession of five designated nuclear weapon states—while simultaneously committing them to pursue nuclear disarmament. The July 1996 ruling of the International Court of Justice (ICJ) has

further complicated this. The ICJ ruled that while the threat or use of nuclear weapons would ‘generally be contrary to the rules of international law applicable in armed conflict’, it could not definitively conclude ‘whether the threat or use of nuclear weapons would be lawful or unlawful in the extreme circumstance of self-defence, in which the very survival of a State would be at stake’. The ICJ coupled this with a unanimous ruling that ‘there exists an obligation to pursue in good faith and bring to a conclusion negotiations leading to nuclear disarmament in all its aspects under strict and effective international control’. See International Court of Justice, ‘Advisory Opinion, Legality of the Threat or Use of Nuclear Weapons’, The Hague, 8 July 1996, General List no. 96.

⁷ Apart from UNMOVIC and the IAEA in tandem, but only in regard to Iraq. The United Nations Institute for Disarmament Research (UNIDIR) and the United Nations Department for Disarmament Affairs (UNDDA) are mandated to consider all such issues as part of their broader remit but neither could be described as a technical body.

⁸ This is historically true of the five ‘recognized’ nuclear weapon states (China, France, the Soviet Union/Russia, the United Kingdom and the United States) as well as, at a minimum, India, Iran, Iraq, Libya, North Korea and South Africa.

⁹ The establishment of the US Department of Homeland Security in 2002 and the appointment of an intelligence czar in 2004 are just two examples. For its part, the European Union has for the first time adopted an integrated WMD policy (see Strategy against Proliferation of WMD, European Council, December 2003).

¹⁰ Jez Littlewood, *The Biological Weapons Convention: a Failed Revolution*, Ashgate, Aldershot, 2005.

¹¹ See Angela Woodward, ‘BW: revisiting the UN mechanism’, *Trust & Verify*, no. 116, September–October 2004, pp. 3–4.

¹² This did not stop the UN Secretary-General’s High-Level Panel on Threats, Challenges and Change from advocating its future use (see UN Secretary-General’s High-Level Panel on Threats, Challenges and Change, *A More Secure World: Our Shared Responsibility*, United Nations, New York, 2004, para. 141).

¹³ As well as those residing in Vienna, Austria, at the IAEA as a result of the Iraq experience.

¹⁴ Information- and intelligence-gathering means owned and operated by individual states. Notable examples are satellites, aerial reconnaissance, electronic eavesdropping and human intelligence activity.

¹⁵ ‘Thirteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2003/580, 30 May 2003, para. 162.

¹⁶ George Perkovich, Jessica T. Mathews, Joseph Cirincione, Rose Gottemoeller and Jon B. Wolfsthal, *Universal Compliance: A Strategy for Nuclear Security*, Carnegie Endowment for International Peace, Washington, DC, March 2005, p. 68.

¹⁷ ‘Strengthening disarmament capabilities of the United Nations—maintaining UNMOVIC competencies’, resolution of the German Bundestag, printed matter (Bundestag-Drs) 15/5589, introduced 1 June 2005, passed 16 June 2005 with the votes of the Social Democrats and Greens, other parties abstaining, no objections (unofficial translation by Oliver Meier).

¹⁸ To date: resolution 1373, 28 September 2001, which prescribes comprehensive obligations on member states to counter terrorism, including that involving WMD; and resolution 1540, 28 April 2004, which obliges member states to take steps to prevent non-state actors from acquiring WMD.

¹⁹ Canada advocates making reports by all NPT states regular and obligatory.

²⁰ The CTBTO, IAEA and OPCW, although they belong to the UN ‘family’ of agencies and organizations, are not strictly UN bodies. They belong to their collective membership, which may or may not coincide with treaty membership or UN membership, although in practice this distinction is disappearing over time. Still India, for instance, while a founding member of the IAEA, is not a party to the NPT. Switzerland was for many years not a UN member but a member of various UN and treaty bodies.

²¹ See ‘Agreement governing the Relationship between the United Nations and the International Atomic Energy Agency, 14 November 1957’, IAEA document INFCIRC/11, 30 October 1959; ‘Agreement to Regulate the Relationship between the United Nations and the Preparatory Commission for the Comprehensive Nuclear-Test-Ban-Treaty Organization’, UN document A/54/884, 26 May 2000; and ‘Agreement concerning the Relationship between the United Nations and the Organization for the Prohibition of Chemical Weapons, Annex to General Assembly resolution 55/283’, 7 September 2001, UN document A/RES/55/283, 24 September 2001.

²² ‘Agreement concerning the Relationship between the United Nations and the Organization for the Prohibition of Chemical Weapons, Annex to General Assembly resolution 55/283’, 7 September 2001, UN document A/RES/55/283, 24 September 2001, article II (c).

²³ Barbara Hatch Rosenberg, ‘Enforcing WMD treaties: consolidating a UN role’, *Disarmament Diplomacy*, no. 75, January/February 2004, www.acronym.org.uk. The WHO already has an agreement with the United Nations that commits it to cooperating with the UN. In particular the WHO has agreed to comply ‘to the fullest extent practicable with any request which the United Nations may make for the furnishing of special reports, studies or information’, subject to suitable financing arrangements. See ‘Agreement between the United Nations and the World Health Organization’, 10 July 1948.

²⁴ The Office of Research and Collection of Information was abolished in 1992 during Boutros Boutros-Ghali’s tenure as UN Secretary-General and has never been reconstituted.

²⁵ One could imagine Australia, Brazil and South Africa playing this role in their respective regions.

²⁶ See ‘Organizational plan for the United Nations Monitoring, Verification and Inspection Commission prepared by the Executive Chairman’, UN document S/2000/292, 6 April 2000.

²⁷ UNMOVIC does not consider itself to have in-house nuclear expertise even though its current Acting Head, Dimitri Perricos, is a former IAEA nuclear inspector. It also contends that it needs more CW expertise due to the overlap with BW.

²⁸ ‘Fifteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2003/1135, 26 November 2003, Appendix III, para. 7.

²⁹ Their employers usually approve of the training courses that their staff members undertake, as it increases their experience and value and provides a certain degree of prestige.

³⁰ This contained frozen Iraqi financial assets, as well as funds from UN-approved Iraqi oil sales that funded the Oil-for-Food Programme. In June 2005, under Iraqi pressure, UN Secretary-General Kofi Annan announced that he would recommend that US\$200 million from the weapons inspection funds be reallocated for Iraqi economic development (see ‘U.N. Secretary General to recommend reallocating some Iraq weapons inspection funds’, Global Security Newswire, 22 June 2005, www.nti.org).

³¹ ‘Thirteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission in accordance with paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2003/580, 30 May 2003, para. 138.

³² It also had four staff at Larnaca in Cyprus, two at the professional level and two at the General Service Level, while in Baghdad it had nine local staff members (see ‘Twenty-second quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission in accordance with paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2005/545, 30 August 2005, paras. 8–9).

³³ ‘Fifteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2003/1135, 26 November 2003, para. 18.

³⁴ Personal communication with UNMOVIC.

³⁵ UNMOVIC has stressed, however, that, at any one time, certain numbers of inspectors will be unavailable for professional or personal reasons. Furthermore, some inspectors were reluctant to go to Iraq after the war when the security situation was so poor.

³⁶ Personal communication with UNMOVIC.

³⁷ While the CTBTO will not have a standing inspectorate, it will have trained and rostered inspectors for on-site inspections of areas where a suspected nuclear test has been conducted. A standing UN verification body might be required to take on this role pending entry into force of the CTBT or in instances where the CTBTO is unwilling or unable to carry out an inspection itself or where a suspected state is not a party to the treaty.

³⁸ UNMOVIC has reported that when surveyed in 2004, 100 of its rostered inspectors said they would be ready to deploy within four weeks. Only about a dozen said that they would not be ready at a particular time or asked to be taken off the roster (personal communication with UNMOVIC).

³⁹ ‘Thirteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2003/580, 30 May 2003, para. 150.

⁴⁰ ‘Fourteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2003/844, 28 August 2003, para. 23.

⁴¹ ‘Thirteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2003/580, 30 May 2003, para. 153. It is not clear whether this remained true after BOMVIC’s offices were affected by the terrorist bomb attack on the Canal Hotel in Baghdad on 19 August 2003.

⁴³ In UNMOVIC’s case, it was recognized at an early stage that the pool would not be able to supply enough of them and additional numbers were contracted.

⁴⁴ UNMOVIC reports that sometimes training had to be ‘up’ as well as ‘down’. For example, some of its experts in the biological field were highly skilled and well trained in being able to identify sophisticated biological laboratories up to BL3 and BL4 levels. But as there were no such laboratories in Iraq these inspectors had to adapt to simpler techniques, such as sampling, which were better suited to verification in the Iraq case (personal communication with UNMOVIC).

⁴⁵ Organized and delivered by Columbia University, New York.

⁴⁶ The most recent were a second enhanced missile training course on dual-use production capabilities hosted by Germany in March 2005 and a general training course in Vienna in May, which included UNMOVIC’s first desk top exercise (which was followed by a field exercise). The UK hosted a BW course at Porton Down in August 2005, and another relating to the petrochemical industry was hosted by Canada in October 2005.

⁴⁷ In the UNMOVIC case, Argentina, Austria, Brazil, Canada, China, France, Germany, Romania, Sweden, Switzerland, the UK and the US hosted such courses.

⁴⁸ Both organizations were routinely invited to participate in UNMOVIC’s training courses. The OPCW did so for the first time in May 2004, taking part in a multidisciplinary course.

⁴⁹ This confidential network links national experts working on technical aspects of the CTBT verification system in order to facilitate exchanges between them on developing and improving the system. It is not accessible to non-governmental experts.

⁵⁰ ‘Tenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2002/981, 3 September 2002, para. 16.

⁵¹ For detailed information on the system and its capabilities see ‘Twentieth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2005/129, 28 February 2005, Appendix.

⁵² ‘Twentieth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2005/129, 28 February 2005, Appendix, para. 5.

⁵³ The Geographic Information System used extensively by UNMOVIC is a commercially available computer software program capable of storing, analyzing, capturing and displaying geographically referenced material from UNMOVIC’s various databases. For further detail see ‘Seventeenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2004/435, 28 May 2004, Appendix, para. 8.

⁵⁴ ‘Twentieth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2005/129, 28 February 2005, Appendix, paras 19–21.

⁵⁵ ‘Ninth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2002/606, 31 May 2002, para. 21.

⁵⁶ ‘Twelfth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2003/232, 28 February 2003, para. 50.

⁵⁷ ‘Ninth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, UN document S/2002/606, 31 May 2002, para. 15.

⁵⁸ ‘Thirteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2003/580, 30 May 2003, para. 35.

⁵⁹ For further information on such requirements, see *Guide to Fact-Finding Missions under the Ottawa Convention*, Verification Research, Training and Information Centre (VERTIC), London, 2003.

⁶⁰ ‘Tenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2002/981, 3 September 2002, para. 21.

⁶¹ ‘Fourteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2003/844, 28 August 2003, para. 7.

⁶² ‘Sixteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2004/160, 27 February 2004, para. 12.

⁶³ In October 2003, the Iraq Survey Group finally made contact with UNMOVIC when the Head of the ISG, Charles Duelfer, and a team visited UNMOVIC headquarters to present their findings, the scope of their work and their methodology. UNMOVIC, however, did not have access to any of the ISG’s supporting documentation, interview testimony or details of OSIs carried out.

⁶⁴ ‘Twenty-second quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2005/545, 30 August 2005, para. 6.

⁶⁵ ‘Twenty-second quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2005/545, 30 August 2005, Appendix.

⁶⁶ For further detail on these, see Annex 3.

⁶⁷ The office has completed a full inventory of the equipment and where required conducted serviceability checks. UNMOVIC has also investigated methods for long-term maintenance of the hardware. UNMOVIC and the IAEA have signed an extension of the lease of these facilities with the government of Cyprus.

⁶⁸ Including metal analyzers, a portable gas chromatograph/mass spectrometer, x-ray digital radiography systems, ground-penetrating radar, a digital surveillance system and a chemical analyzer (see ‘Fourteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2003/844, 28 August 2003, para. 11).

⁶⁹ ‘Agreement Between the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization and the United Nations Development Programme on the Provision of Support Services’, 7 December 2000.

⁷⁰ ‘Seventeenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2004/435, 28 May 2004, Appendix, para. 3. Resolution is a measure of the smallest object that can be determined by the sensor, or the area on the ground represented by each picture element (known as a pixel).

⁷¹ ‘Seventeenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2004/435, 28 May 2004, Appendix, para. 5.

⁷² ‘Report of the First Panel established pursuant to the Note by the President of the Security Council on 30 January 1999 (S/1999/100), concerning disarmament and current and future ongoing monitoring and verification issues’, UN document S/1999/356, 27 March 1999, para. 40.

⁷³ ‘Thirteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2003/580, 30 May 2003, paras. 29–31.

⁷⁴ ‘Thirteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2003/580, 30 May 2003, para. 30.

⁷⁵ ‘Twenty-second quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2005/545, 30 August 2005, Appendix, para. 26.

⁷⁶ ‘Thirteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2003/580, 30 May 2003, para. 60.

⁷⁷ ‘Sixteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2004/160, 27 February 2004, Appendix II, para. 4.

⁷⁸ ‘Nineteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2004/924, 26 November 2004, para. 19.

⁷⁹ By UN Security Council resolution 1051, 27 March 1996.

⁸⁰ ‘Ninth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2002/606, 31 May 2002, para. 20.

⁸¹ ‘Seventh quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2001/1126, 29 November 2001, para. 10.

⁸² ‘Thirteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2003/580, 30 May 2003, para. 158.

⁸³ ‘Twelfth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2003/232, 28 February 2003, para. 17.

⁸⁴ ‘Twelfth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2003/232, 28 February 2003, para. 36.

⁸⁵ ‘Thirteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2003/580, 30 May 2003, para. 41.

⁸⁶ ‘Thirteenth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2003/580, 30 May 2003, para. 150.

⁸⁷ ‘Twelfth quarterly report of the Executive Chairman of the United Nations Monitoring, Verification and Inspection Commission under paragraph 12 of Security Council resolution 1284 (1999)’, Annex to UN document S/2003/232, 28 February 2003, para. 52.

List of published studies and papers

All papers and studies are available as pdf-files at the Commission's website: www.wmdcommission.org

No 1 "Review of Recent Literature on WMD Arms Control, Disarmament and Non-Proliferation" by Stockholm International Peace Research Institute, May 2004

No 2 "Improvised Nuclear Devices and Nuclear Terrorism" by Charles D. Ferguson and William C. Potter, June 2004

No 3 "The Nuclear Landscape in 2004: Past Present and Future" by John Simpson, June 2004

No 4 "Reviving the Non-Proliferation Regime" by Jonathan Dean, June 2004

No 5 "Article IV of the NPT: Background, Problems, Some Prospects" by Lawrence Scheinman, June 2004

No 6 "Nuclear-Weapon-Free Zones: Still a Useful Disarmament and Non-Proliferation Tool?" by Scott Parrish and Jean du Preez, June 2004

No 7 "Making the Non-Proliferation Regime Universal" by Sverre Lodgaard, June 2004

No 8 "Practical Measures to Reduce the Risks Presented by Non-Strategic Nuclear Weapons" by William C. Potter and Nikolai Sokov, June 2004

No 9 "The Future of a Treaty Banning Fissile Material for Weapons Purposes: Is It Still Relevant?" by Jean du Preez, June 2004

No 10 "A Global Assessment of Nuclear Proliferation Threats" by Joseph Cirincione, June 2004

No 11 "Assessing Proposals on the International Nuclear Fuel Cycle" by Jon B. Wolfsthal, June 2004

No 12 "The New Proliferation Game" by William C Potter, June 2004

No 13 "Needed: a Comprehensive Framework for Eliminating WMD" by Michael Krepon, September 2004

No 14 "Managing the Biological Weapons Problem: From the Individual to the International" by Jez Littlewood, August 2004

No 15 "Coping with the Possibility of Terrorist Use of WMD" by Jonathan Dean, June 2004

No 16 "Comparison of States vs. Non-State Actors in the Development of a BTW Capability" by Åke Sellström and Anders Norqvist, October 2004

No 17 "Deconflating 'WMD'" by George Perkovich, October 2004

No 18 "Global Governance of 'Contentious' Science: The Case of the World Health Organization's Oversight of Small Pox Virus Research" by Jonathan B. Tucker and Stacy M. Okutani, October 2004

No 19 "WMD Verification and Compliance: The State of Play" submitted by Foreign Affairs Canada and prepared by Vertic, October 2004

No 20 "WMD Verification and Compliance: Challenges and Responses" submitted by Foreign Affairs Canada, October 2004

No 21 "Meeting Iran's Nuclear Challenge" by Gary Samore, October 2004

No 22 "Bioterrorism and Threat Assessment" by Gary A. Ackerman and Kevin S. Moran, November 2004

No 23 "Enhancing BWC Implementation: A Modular Approach" by Trevor Findlay and Angela Woodward, December 2004

No 24 "Controlling Missiles", by Jonathan Dean, December 2004

No 25 "On Not Confusing the Unfamiliar with the Improbable: Low-Technology Means of Delivering Weapons of Mass Destruction" by Dennis M. Gormley, December 2004

No 26 "A Verification and Transparency Concept for Technology Transfers under the BTWC" by Jean Pascal Zanders, February 2005

No 27 "Missing Piece and Gordian Knot: Missile Non-Proliferation" by Mark Smith, February 2005

No 28 "The Central Importance of Legally Binding Measures for the Strengthening of the Biological and Toxin Weapons Convention (BTWC)" by Graham S. Pearson, February 2005

No 29 "Russia in the PSI: The Modalities of Russian Participation in the Proliferation Security Initiative" by Alexandre Kaliadine, August 2005

No 30 "Indicators of State and Non-State Offensive Chemical and Biological Programmes" edited by Ingrid Fångmark and Lena Norlander, August 2005

No 31 "The 2005 NPT Review Conference: Reasons and Consequences of Failure and Options for Repair" by Harald Müller, August 2005

No 32 "National Measures to Implement WMD Treaties and Norms: the Need for International Standards and Technical Assistance" by Andreas Persbo and Angela Woodward, August 2005

No 33 "Russia and the Chemical Disarmament Process" by Sergey Oznobistchev and Alexander Saveliev, August 2005

No 34 "Transparency and Secrecy in Nuclear Weapons" by Annette Schaper, August 2005

No 35 "Multilateral Nuclear Fuel-Cycle Arrangements" by Harald Müller, August, 2005

No 36 "Nuclear Threat Perceptions and Nonproliferation Responses: A Comparative Analysis" by Scott Parrish and William C. Potter, August, 2005

No 37 "WMD Crisis: Law Instead of Lawless Self-Help" by Harald Müller, August, 2005

No 38 "The Relevance of Gender for Eliminating Weapons of Mass Destruction" by Carol Cohn with Felicity Hill and Sara Ruddick, December, 2005

No 39 "The Influence of the International Trade of Nuclear Materials and Technologies on the Nuclear Nonproliferation Regime" by Dr Vladimir V Evseev, December, 2005

No 40 "A Standing United Nations Verification Body: Necessary and Feasible" by Trevor Findlay, December, 2005

WMDC

THE WEAPONS OF
MASS DESTRUCTION
COMMISSION

www.wmdcommission.org