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DISTRIBUTION STATEMENT A
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Unclassified
SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S) none	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION Southern Methodist University 6b. OFFICE SYMBOL (If applicable)	7a. NAME OF MONITORING ORGANIZATION Office of Naval Research
6c. ADDRESS (City, State, and ZIP Code) Dept of Political Science Dallas, TX 75275	7b. ADDRESS (City, State, and ZIP Code) Federal Building, Room 582 300 E. 8th Street Austin, TX 78701-3273
8a. NAME OF FUNDING/SPONSORING ORGANIZATION DARPA 8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER MDA972-92-J-1011
8c. ADDRESS (City, State, and ZIP Code) 3701 N. Fairfax Drive Arlington, VA 22203	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. / PROJECT NO. / TASK NO. / WORK UNIT ACCESSION NO.

11. TITLE (Include Security Classification)
Third Annual Verification Conference: Issues and Challenges of Verification (unclassified)

12. PERSONAL AUTHOR(S)
Dr. James Brown (editor)

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
FINAL	FROM 911115 TO 920630	920630	88

16. SUPPLEMENTARY NOTATION
Final Procedings

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	treaty verification, arms control

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

The third annual verification conference was held at Southern Methodist University 24-26 April 1992. The theme was "Issues and Challenges of Verification." Various aspects of treaty verification and arms control were presented in papers and discussed in open forums.

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS	21. ABSTRACT SECURITY CLASSIFICATION unclassified
22a. NAME OF RESPONSIBLE INDIVIDUAL Ralph W. Alewine	22b. TELEPHONE (Include Area Code) 703/696-2246 22c. OFFICE SYMBOL

DD FORM 1473, 84 MAR 83 APR edition may be used until exhausted. All other editions are obsolete.

SECURITY CLASSIFICATION OF THIS PAGE

"Issues and Challenges of Verification"

24-26 April 1992

Statement A per telecon
Ralph Alewine DARPA/NMRO
Arlington, VA 22203

NWW 6/29/92

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Program

CONFERENCE PROGRAM

"ISSUES AND CHALLENGES OF VERIFICATION"

Friday, 24 April

2:00-5:00 PM	**Registration** (Doubletree Hotel, Campbell Centre)
6:45-7:30 PM	**Reception** (Doubletree Hotel, Atrium)
7:30-9:30 PM	**Dinner** (Doubletree Hotel, Kansas City Room)
Presiding:	Dr. James Brown Southern Methodist University
Welcome:	Dr. James F. Jones, Jr. Dean and Vice Provost Dedman College Southern Methodist University
Address:	Ambassador Rolf Ekéus Executive Chairman Office of the Special Commission United Nations (UNSCOM) "Arms Control and the New Security Structures"

Saturday, 25 April

8:15-9:45 AM	**Opening Session** (Arthur Andersen Gallery, Fincher Building, Cox School of Business, SMU) (All panels will meet in this room.)
Welcome:	President A. Kenneth Pye Southern Methodist University
Presiding:	Dr. Calvin Christman University of North Texas

Addresses:	MG Robert W. Parker Director On-Site Inspection Agency "The Role of On-Site Inspection in Monitoring Arms Control Treaties"
	and
	General-Lieutenant Vladimir I. Medvedev Chief Nuclear Risk Reduction Center Russian Federation "Main On-Site Inspection Issues During Verification of Implementation of Arms Control Agreements"
9:45-11:00 AM	***Panel I*** ***"LESSONS LEARNED: A ROUNDTABLE WITH THE INSPECTORS"***
Chair:	Robert E. Kelley Los Alamos National Laboratory
Discussants:	Colonel Douglas M. Englund Director of Operations UNSCOM
	Dr. B. C. Barrass, O.B.E. UNSCOM
	MG Johan C. Kosters (Army) The Netherlands First Chief of EEC Monitor Mission to Yugoslavia
	Dr. Heinz Loquai Colonel on the General Staff Center for Verification, Bundeswehr Federal Republic of Germany
11:00-11:15 AM	***Break***
11:15 AM-12:45 PM	***Panel II*** ***"UNILATERAL/BILATERAL/MULTILATERAL EFFORTS AT ARMS CONTROL"***
Chair:	Dr. William P. Snyder Air War College

Speakers:	Amy Woolf Congressional Research Service "Reducing Nuclear Weapons with Unilateral Initiatives: Implications for Arms Control and Verification" Ambassador Maynard W. Glitman "Bilateral Arms Control in the Post Cold War Era" Dr. Michael Moodie US Arms Control and Disarmament Agency "The Future of Multilateral Arms Control: Challenges and Opportunities" Sergei Kisselev Ministry of Foreign Affairs Russian Federation "Soviet Arms Heritage -- A Russia/US Perspective"
12:45-2:30 PM	***Lunch*** (Hughes-Trigg Student Center Ballroom)
Address:	The Honorable Ronald F. Lehman II Director US Arms Control and Disarmament Agency "Issues and Challenges of Verification"
2:30-4:00 PM	***Panel III*** ***"THE NEUTRAL AND NON-ALIGNED: COMPETING AGENDAS"***
Chair:	Colonel Jeffrey B. Jones National Security Council
Speakers:	K. Subrahmanyam The Observer (India) "Toward a Nuclear Weapon Free World: Problems of Verification" Rut Diamint University of Buenos Aires (Argentina) "Arms Control and Verification Initiatives in the Southern Cone" Moacheng Zhuang Beijing Institute for International Strategic Studies (China) "Arms Control and Disarmament in the Asian-Pacific Region"

4:00-4:15 PM	***Break***
4:15-5:45 PM	***Panel IV*** ***"BIOLOGICAL/CHEMICAL/NUCLEAR NON-PROLIFERATION TREATIES: TEMPLATES FOR THE FUTURE?"***
Chair:	O. J. Sheaks US Arms Control and Disarmament Agency
Speakers:	Michael Krepon The Henry L. Stimson Center "Verification Standards for the Chemical Weapons Convention"
	Kyle B. Olson The Jefferson Group "Shifting the Burden and the Blame: Verification of Industry Compliance with Chemical and Biological Arms Agreements"
	David Fischer University of Cambridge "The Nuclear Non-Proliferation Regime as a Template for the Future"
	David Sloss US Arms Control and Disarmament Agency "Verifying a Cut-Off of SNM Production"
7:30-10:00 PM	**Reception and Dinner** (Crescent Hotel Ballroom)
Presiding:	Dr. James Brown Southern Methodist University
Address:	Dr. Willem van Eekelen Secretary General Western European Union "WEU and Arms Control Verification"

Sunday, 26 April

8:30-10:00 AM ***Panel V***
"CHALLENGES OF ECONOMICS AND TECHNOLOGIES"

Chair: Dr. James M. Gerhardt
Southern Methodist University

Speakers: Dr. Jeffrey H. Grotte
Institute for Defense Analyses
"Reducing Costs While Maintaining Effectiveness in Arms Control Monitoring"

BG Henny J. van der Graaf (Ret.)
Center for Verification Technology
The Netherlands
"How to Control Technology? Problems of Horizontal and Vertical Proliferation"

Dr. Roger Ide
On-Site Inspection Agency
"Verification Implementation -- The Burden of Cost and Technology"

Steve Kadner
Aquila Technologies Group, Inc.
"Development and Manufacture of Technical Systems Utilized in the Support of Arms Control and Verification: A Life Cycle Analysis"

10:00-10:15 AM ***Break***

10:15-11:45 AM ***Panel VI***
"FUTURE MODELS OF ARMS CONTROL AND VERIFICATION"

Chair: Dr. Edward J. Lacey
US Arms Control and Disarmament Agency

Speakers: François Géré
Foundation for the Study of National Defence
France
"The Loneliness of the Outer Space Inspector: A Space Arms Control Proposal for the Near Future"

Dr. Michael Wheeler
Systems Planning Corporation
"Verification in the 21st Century: A Strategic Perspective"

Dr. Michael E. O'Hanlon
Congressional Budget Office
"The Future of Nuclear Deterrence Beyond START"

Ambassador David H. Reese
Australia
"Can the Non-Proliferation Treaty Stop Proliferation?"

Noon-2:00 PM ***Lunch*** (Hughes-Trigg Student Center Ballroom)

Speakers

ARMS CONTROL AND THE NEW SECURITY STRUCTURES

Ambassador Rolf Ekéus

The end of East-West confrontation marked the dismantling of a global security structure that has dominated world politics since World War II. The confrontational dualism of this era developed into something of an organizing principle according to which most security related developments have been perceived and structured.

Arms control has thus, almost exclusively been a function of the dialectic of the East-West confrontation. The SALT-START- and INF-negotiations as well as the MBFR talks and the first stage of CFE negotiation are obvious examples of the functional relationship between arms control and the confrontational dualism. Even typically multilateral arms control talks as exemplified by the negotiations of the nuclear non-proliferation and partial test ban treaties as well as for most of the time the Geneva negotiations on a CW ban, have politically been subordinate to this dominating organizing principle.

The radical shift in international relations, a true political mutation on a global scale, will have fundamental consequences for contemporary arms control. The security structures that constitute the paradigm for disarmament negotiations have to be redesigned and understood.

However, such concepts cannot readily be defined out of the present confusing situation. They have to be gradually and organically emerging from collective perceptions of common threats.

Some of these collective threats stem from the consequences of the breakup of the Soviet Union. Another perceived threat against global security and stable peace order is the continuing and worsening trend towards proliferation of weapons of mass destruction and of missile capabilities.

Efforts are under way to halt this dangerous development. The NPT is rapidly gaining in influence as several significant states now sign and ratify the Treaty. A complete ban of Chemical Weapons Convention could and should be concluded this year. Such a Convention should be an effective instrument to halt the unhappy tendency of proliferation of chemical weapons. The BW convention should be strengthened through various means of improving the verifiability of the convention. Supported by arrangements as the Nuclear Suppliers Group, the Australia Group for chemical weapons sensitive compounds and the MTCG, these régimes are and will remain important.

Regrettably, however, there are signs that important states hesitate in allowing fully effective verification arrangements to be associated with the CW and BW conventions.

Nuclear proliferation must be recognized as one of the major threats to international peace and security. Any serious analysis of this problem must lead to the conclusion that the NPT is not enough to eliminate this risk and that the verification effect of the safeguard system is limited. It is uncontested that the safeguard régime is a fair-weather system. Its functions in a politically benevolent environment of states with serious and honest intentions of fulfilling their obligations under the Treaty. But faced with a political structure or constellation inclined to circumvent or violate the Treaty, the safeguard system is not sufficient. The limitation of the system has most recently been demonstrated by Iraq's contemptuous treatment of its obligations as a party to the Treaty. Reforms in the inspection system, such as liberal use of special inspections, may carry some ground but cannot compensate for the inherent weakness of the system's capability to cope with outright violations. Furthermore, the NPT is not effective as regards non-parties to the Treaty even if the parties would agree on a more clear discrimination as regards supplies to non-parties.

The Iraqi experience demonstrates that only a stringent verification and control system can be effective against a systematic effort to acquire a nuclear weapons capability. The binding resolutions adopted by the UN Security Council under Chapter VII of the UN Charter put in place the control and inspection system, which has ultimately been proven to be effective.

To halt proliferation in similar cases, the complete political support by the Security Council is necessary. Thus a decision by the Security Council that proliferation of nuclear weapons under specific political circumstances constitutes a threat against international peace and security would open up for effective action against a State which is intimidating and threatening other States by striving to acquire such as weapons. As in the case of resolution 687 (1991) the Council would have to include in its decision organizational provisions for implementation.

Even if no coherent security concept for the emerging global situation has been formulated or identified, it should be possible to develop new approaches to arms control. Disarmament in the form of fully verifiable arms reduction agreements must continue in order to support an international development towards stable peace and security. Unilateral disarmament has been promoted as one way to avoid long, drawn-out negotiations. Unilateral disarmament can be of some significance, even if its weakness is the inherent absence of verification and control arrangement. The desired positive consequences for security may not fully be realized with such an approach and with the absence of the verification component, the positive effects of cooperation around verification will not materialize.

Contemporary arms control should move beyond arms reduction. The waste of resources associated with arms build up followed by arms reduction should inspire the arms control community to explore the possibility of entering earlier into the cycle of weapons development. Couldn't a reasonable security effect of a weapons system be achieved already by halting the deployment or

rather by making a halt in the weapons cycle already before the weapons have been produced in large scale? Such a radical approach would require creative thinking as regards verification. Measures and methods developed in the CSCE process, especially within the CSBM negotiations in Vienna over recent years, contain many innovations. Transparency with regard to military activities have been complemented with transparency of force structures in the context both of the CFE treaty and of the recent CSBM agreements. The Open Skies treaty contains prospects for multilaterally based aerial survey of virtually the whole Northern Hemisphere.

Even if the Europeans and the North Americans in the CSCE context have come much further than any other region to develop new methods for openness, transparency and verification, an important development is under way in the United Nations where the initiative for a global arms register, after many years of efforts, finally has been approved by the United Nations General Assembly (autumn 1991).

In a world where international security has become a multipolar and rapidly shifting phenomenon arms control is more important than ever. The new emerging security structures are complex and put new demands on creativity and innovation when arms control policies are to be developed.

ISSUES AND CHALLENGES OF VERIFICATION

Ambassador Ronald F. Lehman II

As the world moves beyond the Cold War, new approaches to verification both inside and outside the framework of treaties are needed in response to (1) increased regional threats and regional approaches to arms control, (2) the danger of proliferation of weapons of mass destruction to new countries or states, (3) the instability associated with the breakup of existing states including the nuclear-armed Soviet Union, (4) the expanding web of treaties, agreements, and export controls, (5) the increased UN and multilateral peacekeeping role, and (6) the changing priorities necessitated by recent political revolutions. The United Nations Special Commission's inspections of Iraq, renewed energy at the IAEA, the Vienna CSBMs, the Open Skies Treaty, the draft multilateral Chemical Weapons Convention, and the bilateral agreements on the Korean Peninsula offer insights into the new possibilities. Verification, however, will remain an important issue in the East-West context. The prospective entry into force of CFE and START will take place in a radically altered political and historical context which could not be envisioned by the treaties' architects.

Our long experience of arms control negotiations during the Cold War clearly indicates that verification is assisted by

political changes toward greater openness and, in turn, can be a powerful tool for encouraging further political change. Insistence on transparency helps open up closed societies and insistence on strict compliance reinforces the concept of the rule of law. Even if all societies were democracies, some form of verification would continue to be necessary in order to confirm consensual arrangements among states with military potential.

The design and implementation of arms control treaty verification provisions will remain an important and demanding task of the arms control policy process. Each new provision must be developed and implemented against criteria which assess its potential effectiveness, its cost and overall benefit. Nevertheless, we must look beyond simple agreements and look at the interface of numerous sweeping agreements such as INF, CFE, START, Open Skies, and the emerging CWC. We must examine these regimes to see where they can be used to be mutually reinforcing and where we can avoid inefficient duplication. A carefully constructed array of verification elements together strengthens each treaty or agreement. Even unilateral measures require that we maintain a strong monitoring capability, and such measures also benefit from greater transparency and the existence of verification activities related to existing and anticipated treaties and agreements.

WEU AND ARMS CONTROL VERIFICATION

Dr. Willem van Eekelen

Talking points on the future of conventional arms control

1. To date, WEU has been the focal point for quite valuable exchanges of view on the implications for Europe of negotiations on arms control, their outcome and their future development. These talks took place in the Special Working Group (SWG), which is the main politico-military body where experts from capitals have an opportunity to shape a European approach to the issues at stake. This ongoing and rather loose consultation proved particularly useful in the preparation of the CFE Treaty.

2. The SWG is considering the security aspects of the Helsinki Review Conference of the CSCE.

The arms control implications of the admission of a succession of States of the defunct Soviet Union to the CSCE is a central issue. Their admission would provide an essential lever to obtain clarification and guarantees from the CIS States:

- First and foremost, a reconfirmation of their commitment to ratify and implement the CFE Treaty.

- Secondly, a commitment to apply the CSBM provisions notwithstanding the area of application of the Vienna documents.

- Third, a recognition of the importance of continued arms control negotiations as an integral part of the CSCE process. This would ensure that all CIS States take part in the "CFE 1a" negotiations and are included in any "CFE 1a" agreement.

3. The geopolitical landscape of Central Asia, which is very close to the area of tension stretching from Morocco to Pakistan, in itself calls for the utmost caution in our approach to arms control issues with Kazakhstan and the four smaller republics on its southern border.

A regional approach seems as justified as it is for the Middle East, with a similar agenda:

- control of nuclear weapons;
- ballistic missile proliferation;
- chemical weapons;
- conventional weapons.

Western organizations such as the Nuclear Suppliers' Group, the Missile Technology Control Regime and the Australia Group, could play a role offering precedents in the field of control procedures, denial of technology with military applications and restrictions on the export of items likely to be used in the development of weapons or their delivery systems.

The aim for the West should be both to limit if not avoid proliferation and to prevent an escalating arms race in a particularly volatile region of the world. Rather than an elusive regional balance of power, one should promote military transparency, confidence and security building measures as well as regional arms control agreements.

Of course, all this would be more easily attained if Europe showed the way by ratifying the CFE Treaty and committed itself to a constructive process in the framework of CSCE.

4. The strengthening of the role of international organizations (UN, CSCE, NATO and WEU) in arms control is a vital objective for the Nine of WEU who wish, inter alia, to commit all CSCE States to participation in the UN arms exports register and to see the CSCE take on a role in peacekeeping. Peacekeeping should also take into account the need drastically to reduce, on the spot, the armouries of the respective warring factions.

Recent situations have highlighted the need to codify norms in that respect.

Arms control within the CSCE framework must be seen in the wider context of the establishment of a European security forum or a permanent committee for security, disarmament and conflict prevention. The negotiation of concrete arms control measures is a key component of a permanent security dialogue and should be closely linked to the strengthening of the conflict prevention functions of the CSCE. The post-Helsinki negotiations should be an integral part of institutionalized cooperation in the field of security under the authority of the CSCE Council of Ministers.

The further codification of CSCE commitments, the harmonization of CFE commitments, new transparency and confidence-building measures, new advances towards genuine arms control for the last decade of the XXth century would all contribute to the edification of a pan-European security architecture and a network of multilateral guarantees in an extended ATTU zone.

Having put its house in order without leaving itself deprived of sufficient deterrence to confront an aggressor, Europe would be in a better position to tackle the steady and worrying proliferation of advanced weapons elsewhere in the world. This would also be made easier if positive examples of sub-regional agreements could be used as precedents for the most dangerous areas of the third world.

5. Europe should emulate the United States in putting forward proposals to make the world a safer place. The centrifugal forces of nationalist and ethnic unrest threaten stability on several continents Economic deprivation and uncontrolled population growth do nothing to improve the picture. Over 20 countries are suspected of having or of developing nuclear, biological or chemical weapons as well as the vectors for their eventual delivery. The necessary technologies are more readily available, and more easily absorbed by the less developed countries. Most of them date from the 1940s and are easier and cheaper to develop. Most of these technologies are dual purpose. They have perfectly legitimate and obvious civilian applications. To restrict trade would be perceived as limiting the access to modern industrial development. A space launch programme can be used to develop a ballistic missile programme; pharmaceutical industries can easily switch from the production of antibiotics to biological warfare agents. Illicit sales have also to be taken into account and control is difficult to achieve with any degree of accuracy. Proliferation is more than a risk because most customer countries want state of the art weapons with a potential for mass destruction; this will increasingly challenge the defences of Europe and the Atlantic Alliance. The arms race already under way in the Middle East and South Asia has to be curtailed. China must be involved in the struggle against proliferation.

The Gulf war has helped to focus attention on the need for a global approach to arms control. Export control laws have been tightened; penalties for violators increased; enforcement regimes stepped up. The IAEA has expanded its activities and the Missile Technology Control Regime has increased its impact. The problem of proliferation will remain at the forefront of our preoccupations.

Panels

OPENING SESSION

Saturday, 25 April 1992
8:15-9:45 AM
Arthur Andersen Gallery

Welcome:	President A. Kenneth Pye Southern Methodist University
Presiding:	Dr. Calvin Christman University of North Texas
Addresses:	MG Robert W. Parker Director On-Site Inspection Agency "The Role of On-Site Inspection in Monitoring Arms Control Treaties"
	General-Lieutenant Vladimir I. Medvedev Chief Nuclear Risk Reduction Center Russian Federation "Main On-Site Inspection Issues During Verification of Implementation of Arms Control Agreements"

THE ROLE OF ON-SITE INSPECTION IN MONITORING ARMS CONTROL TREATIES

MG Robert W. Parker

As the United States Government enters into additional arms control treaties over the next several months and years, on-site inspection will continue to play a significant role in treaty monitoring activities. Monitoring is a necessary function of treaty implementation and it is an essential segment of any agreement to insure parties abide by the terms of the specific treaty. Monitoring provides the mechanism to discover, report, and respond to any possible treaty violation. Monitoring acts as a deterrent against cheating and serves as an alarm device to provide time to respond to the compliance or cheating situation. Within the U.S. Government, monitoring is done using various methods including national technical means, data exchange, confidence building measures, diplomacy and on-site inspections. No single one of these regimes provides total confidence for compliance but the synergistic affects of all these regimes do provide the policy community with the confidence level necessary to make compliance judgments.

I would like to address that area of treaty monitoring, on-site inspection, which I am most familiar with. On-site inspections are designed basically to observe, record and report events and activities at a certain location within a specific timeframe. This inspection regime provides the policymakers with a snapshot in time of activities at a particular facility and base. The on-site inspectors do not make compliance calls, this is the role for the policy community. However, the data reported from these on-site inspections are critical in the policy formulation process.

When the U.S. and the former USSR signed the historical Intermediate-Range Nuclear Forces Treaty in December 1987 there was no mechanism within the USG to perform a key aspect of the inspection protocol . . . on-site inspections. Within weeks of signing the INF Treaty, President Reagan directed the formation within the Department of Defense of the On-Site Inspection Agency. The initial charter of this organization was to conduct on-site inspections within the USSR and the appropriate Eastern Bloc basing countries as outlined by the treaty, and to monitor the escorting of Soviet inspectors at U.S. bases and facilities. In mid-1990, President Bush expanded OSIA's charter to "Plan and Prepare for Future Treaties" to include CFE< STARÊ, CW, and Nuclear Testing. Since then additional requirements have been added including DOD Executive Agent for UN Special Commission on Iraq; the Humanitarian Relief for the Former Soviet Union; Open Skies; and Confidence and Stability Building Measures (CSBM).

OSIA has nearly four years of experience performing inspections, escorting and monitoring activities including nearly 700 INF inspection/escort missions; over 60 CFE mock inspections in Europe with our NATO Allies, and the former Warsaw Pact Members; over 50 mock inspections in preparation for

the START Treaty, in additional to 10 exhibitions as required by this treaty; on-going mock inspections for CW; and over 1000 days of portal monitoring and escorting for two U.S. nuclear tests at the Nevada Test Site. This organization has grown from the original 40 inspectors in January 1988 to our current manning of nearly 700 people spread across 19 time zones. monitoring treaty compliance is costly. For example, the OSI regime for FY 1992 treaty monitoring is nearly $400M.

Each treaty has differing OSI requirements ranging from simple equipment inventory to highly technical nuclear testing regimes. Additionally each treaty has some type of continuous monitoring functions ranging from production monitoring to destruction certification. The technologies required for OSI differ significantly by treaty. Treaties like INF, START and CFE are basically low tech with emphasis on human presence while the nuclear test treaty provides for seismic stations and highly technical hydro-dynamic measurements.

There have been many lessons learned over the past nearly four years of treaty monitoring. Early preparation is essential for successful implementation of on-site inspections, while quality people are key elements of any OSI regime. Technology should be designed to meet the objectives of the treaty inspection protocol while maintaining a keep-it-simple approach. No aspect of monitoring provides all the data necessary to making compliance calls. However, on-site inspections plays an essential role in deterring cheating and provides necessary information to the policymakers.

MAIN ON-SITE INSPECTION ISSUES DURING VERIFICATION OF IMPLEMENTATION OF ARMS CONTROL AGREEMENTS

General-Lieutenant Vladimir I. Medvedev

Until the middle of the 1980s, the Soviet side has had a very restrained attitude toward on-site inspections (as a means of verifying the implementation of arms control agreements). National technical means of verification were favored. During the second half of the 1980s, this attitude at first changed in areas such as chemical weapons demilitarization and the prohibition of nuclear testing, and then spread to the area of nuclear weapons limitation. A very decisive move was made as the finishing touches were being made to the INF Treaty, which implemented the broad-ranging mechanism of on-site inspections. This, in turn, called for the creation of appropriate organizations (i.e., inspection services).

The Soviet inspection service was created and has operated in conjunction with the National Nuclear Risk Reduction Center (NNRRC), both of which form one common organization. There are also appropriate units within the Armed Forces which operate jointly with the NNRRC and form a common organizational structure for verifying the implementation of arms control treaties and agreements. This structure is fluid, and is reorganized when new missions arise. This structure has now been in place for four years. Since its beginning in 1988, it has acquired much experience in implementing the INF Treaty (in total 800 inspections were conducted), and more recently as we prepare to implement the START and Conventional Forces Treaties.

The lessons learned allow us to perceive more clearly the important, practical issues relating to creating and operating inspection services, to include optimizing the organizational structure of these services, selecting and training inspectors and escorts, defining the working relationship between inspectors and escorts, presenting official claims of the parties to the other side and finding ways to resolve them during the course of inspection activities. While we train to implement future treaties, a number of additional issues appear on the agenda, such as how to implement multilateral treaties, how to conduct aerial inspections, how to conduct an inspection of a region on demand, and others. The issues listed above and how they apply to the CIS shall be briefly addressed in General Medvedev's speech.

Lessons Learned: A Roundtable with the Inspectors

Panel I
Saturday, 25 April 1992
9:45-11:00 AM
Arthur Andersen Gallery

Chair: Robert E. Kelley
Los Alamos National Laboratory

Discussants: Colonel Douglas M. Englund
Director of Operations
UNSCOM

Dr. B.C. Barrass, O.B.E.
UNSCOM

MG Johan C. Kosters (Army)
The Netherlands
First Chief of EEC Monitor Mission to Yugoslavia

Dr. Heinz Loquai
Colonel on the General Staff
Center of Verification, Bundeswehr

LESSONS LEARNED IN IRAQ REGARDING VERIFICATION AND COMPLIANCE

Colonel Douglas M. Englund

1. This summary will emphasize lessons learned at the operational level during UNSCOM's eleven months of existence and after some 34 inspections. The 35th mission, an inspection team aimed at verifying some of Iraq's recent CS declarations, is scheduled to be present in Iraq during the Verification Conference.

2. UNSCOM inspection operations are conducted under a unique set of circumstances that differ significantly from what we have come to know as traditional on-site inspections. This milieu is sufficiently at variance in several aspects that bear discussing.

a. a UN operation. UNSCOM is a truly multinational organization that includes broad representation from states party to the UN -- particularly from those with special expertise in the various weapons of mass destruction.

b. Multidisciplinary. Inspection operations are planned and conducted in four broad areas of mass destruction weapons: ballistic missiles; nuclear weapons; chemical weapons; and biological warfare.

c. Non-permanent corps of inspectors. UNSCOM inspectors are provided by member states on an ad hoc basis to each team as it organizes, and they return to their national duties upon completion of the inspection.

d. Broad-based information gathering resources. Inspections are guided by truly international contributions of information and have direct access to a wide array of surveillance assets.

e. Unilateral; reciprocity is not an issue. The terms of reference for inspection activities are defined by the implementing party.

f. UNSCOM is both policymaker and executor. Within the overarching guidelines of Security Council resolution 687 (1991), UNSCOM both formulates policy and carries it out.

g. Permanent forward base directly responsible to the Special Commission. UNSCOM has a substantial logistics and support personnel base continuously resident in Baghdad, including dedicated vehicles and helicopters.

h. Personal risk is a major factor. Throughout the UNSCOM encountered significant hazards in terms of unexploded ordinance and lethal chemical agents and have had to prepare for potential radiological and biological hazards.

i. Anywhere, anytime.

3. As is readily apparent, the UNSCOM experience exhibits many departures from the kinds of on-site inspections currently being practiced. Moreover, UNSCOM was engendered by Security Council resolution 687 (1991) and as such can be expected to wither away when that mandate is satisfactorily completed. Thus, while the UNSCOM experience is unprecedented, we realize fully that the precedent established cannot be translated wholesale into the normal arms control and disarmament arena. There are, of course, some lessons learned we do feel are worthy of note.

a. Anywhere, anytime. This aspect may well be the sine qua non of our success.

b. Intelligence cooperation. In a multinational endeavor that cuts across many historical, cultural, and political lines that have been obstacles in the past, adaptability and flexibility is an absolute necessity if information is to be successfully shared.

c. Communications. Because team leaders are regularly confronted by new situations in the field that are not covered by guidance or by past practice, we have found that providing secure communications between UNSCOM in New York and our teams in their field locations has been invaluable in problem resolution.

d. Data base management. Always a problem in any organization, and UNSCOM is no exception. You will never have the data base you love, but you need to love the one you have.

e. Staffing by contributions. Perhaps not the best way to staff an organization in the long run, but certainly expedient. In favor of this approach in the UNSCOM experience is that member states have been magnificent: extremely responsive, both in terms of timeliness and in terms of expertise. On balance, a major plus. Countries want to participate.

f. Funding by contributions. Not a major plus.

g. Safety. Safety has been planned into our operations in our operations in terms of the fitness of the people selected, the addition of appropriate skills to the inspection teams (doctors, medics, EOD, structural engineers, etc.) and the emphasis placed on avoiding or reducing hazards.

LESSONS LEARNT: CHEMICAL/BIOLOGICAL INSPECTIONS IN IRAQ

B. C. Barrass

Introduction

1. Discussions on the lessons to be learnt from the UNSCOM experience in Iraq must recall that the circumstances which led up to Security Council resolution 687 were unique. This necessitates some degree of caution when translating the lessons learnt from the UNSCOM experience into a multilateral context. Nevertheless, there are useful lessons to be learnt and it would be a serious error of judgment to assume that the UNSCOM experience is so unique that no generally valid lessons can be learnt. It would be an even more serious mistake to assume that, because UNSCOM inspections have no so far found incontrovertible evidence of biological munitions, the whole concept of verification in the biological context is flawed.

2. Several lessons can be learnt from the UNSCOM experience, at various levels of detail, but time does not allow all of them to be discussed. A limited number have been selected for specific mention; they should be regarded as illustrative rather than exhaustive.

Objectives of the chemical and biological inspections

3. In order to place these inspections into context, it is necessary to appreciate their objectives, which are somewhat different in the two cases.

a. Chemical inspections

Since Iraq had declared at least some of its chemical assets (CW agents, munitions, research, development, production, filling and storage facilities), the primary aim of the chemical inspections was to verify these declarations and to inspect other, undeclared, sites designated by UNSCOM based on information from other sources to ensure that there were no concealed CW capabilities. A second important aim in verifying Iraqi's chemical warfare assets.

b. Biological Inspections

Initially Iraq stated that it had no biological weapons. The aim of the first biological inspection therefore was to find evidence for a programme and its nature. After Iraq admitted to a BW programme, the objective was changed so as to determine the extent and magnitude of the programme.

Accomplishments to date

4. To date seven chemical inspections have been successfully carried out, with an eighth in progress. Two of these inspections concentrated on one site, the remainder visited several sites. Two biological inspections have been successfully carried out, one of which concentrated on one site and the other visited several sites. One contained chemical/biological inspection, which visited several sites, has been successfully carried out.

5. Various obstacles, such as cleaning up, reconstruction and some destruction activities at some of the sites, the virtually complete lack of detailed programme documentation, the burial of some munitions and the movement of relevant items to other sites have been encountered. Nevertheless, it proved possible to confirm the Iraqi declarations, to differentiate between legitimate and suspect activities, made recommendations regarding sites requiring compliance monitoring and to obtain information necessary for planning the destruction of Iraq's CW capabilities.

6. These accomplishments would not have been possible without detailed and determined on-site inspections by dedicated professional experts supported by professional support staff backed by a planning and logistics staff at the UNSCOM Headquarters in New York.

Summary of Lessons Learnt

Team Composition

7. The experts on an inspection team must be selected to match the sites targeted for that particular inspection. Inspections of chemical and biological sites in the civilian sector will not necessarily require the same team composition as military sites. In addition to the technical experts on the team, there will be a need for professional support staff who represent an important and integral element in the team composition.

Inspection Skills

8. The ability to effectively lead and participate in an inspection is a skill in its own right. Some aspects of this skill may be taught but much will have to be learnt by personal experience. Some degree of continuity as far as inspection team members, particularly chief inspectors, is therefore required.

Sampling/Analysis

9. Collection of sample for chemical or biological analysis is a useful and, in some cases, an essential part of inspections. On-site analysis of the samples, in real time, can help guide the further conduct of an inspection.

Documentation and Information Assessment

10. It is difficult, time consuming and resource intensive to piece together inspection data to give an overall view of a particular weapons programme. A

special unit, with expert personnel, is required to receive, handle, manipulate and assess such data, which arises in considerable quantity from inspections. Access to programme documentation belonging to the inspected country would be considerable benefit, if it can be acquired.

11. At a different level, ongoing data assessment is a necessary activity by a team during an inspection in order to enable the inspection to be conducted effectively and directed into the most productive channels.

THE YUGOSLAV CONFLICT

Major General Johan C. Kosters

Introductory

In pursuing their of independence, Croatia and Slovenia triggered a economic, social and political crisis in Yugoslavia. By summer 1991 the overall crisis had escalated to a civil war which de facto marked the end of the Socialist Federal Republic of Yugoslavia. The republics of Bosnian-Hercegowina and Macedonia face similar problems.

From the outset the CVSE and the European Community had assumed their responsibilities - as laid down in the Paris Charter - to resolve the Yugoslavian crisis. On the 15 July 1991 with the consent of all parties involved the EC started organizing a mission which was to help stabilize a ceasefire and monitor the implementation of an agreement which had earlier been reached by the Yugoslavian parties.

The situation in Yugoslavia represents a test for CVSE, EC and even UN asto how to deal best and resolve such problems especially as the overall situation in some of the republics of the
former Soviet Union could lead to the same difficulties.

Contents of the briefing

The briefing will touch on the organizational structure of the EC-Mission, the general assignments for the monitors and execution of these assignments. This will lead to a discussion on the temporary results of the EC-mission and the relation to the coming activities of a UN peacekeeping force. Good monitoring and verification of memoranda of understanding and cease-fires are hard to reach in view of the conflict's particular complexities exacerbated by a range of factors such as the deeprooted and intense ethnic and religieus tensions, des-information and political impotence. These factors are largely influenced by the number of dead or wounded people, the increase in refugees and the enormous material damage resulting from the crisis.

Derived from the experiences are lessons learned for similar operations.

N.B.: This resume is closed by 20 january 1992. Latest experiences or remarkable changes in the situation could influence the text of the briefing at the Verification Conference.

SUMMARY OF REMARKS

Col. Dr. Heinz Loquai

I. Background

1. The organization I represent - the Federal armed Forces Verification Center - is responsible for verification measures in the area of conventional arms control. Such measures are based on
   - the CSBM-Process (comprising all European States, the USA and Canada) and
   - the CFE-Treaty (comprising all NATO nations and the former Warsaw Pact members).

2. During the past year we conducted a total of approximately 100 inspection measures in most European states, this is to say in an area ranging from Norway to Italy and from Russia to Portugal.
   Mostly, such inspections were mock inspections, since the CFE Treaty has not yet been ratified.

3. Both agreements constitute equal rights for all parties. The verification measures are based on the general idea of cooperative arms control, which is to say, in accordance with the provisions of the Treaty the inspected state is obliged to support the inspectors in executing their rights. From our experience it is, thus, very difficult to draw conclusions which could apply to inspections in a hostile environment.

II. Lessons Learned

1. The counting of equipment is in most cases a relatively simple task, provided that the inspected unit has made the necessary preparations and is ready to cooperate adequately with the inspectors.
   During almost all inspections we have met such an attitude.

2. In no case we have had the impression that there was any attempt to cheat or to hide something. There were differences between the notified and the actual numbers. There were errors, but in all cases we were given a clear explanation of the differences.

3. In a lot of cases the East European States pursued a policy characterized by extreme openness and liberality. They showed us much more than was required by the provisions of the Treaty.

4. The CFE-Treaty, which is a very complex treaty, has some "useful ambiguities" (Talleyrand). It, thus, depends on the inspectors and the inspected part to find reasonable solutions.

5. The performance of a team is dependent on three main factors:
   - the personality of the team leader
   - the bonds within the team
   - the spectrum of expertise within the team.
6. Internationally-composed teams are effective and very useful, provided that there is enough time for preparation. Language, however, is a key problem.

7. Beyond the mere counting the inspectors are able to build and maintain confidence. By talking to officers and soldiers a lot can be learned about the economic and political situation of the respective country and talking with the people makes it possible to create an atmosphere of mutual understanding and confidence.

III. General Conclusions

1. Verification requires a clear-cut definition of the subject which has to be dealt with:
   The greater the ambiguity in the provisions of a treaty the greater the potential of possible conflicts.

2. Effective verification requires a combination of technical means and the use of common sense and leadership at the object of verification.

3. On-site inspections are the most efficient way of verification; there is no substitute for this kind of inspection.

4. An effective verification regime is composed of four main elements:
   - An exchange of precise information.
   - Means of finding out at once any serious non-compliance with the Treaty.
   - A body for the solution of conflicts.
   - Effective measures for imposing sanctions in the case of deliberate non-compliance with the Treaty.

Unilateral/Bilateral/Multilateral Efforts at Arms Control

Panel II
Saturday, 25 April 1992
11:15 AM-12:45 PM
Arthur Andersen Gallery

Chair: Dr. William P. Snyder
Air War College

Speakers: Amy Woolf
Congressional Research Service
"Reducing Nuclear Weapons with Unilateral Initiatives: Implications for Arms Control and Verification"

Ambassador Maynard Glitman
"Bilateral Arms Control in the Post Cold War Era"

Dr. Michael Moodie
US Arms Control and Disarmament Agency
"The Future of Multilateral Arms Control: Challenges and Opportunities"

Sergei Kisselev
Ministry of Foreign Affairs
Russian Federation
"Soviet Arms Heritage -- A Russia/US Perspective"

REDUCING NUCLEAR WEAPONS WITH UNILATERAL INITIATIVES: IMPLICATIONS FOR ARMS CONTROL AND VERIFICATION

Amy F. Woolf

In the 1990s, the arms control agenda may be dominated by informal discussions and unilateral statements outlining broad changes in programs and forces. Bilateral negotiations and formal treaties may a part of the process, but their role may diminish. Unilateral measures may have advantages over bilateral treaties and different implications for verification.

Unilateral arms control measures can be adopted and implemented relatively quickly; some could be reversed relatively quickly. This allows the nations to keep up with, or catch up with, changes in the national security environment. Bilateral agreements take longer to adopt and implement because they must contain equal limits and balanced trades among differing weapon systems. With unilateral measures, equivalence and reciprocity are not needed; each side eliminates forces that it has determined it no longer needs or can no longer afford. The complex, detailed verification regimes in bilateral agreements also take time to negotiate. Unilateral measures have instead relied on existing monitoring capabilities and informal exchanges. Finally, bilateral agreements contain precise definitions to reduce ambiguity and minimize conflicts. Unilateral measures may not need this level of detail if the nations can discuss the measures and explain their initiatives. Yet ambiguities in unilateral measures can create problems if one of the nations seeks to take advantage of the uncertainties. So, if greater certainty or predictability is desired, bilateral agreements may be preferred.

Unilateral measures may also allow for sweeping, rather than marginal, changes in nuclear weapons programs. Yet, the unilateral measures adopted in September, October, and January appeared to be "sweeping" because recent changes in Eastern Europe and the Soviet Union

generated a long list of things that could be limited, reduced, and withdrawn without causing harm to national security. Domestic political and budgetary pressures also placed weapon systems in "unilateral arms control" packages. Bilateral agreements may have produced a similar result; they too could have been used to eliminate old and unwanted weapons.

The nations did not outline special verification provisions with their unilateral measures, but each will monitor the other's military forces and activities with its own national technical means of verification (NTM). With their improving relationship, they may also be able to cooperate easily and share information about their military forces and activities. At the same time though, the nations may not need the added details or greater access provided by cooperative activities to confirm implementation of unilateral measures. NTM and informal exchanges are probably sufficient to confirm compliance with most of the general obligations outlined in unilateral measures.

On the other hand, warhead dismantlement, which has been included in unilateral initiatives, may be a case where the monitoring and verification requirements argue for bilateral arms control. The United States has to rely on NTM and the word of Russian officials and to determine whether Soviet warheads have been dismantled. Yet, a Russian failure to dismantle warheads could be detrimental to U.S. national security if the warheads were returned to the Russian arsenal or appeared in the arsenal of another nation or terrorist group. The nations could use informal invitations to provide greater access to dismantlement facilities. But unilateral invitations can be revoked, or a nation could unilaterally restrict access. If such a reversal or lack of reciprocity is not acceptable, the nations probably should use bilateral, rather than unilateral arms control to implement the measures.

The pace and scope of recent changes in the national security environment have made it possible for the United States to alter unilaterally many facets of its nuclear weapons force posture and its nuclear weapons programs. Yet, if detailed definitions are needed to avert misunderstandings during implementation, or if complex verification provisions that apply equally to both are needed, bilateral agreements may be the preferred vehicle for arms control.

BILATERAL ARMS CONTROL IN THE POST COLD WAR ERA

Maynard W. Glitman

During the cold war, bilateral arms control was identified almost exclusively with negotiations concerning United States and Soviet nuclear systems. In the post cold war era it has become conventional wisdom to suggest that the scope for bilateral arms control today, especially that involving fully developed treaties with stringent verification provisions, falls somewhere between "extremely limited" and "non-existant".

Has the agenda in fact been exhausted by the INF and START Treaties as well as by unilateral moves on SNF and hopes for a quick and detail free follow up to START ? Has the very process itself been rendered meaningless by the collapse of the Soviet Union?

The answers to these questions hinge principally on two elements: Does the continued existence of a large nuclear arsenal, in part unbound by treaty commitments, in what was the Soviet Union represent a potential threat to the security of the United States and, can arms control help us reduce such a potential threat.

INF missiles, along with the scope for further negotiations concerning them, have been eliminated under the INF Treaty. However, while strategic systems are scheduled for reduction under the START Treaty, and short range nuclear forces (SNF) are being reduced on a unilateral basis, there is need and scope for further arms control action in these areas.

What type of action to take and with whom to take it are inter-related issues. Treaties with their legally binding character provide the optimal approach in terms of providing: A), precision of undertakings; B), stringent verification; C), grounds for judging compliance and for taking counter measures should a party cease to abide by accords and, C), gaining public support for such counter measures. They also take more time to complete in comparison with politically binding agreements or unilateral steps, although the precedents set by the INF and START Treaties plus the improved climate should have a positive impact on this aspect.

Unilateral measures are useful when speed is of a higher priority than precision. A rough rule of thumb could help determine when we should follow this approach i.e. is the measure in our interest regardless of whether the other side follows suit and, would our security be adversely effected if the other side undid its corresponding measures.

Changes in the level and composition of strategic forces established by the START Treaty ought logically to be codified in a legally binding form, e.g. by amending or adding a protocol to that Treaty. It might also be advisable to determine whether markedly lower force levels might require modifications in other provisions of the Treaty.

Ukraine's recent threat to halt the removal of SNF systems from its soil because it was not assured that Russia was destroying these weapons demonstrates there may be value in negotiating an ex post facto accord to codify the unilateral SNF reductions and to establish an appropriate verification regime.

While the internal political situation in the former Soviet Union remains uncertain, all the members of the Commonwealth of Independent States have agreed that nuclear weapons will remain under central control. Russia has been generally accepted as the successor to the Soviet Union in this area. However, the continued presence of nuclear weapons in three other states of the former Soviet Union plus a degree of ambiguity surrounding the ultimate plans of Ukraine and Kazakhstan underscore the need to guarantee that these states along with Belarus are legally bound in some manner to the START Treaty and to any further arms control measures taken concerning strategic forces which would impact on that treaty. Moreover, engaging these states in an arms control process would help ensure they recognize their responsibilities in this area and understand that the US also recognizes those responsibilities.

In sum the agenda for traditional bilateral arms control is far from exhausted. There is scope, and opportunity for, plus benefits to US security from, further mutual steps to reduce the level of strategic systems and to channel those remaining into a more stabilizing force structure. Negotiating legally binding accords would provide the optimal approach to achieving this result.

THE FUTURE OF MULTILATERAL ARMS CONTROL: CHALLENGES AND OPPORTUNITIES

Michael Moodie

The enormous changes the world has witnessed over the last 18 months have created both opportunities and challenges for multilateral arms control. The international community can now demonstrate decisively its commitment to making arms control an essential instrument in building a more stable and peaceful world.

The Changing Context

Three major changes helping to shape the international arms control environment have been the end of the Cold War, the breakup of the Soviet Union and the Persian Gulf war and its aftermath. These changes have tended to break down the traditional structure within which arms control efforts, including multilateral approaches, have been pursued. They have also created new players and new problems for the multilateral arms control agenda such as the potential proliferation of nuclear expertise (to say nothing of nuclear weapons and equipment) from the territory of the former Soviet Union. Some of these developments have also transformed what had been theoretical concerns for many countries (e.g., chemical and biological weapons use) into very real security challenges.

The Changing Issues

Multilateral arms control has traditional focused on either kibbitzing on the East-West agenda or the negotiation of global norms such as the Nuclear Nonproliferation Treaty (NPT) and the Biological Weapons Convention (BWC). While elements of the East-West agenda remain, they are not necessarily the defining arms control metric for the post Cold War period. Although the development of global norms -- such as the Chemical Weapons Convention (CWC) -- remain important, other issues are also asserting themselves in the multilateral context, including a range of regional arms control questions. A potential harbinger of new issues for the multilateral agenda, including destabilizing conventional military buildups and the need to balance technology sharing and technology protection, could be the resolution passed last December by the UN General Assembly on Transparency in Armaments.

The Changing Modalities

Perhaps the biggest challenge in the multilateral arms control arena is adapting the mechanisms for conducting such efforts to the realities of the new world. That process is moving forward in Europe where the Conference on Security and Cooperation in Europe (CSCE) is likely to mandate during its current meeting in Helsinki a new Forum for Security Cooperation (FSC) which will combine arms control and security dialogue. Elsewhere, the Conference on

Disarmament (CD) in Geneva, assuming it can conclude the CWC (and we all hope that it will), must closely examine the relevance of its traditional agency for today's most important security problems. Finally, the prospects for a heightened role for the United Nations in advancing the multilateral arms control agenda must be carefully assessed and exploited.

SOVIET ARMS HERITAGE - A RUSSIA/US PERSPECTIVE

Sergei Kisselev

The traditional all-out confrontation with the United States - an inherent part of the totalitarian Soviet society - has led the USSR to a state of dependence upon and mere addiction to the "vanguard of capitalism" both militarily, as well as socially and ideologically, providing a natural raison d'etre to the Bolshevik rulers. The result of this intentionally bred mania is not a militarized economy, militant society and bellicose way of thinking in the one sixth of the entire world.

Demilitarizing the Soviet society was the underlying purpose of Gorbachev's reforms, and it is now the proclaimed aim of the new democratic forces in Russia. A certain duplicity of perestroika due to the massive opposition from the Communist nomenclature - and from the vast majority of the brain-drained Soviet population for the matter - to the Gorbachev-Shevardnaze tandem, was removed by the suicidal counter-offensive of the Party and the KGB in August 1991.

The dramatic events in August signalling the final end of the Cold War era have given rise to the emergence of 15 new independent states each demonstrating its own identity and priorities in the international field. As a result, the United States instantly lost its major partner to the security and arms control business, the partner which due to the fundamental changes it was undergoing - was gradually becoming more predictable and friendly. Now the US has to face over a dozen of new players each anxious to declare its right to the Soviet heritage including its ominous military machine.

Equality doesn't remove Russia's special obligations with respect to world peace and security. By applying the continuity concept, Russia found a natural way out of an apparent no-win situation when all former Soviet constituent republics could have legally argued for their successor rights to the privileges enjoyed by the USSR as a nuclear superpower.

Establishing a system of single control over the Soviet nuclear forces serves as the only viable guarantee of firm security both for Russia and for the other parties to the Community of Independent States. This might not prove easy to be achieved in practice. Some of the newly independent states still having nuclear weapons in their

territories, like the Ukraine, are very eager to quickly achieve a non-nuclear status. In this situation it is important to stay away from trigger-happy, Bolshevik style solutions like those aimed at forcibly disrupting normal operation of nuclear bases by cutting off their command and control systems from Moscow or by physically disabling the nuclear weapons otherwise. Apart from creating a new unbalanced situation of strategic uncertainty and a possible confrontation with Moscow, these methods will lead nowhere.

Another area where orderly, synchronized measures by the former Soviet republics might lead to a better security climate is the due recognition by all of them of the Soviet international obligations including those in the disarmament area. The key issue here will undoubtedly be international agreements in the nuclear field. Russia, for its part, has declared that as the follower of the USSR it took over all Soviet treaty obligations. It has also proposed to set up an interstate organ to provide for the coordination within the Community as far as the future application of such "difficult" treaties as START or CFE is concerned.

Evidently, with the radical turn to democracy in Russia one has to give thought to a possible organization of a new global security mechanism, more cost-effective and reoriented to the new realities in the world. The collective security concept based on the balance of terror and on the division of spheres of influence should give way to a security based on the absence of mutual threats from the two most potent military powers. The willingness on both parts is still there, with a restructuring of military postures, such as more widely shared understanding of the absence of a political interest to fight each other would be complimented with the practical inability to do so effectively.

Ensuring this absence of threat situation will necessitate putting the Russian-US security cooperation on an economically sound and long-term basis. Transparency in the defence field, as well as coordination in arms transfers and in the conversion of the military-industrial complexes to civilian purposes seem to be the three major aims here.

The first years of implementing bilateral arms control agreements have shown that disarmament is a costly affair. The ironic dialectics of democracy in Russia has put the two major events - the transition from the totalitarian society and the advent of disarmament - in the same time frame. Clearly, it is not the Russian people alone that are interested in the success of both endeavors. Cooperation and help from the outside world is vitally important.

The Neutral and Non-Aligned: Competing Agendas

Panel III
Saturday, 25 April 1992
2:30-4:00 PM
Arthur Andersen Gallery

Chair: Colonel Jeffrey B. Jones
National Security Council

Speakers: K. Subrahmanyam
The Observer (India)
"Toward a Nuclear Weapon Free World: Problems of Verification"

Rut Diamint
University of Buenos Aires (Argentina)
"Arms Control and Verification Initiatives in the Southern Cone"

Moacheng Zhuang
Beijing Institute for International Strategic Studies (China)
"Arms Control and Disarmament in the Asian-Pacific Region"

TOWARDS A NUCLEAR WEAPON FREE WORLD
PROBLEMS OF VERIFICATION

K. Subrahmanyam

With the break up of the Soviet Union a new dimension to the nuclear proliferation problem has been added. Large number of tactical nuclear weapons may fall into the hands of various unauthorised groups in the former Soviet republics and may also be acquired by leaderships of States and terrorist groups outside Soviet Union. The same risks will arise in case China breaks down under the pressure of democratic wave or in Pakistan if there are conflicts between some sections of military and civilian forces. Another dimension to proliferation is the availability of technological mercenaries from the erstwhile Soviet Union and also from western nations as their nuclear weapons programmes are retrenched. A third dimension is the undeclared nuclear weapon states - Israel, Pakistan and possibly South Africa with their arsenals and India with its demonstrated nuclear capability. Conventional nonproliferation strategies did not anticipate these risks and therefore new strategies have to be thought through.

The NonProliferation Treaty, while successfully limiting the number of nuclear weapon nations, both declared and undeclared, has grave inadequacies. As the Iraqi example showed accession to the Treaty is no guarantee against a nation going nuclear. The safeguards of the International Atomic Energy Agency cannot ensure there are no undeclared facilities in a so-called non-nuclear weapon state.

Therefore there are now new compulsions to look at the entire issue of nonproliferation - especially in the light of the draft treaty under discussion to ban and eliminate the use of chemical weapons. What applies to one category of weapon of mas destruction (the chemical) cannot be denied from being extended to another category (the nuclear). The new nonproliferation strategy has to be based on the delegitimisation of nuclear weapons and the international aim of eliminating them on the basis of an agreed time frame.

Till now the verification procedure in respect of nuclear arms control related mostly to identification of launch vehicles and their destruction. Verification of nuclear warheads and fissile material stockpiles and their reduction and elimination pose different sets of problems and those procedures are closer to those under discussion for chemical weapons.

It is not realised in the case of chemical weapons that privileged position for some nations to retain the weapons will stand in the way of halting weapon proliferation. It is also clear that complete elimination and steps to prevent fresh manufacture of the weapons will need their delegitimisation. It is also imperative to have a universal nondiscriminatory regime which will monitor steps taken by any country towards manufacture of weapons. The elimination of

nuclear weapons and its verification call for the revival of an international regime like the Baruch plan.

But the Baruch plan failed because the one country that had the monopoly over the weapons would not agree to the destruction of its weapons before bringing the plan into effect, which meant for a period of time it would be the sole possessor of the weapon while the rest of the world was disarmed.

That position is no longer obtainable. There are now some 8-9 states with weapons and capabilities to produce weapons. Therefore a new international regime and a new verification procedure to monitor the progressive reduction and elimination of nuclear weapons to promote such a regime are necessary. According to experts like Dr. Theodore Taylor, at present there are no technical means available for providing high assurance that secret activities towards accumulation of nuclear explosives or the key materials needed to make them would be detected or prevented. This is also the case in respect of progressive chemical weapons. Therefore, verification in respect of elimination of nuclear warheads and fissile materials will depend on type of regime and procedures adopted in the case of chemical weapons.

This is an area which has not received adequate attention so far.

ARMS CONTROL AND VERIFICATION INITIATIVES IN THE SOUTHERN CONE

Rut Diamint and Andrés Fontana

Arms Control and Verification Initiatives (hereafter ACVI) have not been a central issue in the security policy agenda of this region. Nevertheless, recent tendencies in the foreign policies of Southern Cone countries (hereafter SCC), together with extra-regional factors, have favored the gradual emergence of this issue as a relevant aspect of inter-state relations. In spite of a significant degree of heterogeneity, the SCC developed, as a substantive aspect of their foreign policies, an increasing interest in--as well as a specific approach for--regional initiatives. This was the result of domestic economic and political needs, within a new global context where the configuration of blocs became an imperative for international insertion.

Those tendencies were accentuated after the end of the East-West confrontation and the emergence of the United States as an excluding hegemonic power in worldwide military affairs. In addition, successful pressure on SCC for reducing their military expenditures and dispositives, and limiting their arms production and missile and nuclear projects, increased in geometric progression, at least in the case of Argentina.

However, ACVI are neither an automatic result of those tendencies, or the major aspect of disarmament processes in this region. In addition, their capacity to produce substantive effects depends on a large number of factors, particularly the relative weight of military actors in domestic politics. Firstly, ACVI are not an aspect of systematic disarmament policies, but rather the result of foreign policy goals--although they may converge with other measures, for example, military reforms, industrial military complex privatization processes, and military budget reductions which, as a whole, produce disarmament effects. Secondly, those processes take place neither likewise nor simultaneously in the SCC, due to significant variations in the aforementioned resistance capacity of military actors.

This paper analyzes the ACVI taken by SCC in relation to both those local processes and conditioning factors, and the global and regional tendencies described in the first place. For that purpose, the paper analyzes some contrasts in the recent tendencies of SCC foreign policies in regard to influences and demands from extra-regional powers. Secondly, it focuses on the major regional initiatives, such as the Mendoza Agreement (proscription of the production or procurement of biological and bacteriological weapons); the Guadalajara Agreement (exclusive pacific use of nuclear energy), and others. Finally, it deals with particular cases in which resistances to this kind of policy goals have been meaningful (e.g., some industrial military projects, some cases of arms exports, and some ineffective attempts to military reform or budgetary restrictions).

ARMS CONTROL AND DISARMAMENT IN THE ASIA-PACIFIC REGION

Maocheng Zhuang

At present, the world is in a period of great turn. As a result of the dying away of the Warsaw Pact and the disintegration of the former Soviet Union, the situation of the Cold War in the postwar years characterized by the tense confrontation between the East and the West exists no longer. Generally speaking, the world situation is developing in the direction of relaxation. However, under the circumstances in which the old bipolar system has been broken but a new pattern has yet to take shape, the world is still not tranquil. The various old contradictions are far from being resolved while new ones emerge incessantly, some of which have even led to new intense conflicts. Therefore, the overall relaxation of the international situation does not mean a greater stability in all regions and sub-regions than before. We are still living in a turbulent and volatile world.

In comparison with Europe and the Middle East, the current situation in the Asia-Pacific region is relatively stable. A political settlement of the Cambodian question has been reached. The atmosphere of reconciliation existing between the North and the South on the Korean Peninsula continues to develop. New progress has been made in the political settlement of the Afghan issue. The domestic political situation of most Asian countries is stable and the development of their economies is accelerated. The relations between nations have been improved and their political and economic situation in the Asia-Pacific region since the end of the World War II, and the region has become one with the quickest economic growth with the greatest vitality in the present-day world.

Nevertheless, it should also be noted that many factors for instability and various potential dangers which may engender tension or conflict exist in this region as well.

-- The original regional "hotspot" issues have not yet resolved completely. The Korean Peninsula remains a sensitive area and it still takes a long time to get rid of the misunderstandings between the North and the South and to achieve an ultimate peaceful unification. The contradictions among the factions of political forces in Cambodia continue to exist. The civil war in Afghanistan has not stopped so far.

-- Complex contradictions and struggles exist within or between some countries. National split, territorial issues and disputes on maritime rights and interests in this region remain very prominent. Contradictions on ethnic and religious sect questions in some countries are acute.

-- The United States and Russia continue to maintain their large-scale military presence in the Asia-pacific region in excess of their defence needs. The disarmament measures to be taken are far short of the level as demanded by the countries in the region.

-- The danger of proliferation of nuclear weapons continues to grow. Except in the Sub-continent of South Asia, the proliferation may also occur in

other areas of the region. The dissolution of the former Soviet Union has given rise to new complex factors of the proliferation problem in this region.

The most effective way of eliminating the above-mentioned negative factors and promoting the security and stability of the region is to conduct political dialogues between nations and between various political forces of this region, to increase mutual trust and to carry out arms control and disarmament. In recent years, a new situation has emerged. The United States and Russia have contracted their military deployments in this region. The former Soviet Union made public its intention to reduce its troops in Asia by 200,000 and to withdraw all its naval and air force units stationed at Cam Ranh Bay of Vietnam and ground forces in Mongolia. The United States has planned to make an 11% reduction (15,000 men) of its first-line forces in the Asia-Pacific region and has also decided to withdraw all its tactical nuclear weapons from South Korea and abandon its naval and air bases in the Philippines. China and the former Soviet Union have reached an agreement in principle on the reduction of their troops in both sides of the common boundary. Some other countries in this region have started or will start to discuss the question on confidence-building measures and reduction of troops in border areas as well. However, compar d with Europe, the efforts of arms control and disarmament in the Asia-Pacific region have just started and there is a long way to go.

There are multiphased specific reasons for the relatively slow progress made in this field.

-- The strategic emphasis of the United States and the former Soviet Union have always been placed on Europe. Both of them have paid their attention first to the security and stability of Europe and have made great efforts to relax the tension and to reduce the military confrontation there. The readjustments they have made to their military strategies and military deployment in the Asia-Pacific region obviously have lagged behind the development of the situation there.

-- Compared with Europe, the Asia-Pacific region has vaster territory, much larger population and greater differences in the specific conditions of the different countries, contradictions among countries are much more complicated than those in Europe.

-- The concept of security of the Asian-Pacific countries is also different from that of the European countries. In Europe, the common objective is how to avert the outbreak of another major war, and nuclear war in particular. In the Asia-Pacific region, as the overwhelming majority of countries were reduced to colonies or semi-colonies in the past and suffered from aggression and plunder by foreign forces for a long time, their concept of security has mainly been to prevent outside intervention and aggression and to safeguard their national sovereignty and territorial integrity. Therefore,not only quite a few countries are reluctant to carry out unilateral disarmament of their own accord, but also their demand for a regional multilateral disarmament is far less strong as that of the European countries.

-- There is a lack of multilateral mechanism of negotiation in the region. As there have never been two opposing blocs like Europe, and the contradictions and conflicts existing in this region are mainly of bilateral nature,

the parties concerned often wish only to solve their problems through a bilateral or a limited channel rather than a region-wide mechanism of negotiation.

Recognizing the differences among different regions, it is necessary to take specific measures which suit the characteristics of the Asia-Pacific region in order to push ahead its process of arms control and disarmament. The European model is applicable to the European countries but not to the Asian-Pacific countries. The conditions for establishing a mechanism of conference on security and cooperation in Asia similar to that in Europe are not yet ripe. The practicable way for this region should be a gradual establishment of a multi-layered and multi-channelled mechanism of dialogue which can be divided into bilateral, sub-regional and regional levels. With respect of the arms control and disarmament measures, steps should be taken gradually, beginning with easy questions and moving to difficult ones and from small scale to large scale.

* Promoting the establishment of bilateral and multilateral mechanism of dialogue between countries (areas) concerned, conducting timely consultation on relevant questions, enhancing communication, increasing trust and preventing the intensification of contradictions and the outbreak of new conflicts, and further establishing confidence-building measures in the military field when conditions are ripe, so as to further relax tension and avert military friction.

*Advocating and encouraging the adoption of unilateral arms control and disarmament measures by all countries of their own accord to reduce their forces and weapons, control over their military expenditures and slow-down their weapon development programmes for the purpose of preventing the size of their military forces from exceeding the justified needs of defence and promoting all countries to readjust their military strategies and force structure so as to make them defensive in nature only.

*Propelling all countries with tension existing between them to hold bilateral or multilateral talks, to take appropriate measures jointly and especially reduce their military forces in the border areas and lower the level of military confrontation.

*The two biggest military powers, the United States and Russia, take a special responsibility for expediting the disarmament process in the Asia-Pacific region and reduce to the maximum their military activities and the scale and frequency of their exercises there.

*All Asia-Pacific countries should refrain from dispatching their military forces and establishing military bases abroad. All countries countries concerned should withdraw their troops and weapons, and nuclear weapons in particular, being deployed on the territories of other countries in the region. The military personnel and weapons they have reduced in other parts of the world should not be transferred to the Asia-Pacific region.

*Efforts should be made to strengthen the mechanism of non-proliferation, to prevent the proliferation of nuclear weapons and other weapons of mass destruction to the Asia-Pacific region, to urge all countries concerned to sign and abide by the Treaty on the Non-Proliferation of Nuclear Weapons and to encourage and promote the establishment of nuclear-free zones (such as in South Asia and the Korean Peninsula) and peace zones (such as in Southeast Asia and Northeast Asia) by the relevant countries.

To push forward the process of arms control and disarmament in the region, all countries there should exert themselves to create a favourable political atmosphere and other necessary conditions for the realization of the above-mentioned steps and measures. The efforts to eliminate all negative factors bearing on the security of this region and to improve and develop the cooperation between all countries energically are conducive to the continued progress in this connection. There, all countries should:

-- abide by the Charter of the United Nations and maintain and develop friendly relations and cooperation on the basis of the five principles of mutual respect for sovereignty and territorial integrity, mutual non-aggression, non-interference in each other's internal affairs, equality and mutual benefit, and peaceful coexistence;

-- not seek hegemony and spheres of influence in the region or the sub-regions; not control other countries or encroach upon the sovereignty of other countries in any form or under any pretext and not impose their own ideology and concept of values on other countries, still less interfere in the internal affairs of other countries by making use of them;

-- solve all disputes, conflicts and issues left over from history between nations by peaceful means and through talks and negotiations without resorting to force or threat of force;

-- undertake (for nuclear states) to respect the status of nuclear-free zones and peace zones, guarantee not to use or threaten to use nuclear weapons against non-nuclear states and nuclear-free zones and guarantee not to be the first to use nuclear weapons against other nuclear states;

-- promote a further political settlement of the "hotspot" issues of this region and urge all parties concerned to achieve and implement reasonable and fair solutions at at early date;

-- forge closer economic ties between themselves, strengthen exchange and cooperation on the basis of equality and mutual benefit and promote common development.

Biological/Chemical/Nuclear Non-Proliferation Treaties: Templates for the Future?

Panel IV
Saturday, 25 April 1992
4:15-5:45 PM
Arthur Andersen Gallery

Chair: O. J. Sheaks
US Arms Control and Disarmament Agency

Speakers: Michael Krepon
The Henry L. Stimson Center
"Verification Standards for the Chemical Weapons Convention"

Kyle B. Olson
The Jefferson Group
"Shifting the Burden and the Blame: Verification of Industry Compliance with Chemical and Biological Arms Agreements"

David Fischer
University of Cambridge
"The Nuclear Non-Proliferation Regime as a Template for the Future"

David Sloss
US Arms Control and Disarmament Agency
"Verifying a Cut-Off of SNM Production"

VERIFICATION STANDARDS FOR THE CHEMICAL WEAPONS CONVENTION

Michael Krepon

The Chemical Weapons Convention (CWC) will be subject to strong criticism as a result of weaknesses in its verification provisions. The convention's limitations cannot be viewed in a vacuum, however. At the most basic level, if the policy choice is between having a convention and not having a convention, the answer to most will be self-evident, particularly after President Bush's decision to renounce the use of chemical weapons once the convention enters into force and his stated intention to dispose of existing stocks unconditionally. Under these circumstances, a convention that requires similar obligations of other states is better than none at all, and a convention with weak verification provisions is better than none at all.

The United States is less dependent on the CWC's verification provisions than any other potential signatory because of America's unique intelligence-gathering and military capabilities. As a result, Washington can accept porous arrangements for the CWC and still meet a minimal standard for "adequate" or "effective" verification. The acceptance of weak verification provisions in this case would not threaten U.S. national security interests.

For Washington, the three essential elements of effective

verification--detection of militarily significant violations in sufficient time to take effective responses--can be addressed outside the context of the CWC. Provision of timely warning to policymakers will continue to come primarily from varied intelligence sources and methods rather than from the actions of the international inspectorate. By foregoing retaliation in kind, the Bush administration has clearly implied that chemical attacks against properly trained and equipped U.S. forces will not be militarily significant. Finally, the appropriate response to chemical attack deemed necessary in the Persian Gulf War against Saddam Hussein--devastating conventional firepower--is not constrained in any way by the CWC.

These conclusions do not constitute an endorsement for weak verification provisions in the CWC. To the contrary, stronger verification arrangements are essential in the crucial battles ahead to contain the proliferation of unconventional weapons. In particular, breakthroughs are needed in multilateral negotiations to move the international community beyond its traditional protective approach to suspect sites.

Effective challenge inspection provisions can be devised without jeopardizing important secrets unrelated to the Convention. With appropriate political direction, the ingenuity that allows states to engage in sensitive research and development can also extend to ingenious procedures that permit foreign access while protecting legitimate secrets. Succeeding U.S. administrations

have avoided this obvious middle ground.

Strenuous verification provisions are clearly preferable to lax ones, as long as they allow states to protect secrets unrelated to their obligations under the agreement, and as long as the cost of verification arrangements does not exceed their effectiveness. Provisions to allow for strengthening measures for verification and implementation after entry into force are particularly important if the Convention is not to become a static document.

In the final analysis, access rights are critical to the credibility and integrity of the CWC. The Convention will be a useful agreement even with lax monitoring provisions, but it has the best chance of accomplishing its objectives if managed access to suspect sites is an obligation and not an option.

SHIFTING THE BURDEN AND THE BLAME: VERIFICATION OF INDUSTRY COMPLIANCE WITH CHEMICAL AND BIOLOGICAL ARMS AGREEMENTS

Kyle B. Olson

One of the hallmarks of multilateral diplomacy in the 1980's-1990's has been the successful promotion of arms control regimes with teeth. From Ronald Reagan's admonition to "Trust, but verify", to the latest meetings of experts on chemical and biological weapons in Geneva, the international community has increasingly embraced the notion of new arms agreements backed up with mechanisms for actively policing their enforcement. The objective of this new emphasis has been to eliminate the opportunity for treaty participants to violate the rules with clandestine weapons production and deployment programs.

Recent experience has shown that the proliferation of nuclear, chemical and biological weapons is a serious concern. Iraq's aggressive program in all three areas is only the tip of the iceberg. Clearly, the need to rein in military programs built around weapons of mass destruction has never been more urgent, nor, thanks to the end of the Cold War, more attainable. Examination of the experience in Iraq, both before and after the war, dramatically illustrates the need for aggressive verification of compliance as an essential element of effective arms control regimes.

In designing the reporting and inspection systems for these agreements, however, the governments taking part in the negotiations have increasingly shifted their attentions from military sites and facilities to civilian, commercial research and production sites. Although defensible in many regards, not the least being the need to address obvious potential "breakout" points, this shift has at times endangered, and continues to slow, the new Chemical Weapons Convention (CWC) and its ban on these arms, and threatens to sink efforts to revise the 1972 Biological Weapons Convention (BWC).

The shift toward addressing the potential and demonstrated capabilities of civilian facilities in these agreements poses significant problems for the private sector, that may not be balanced by corresponding security gains. Due to the structure of the current draft agreement, the CWC-created Organization for the Prohibition of Chemical Weapons will find itself devoting virtually all of its efforts to monitoring civilian industry within five-to-ten years of the treaty's conclusion. Allowing for what will inevitably

be a more-or-less proportional allocation of site inspections, more effort will be expended on inspecting plants in Texas, Ohio and California, than those in Iran, Libya, or North Korea. A similar pattern will likely emerge if efforts to graft a verification regime onto the existing BWC are successful.

Because of the potentially adverse impact of arms control inspections and reporting requirements on confidential business information, managers of affected industries will be required to devote personnel and capital resources to treaty compliance planning. Mastering the details of the chemical and biological weapons treaties and their various appendices will become an important aspect of business operations for a wide variety of enterprises, ranging from chemical and pharmaceutical producers, to the plastics, electronics, and aerospace industries, to university research laboratories and agricultural experiment stations.

The two primary motivations for being on top of the subject will be: a) the desire to minimize what are seen as inevitable financial losses associated with plant inspections, and b) the fear of being accused of violations of the arms control agreements. While these factors will lead many to take the steps necessary to protect themselves, others may find themselves caught unawares. The potential for substantial friction between arms control authorities -- both domestic and international -- and the industrial community seems very substantial.

Despite these concerns, those industry groups which have studied the verification issue, such as the chemical manufacturers, support efforts to complete a treaty, inspections and all. They acknowledge the risks, but feel the benefits to security and commerce largely offset the problems.

Efforts to reassure industry that they are not being forgotten, let alone being given a disproportionate share of the role of scapegoat, should be more forthcoming from the U.S. government and the international community. Measures should be taken to assure the private sector that it will have input into the arms control system, and means put in place to address potential abuses of the regime. Such steps can be implemented with little effort but much benefit to both the regulated industries and the many nations prepared to place their confidence in these new instruments of international law.

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THE NUCLEAR NON-PROLIFERATION REGIME AS A TEMPLATE FOR THE FUTURE

David Fischer

Each component of the nuclear non-proliferation regime is historically a specific response to a new challenge or opportunity. Eisenhower's proposal to create the IAEA was prompted by fear of the growing Soviet nuclear arsenal (e.g. the report in summer 1953 of the first Soviet H-bomb test). The Cuban crisis spawned the partial test ban treaty of 1963 and the Tlatelolco Treaty of 1967 creating a Latin American nuclear-weapon-free zone as well as the Nuclear Non-Proliferation Treaty of 1968, the keystone of the regime. The London Nuclear Suppliers' Club was formed largely in reaction to the Indian test of 1974. Recent events in Iraq and the former USSR may help forge new components such as an "IPS" suggested below.

With the Cold War over, the main threat to world security is nuclear proliferation from suspect nuclear programmes in Third World dictatorships and even more alarmingly from the collapse of the USSR. This could spawn two new nuclear-weapon states and a haemorrage of weapons, materials and nuclear scientists. With additional authority and resources the non-proliferation regime will help us to deal effectively with both risks and take us further along the path of nuclear disarmament.

The Third World

The 151 nations in the NPT cover the entire industrial North as well as over 110 Third World countries. In the past eighteen months two longstanding hold-outs, France and China, have acceded to the NPT and three of the six "threshold" nations, thought to have coveted nuclear weapons (Argentina, Brazil and South Africa) have renounced them and accepted full safeguards on their nuclear activities. For the first time the engine of proliferation has been put into reverse.

But two dictatorships, Iraq and North Korea, both party to the NPT, have flagrantly violated it. If Saddam Hussein had not been defeated his secret programme might have given him the bomb within two years. There has been a massive failure of Western intelligence and serious flaws in IAEA verification.

How can we prevent a repetition? The IAEA cannot take over the tasks of national intelligence services. But if its inspectors get access to national intelligence data so that they know where to look and if they exercise their unused rights to go anywhere, any time, another secret programme is likely to be detected. The IAEA also needs the full backing of the Security Council in case a government says no to its inspection. Postwar Iran has shown that in this way an illegal programme can be unmasked and rooted out. There may not be another Iraq, but we dare not ignore the risk.

North Korea has violated the NPT by stalling on its safeguards agreement, thus keeping out IAEA inspectors, and by building unsafeguarded nuclear plants. The remedy: the US, Japan, Russia and China must bear down on North Korea. And any breach of the NPT must be considered by the Security Council as a threat to peace.

Saddam Hussein managed to get hold of forbidden nuclear hardware. Exporting countries must enforce the controls they have agreed to and the "trigger" lists of sensitive nuclear exports be made comprehensive. Both tasks are, at least partly, in hand.

In 1968 the US, UK and USSR promised nuclear disarmament and a treaty banning all nuclear tests. The first promise is being fulfilled; the second, a comprehensive test ban is not. This could endanger the NPT when it comes up for extension in 1995.

Proliferation in and from the CIS

Finding work for ex-Soviet scientists in institutions like the IAEA. But the nuclear material taken out of the warheads should be put under international lock and key (thus reviving the major role that Eisenhower envisioned for the IAEA) and released only for specified and safeguarded end use.

Plutonium will create special problems but an *international plutonium storage system* ("IPS) could handle not only recovered military plutonium but the hundreds of tons of civilian plutonium likely to be produced by the year 2000. All fissile material not actually in use in reactors or research should eventually be put into the custody of such a system.

A nuclear cutoff

If all civilian plants in the CIS and USA came under IAEA safeguards Britain, France and China and eventually on Israel, India and Pakistan would come under strong pressure to follow suit. We would eliminate a deeply resented discriminatory aspect of the regime, choke of production of fissile material for new weapons, and move a little closer to a nuclear-weapon-free world.

But for eight years the IAEA's safeguards budget has been blocked by a no-growth fiat despite increasing responsibilities (more plants, more spent fuel, full-scope safeguards in Argentina, Brazil, South Africa and potentially in many CIS states). *This block must go.*

Past achievements and mistakes

The regime has already served as the template for progress in arms control and disarmament, e.g. the IAEA pioneered systematic on-site inspection by an international body, sending its inspectors into the USSR long before INF,

CFE and START existed. The draft treaty on Chemical Weapons reflects IAEA experience.

But the IAEA must correct the current imbalance under which it deploys 70% of its safeguards resources in Germany, Japan and Canada; it must also apply the lessons of Iraq and the Security Council must formally take on the role of guardian of the non-proliferation regime.

VERIFYING A CUT-OFF OF SNM PRODUCTION

David Sloss*

The Nuclear Nonproliferation Treaty (NPT), Chemical Weapons Convention (CWC) and Biological Weapons Convention (BWC) are open to signature by all states and are designed to curb the spread of weapons of mass destruction. In considering these agreements as "templates for the future," one must address other possible agreements that would be open to signature by all states and that could help curb the spread of weapons of mass destruction. One such agreement would be a ban on the production of special nuclear material (SNM) for weapons -- a so-called SNM "cut-off."

In October 1991, then-President Gorbachev proposed a bilateral U.S.-Soviet cut-off agreement. In formulating its response, the U.S. must determine whether it has a continuing national security requirement to produce SNM for weapons. This paper assumes that we do have a continuing requirement to produce tritium for weapons, and attempts to answer the following question: "If the U.S. determined that it did not need to produce highly enriched uranium (HEU) or plutonium (Pu) for weapons, what type of agreement might be in the United States' interests, and how could such an agreement be verified?"

A bilateral U.S.-Russian cut-off agreement, by itself, would not impose any significant constraint on the Russian nuclear threat. If accompanied by significant reductions in current stockpiles, such an agreement could constrain that threat in a meaningful way. However, deep reductions in SNM stockpiles would arguably be contrary to U.S. interests. While a bilateral cut-off agreement, without stockpile reductions, would offer substantial political benefits, it could undermine U.S. leverage to pursue a multilateral cut-off agreement.

If China, India, Pakistan and Israel adhered to a multilateral cut-off agreement, it would offer substantial nonproliferation and national security benefits. Such an agreement would bring the three principal NPT hold-outs (India, Pakistan and Israel) into the international nonproliferation regime. I would freeze the arsenal of the one remaining communist state able to threaten U.S. Territory with nuclear weapons. And, it would reinforce the international norm against nuclear proliferation by codifying an obligation that could apply universally to all states.

Production of HEU requires an enrichment facility; production of Pu for weapons requires a reprocessing facility. There are currently about twenty countries with some degree of enrichment and/or reprocessing capability. All but eight are already obligated under existing Treaties not to produce HEU or Pu for weapons. The eight countries who are not so obligated are India, Pakistan, Israel and the five nuclear weapon states. Negotiation of a multilateral cut-off agreement would have to include, at a minimum, these eight states. Other states with enrichment and/or reprocessing capabilities could also

be included in the initial negotiations. After a Treaty text had been finalized, it could be open for signature by all states.

The verification regime for a multilateral cut-off agreement should include two key elements: full-scope IAEA safeguards and challenge inspections. For non-nuclear weapon states, full-scope safeguards means that all nuclear material in the country is subject to IAEA safeguards. For nuclear weapon states, this concept would have to be modified to exclude nuclear material produced for military use prior to entry into force of a multilateral cut-off agreement. For India, Pakistan, and Israel, certain unsafeguarded material produced prior to entry into force of the agreement would be excluded.

IAEA safeguards are not perfect. It is difficult to detect diversions of one "significant quantity" at large reprocessing plants. The CWC grants access without right of refusal to the perimeter of any facility within 36 hours. Access inside the perimeter must be granted within five days, but access inside buildings may be refused. In the chemical weapons context, inspection of the outside of a building reveals little about what is happening inside. However, in many cases it may be possible to detect a covert nuclear facility merely by inspecting the outside of the building. Thus, under a cut-off agreement, it should be easier than it has been in the CWC to design a challenge inspection regime that satisfies critical verification requirements while still protecting sensitive information.

*The views expressed herein are strictly those of the author, and do not reflect official positions of the United States Government or the Arms Control and Disarmament Agency.

Challenges of Economics and Technologies

Panel V
Sunday, 26 April 1992
8:30-10:00 AM
Arthur Andersen Gallery

Chair: Dr. James M. Gerhardt
Southern Methodist University

Speakers: Dr. Jeffrey H. Grotte
Institute for Defense Analyses
"Reducing Costs While Maintaining Effectiveness in Arms Control Monitoring"

BG Henny J. van der Graaf (Ret.)
Center for Verification Technology
The Netherlands
"How to Control Technology? Problems of Horizontal and Vertical Proliferation"

Dr. Roger Ide
On-Site Inspection Agency
"Verification Implementation -- The Burden of Cost and Technology"

Steve Kadner
Aquila Technologies Group, Inc.
USSR
"Development and Manufacture of Technical Systems Utilized in the Support of Arms Control and Verification: A Life Cycle Analysis"

REDUCING COSTS WHILE MAINTAINING EFFECTIVENESS IN ARMS CONTROL MONITORING

JULIA L. KLARE

JEFFREY H. GROTTE

Decisions regarding the verification of arms control treaties frequently downplay the financial aspects of the inspection regimes they put into place. Nevertheless, budgets for arms control are not unlimited, and with the advent and potential advent of such comprehensive treaties as INF, START, CFE, and the CWC, the resources devoted to monitoring and verification are expected to mount significantly. With government budgets tight, it is important to examine monitoring regimes from both cost and effectiveness points of view to ensure that scarce monies are spent wisely.

The recent changes in Eastern Europe and the (now former) Soviet Union alter the context in which arms control occurs. Whereas, when INF and START were negotiated, our chief arms control focus was on reducing and stabilizing the hostile tactical and strategic nuclear threat of the Warsaw pact, we are now concentrating on the proliferation of weapons of mass destruction in developing countries while

employing less formal agreements to continue arms control initiatives with the former Soviet states. These facts also suggest that economies can be sought in existing and future treaties.

In this paper, the authors examine the INF, START, CFE, and CWC treaties to explore how they vary with respect to monitoring. The types of facilities inspected and the data required by the various treaties are compared, and estimates of the costs of inspecting those facilities reported.

The factors that cause some treaties, notably the Chemical Weapons Convention, to be more costly than others, such as the Conventional Forces in Europe treaty, are identified, and proposals offered for reducing monitoring costs in the future. If applied to the START and CFE regimes, the authors estimate that nearly $4 billion dollars could be saved over the fifteen-year lifetimes of those treaties.

HOW TO CONTROL TECHNOLOGY?
PROBLEMS OF HORIZONTAL AND VERTICAL PROLIFERATION

BG Henny J. van der Graaf (Ret.)

1. The ongoing process of arms control resulted in the 1990 CFE TREATY, the 1991 START TREATY, the strengthening of the 1972 BIOLOGICAL WEAPON CONVENTION by a number of confidence-building measures during the 1991 BWC Review Conference and a number of unilateral reciprocal initiatives by the US and the former USSR with respect to nuclear disarmament. It is expected that by the end of 1992 a chemical weapons treaty will be concluded.

2. It can seriously be questioned though, to what extent the results of arms control so far can be regarded as sufficient in terms of prevention of horizontal and vertical proliferation, especially to regions of conflict or tension.

3. The recent disclosure of Iraq's nuclear weapon programme provided a wake-up of the imminent danger of nuclear proliferation. This is underscored by activities in other hot spots around the world such as Pakistan, North Korea and Iran.

As to the Non Proliferation Treaty and its IAEA safeguards system, UNSCOM inspections in Iraq revealed serious shortcomings in the monitoring capabilities, which will have to be addressed. At the same time also further initiatives of the nuclear weapons states in the sphere of further reductions and nuclear testing are required to safeguard the continuation of the NPT after 1995.

4. The number of developing countries possessing chemical weapons is of growing concern. An early conclusion of the Chemical Weapons Convention this year would help to stop further proliferation provided it will be accompanied by effective routine and challenge inspections. The verification provisions and in particular the extent of their intrusiveness remain one of the main stumbling blocks.

5. Practice has shown that the Biological Weapon Convention is far from perfect and contains serious shortcoming by lacking precise definitions of what is prohibited or not and lacking verification provisions. An expert group on verification has been tasked by the Third Review Conference. Still it is quite uncertain whether agreement will be reached on a verification regime tailored to the BWC. Hopefully the UNSCOM experience will have a positive influence on the work of the expert group.

6. Deployment of full *Global Protection Against Limited Strikes (GPALS)* PROGRAMME would endanger the ABM treaty. Not only would GPALS undermine the treaty, its effectiveness can be doubted as well.

7. Although the end of the East-West confrontation led to a decline in demands of *conventional weapons* in Europe, supplies to other parts of the world, especially to the Middle East, are increasing. To prevent large scale transfers of conventional weapons and related technology to regions of tension stricter export regulations should be implemented. At present, the Nuclear Suppliers Group, the Australia Group and the Missile Technology Control Regime exist as multilateral export control regimes. However, these control regimes are as yet not well integrated while information is not well shared and recipients are in most cases excluded.

8. Controlling the weapon innovation process is another means to counter vertical proliferation. A clear relationship exists between military doctrine and R&D. Defence dominance, defence sufficiency and crisis management should be the guiding principles of modern military doctrines. Technological requirements should be checked against military doctrines and controlled through a system of so-called *Technology Control Statements,* nationally, regionally and globally. The key question such TCS will have to address is whether such technology or weapons do contribute to stability through defence dominance, and crisis management capabilities. Preconditions for such TCS are regular exchanges of information on military doctrines, on technological programmes and on military R&D budgets.

9. **Concrete steps:**

9.1. The process of unilateral reciprocal steps in the field of nuclear disarmament between the US and the former USSR should be continued toward a minimum deterrence posture of about 1000/2000 warheads around the year 2000.

9.2 . A comprehensive nuclear testban treaty should approved. If limited testing remains to be considered as sine qua non for reliability purposes, a limited amount of tests at very low levels could be agreed among the nuclear powers, but under international control at declared test sites.

9.3. The IAEA should be strengthened through better funding and improved safeguard mechanisms (access to national intelligence, challenge inspections, aerial surveillance and adequate enforcements).

9.4. Militarization of outer space should remain prohibited, the ABM Treaty should remain in force, although provisions could be strengthened. GPALS should be restricted to a limited number of mobile ground/sea launched systems, internationally funded and supported by internationalized space-based command and control as well as internationalized space based surveillance.

9.5. Chemical Weapons Convention with an effective inspection and enforcement regime should be concluded before the end of this year.

9.6. The 1972 Biological Weapons Convention should be supported by an effective verification and enforcement regime. The Australia group should expand its responsibilities regarding non-proliferation of transfer of micro-organisms, technology and equipment which could be used for the production of biological weapons.

9.7. The MTCR should extend its membership to all major suppliers and recipients, reduce the thresholds to ranges of 100/150 km and payloads to 200 kg. It could be envisaged to develop the MTCR into treaty form with its own verification and enforcement provisions. MTCR should be supported by regional agreements banning all ballistic missiles above the Agreed MTCR-thresholds, by an Attack Aircraft Control Regime (AACR) and by an internationally funded limited GPALS system, as mentioned above.

9.8. Members of regional export control regimes like the European Community should accept export control regulations based upon the strictest national regulations in order to avoid that countries with the weakest regulations would become staging areas for illegal exports.

9.10. Arms exporters should in harmony with global and regional efforts towards arms control and disarmament, gradually reduce their arms exports by 2-5% per annum and accordingly convert the industrial capacity to civilian use. At the same time criteria should be established for inclusion in national law forbidding inhabitants to render scientific services to foreign governments and industries by the development of "illegal" military programmes.

9.11. The military technological innovation process should be "controlled" through an interlocking system of independent national, regional and global Technology Control Statements.

VERIFICATION IMPLEMENTATION
THE BURDEN OF COST AND TECHNOLOGY

Roger Ide

The On-Site Inspection Agency (OSIA) is charged with the lead role in the U.S. implementation of several arms control treaties to which the U.S. is (or is likely to become) party, including treaties on Intermediate-Range Nuclear Forces (INF), on the nuclear Threshold Test Ban (TTB) and on Conventional Forces in Europe (CFE). Such responsibility will likely extend to other arms control treaties currently under consideration, such as the Strategic Arms Reduction Treaty (START) and the Treaty on Chemical Weapons (CW).

Activities involved in on-site inspection for the INF Treaty include the witnessing of destruction of treaty-limited items (TLI), monitoring activities at the portal of a plant capable of producing TLI, and numerous inspections each year, all in the Commonwealth of Independent States (CIS). They also include escorting of CIS teams conducting those same activities in the U.S.

This on-site inspection process is not highly technical, and for the most part the equipment involved is simple and straightforward, so that few specialized technologists are required. Accordingly, OSIA personnel (including certain contractor personnel acting under OSIA direction) carry out essentially all of the facets of on-site treaty implementation.

In contrast to this, on-site inspection activities called for by the Threshold Test Ban Treaty (TTBT) involve quite complex measurements of the yield of a nuclear explosion through close-in recording of properties of the resultant shock wave, as well as measurements of the seismic signal at greater distances. A rather large amount of sophisticated instrumentation is required, operated by a large cadre of technical specialists. To carry out these activities, multi-agency inspection teams are called for. OSIA's role in the TTB Treaty implementation in the CIS is to provide U.S. team leadership, transportation, administration and logistics. For the verification activities themselves, personnel from the Department of Energy (DOE), the Defense Nuclear Agency (DNA) and the Air Force Technical Applications Center (AFTAC) are incorporated into the U.S. teams and, to some extent, into the escort functions for CIS teams working in the U.S.

Obviously, the technology employed in on-site arms control verification can generate a variety of "burdens" to be borne by the implementing agency, particularly in terms of the equipment required to carry out on-site inspections. In order to facilitate on-site inspection and to maximize its effectiveness, the equipment to be utilized should possess the following characteristics:

-- it should be easily portable
-- it should be rugged and reliable
-- it should be simple to operate, maintain, and repair
-- it should generate the required data dependably
-- it should be "transparent" to the inspected party

From the viewpoint of the implementing agency, such criteria for inspection technology should be kept in mind during the negotiation of details of arms control agreements.

Development and Manufacture of Technical Systems Utilized in the Support of Arms Control and Verification - A Life Cycle Analysis

Steven P. Kadner

Introduction

The development of technical systems utilized in the support of Arms Control and Verification has traditionally proceeded in an uncoordinated mode. Life cycle considerations in research, design, manufacture, implementation, operation and maintenance support have not, in general been, applied to the safeguards regime. From a technical perspective, each safeguards instrument, whether utilized in surveillance, containment, or analysis, is typically conceived as a unique entity with little or no regard to interaction with other devices in the field. This is true not only across safeguards domains (e.g., chemical vs. nuclear), but also within each domain. While this may have been acceptable when there was relatively little safeguards activity, both current and future requirements necessitate a critical examination of how to implement systems with greater regard for economy. Care must be taken in this examination, to ensure that both long term, as well as immediate costs are considered. The entire set of activities surrounding monitoring efforts must be taken into account. Factors such as: construction cost, inspector overhead, maintenance, replacement etc. all contribute to the total life cycle cost of the safeguards effort. Our analysis presents a number of existing, and emerging, technologies that can be directly adopted for implementation of safeguards monitoring.

Three significant factors have changed since monitoring instrumentation for implementing safeguards treaties first needed to be developed:

1. Commercial technologies have progressed in many of the areas necessary for safeguards monitoring.
2. The kind and number of safeguards monitoring activities have greatly expanded.
3. More complete understanding of the monitoring requirements is available.

It is the second factor that generates the critical need for review of safeguards practices. Recent geopolitical changes, while greatly reducing tension, increase the need, (and opportunities) for monitoring. This arises both from greater willingness to consider adoption of treaties that require verification, and from the increased concern for restricting proliferation of potentially hazardous material.

One of the basic tenants of safeguards monitoring is that it must be continuous at each site at which controlled materials are present. While obvious, the implications are frequently overlooked. As many of the sites can be expected to be of interest for quite extended periods of time (either because they are commercial plants with substantial life expectancies, the nature of the substances, or both), care must be taken to recognize long term effects to the monitoring efforts. This includes understanding of life expectancies of the monitoring equipment, and planning replacement strategies.

With a constant (or shrinking) number of inspectors, and a growing number of sites that require monitoring, techniques must be developed that reduce inspection time. Not only is the actual time to evaluate acquired information a concern, so must the training overhead be considered. At the present time there is a proliferation of monitoring instruments, with absolutely no regard to any commonality in the manner of operation. As a result, inspectors must either spend considerable time learning (and refreshing) necessary operating procedures, or a scheduling imposition on which sites can be reviewed by which inspectors must be accepted. This, of course, increases complexity and cost of the monitoring effort. In addition, without any standardization, problems become more acute as equipment ages. This is due both to an additional training burden (as the inspectorate personnel change) and from the usual increase in difficulty when maintaining aging hardware.

Two changes to the current procedures are necessary: more careful (and realistic) evaluation of the long term requirements of safeguards monitoring, and a substantially altered approach to the development of monitoring systems. There appears to be a great reluctance to aggressively consider generally available technologies when developing safeguards instrumentation. A more subtle point, usually completely ignored, is evaluation of emerging standards and protocols, to enable future adoption of commercial components when none are immediately available. In combination, reductions both in direct development costs and long term support can be achieved. It is particularly important to recognize that the commercial world has, in many areas, come to require a very similar set of services as needed for safeguards. These efforts run the entire gamut of technologies necessary for safeguards monitoring, from packaging to security and information exchange.

Life Cycle Definition

The following elements are proposed for the "Safeguards Life Cycle"

1. Cost of development.
2. Qualification of developed items to safeguards standards.
3. Manufacturing investment with volume cost considerations.
4. Installation, familiarization and training.
5. Relationship of labor expense to equipment expense.
6. Maintenance and expendable supplies.
7. Obsolescence of imbedded components and technologies.
8. Cost of integrating new and next generation instrumentation.

Life Cycle Improvement through use of Base technologies

The most significant factor is simply the exponential increase in technological sophistication. As a result, it is possible to apply generally available products to an ever expanding set of applications. We will examine the relevant technologies and explore examples from a variety of arenas that are directly applicable to safeguards efforts. Included are: Local Area Networking (LAN) technology that provides an increasingly available medium for data exchange; digital imaging techniques that allow new modes of acquiring; storing and analyzing safeguards data; and developments in micro-processors that provide the processing capacity that tie components together. LAN capability, (e.g., Ethernet), is a feature of essentially all new (and many current) locations requiring safeguards review. We will discuss how such a facility can be directly utilized to implement necessary monitoring within the constraints associated with verification procedures. Another example of current technology is the implications of the proliferation of personal computer (PC) platforms. The combination of standard hardware and software (e.g., MS/DOS) has been the catalyst to creation of standards. These systems will be presented as the basis (and precursor) to components of integrated surveillance packages for safeguards review applications. We will review the emergence of standards that are relevant to the needs of the safeguards verification. It will be demonstrated that in a wide variety of diverse applications, solutions to the same class of problems inherent in the safeguards are readily available. By capitalizing upon this off-the-self technology, many aspects of implementing safeguards verification can be readily addressed.

Conclusions

Without substantial evaluation of how safeguards systems are implemented, the cost to maintain the requisite level of monitoring will rapidly become unsupportable. It is particularly painful that this process is not much further along, given the plethora of already available options. It is also possible to identify developing trends, such that systems can be configured to take advantage of new opportunities during the life of the system. In addition, more sweeping changes must be considered, to define and adopt procedures and standards for safeguards instrumentation. These efforts should be taken so that safeguards techniques and instruments can be shared across both political (i.e., multiple authorities) and risk (e.g., chemical and nuclear) boundaries. By making these fundamental changes, long term safeguards monitoring can be both more rigorous and at the same time more affordable.

Future Models of Arms Control and Verification

Panel VI
Sunday, 26 April 1992
10:15-11:45 AM
Arthur Andersen Gallery

Chair: Dr. Edward J. Lacey
US Arms Control and Disarmament Agency

Speakers: François Géré
Foundation for the Study of National Defence
France
"The Loneliness of the Outer Space Inspector: A Space Arms Control Proposal for the Near Future"

Dr. Michael O. Wheeler
Systems Planning Corporation
"Verification in the 21st Century: A Strategic Perspective"

Dr. Michael E. O'Hanlon
Congressional Budget Office
"The Future of Nuclear Deterrence Beyond START"

Ambassador David H. Reese
Australia
"Can the Non-Proliferation Treaty Stop Proliferation?"

THE LONELINESS OF THE OUTER SPACE INSPECTOR
A SPACE ARMS CONTROL PROPOSAL FOR THE NEAR FUTURE

François Géré

1. General framework

Our proposal is based upon the following assumptions:

* First, a dramatic increase of human activities in Space. The end of the century has already shown a significant acceleration of the increase of the number of satellites. The Gulf War boosted several programs. In a period of large reductions in defense spendings, space activities keep a constant level or even grow.

* Second, as Environment plays a larger role in the policy of developed countries, it is widely considered a component of national and integrate states "grand strategy". In this context, Space acquires a special importance for two reasons: 1) it is an element of our planet system which has to be protected against polluting factors. 2) it plays a key role in monitoring Earth-health.

*Our third assumption is that space policy is becoming a major factor in international affairs. Because of the all-out need of informations and data exchanges, communication systems are already a key element in the wealth of states. And because of the high-tech expertise and the related expensiveness of space satellites and all space-based items, space policy will be a factor of polarization in international relationships. Such a phenomenon can always produce antinomic effects. I can favour more cooperation through easier agreements. But, on the contrary, it can generate more competition, harder rivalries and, ultimately, turn out to become a serious threat to global security.

*Consequently, our fourth assumption consists in the risks stemming from the existence of space weapons. Here we shall consider two cases: 1) unambiguous weapons: ASAT and interceptors. While the former already exist and are directed against space, the latter do not and, moreover are prohibited by both an international convention (Outerspace, 1967) and a bilateral treaty (AABM, 1972). 2) ambiguous weapons such as satellites which are connected or are able to be connected with ground-based weapons. Early warning satellites (DSP, to become FEWS follow on Early Warning Systems), navigation satellites (GPS) and ultimately sensors such as "brilliant eyes" which could become the first segment of a space-based military system including interceptors, dual-use items, such as lasers, radars, telescopes can enter the category.

*The fifth point is that space represents an attractive battlefield to begin a major war. One can expect to destroy the bulk of its enemy's communication system while avoiding strikes against populated areas, thus diminishing both the ability and the incentive to escalate or retaliate with nuclear strikes.

For all those reasons space arms control is a necessity.

2. Defining Space Arms Control

At the present time, it is very challenging to address arms control and verification issues in space for at least four reasons: 1) the situation of one of the most important space-powers has changed so dramatically that nobody can predict what Russian space power will look like within ten years. However, Boris Eltsine's recent proposals on a ban of ASAT and the internationalization of the MIR station seem to go on the right track. 2) the United States remain the biggest space power in the world, no serious challenger can emerge in the near future. The situation in space is totally unbalanced. 3) consequently arms control negotiations will be affected in their very deep nature. Even if the basic principles remain, stakes, agenda and negotiating approaches will be modified. 4) all the existing agreements about space have to be reviewed because of those changes and also because of the dramatic evolution in technologies since 1967.

Because of this extreme fluidity and uncertainty, one could consider our proposal pure science fiction, But, at the same time, one should also take into account that it is a time both of opportunity and necessity to address those issues and put recommendations on the table.

Necessity means that all the programs which are going on as well as those which are under conception have to figure out what will be the new nature of space competition and/or cooperation in the near future.

3. Defining the framework of Space Arms Control (SAC) negotiations

We propose a general concept of SPACE HEALTH and SECURITY. The concept embodies that because space is a vital environment element, we must establish a linkage between military and civilian uses of space and consider that damages and insecurity in space pose a global threat to humankind and Earth as a whole. Consequently those issues have to be addressed together.

Former negotiations, treaties and proposals offer interesting milestones: for instance: The treaty on Outer Space ;(1967) but also the declaration about the Antarctic as a commonwealth for humanity provide the right guidelines.

It means that every nation has to receive benefits from the exploration and exploitation of the resources of space in order that it would consider it an element of growth and development rather than a source of frustration.

As a starting point, we will take into account the proposals submitted by several states before the Conference on Disarmament and the ad-hoc committees of the United Nations:: PAROS and COPUOUS. Proposals such as ISMA (France,

PAXSAT (Canada) and ISI (former Soviet Union) provide interesting ideas. But we will have also to face two kinds of situations:

First the settlement of an international Regime under the control of a Space Security Council which could be a sub-section of the Security Council of the UN.

Second, because of the impossibility to agree upon such an institution or only because the trust in this authority would be too weak, states would prefer considering bilateral or multilateral SAC agreements.

4.Implementing a SAC agreement.

Here we propose a three-layers arms control measure.

I <u>BAN</u>
on nuclear devices in space
on weapons in space and against space such as ASAT, space mines....

II. <u>Limitations and Safeguards</u>
It is possible to agree upon quotas for launches, for satellites of each type and each purpose related to the need and the national or international character of the satellite.

III. <u>Confidence-Building Measures</u>
Transparency of space activities should be the highest priority and top goal. This can be achieved through a great variety of measures such as notification of launches, exchanges of data about outer-space activities, declarations about the items on board and the purposes of satellites missions.

5. A Verification Regime of the SAC agreements

Even after the cold war we should keep the stance the United States made several years ago, in a different context, for verification. The stakes are too high to rely only upon declarations, and CBM. Moreover, if a ban is settled on ASAT and high dangerous devices, it has to be verified.

The problems are who, what and how.

As mentioned, a SAC agreement might result from an international treaty or a bilateral treaty. Therefore we should consider a large scale of verification regimes. But it is possible to formulate some principles and recommendations.

1. Ground-based facilities are the easiest to verify. The former Soviet Union propose such a regime including disturbing restrictions. However, to have inspectors on launch sites could be one of the cheapest ways to deal with verification. It is also conceivable to have random inspections in some of the reception centers of satellites data. But in many cases the level of intrusiveness

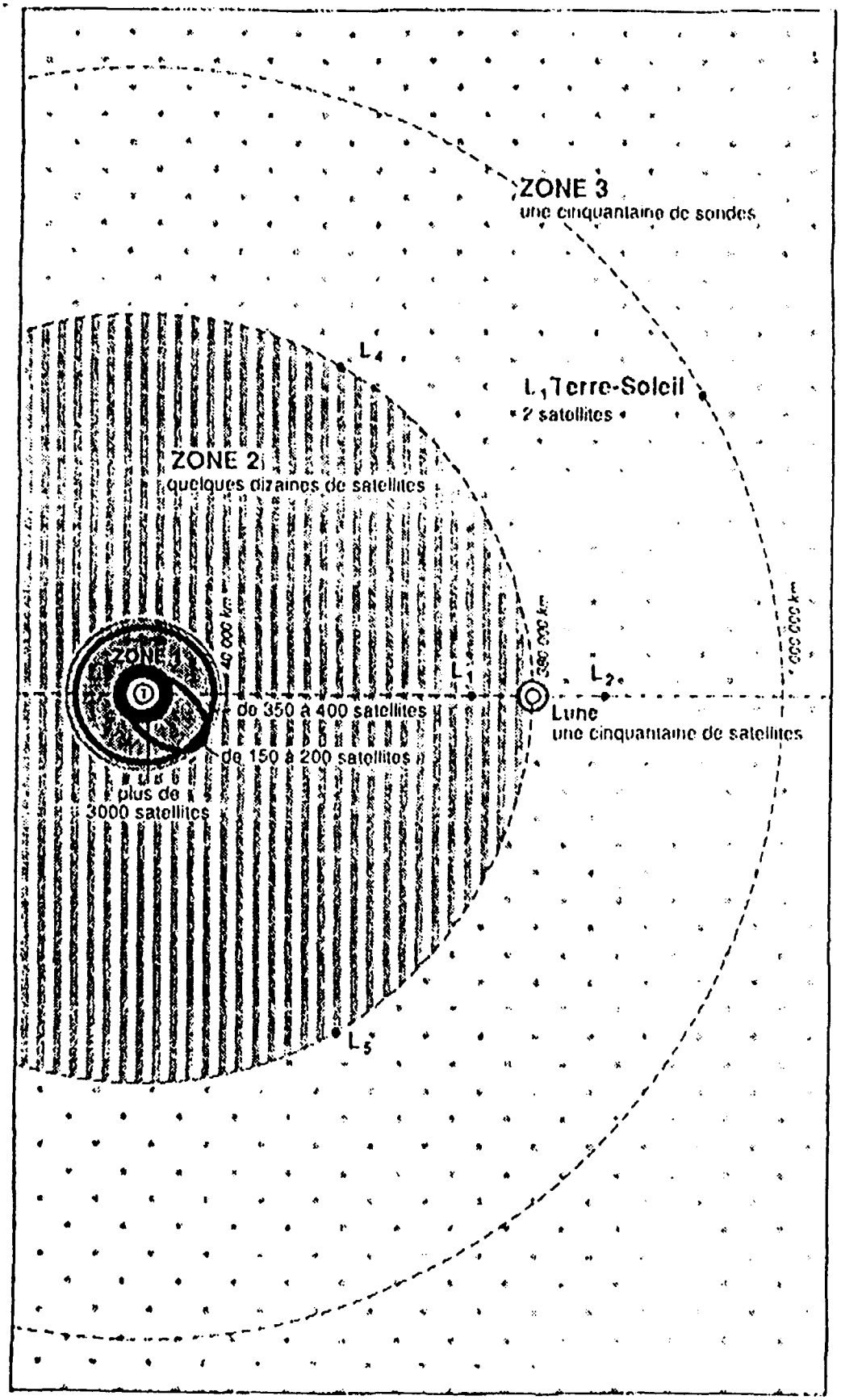
could easily become unbearable. Of course, better information can be obtained by the traditional intelligence channels and the data they collect. But it is important to have a real level of transparency in order to avoid the ordinary quagmire "they don't know what we know about them".

2. Therefore we have to consider two futuristic types of verification: the first one by the national technical means themselves. On a bilateral basis or better, on an international basis, satellites can be used to verify some declared characteristics of space-based items. The second, more intrusive and reliable, would be on-site inspection conducted by international teams in space.

Experience and training exists from cooperation between astronauts coming from different countries. An international space station could be used as basis for such a verification.

To conclude, we will address two problems. The first one is cost-effectiveness of verification. One could argue that because of the importance of the goal there must be no reluctance to invest large amounts of money in space verification. It is also true that space investments are not exactly directed towards immediate profits. However, solutions that could allow to spare some money would certainly be considered with greater favor and consequently, would gain more support for implementation. A trade-off between cost and intrusiveness would be a stimulating one.

Sanctions are, of course, the second problem. Again, it depends on the juridicial and political nature of the agreement. On an international basis, economic sanctions are easy to foresee. A reduction of quotas, if there were any, or more important, the obligation to destroy the illegal space-based items would be costly penalizations a state would have to consider seriously before deciding to cheat.


ZONE 3
une cinquantaine de sondes
L4
L1 Terre-Soleil
2 satellites
ZONE 2
quelques dizaines de satellites
40 000 km
ZONE 1
de 350 à 400 satellites
de 150 à 200 satellites
plus de
3000 satellites
L1
L2
Lune
une cinquantaine de satellites
L5

VERIFICATION IN THE 21ST CENTURY: A STRATEGIC PERSPECTIVE

by

Dr. Michael O. Wheeler

Future models of arms control or verification cannot be constructed unless one has a well-informed appreciation of world politics and the major forces which affect changes in the international system. Two variables are especially important in this regard: the future of armed conflict, and the future of national sovereignty. Examining the implications of those forces for the future of verification is what is meant by a strategic perspective on verification.

During the Cold War, national security was polarized by the Soviet threat. With the end of the Cold War, the security agenda has become more diffuse and confused. Some of the problems on that agenda are not new, e.g., the proliferation of weapons of mass destruction, or the threats of territorial aggression in regional settings. Other problems are only dimly perceived.

Arms control was one of the proudest achievements of Cold War diplomacy, and by the end of the 1980s was an important catalyst for change in East-West relations. Progress in East-West arms control was reflected in progressively more intricate verification regimes. Progress also was proceeding on multilateral arms control issues affected by, but larger than, the Cold War. As the Cold War ended, verification was a part of all serious arms control agendas.

Just as arms control came to be recognized as part of wider security strategies, verification came to be understood as an intensely political process in which the information provided by all-source monitoring contributed to the political process in which states party to an arms control agreement addressed three questions: Is the agreement being violated? If so, what risks are posed by the violation? What are the best responses?

This process invariably was complex, and yielded no simple answers. The relationship among the parties to a treaty, the structure of incentives and risks generated by the agreement, and the context within which the agreement operates heavily influenced the process.

Assuming that the Cold War truly is over, does concerted United Nations action against Iraq offer an insight into future arms control? Is more frequent and effective collective action within the framework of the United Nations the wave of the future? Will arms control and verification expand in new and revolutionary ways to support that vision?

The two variables which most critically affect answers to these questions are the future of armed conflict and the future of how nation-states define sovereignty in practical terms.

The concept of complex interdependence used by Robert Keohane and Joseph Nye provides a starting point for analyzing the future of armed conflict. Although armed conflict may diminish in relations between complexly interdependent states, that relationship is unlikely to obtain outside of modern industrialized societies. Regional conflicts are not likely to diminish.

Does this portend an increased role for preventive (and perhaps coercive) diplomacy? For this to happen, governments will have to consider how far they are willing to proceed in modifying the existing rules of the game, especially as regards national sovereignty.

The adjustments of sovereignty we have seen in recent years are adjustments at the margin, not fundamental changes. That is unlikely to change in the future.

If this assessment is sound, the likely function of arms control in the next century is likely to largely resemble roles it now plays. Among highly industrialized societies, it may play the role of helping stabilize relations under conditions of extraordinary change. In regional contexts, it may be pursued as a mechanism for attempting to catalyze change.

Arms control will be one, but not the only, instrument of national security strategies. Nations will continue to monitor one another's behavior. Some (but not all) of that monitoring will be sanctioned by arms control regimes. Verification of compliance with arms control agreements will continue to be an important political factor domestically and externally, but the level of concern will reflect the general climate of relations, and how the risks and incentives generated by that climate of relations is reflected in the domestic political processes of the nation-state.

THE FUTURE OF NUCLEAR DETERRENCE BEYOND START

Michael E. O'Hanlon

As the confrontation between the United States and the Soviet Union has diminished, debate has intensified about the appropriate size and role for U.S. nuclear forces. The Strategic Arms Reduction Talks (START) Treaty, which was signed by Presidents Bush and Gorbachev in July 1991, would make some important changes, but it falls far short of the hopes some people hold for arms control--particularly after the failed Soviet coup in late August. Recent unilateral reductions and calls for further negotiated reductions by both Bush and Gorbachev demonstrate that the idea of deep cuts in nuclear forces may be gaining momentum.

A study by the Congressional Budget Office (CBO), *The START Treaty and Beyond,* prepared at the request of the Chairman of the Subcommittee on European Affairs of the Senate Committee on Foreign Relations, examines the effects of both the START treaty and possible agreements that would make much deeper cuts in U.S. nuclear forces.

The study finds that, although START would save at most a few hundred million dollars a year compared with the Administration's current plan for nuclear forces, deeper cuts promise substantial savings. For example, the United States could save more than $17 billion a year over the next 15 years, compared with current plans, if it reduced its total strategic warheads to 1,000 and eliminated all theater (shorter-range) forces. A force with 3,000 strategic warheads and 2,000 theater warheads could pare the budget by more than $15 billion a year. These savings reflect changes in all costs associated with nuclear weapons--including strategic defenses and warhead production--as well as the added costs of compliance and verification.

The study also finds that the Administration's plan submitted in February 1991, which may have anticipated the START treaty, has already educed the average cost of nuclear forces by nearly $7 billion per year. The unilateral reductions President Bush announced in September 1991 might save another one-half billion dollars a year.

The deep cuts embodied in some of the options in this study would require fundamental changes in the prevailing view about how many warheads are needed to deter war. Nevertheless, the modern arsenals in these options would preserve enough flexibility that the United States would not need to target cities; conventional forces, economic infrastructure, and nuclear forces could be targeted instead. These nuclear forces could also be highly survivable, even in the event of Soviet cheating. Deep cuts by the superpowers might also help pressure other countries not to develop their own nuclear forces. Provided that U.S. conventional forces remain globally active, deep cuts should not jeopardize the ability of the United States to deter conflicts around the world.

CAN THE NPT STOP PROLIFERATION?

D. H. Reese

In the 22 years of its existence the Nuclear Proliferation Treaty has increased its political authority for the international management of nuclear technology and containment of the proliferation of nuclear weapons.

This is best demonstrated by the recent decisions to sign the NPT, by France and China, which were the two nuclear weapon states (out of the original five) not to accede to the NPT in 1970. Additionally, a number of states which were cause for concern at the time of the NPT review conference in 1985 have either joined the NPT or taken steps to abate that concern.

Nevertheless, the spread of technology has put nuclear weapon technology within reach of an increasing number of states. Among the non-signatories of the NPT Israel has, for some time, been assumed to have joined the ranks of the nuclear weapon states. similarly India and Pakistan are believed to have nuclear weapon capability.

Furthermore, states which have signed the NPT have, or appear to have, developed covert programs to acquire nuclear weapons. In the case of Iraq this program was uncovered by UNSCOM inspections in the wake of the Gulf War. The North Korean picture is less clear. It has an unsafeguarded nuclear program: the agreement between North and South Korea last December for a nuclear-free peninsula awaits verification through inspections.

Disintegration of the Soviet Union has generated uncertainty about the status of the nuclear weapons and/or facilities located in the new republics.

Problem states/regions need to be looked at one by one. States become nuclear powers for one or more of a range of reasons. A state may believe its security is at threat from neighbouring state(s) which may or may not be nuclear-armed. A state may seek military dominance through nuclear weapons. Or a state may go down the nuclear path for more nebulous notions of status.

It may be that states' security concerns can be met by means other than nuclear weapons. In the Middle East proposals include the Egyptian idea of a ban on weapons of mass destruction. The Permanent Five are developing approaches to the problem, including a ban on surface-to-surface missiles. In the sub-continent the US has promoted the idea of a five-power conference. Other ideas include the concept of nuclear-free zones.

Apart from political approaches to the problem there remain the measures managed by the IAEA, through which the non-proliferation regimes is conducted. Weaknesses in the IAEA inspection regime, demonstrated by Iraq,

have led to confirmation of the IAEA's authority to conduct special inspections. Full scope safeguards are being adopted to ensure that all nuclear materials exported are subject to safeguards. The problem of dual-use materials is one on which further work is needed. Much of Iraq's equipment was bought 'off-the-shelf' over the past 10 years.

Access to education in nuclear-related fields is nuclear-related fields is another area requiring closer monitoring. Fluid mechanics, for example, is a course from which students from certain countries might be precluded if there were any suggestion that the knowledge might be used to acquire nuclear weapons. Expertise available in the former Soviet Union also needs to be managed so that it is not misused.

The future of the NPT is dependent on the outcome of the 1995 review. Members have an obligation under Article VI to pursue nuclear disarmament. Some non-aligned states, particularly Mexico, have made an issue of this article. The touchstone for Mexico has been nuclear testing, and it was this issue which prevented a final document at the NPT Revcon in 1990. While the testing issue may be significant, states can acquire nuclear weapons without testing, and I do not see the wisdom of putting an extension of the NPT at risk on this issue. Nevertheless, it will be a matter of contention at the extension conference.

The nuclear weapon states are reducing testing. Combined with United States and Russian negotiations to reduce the numbers of weapons we are beginning to see a vertical reduction in nuclear weapons. There is a long way to go but already it is possible to envisage a re-consideration of the idea of deterrence between East and West. In time it may be that nuclear weapons in Europe come under the control of a single European organisation. In this situation it is not impossible to envisage defensive systems contributing to a world in which nuclear weapons are not the danger they are today.

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