

# Nuclear Weapons Convention

# Monitor

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Complete Nuclear Disarmament:  
Report from roundtable, Ottawa, January  
2002**

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A Nuclear Weapons Convention is a treaty, framework, or regime to prohibit nuclear weapons, with a plan for their verified elimination. The *NWC Monitor* includes analyses and opinions exploring the political, legal, and technical aspects of progress towards complete nuclear disarmament.



1985 Nobel Peace Prize



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This issue of the *NWC Monitor* reports on a roundtable discussion hosted by The Simons Foundation and held at the Department of Foreign Affairs and International Trade in Ottawa, Canada, January 10-11, 2002. Thanks to Beverly Delong and Emily Schroeder for serving as rapporteurs.

The views presented here are those of the authors or sources indicated, and not necessarily those of their affiliations or the *NWC Monitor*. The comments listed in Sections 2-5 represent individual opinions or sample perspectives voiced during the roundtable discussions in Ottawa. These comments are not intended to imply consensus or suggest any participant attribution. The editor is solely responsible for the views expressed in the introduction. The spelling conventions of the authors have been preserved.

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# Acronyms

ABM	Anti-Ballistic Missile (Treaty)
BCW	Biological and chemical weapons
BTWC	Biological (and Toxin) Weapons Convention (also BWC)
CBM	Confidence-building measure(s)
CTBT	Comprehensive Nuclear Test Ban Treaty
CTBTO	Comprehensive Nuclear Test Ban Treaty Organization
CTR	Cooperative Threat Reduction
CWC	Chemical Weapons Convention
DoD	Department of Defense (US)
FTB	Flight test ban
GPS	Global Positioning Satellite
HEU	Highly-Enriched Uranium
IAEA	International Atomic Energy Agency
ICC	International Criminal Court
INF	Intermediate-range Nuclear Forces (Treaty)
IOZP	Indian Ocean as a Zone of Peace
LEU	Low-Enriched Uranium
LOC	Line of Control
MPC&A	Material Protection, Control and Accounting
MTCR	Missile Technology Control Regime
NGO	Non-Governmental Organization
NMD	National Missile Defense
NNWS	Non-Nuclear Weapon State
NPT	Nuclear Non-Proliferation Treaty
NSC	National Security Council
NTM	National Technical Means
NWC	Nuclear Weapons Convention
NWFW	Nuclear Weapon Free World
NWFZ	Nuclear Weapon Free Zone
NWS	Nuclear Weapon State
OPCW	Organization for the Prohibition of Chemical Weapons
OPNW	Organization for the Prohibition of Nuclear Weapons
PU	Plutonium
SALT	Strategic Arms Limitation Talks
SANWFZ	South Asian Nuclear Weapons Free Zone
SLV	Space Launch Vehicle
SLCM	Submarine-launched cruise missile
START	Strategic Arms Reduction Treaty
UN	United Nations
UNGA	United Nations General Assembly
UNSC	United Nations Security Council
UNSCOM	United Nations Special Commission (on Iraq)
WMD	Weapons of Mass Destruction
ZBM	Zero Ballistic Missiles

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# 1. Complete Nuclear Disarmament: Summary of Roundtable, Ottawa, January 2002

A roundtable on “Legal and Technical Aspects of Complete Nuclear Disarmament,” hosted by The Simons Foundation with the support of Canada’s Department of Foreign Affairs and International Trade, took place in Ottawa on January 10-11, 2002.<sup>1</sup> The roundtable brought together governmental representatives and independent experts to explore the legal and technical aspects of a framework for complete nuclear disarmament. The roundtable used the model Nuclear Weapons Convention (NWC) to explore the future requirements of a regime for the effective and verified reduction and elimination of nuclear weapons.

In advance of the roundtable, participants received a list of 13 open-ended questions regarding technical and legal – including structural – aspects of complete nuclear disarmament. (See the list of discussion questions, page 4.) The roundtable deliberately addressed legal and technical considerations before political questions, in order to generate new ideas and focus on the “how” of nuclear disarmament as distinct from the more familiar discussion of “whether” it is possible.

## Discussion and Themes

All the participants strongly and publicly support the goal of complete nuclear disarmament. Governmental participants represented non-nuclear weapon states and non-governmental participants had published on and promoted nuclear arms control, non-proliferation, and disarmament. Nevertheless, there was a range of perspectives on the tactics and strategies best suited for promoting nuclear disarmament, and the role of a future NWC, as well as the role of a model NWC in the current political process. In this context, the roundtable succeeded in engaging these sympathetic skeptics in the exercise of projecting into a future world and exploring the requirements of and obstacles to nuclear disarmament against the background of a currently unfavorable political environment.

Among the themes that emerged during the course of the discussions were the following:

- **Long-term goal and next steps:** To what extent can a focus on the long-term goal of nuclear disarmament facilitate the identification and promotion of next feasible steps? Is it possibly counter-productive – because seen as too ambitious – to discuss the end goal? There was no singular answer to these questions, and a preliminary conclusion appears to be that selective use of the NWC as both a tool and as a concrete political objective is most appropriate. NWC promoters should be sensitive to disingenuous or bad faith claims of support, and take steps to rebut or dissociate from these, but the NWC can be a valuable tool and litmus test of commitment to nuclear disarmament.
- **Verification and the political process:** The Comprehensive Nuclear Test Ban Treaty (CTBT) political process benefited from the extensive research on verification that preceded conclusion of negotiations. The NWC, or a future regime for complete nuclear disarmament, could benefit from similar research if it helps establish the feasibility of verifiable nuclear disarmament. The more complex and unresolved political questions, however, make this somewhat more elusive for some than the case of the CTBT. A few participants expressed a preference for resolving questions of political process first.
- **Societal Verification and Whistleblowers:** The role of societal verification and protection for whistleblowers was a recurrent theme. Some saw this as the most promising approach to nuclear disarmament, including education aimed at increasing scientific and societal responsibility. Non-governmental monitoring and other non-treaty based methods of promoting accountability were discussed, as was the potential social and psychological context for citizens who “blow the whistle” on activities that undermine nuclear disarmament. The question of societal norms – and the value placed on nuclear weapons – is a crucial part of this theme.

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<sup>1</sup> In consultation with the International Physicians for the Prevention of Nuclear War, Lawyers’ Committee on Nuclear Policy, and Physicians for Social Responsibility.

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- **Delivery vehicles and warheads:** On the technical side, verified reduction of delivery vehicles (particularly missiles) in addition to warheads received much attention. The model NWC addresses delivery vehicles in general terms, although these would be harder to hide and therefore possibly easier to verify than warheads. More research is needed on this question.
  - **Costs of disarmament:** It was suggested that a thorough exploration of the costs of disarmament would be useful. These are not fully understood. They could also be compared to the costs of armament, although some disarmament activities are likely to be even more costly than the building of the weapons. The larger context, including the political and opportunity costs from building the weapons, could offset concerns about the economic costs of disarmament itself. In any case the costs rise as disarmament is delayed.
  - **Carrots and sticks:** The approach in the model NWC places an emphasis on compliance over coercive enforcement, but it would be useful to explore and develop additional possible incentives in order to make compliance more attractive than non-compliance. More carrots, as well as carrot cake, are needed. The model NWC suggests an optional protocol for the compulsory settlement of disputes and an optional protocol providing support for alternatives to nuclear energy.
  - **Non-participants:** The likelihood of states that would not participate in the political negotiation process or the implementation of a future NWC raises critical questions about its feasibility. At the same time, this question is not unique to the NWC – since three nuclear weapons capable states are outside of the Non-Proliferation Treaty regime today – and focusing on a nuclear disarmament regime might, in fact, serve to draw in these states or, at a minimum, help identify the source of resistance.
  - **Implementing agencies:** There was much discussion but no general consensus on the question of an implementing agency (or agencies) for a future NWC. Should it be a new body, or should it build on the existing implementation and verification bodies? Resolution of this question will depend on political structures that emerge, expertise and experience of existing agencies, bureaucratic culture, concerns about duplicating efforts, and the ability to modify or separate the mission(s) of existing bodies.
  - **Conspiracies, hidden arsenals and materials:** An unexpected theme that received much attention was the possibility of a conspiracy to cheat a future NWC regime. There was a wide-ranging discussion about the likelihood of such a conspiracy in light of the political environment that would exist if an NWC comes into force. A related topic, about disclosing past nuclear weapons programs (as in the case of South Africa) raised the question of encouraging such openness and finding ways to reward or commend the disclosure and decision to abandon the program.
  - **Low levels vs. zero:** There was no consensus on the relative difficulty of verifying low levels of nuclear weapons as opposed to verifying maintenance of a nuclear weapons free world. The perspective tended to depend on the possible value of nuclear weapons as this would be perceived by those with the authority and means to clandestinely develop or maintain nuclear weapons. On the one hand, as long as nuclear weapons exist and are known to exist, the relative numbers would be of marginal concern in comparison to the existence of even one weapon or the capability to develop one secretly. On the other hand, maintaining a nuclear weapons free world once the infrastructure had been verifiably dismantled and the nuclear option renounced could be more straightforward than verifying a dynamic and politically sensitive process.

The roundtable participants noted that despite the current and near-term hostile political environment regarding treaties and multilateral – or even bilateral – verification-based regimes and irreversibility, it is important to maintain and develop the knowledge, expertise, and training relevant to disarmament. It is also important to continue to develop and support cooperative, verifiable, and irreversible approaches to security. On a regional level, especially in South Asia, there is an urgent need for cooperative approaches to avert nuclear war.

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## **Legal and Technical Aspects of Complete Nuclear Disarmament Questions for Discussion Ottawa, January 10-11, 2002**

1. What are the essential verification requirements for transition to low levels (hundreds) of nuclear weapons? What are the essential verification requirements for transition from low levels to complete elimination?
2. What are the essential verification requirements for maintaining a regime of nuclear disarmament while the capability and technology are still accessible, and in later generations?
3. What existing verification bodies and mechanisms (NPT safeguards, US-Russian arms reduction treaties, regional agreements, CTBTO) will need to be expanded? How? How should they be coordinated? Is a new umbrella agency necessary? If so, how would it bring efforts together? If not, what is working best about the regime now that could be built on?
4. What should be the elements of a future regime to verify a ban on fissile materials for weapons purposes? How inclusive must it be to facilitate complete nuclear disarmament? What materials, in what forms, would be subject to verification?
5. How inclusive must declarations of warheads and fissile materials be? Who should have access to this information? What data-sharing agreements are necessary to balance transparency and confidence with concerns related to non-proliferation and classified information?
6. What nuclear facilities must be subject to verification? How intrusive should the verification regime be? What combination of sensors, inspections (systematic and challenge), and data-sharing is optimal to balance confidence-building with certainty and efficiency?
7. How inclusive should control over delivery systems be? What existing verification mechanisms are applicable and what must be developed?
8. What are the essential elements of a legal regime to enforce state compliance with an obligation of non-possession of nuclear weapons? What types of peaceful collective measures would be effective for this purpose?
9. What are the essential elements of national implementation? How do these correspond to a legal regime that provides for effective and fair criminal prosecution of individual violators of basic norms of non-possession of nuclear weapons?
10. What will be the role of societal verification? Should individuals be required to report violations of the disarmament regime?
11. What are the essential elements of a legal regime that protects individual whistleblowers at both the national and international levels? What protections could a state offer citizens reporting on suspected violations by employers? Should there be transnational protection arrangements for individuals who report violations by states?
12. What expertise and skills base must be developed to enable the implementation of a universal disarmament regime? What existing or new areas of research must be developed or expanded?
13. What policy and security changes are required to allow the development and implementation of the requirements identified above?

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## **Recurrent Themes**

- Next steps should be consistent with the long-term goal.
- Focusing on the long-term goal should not detract from pursuing next steps.
- Verification requirements depend on the political process and climate, internationally and internally.
- Open democratic societies are not likely to sustain clandestine nuclear activities under a global disarmament regime.
- Societal verification includes informed citizen participation and could require protection for whistleblowers.
- Education in proliferation dangers and disarmament norms is essential.
- Confidence in fissile material accounting and control cannot be complete and will be increasingly difficult to attain without immediate efforts to document the histories of nuclear programs.
- Verified disarmament of both delivery vehicles and warheads should be pursued.
- The costs of disarmament should be compared to the costs of proliferation – past and current arsenals, opportunity costs, and the potential costs of use.
- More creative arms control, non-proliferation, and disarmament carrots and sticks are needed.

## **Participants**

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Merav Datan, International Physicians for the Prevention of Nuclear War & Physicians for Social Responsibility  
Bev Delong, Canadian Network to Abolish Nuclear Weapons & Lawyers for Social Responsibility  
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Jaya Tiwari, Physicians for Social Responsibility  
Alyn Ware, Lawyers' Committee on Nuclear Policy



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## 2. Verification: General Considerations and Phases

### Questions

- **What are the essential verification requirements for transition to low levels (hundreds) of nuclear weapons?**
- **What are the essential verification requirements for transition from low levels to complete elimination?**
- **What are the essential verification requirements for maintaining a regime of nuclear disarmament while the capability and technology are still accessible, and in later generations?**

### Comments

- We cannot completely separate the legal and technical requirements from the international political environment.
- The focus of arms control verification regimes to date has been on delivery vehicles rather than warheads. This has worked for reductions to a few thousand nuclear weapons.
- For further reductions, into the hundreds, we need verification measures for warheads paralleling those for delivery vehicles, namely: data exchange, confirmation, baseline inspections, challenge inspections, and continuing inspections of the dismantlement process.
- We also need a parallel system for fissile materials, and it should be as comprehensive and inclusive as politically and technically possible.
- If reductions proceed without establishing a baseline of information, we will lose important knowledge and it will be difficult to gain confidence that warheads and fissile materials are not hidden somewhere.
- If accounting took place over 5-10 years with confidence, this accounting could be the basis for further nuclear disarmament.
- Civil society has to assume the role of governments in arms control monitoring. This is a problem in societies that are not open.
- Hidden nuclear arsenals require maintenance by experts who would agree to be part of a conspiracy, which is unlikely in a democratic society.
- Because of the destructive power of nuclear weapons, non-compliance becomes more significant as we approach complete nuclear disarmament. In an otherwise nuclear weapon free world, a single nuclear weapon could translate into substantial political leverage.
- Verification of compliance with an agreement on complete nuclear disarmament is easier than verification of agreement on very low levels of warhead numbers.
- We need to think of phases in terms of transition – from the current stage based on strategic offense. The 2000 NPT Review Conference final document outlines good measures, but some of these have been undermined.
- Some elements of disarmament, arms control, and verification could be expensive – possibly more than the weapons – but less than their potential damage or indefinite maintenance.

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## Verification Requirements for Transition to Low Levels

Steve Fetter\*

Verification requirements for transition to low levels of nuclear weapons depend mostly on the evolution of international politics. Beyond the current international political environment, it is possible to imagine future environments in which the technical demands for verification would be very much lower, and possibly very much higher. The 1980s taught us to be aware of the potential for dramatic and unanticipated change.

For example, it is not out of the question that, 10 or 20 years from now, relations among the nuclear powers could be quite friendly. Democratic rule might be solidified in a prospering Russia, and the Taiwan issue might be resolved in a more pluralistic China. If we get to the point where armed conflict between the nuclear powers seems implausible or unimaginable, then low levels of nuclear weapons could be achieved with little in the way of formal verification. Certainly no verification would be required between the United States, the United Kingdom, and France, even if their relations cooled a bit. Perhaps it is unrealistic to imagine that relations between these three countries and Russia and China could ever be so warm, but we are moving in that direction and I'd rather not rule out the possibility altogether.

Although less likely, it also seems possible that a movement toward low levels of nuclear weapons could take place in a much less hospitable international environment. For example, if terrorists steal or purchase a Russian nuclear weapon and use it in a city in North America or Europe, if the government of a nuclear power collapses less gracefully than the Soviet Union, or if nuclear war breaks out in South Asia with horrible consequences, one could imagine strong public demands for deep reductions and much greater safety, security, and accountability for nuclear weapons, if not for their complete prohibition. In any case, it would be evident that a large U.S. arsenal offered absolutely no protection against this sort of threat. In this sort of environment, the demands on verification might be higher than we now imagine.

The requirements for verification depend on what the world will look like many years from now, and that's hard to predict. Only if we assume that things will look pretty much like they do today, can we extrapolate in a straightforward way from the verification requirements of existing arms control and nonproliferation agreements to what might be required as we move to low levels of nuclear weapons.

**Only if we assume that things will look pretty much like they do today, can we extrapolate in a straightforward way from the verification requirements of existing arms control and nonproliferation agreements to what might be required as we move to low levels of nuclear weapons.**

Existing nuclear arms control agreements between the United States and Russia have not dealt with nuclear weapons *per se*. Instead, these agreements have focused on strategic delivery vehicles and their launchers—intercontinental-range missiles, silos, submarines, and long-range bombers. This is mostly because missiles, submarines and bombers are much easier to count and much harder to hide than nuclear weapons. It's also true that delivery vehicles are much more expensive than the nuclear weapons they carry, so controlling their number is a bigger barrier to breakout; and nuclear weapons that are mounted on strategic delivery vehicles, ready to be delivered quickly almost anywhere in the world, are much more militarily and politically salient than warheads in storage.

So the START agreements, like the earlier SALT agreements, limit strategic delivery vehicles and launchers. The number of warheads mounted on these delivery vehicles is limited by counting rules, although there are provisions to inspect a few missiles each year to make sure they aren't carrying more than the counting rules allow. There are no limits of any kind on the number of strategic warheads that can be maintained in storage, nor are there any verifiable limits on deployed or stored non-strategic warheads. There are agreed limits on the number of nuclear-armed SLCMs and unilateral commitments to reduce or eliminate certain classes of tactical warheads, but none of these are verifiable.

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\*These comments were prepared for the Ottawa Roundtable on Legal and Technical Aspects of Complete Nuclear Disarmament, January 10-11, 2002.

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The fact that non-deployed or tactical warheads remain outside verified controls has not interfered with the ability of the United States and Russia to agree, over the last decade, to reduce the number of deployed strategic warheads from over 10,000 deployed strategic warheads to about 2,000 warheads. But significantly deeper reductions will not be possible unless we subject the warheads themselves—all nuclear devices, regardless of their status—to accounting and verification.

Non-deployed and non-strategic warheads pose a threat. The U.S. could mount stored warheads onto its Minuteman and Trident missiles, and load extra bombs onto its B-52 and B-2 bombers. It could reconfigure the B-1 bomber to carry nuclear warheads, or it could use tactical aircraft. Unconventional means of delivery would also become a significant issue as nuclear forces are reduced. Nuclear weapons could be delivered with a wide variety of military and commercial aircraft and ships—they even could be smuggled across borders. If we reduced to low levels, we would not be content to simply count the number of ICBMs, subs, and bombers. We'd want to count the individual warheads. In today's international environment, if the U.S. had 200 warheads, we'd want to make sure that Russia or China also had 200, and not 500 or 1000 warheads.

Thus, at least in the current international political environment, the essential verification requirement for a transition to low levels of nuclear weapons is a comprehensive regime for counting all nuclear warheads. This would begin with the nuclear powers exchanging detailed information on their warhead stockpiles, and would grow to include on-site inspections at deployment and storage sites to confirm these declarations, at assembly facilities to verify the dismantling of warheads, and challenge inspections to gain confidence that there are no secret stockpiles or warhead production facilities. This will be hard, because nuclear weapons are fairly small and need relatively little maintenance. Although we will never be completely confident that there are no hidden warheads, the operation of this sort of regime should give us the confidence to go to very low levels of warheads.

#### **Nuclear materials**

To bolster our confidence, we will need a comparable regime for nuclear explosive materials—plutonium and high-enriched uranium. The main elements of this are a production cutoff, to verify that nuclear explosive materials are not being produced for nuclear weapons;

**We have to subject nuclear warheads to the same degree of accounting as strategic delivery vehicles, and we have to subject nuclear explosive materials in weapon states to roughly the same degree of accounting as these materials enjoy in non-weapon states. If we can do this, we could reduce to very low levels, and perhaps all the way to zero.**

secure storage for excess materials recovered from dismantled warheads; a method for permanently disposing of these materials or rendering them unsuitable for reuse in weapons; and a comprehensive declaration of historical production and current stockpiles, including stocks in warheads. Because materials in warheads and warhead components probably would not be subject to verification, nuclear archaeology techniques could be used to confirm the accuracy and completeness of the declarations.

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roughly the same degree of accounting as these materials enjoy in non-weapon states. If we can do this, we could reduce to very low levels, and perhaps all the way to zero.

**Steve Fetter**  
**University of Maryland**

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### 3. Existing and Pending Disarmament and Verification Regimes

#### Questions

- **What existing verification bodies and mechanisms will need to be expanded? How?**
- **How should they be coordinated?**
- **Is a new umbrella mechanism necessary?**
- **What is working best about the current regimes?**
- **How can they be built on?**
- **What data-sharing agreements are necessary to balance transparency and confidence with concerns related to non-proliferation and classified information?**

#### Comments

- Implementing the NWC would require a dedicated international organization because of the complexity of monitoring nuclear disarmament and the confidentiality of information involved. With the special sensitivity around nuclear weapons, we need a tighter regime than what we have currently under existing agreements. The OPCW, UN and IAEA have experience in handling confidential information that a NWC could draw on.
- The model NWC could be improved by further exploring the balance between transparency and confidentiality. The Chemical Weapons Convention (CWC), for example, requires that confidential information be submitted in special annexes to state parties declarations.
- The idea of domestic penal legislation was first introduced during the negotiations on the CWC in the Conference on Disarmament. The legally-binding requirement for states parties to pass such legislation can serve as a good model for the NWC.
- The Canadian national authority under the CWC sold the convention to industry by making videos that explained the convention and its benefits.
- Whistleblowers need to be certain that sources of the information they submit is protected. States need to be sure that commercial or other secrets are kept confidential.
- Another relevant novel feature of the CWC is challenge inspections. The purpose was to form a norm of 24-hour notice. This tool has not yet been used, however, possibly because it would be seen as a political insult or could trigger a reciprocal inspection request.
- Under the NWC, the implementing agency's director-general, in addition to states, should have the right and responsibility to initiate a challenge inspection.
- The NWC Technical Secretariat should have a standing inspectorate of professional teams of inspectors. These could undertake routine, randomly chosen, and/or challenge inspections. The Secretariat should also have the capacity and mandate to analyze data from a variety of sources, including open sources.
- The IAEA *could* evolve into an implementing agency for the NWC but there are also advantages in creating a new agency, which could build on US-Russian verification activities.
- The IAEA would be a good institution to implement and verify a fissile materials cutoff treaty, although some believe the IAEA role in promoting nuclear energy is problematic in the context of nuclear disarmament and its verification.
- But the IAEA role is also seen as important because it possesses expertise in monitoring nuclear non-proliferation.

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- Should the NWC agency be free standing or under the aegis of the UN? If under UN auspices there is the question of whether the Security Council veto would affect it. One argument is that nuclear weapon states would have to relinquish their veto in this context.
  - In 1986 Canada submitted a report to the UN General Assembly on verification seeking to define it generally and promote pooling of resources to maximize effectiveness. It noted that verification should help meet the need to institutionalize rules and procedures and should not assume bad faith but provide a framework if non-compliance occurs. The verification process itself, however, does not identify what can or should be done in the event of non-compliance.
  - A conceptual question regarding the verification of a nuclear weapons convention is whether the focus is on verification of the process of destruction of weapons or the post-destruction situation (e.g., South Africa).
  - If the former, then we need to consider how to address the case of a non-nuclear weapon state inspector without violating non-proliferation principles regarding the transfer of knowledge. Inspectors could be present but not actually watch the destruction process, for example.
  - States will probably be reluctant to pay for a new agency, and non-nuclear weapon states might ask why they should pay for disarmament and verification activities. The counter-argument would be that ridding the world of nuclear weapons is in the interest of all states.
  - It might be useful to think in terms of the evolution of an appropriate implementing agency, building the elements even before the completion of a treaty. The elements could include a voluntary register, trial inspections, training of inspectors.
  - The US Department of Energy is recording the history and collecting information about the knowledge, theory, and practice of building nuclear weapons. There should be a similar project to gain confidence in disarmament – information with respect to warheads, PU and HEU inventories. There are very few people left in the US and Russia with information of the history of what has been done.
  - The proposal could be widened to include the oral history of diplomats and officials who have been engaged in these regimes of disarmament negotiation.
  - There is a UN General Assembly resolution calling for a study on non-proliferation and disarmament education. It is hard to assess the prospects of the disarmament regime without looking at education.

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# The Verification and Compliance Regime for a Nuclear Weapon-Free World

Trevor Findlay\*

## Introduction

The verification and compliance regime for a nuclear weapon-free world will need to be more effective than any disarmament regime hitherto envisaged. One hundred per cent verification of compliance with any international arms agreement is highly improbable. However, in the case of nuclear disarmament the security stakes will be so high that states will not agree to disarm and to disavow future acquisition of nuclear weapons unless verification reduces to a minimum the risk of non-compliance.

Similarly, the compliance mechanism must be as compelling as possible, providing a high degree of assurance that any violation will be dealt with firmly and effectively. Both the verification and compliance systems must be able to cope with the most feared threat to complete nuclear disarmament – breakout – where a state party is suddenly revealed to have a previously hidden nuclear arsenal or to have produced new weapons.

Meeting these requirements is a tall order, but not an inconceivable one. For a start, a verification and compliance regime for total nuclear disarmament will not be constructed from scratch. It will build on the practical experience of the disarmament process as it moves towards zero and draw on yet unforeseen developments in the information and technology revolutions. Moreover, the same conjunction of good relationships between major states that will permit the negotiation of a nuclear disarmament treaty will necessarily overcome many of the obstacles, which today seem insurmountable, to the construction of an appropriate verification and compliance system.

## What are verification and compliance?

Verification is the process of gathering, analysing and using information to make a judgement about compliance or non-compliance with an agreement. A compliance mechanism is a process for taking action on the basis of a verification judgement. The aim of verification is to increase confidence that a treaty is being implemented fairly and effectively. It does this by:

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

The effectiveness of verification is a function of the scope of the treaty concerned, the monitoring mechanisms, techniques and technologies used, the credibility of the compliance arrangements and the political and strategic environment in which the treaty operates.

## Verification procedures, techniques and technologies

An array of procedures, techniques and technologies that would be used to verify complete nuclear disarmament has already been identified, researched and evaluated. In some cases they have been already implemented, especially in relation to US/Russian bilateral nuclear arms limitations, the nuclear test ban and nuclear safeguards. Continuing research is needed to ensure that the latest technological advances are incorporated and promising avenues pursued. The long-term aim should be to preclude verification from becoming a negotiating obstacle once the political will to achieve nuclear disarmament emerges.

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## Dismantlement and destruction of declared weapons

Presumably, by the time the transition to complete nuclear disarmament is imminent, the US and Russia will have reduced their arsenals below 1,000 warheads each through a continuing Strategic Arms Reduction Treaties (START) process, non-strategic reductions and limitations and/or unilateral measures. Their remaining weapons are all likely to be considered strategic: tactical weapons, those for battlefield use, will have to have been prohibited and the ban subject to verification (itself a highly challenging undertaking which will set precedents for intrusive verification).<sup>2</sup> Depending on the size of the remaining US and Russian arsenals, the lesser nuclear weapon states (China, France, India, Israel, Pakistan and the UK), all of them by this stage declared, will either have joined in the process or be ready to. The remaining weapons, as zero is approached, will certainly no longer be on alert status or deployed on missiles or aircraft, but kept in secure storage.

The first task of any verification system for a nuclear weapon-free world once this stage is reached will be to verify the dismantlement and destruction of all remaining weapons. This would begin with each possessor state submitting to an international verification organisation (the nature of which remains to be determined) a declaration giving a detailed inventory of its remaining weapons and weapons-grade fissionable material and their location. The weapons and materials would be placed, if this had not already been done, in sealed containers with a unique tamper-proof tag and seal affixed to each warhead and container. Any untagged items subsequently discovered would constitute a treaty violation. The containers would be stored in secure identifiable locations, sometimes referred to as “bonded store,” well away from any potential delivery systems.<sup>3</sup> After declarations had been made, these sites would be monitored permanently by international and national on-site inspectors, supplemented by a range of sensors directly linked by satellite both to the national and international verification organisation. Such a system would be the starting point for verifying the dismantlement and destruction of the weapons. (Some experts have suggested pooling all remaining weapons into a single site under international auspices, although this may be considered a step too far by some nuclear weapon states and too tempting a target for a state with a secret cache of remaining weapons).

Before destruction could begin, the contents of the bonded stores would require authentication to prove that they were not fake. This would have to be done without revealing sensitive design information, particularly to international inspectors from non-nuclear weapon states. Research is underway in the US and UK<sup>4</sup> into infallible authentication techniques based on measurement of radiation emissions and other characteristic signatures.<sup>5</sup> “Fingerprinting techniques” can be used to determine that weapons purportedly of the same type are in fact identical in composition and manufacture.<sup>6</sup>

After authentication, chain-of-custody procedures, like those developed for the 1987 Intermediate-range Nuclear Forces (INF) and the START I and II treaties (1991 and 1993), could be used to monitor the transport of the items to destruction/disposition sites; to verify the dismantling and destruction of weapon components; and to ensure that weapons-grade fissionable material is placed under international safeguards.

As Tom Milne and Henrietta Wilson note, it is conceptually simple to design a dismantling facility with one entrance and one exit. International inspectors would not have access to the inside of the facility, where

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<sup>2</sup> For some states, such as Israel, India and Pakistan, whose likely intended targets are relatively close, warheads designed for short-range systems would be considered “strategic” for arms control purposes.

<sup>3</sup> The following is adapted from Tom Milne and Henrietta Wilson, “Verifying the Transition from Low Levels of Nuclear Weapons to a Nuclear Weapon-Free World” *VERTIC Research Report*, no. 2, June 1999, p. 17 ff.

<sup>4</sup> For information on the nuclear verification research programme of the UK’s Atomic Weapons Establishment at Aldermaston see Gary George and Martin Ley, “Nuclear warhead arms control research at the AWE” *Verification Yearbook 2001*, VERTIC, London, 2001.

<sup>5</sup> See Oleg Bukharin and Kenneth Luongo, “US-Russian Warhead Dismantlement Transparency: The Status, Problems, and Proposals” Princeton University/Center for Energy and Environmental Studies (PU/CEES) report no. 314, April 1999.

<sup>6</sup> Theodore B. Taylor and Lev P. Feoktistov, “Verified Elimination of Nuclear Warheads and Disposition of Contained Nuclear Materials” in Francesco Calogero, Marvin L. Goldberger and Sergei P. Kapitsa (eds), *Verification: Monitoring Disarmament*, Westview Press, Boulder, Co., 1991.

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national personnel would carry out the dismantlement. However, the warheads would be monitored entering the facility and correlated with the warhead “pits” (reformed into shapes that have no security classification) and other components and materials as they came out through the exit. The pits would be placed under international safeguards and removed to internationally monitored storage facilities to await final disposition.<sup>7</sup>

### **Restrictions on delivery systems**

By the time the transition to zero occurs there will presumably be much more stringent limitations or even outright bans on different types of delivery systems – strategic bombers, ballistic and cruise missiles and nuclear-armed submarines – in place between Russia and the US. These will need to be extended to the other nuclear weapon possessors. If outright bans are impossible to negotiate, specific numbers of delivery systems may be permitted for conventional weapon delivery purposes, or in the case of ballistic missiles for space launch purposes, although such exceptions would make verification more difficult. However, since a great deal of experience has already been and will be further accumulated with regard to verifying numbers of deployed strategic bombers and ballistic missiles, universal restrictions or bans on these items could be verifiable with a high degree of confidence. Intrusive on-site inspections in port could ensure that submarines were no longer nuclear-armed.

Banning other delivery systems is more problematic. Non-strategic aircraft can be used to deliver nuclear weapons. Any cruise or short-range missiles permitted for conventional purposes in a nuclear weapon-free world could be relatively easily converted for nuclear use. Similarly, non-conventional means of delivering nuclear weapons (such as in a suitcase or the hold of a ship) would be as impossible to control and verify as they are today. This makes even more important the need for an effective verification system regarding nuclear warheads themselves.

### **Prevention of diversion of fissionable materials to new nuclear weapons production**

Since it is highly unlikely that all use of nuclear materials will be banned in a nuclear weapon-free world, there will continue to be a need for a strong regime of nuclear safeguards to prevent diversion of nuclear materials from peaceful uses to weapons. Such a system would be based on, but be even more stringent than, the strengthened safeguards system currently being implemented by the International Atomic Energy Agency (IAEA).

A safeguards system in a nuclear weapon-free world would need to cover all nuclear material worldwide (civil and military), including all weapons-usable nuclear material, whether in reactors, stockpiles or extracted from dismantled weapons. The amount of material and number of facilities requiring safeguards would therefore increase substantially, compared with today. If weapons-usable materials (plutonium and Highly-Enriched Uranium (HEU)) continued to be permitted for peaceful purposes, primarily in nuclear power and research reactors, the verification task would be much greater than if nuclear reactors were permitted to use only Low-Enriched Uranium (LEU).

In addition, if HEU continued to be used in naval propulsion, special arrangements would need to be made to bring such material under nuclear safeguards. Safeguards should also be extended to uranium mining and milling (currently they only begin when uranium is converted to “yellowcake,” a form suitable for fuel fabrication or enrichment) to ensure that all sources of new fissionable material are accounted for.

Other ways in which safeguards would have to be further strengthened include increasing the intrusiveness of inspections, lowering the quantities and increasing the types of nuclear materials requiring declaration and inspection, and increasing the intelligence and data-handling capacities of the international verification organisation.<sup>8</sup> Some of the most important measures would be the following:

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<sup>7</sup> Milne and Wilson, p. 21.

<sup>8</sup> Adapted from Steve Fetter, “Verifying Nuclear Disarmament” Occasional Paper, no. 29, The Henry L. Stimson Center, Washington DC, Oct. 1996.



- The current “significant quantity” of weapons-usable material considered necessary for producing a nuclear weapon (8 kilograms of plutonium or 25 kilograms of HEU) would have to be lowered to provide greater reassurance.
- Other nuclear materials recently identified as weapons-usable would have to be accorded their own standards.
- The standard for “timely detection” would also have to be revised downward from months to weeks, since former nuclear weapon states could convert diverted material into a fabricated weapon more quickly than non-nuclear weapon states to which the current standard applies.
- All nuclear facilities, whether operating or decommissioned, would have to be monitored continuously and the data transmitted in real-time to the verification headquarters by satellite link.
- Intelligence information of the highest quality would have to be available to the international verification organisation.
- Permanent environmental monitoring, especially around nuclear and nuclear-related facilities, would have to be undertaken, to detect normal as well as accidental releases into the environment
- Import/export regimes will need to be multilateralised, strengthened and universalised.

Finally, the international verification organisation will need the right to conduct virtually no-notice “anytime, anywhere” inspections of any suspect site, an even more intrusive system than that envisaged for the Organization for the Prohibition of Chemical Weapons (OPCW) under the Chemical Weapons Convention (CWC).

#### **Timely detection of research, development and manufacture of new nuclear devices**

This will be one of the most difficult verification tasks in a nuclear weapon-free world, since the facilities required for these activities, unlike those for the illicit production or diversion of fissionable materials, are relatively small and may be relatively easily hidden. Illicit new production is unlikely to be done at old facilities, but at new, specially designed facilities underground or at remote locations.

While random and challenge on-site inspections, aerial monitoring through a co-operative open skies inspection regime and satellite imagery (from an internationally-controlled satellite system) may reduce the risks and increase the costs of such activities to an actual or potential violator, it is difficult to conceive of systematic verification techniques to completely guarantee the detection of such violations.

The possibility of detection may however be enhanced through two means that are external to the formal verification system. One is so-called national technical means (NTM), which refers to verification and monitoring capabilities under individual state control and which include satellite monitoring, electronic eavesdropping, information-gathering and espionage. These will all continue and perhaps intensify in a nuclear weapon-free world. Many states will require the additional assurance that national systems can provide before ratifying a nuclear disarmament convention. While data from such systems may be manipulated and used in a self-serving fashion or be misused politically within the state concerned, such possibilities would be attenuated in a nuclear weapon-free world by the existence of a strong multilateral system with its own independent data collection and analysis capabilities.

The second complement to the official verification system is “societal verification,” which employs civil society, including non-governmental organisations, professional organisations (such as academics, scientists and engineers) and individuals, to monitor the activities of governments and if necessary “blow the whistle.”<sup>9</sup> A nuclear weapons convention should make specific mention of and provision for societal verification. While one could not rely completely on such methods, they certainly add to the complexity of the task facing any would-be violator. Organised societal verification is most feasible in open societies, but even closed societies or open societies with secretive programmes have difficulty in preventing defectors and others from leaking national security information. The cases of Mordechai Vanunu in regard to the Israeli nuclear arsenal, Kamal Hussein in relation to Iraq’s biological weapons programme and various Russian defectors and “whistle-

<sup>9</sup> See Dieter Deiseroth, “Societal verification: wave of the future?” *Verification Yearbook 2000*, VERTIC, London, 2000.

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blowers” are instructive. Cheap and ready access to satellite imagery<sup>10</sup> and the instantaneous capabilities of modern communications greatly increase the possibilities for non-governmental organisations to participate in verification activities.

### **Components of a verification and compliance regime**

The official verification capabilities will likely be organised and managed by a dedicated verification and compliance regime established by and for a nuclear disarmament convention. A Model Convention on the Prohibition of the Development, Testing, Production, Stockpiling, Transfer, Use and Threat of Use of Nuclear Weapons and on their Elimination has already been drafted, one version of which was submitted by Costa Rica to the UN General Assembly in 1997.<sup>11</sup> The regime will be elaborate, intrusive and expensive (compared with current multilateral disarmament agreements, but not compared with the cost of maintaining nuclear arsenals). While the specifics of such a regime are necessarily speculative, standard verification and compliance models for international disarmament agreements are likely to be emulated. The following outline is based on an assumption that there would be a single, universal nuclear disarmament convention which would supersede the Nuclear Non-Proliferation Treaty (NPT), the Comprehensive Nuclear Test Ban Treaty (CTBT) and other nuclear-related treaties.<sup>12</sup>

#### **A Conference of States Parties**

This would comprise representatives of all states parties. Given the importance of nuclear disarmament to all states and the breakout danger, membership will need to be universal. The conference would be the ultimate decision-making body for the treaty, responsible for its overall effectiveness, including compliance by all states parties. The conference would be able to recommend amendments to the treaty, which in this case would have to be binding on all parties. It would be impossible to envisage a nuclear disarmament treaty with selective adherence by states parties to amendments.

#### **Executive Council**

This would be a standing body, comprising a representative selection of states parties, which would be responsible for day-to-day decision-making about the operation of the treaty, particularly its verification and compliance mechanisms. Constantly alert to potential non-compliance with the treaty, it would receive a steady stream of virtually real-time reports from the treaty secretariat based on information from the treaty verification and monitoring system. This would permit the Council to make judgements about compliance and non-compliance. It would also have the power to demand clarification from any state party and an immediate on-site inspection anywhere on the territory of any state party. The Council would ultimately have the power to recommend action in the case of non-compliance, including by referring the matter to the UN Security Council. Finally, the Executive Council could order improvements or adjustments to be made to the verification system as necessary.

All the current nuclear weapon states (both declared and non-declared) would need to be permanent members of the Executive Council, as presumably would all states with a significant “virtual” nuclear weapon capability (that is, the ability to manufacture a nuclear device within a short period by virtue of their industrial and non-military nuclear capabilities and assets<sup>13</sup>). All these states would need to be closely involved and have a strong sense of “ownership” of the regime, since, unlike other disarmament agreements, the existence of only one

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<sup>10</sup> See Bhupendra Jasani, “Remote monitoring from space: the resolution revolution” *Verification Yearbook 2000*, VERTIC, London 2000.

<sup>11</sup> See UN document A/C.1/52/7 and draft convention in Merav Datan and Alyn Ware, *Security and Survival: the Case for a Nuclear Weapons Convention*, International Physicians for the Prevention of Nuclear War, Cambridge, Mass., May 1999.

<sup>12</sup> This would naturally have to be done without damaging these existing treaties (as the CWC was negotiated without damaging the 1925 Geneva Protocol).

<sup>13</sup> For a comprehensive discussion of virtual nuclear capabilities see George Palocz-Horvath, “Virtual Nuclear Capabilities and Deterrence in a World Without Nuclear Weapons”, *VERTIC Research Report*, no. 3, Oct. 1998.

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treaty “holdout” would completely defeat the treaty’s purpose. Hence the Council would be a large body, perhaps needing a small executive sub-organ to make routine decision-making more efficient.

#### **An Organization for the Prohibition of Nuclear Weapons (OPNW)?**

Some such body would be required to establish, administer and operate the international verification and monitoring system for the treaty. It would be staffed by international civil servants and scientific and technical experts and be headed by the equivalent of a Director-General. It would presumably include a large technical secretariat, which would manage the verification system, and an international inspectorate responsible for on-site inspections. A scientific advisory board would also be indispensable. As well as a headquarters, the organisation would presumably need regional offices and offices in all of the former nuclear weapon states and virtual nuclear weapon states in order to liaise closely with national authorities responsible for compliance with the treaty and for peaceful nuclear activities permitted by the treaty. The organisation would either supersede and subsume the IAEA and its nuclear safeguards system or the IAEA itself would become the organisation responsible for verifying complete nuclear disarmament. This organisation would also absorb the Comprehensive Nuclear Test Ban Treaty Organization (CTBTO), since the detection of clandestine nuclear tests would also be an integral part of the OPNW’s verification task.

#### **Arrangements between former nuclear weapon states**

In addition to the international arrangements, there are also likely to be extant arrangements between pairs and groups of former nuclear weapon states, which were established to give them additional mutual reassurance as the nuclear disarmament process proceeded towards zero. These could have been designed to endure indefinitely or only until the multilateral system proved its effectiveness. Such arrangements would include those for the bilateral US/Russia nuclear reduction treaties from START I onwards and any similar arrangements between, for example, China and the US, China and India, India and Pakistan and Israel and its neighbours.

#### **Strengthened Security Council**

As the likely final arbiter in any compliance dispute (as in the case of other multilateral disarmament agreements), and therefore a vital component of any compliance system for a nuclear weapon-free world, the UN Security Council would need to be reformed. It is inconceivable that the current permanent five members, which are all nuclear weapon possessors, could be permitted to veto action against themselves or any other state which violated a nuclear weapon ban. In addition, all the current nuclear weapon states, declared and non-declared, and all the other major powers, most of which are also capable of acquiring nuclear weapons, would have to be represented permanently on the Council. Hence a mix of nuclear and non-nuclear great powers would comprise the permanent members of the Council, helping de-legitimise nuclear weapons, although necessarily continuing to reflect the actual distribution of power in an inegalitarian international system.<sup>14</sup>

#### **The “breakout” problem**

While all the verification techniques and institutional arrangements described above would aim to prevent and/or deter breakout, it could, nonetheless, occur. Although in the abstract such an event might seem cataclysmic, in reality its impact would depend on the particular circumstances: whether the violator then threatened to use such weapon (or weapons) to coerce a neighbour or the international community generally; the state of readiness and deliverability of the purported weapons; the relative conventional military strengths of the violator and the rest of the international community combined; the willingness of the international community to respond; and the existence of defences against whatever delivery system the violator might try to use.

Potential responses to such an event include not only sanctions against a violator – political, economic and military – but guaranteed mutual assistance in the case of threatened or actual nuclear attack. Missile defences

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<sup>14</sup> In addition to the current Permanent Five one could imagine adding, for instance, Brazil, Canada, Germany, Japan, India, Indonesia, Nigeria and South Africa.

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against nuclear attack by ballistic missile and aircraft could decrease the threat for states most concerned about breakout. Perhaps most important would be the residual ability of states to quickly reconstitute a nuclear device or arsenal in order to deter the violator. For the former nuclear weapon states, depending on how long a nuclear weapon-free world had existed, this might amount to only a month or two. The threat could then be countered, albeit at the risk of re-igniting a nuclear arms race. An alternative suggested by some observers is a small deterrent arsenal under international control, although this would raise command and control difficulties and be incompatible with total nuclear disarmament.

Since the achievement of nuclear disarmament would require consensus among the great powers that their relationships had improved so much as to obviate the need for nuclear weapons, the main threat to a nuclear weapon-free world would be a “rogue state” which had not previously produced nuclear weapons. In considering such a case one has to ask what might be the motivation for acquiring an illicit nuclear arsenal. If it were to be used for political purposes, presumably blackmail, the existence of the arsenal would have to be revealed, or at least hinted at, thereby alerting the international community to a major violation of the treaty. A “demonstration shot” would have the same effect (and, humiliatingly, might fail). The possibility of an illicit nuclear weapon being used to alter the course of a major conventional war would be presaged by the outbreak of such a war: efforts would have to be made to prevent any nuclear-capable state being backed into such a corner.

The most worrying scenario would be a “bolt-from-the-blue” pre-emptive strike by the proverbial madman – a nuclear Hitler. Such a rogue state would already be subject to intensified scrutiny by the verification system, including on-site inspections when suspicions were aroused. Any weapon(s) produced would be untested, could not be deployed until the last minute, could probably not be delivered by conventional means, and overt training for use would have been impossible. Such a scenario is of course possible today and in some respects is more likely today given the weakness of existing verification regimes. In the current nuclearised world such an attack is deterred by the certainty of nuclear counter-attack. In a nuclear-free world it would have to be deterred by devastating and increasingly accurate and powerful conventional attack, the credibility of which would be enhanced by mutual guarantees by the great powers to come to any state’s assistance were it to be threatened or attacked with nuclear weapons.

These hypothetical scenarios notwithstanding, what is clear is that neither the technology of verification nor the broader verification and compliance system can solve the breakout problem alone. Verification can never provide complete assurance that a small clandestine nuclear arsenal or hidden cache of plutonium will be discovered. What verification can do is to significantly, albeit unquantifiably, reduce the likelihood of breakout occurring through a mix of deterrence and enhanced warning time through early detection.

#### **Necessary precursors for effectively verifying a nuclear weapon-free world**

Such a dramatic expansion in the scope and intrusiveness of verification as envisaged above will require an iterative process of increasing transparency and confidence-building over many years. In addition to deep cuts by the two largest nuclear weapon states, the US and Russia, all the other nuclear weapon states will need to be drawn into preparing the necessary precursors for a verifiable total nuclear disarmament treaty.

#### **Nuclear transparency**

The sooner transparency can be achieved in relation to numbers, types and deployments of nuclear weapons, delivery systems and holdings of special nuclear materials, the earlier and deeper can confidence be implanted. Transparency about past production of fissionable materials will be particularly challenging since, even with the best intentions, it will be virtually impossible for any nuclear weapon state to give a completely accurate account. The experience of the IAEA in verifying South Africa’s account of its past production, even with a high degree of co-operation from the South African authorities, is salutary. Documentation of past production (“nuclear archaeology”) must begin now, while any glaring discrepancies discovered are not strategically significant and potentially destabilising.

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### **Confidence-building measures**

These should include exchanges by the nuclear weapon possessors on the acceptability of various intrusive verification techniques and growing familiarity with each other's nuclear establishments and facilities through exchanges of visits and co-operative monitoring ventures. This process is likely to begin with the US, UK, France and Russia, but needs to be quickly extended to China, India, Pakistan and Israel.

### **Deepening experience with nuclear and other verification regimes**

A key precursor of a verification system for nuclear disarmament will be the US and Russian experience of verifying deep cuts in START III and beyond, building on their already extensive bilateral experience in verifying the INF and START I and II treaties. The lessons need to be shared with all nuclear weapon states. Multilateral experience in verifying the CWC, the Biological and Toxin Weapons Convention (BTWC) and CTBT, in which all states may participate, will also be germane, particular in regard to on-site inspections and the operation of global multilateral monitoring networks. Valuable lessons have already been learned, including that on-site inspections can be managed in a way that does not reveal security or commercial proprietary information and that some of the concerns that states have prior to negotiating intrusive regimes fall away once implementation occurs and experience grows.

### **Research and development**

Currently the vast bulk of research into verification procedures, techniques and technologies is conducted in the United States. Other nuclear weapon states need to establish their own programmes, not only because they need to be convinced of the capability of various standard verification techniques, but also because they could develop innovative techniques and technologies themselves. The non-nuclear weapon states should also be encouraged to conduct such research, as they did in the case of the CWC and CTBT.

### **Conclusion**

An impressive and reliable verification system can, even on the basis of current knowledge, be constructed to verify with high, albeit unquantifiable, certainty that all parties to a universal nuclear disarmament treaty are complying with their obligations. Verification can increase the risks of detection and consequent political costs to any potential violator, extend the warning time to permit responses to be mounted, as well as fostering mutual trust and confidence among the parties.

The path to such a world, clearly different from our own, but not impracticably idealistic, is an iterative one, through increasing transparency, confidence-building, an evolving attitude towards the utility of nuclear weapons, growing experience with verifiable interim steps towards nuclear disarmament and the gradual involvement of all the nuclear weapon states, both declared and undeclared.

Yet there can be no foolproof guarantee against unexpected "breakout" through the retention of hidden stocks or the manufacture of new ones. This scenario must, however, be seen not just in the context of the verification and compliance systems established specifically for a nuclear disarmament treaty, but in the evolution of the international system between now and then. States will have to have made significant changes in their attitudes towards the limits of sovereignty, the rule of international law and the governance of the international system, particularly in regard to enforcement, for nuclear disarmament to be negotiated.

The attainment of a nuclear weapon-free world is so dependent on such changes that we will only be able to judge its verifiability as we become seriously engaged in moving towards that world. In doing so we need to ponder whether a world with seven declared, one undeclared and numerous potential nuclear weapon states is safer than a denuclearised world with a strong international verification system and the remote chance of nuclear "breakout."

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## 4. Considerations of Complete Nuclear Disarmament: Materials, Facilities, Warheads, and Delivery Systems

### Questions

- **What are the elements of a regime to verify a ban on fissile materials for weapons purposes?**
- **What materials, in what forms, should be subject to verification?**
- **Who should have access to this information?**
- **How intrusive should the verification regime be?**
- **What combination of sensors, inspections (systematic and challenge), and data-sharing is optimal to balance confidence-building with certainty and efficiency?**
- **What nuclear facilities must be subject to verification?**
- **How inclusive should control over delivery systems be?**
- **What existing verification mechanisms are applicable and what must be developed?**

### Comments

- Nuclear weapons materials exist in many forms and their properties vary. By far the largest quantities are inside weapons or held for military purposes, naval fuel, considered excess, or declared excess. Smaller quantities have already been disposed of, are under IAEA or Euratom safeguards, or civilian owned. (See chart, p. 21)
- It will be a great challenge to take inventories of the military stocks and materials declared excess, adapt facilities to material protection, control, and accounting (MPC&A), and establish safeguards. (See chart, p. 23.)
- Efforts to increase the security of fissile materials can include both voluntary activities and internationally binding commitments, building on existing and pending measures. (See chart, p. 25.)
- We need internationally agreed standards for MPC&A and better standards for export control. Only if we have all of these can we properly address the question whether we need an umbrella agency.
- The following facilities should be subject to verification: Facilities which can produce nuclear materials, facilities which can handle or fabricate nuclear components or can transform components back into fissile materials, civil facilities which can fabricate fissile materials into fuel, and assembly/disassembly facilities where components are assembled or disassembled into warheads. It is probably not feasible to subject command and control facilities to safeguards.
- The focus of verification would be on fissile material. It might not be necessary or possible to include certain other materials suggested in the model NWC (e.g., fusionable material).
- Sensors are good for measuring static objects, e.g., a complex that has been shut down.
- A combination of technology and sampling would make it technically possible to identify warhead components without reference to the design information. After dismantlement inspectors would confirm fingerprints of warheads, which would then be sealed and stored. The ideal system would include information on type, status, serial numbers (if possible) arming and fusing of components. The technologies already exist so getting official agreement on tagging objects/warheads should not be difficult.
- A focus under the INF on delivery vehicles rather than warheads would have required an intrusiveness that was not possible during the Cold War.

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- Once we are agreed on the verification for warheads and fissile materials we would need confidence that dismantlement and irreversible destruction of warheads were taking place. This would require declarations of stockpiles, dismantling of warheads, and transparency with respect to fissile materials stockpiles.
  - In addition, verification will require data on operational facilities, inspections, and bar-coding warheads and components (for accounting purposes). It is also important to authenticate the nuclear weapons to be dismantled (to make sure they are real), then confirm that they are dismantled and put the parts in storage pending destruction.
  - A prohibition on the manufacture of new warheads requires closure of warhead production sites – or their conversion into destruction sites – and continuous monitoring.
  - Today a lot of money is put into routine activities that are not necessarily expected to yield new information. Fewer inspections of a more random nature might be preferable.
  - Real nuclear disarmament also requires a stronger commitment to transparency and to legal and technical irreversibility, a culture that motivates individuals to comply with disarmament and to resist – and report – non-compliance, the possibility of enforcing clarifications, international trust, and unexaggerated publication of verification results.
  - Given the lack of media attention to the requirements, costs, and benefits of complete nuclear disarmament, it is not surprising that parliaments do not deal with it and that commitments for financing are low.
  - Control of delivery vehicles is a minor point within the model NWC. Further development of this issue would be helpful. Control of delivery systems, however, is only part of what is necessary. It will also be necessary to destroy delivery vehicles that can only be used for nuclear weapons.
  - There is time for political development in this area since the supposed missile threat does not yet exist and NMD has not yet been implemented. Over the long term we will need global missile disarmament but we should start with a moratorium, improved export control, and data exchange.
  - Specifically, immediate possibilities are to delay or prevent missile production and testing, and to establish regional ballistic missile free zones. Verification requirements depend on the precise activity, but there are a number of current systems that can be used for verification.
  - Capabilities for remote sensing are improving and disarmament will require more investment and technical progress. It will be necessary to determine what type of rockets are being tested and whether they are banned or allowed. Onsite inspections will also be important.
  - A missile control regime would have links to space based arms control. Thought should be given to integrating missile control and space arms control efforts.
  - Regarding breakout – the question of secret stockpiles of nuclear weapons or a secret development program – we have two possibilities: A world with a treaty regime or a world without a treaty regime. We would be better off with a treaty and mechanisms for dealing with breakout than with poor capability to detect secret stockpiles and programs.

## Nuclear weapons usable fissile materials

Figures in tons

	USA	Russia	UK	France	China	India	Pak	Israel	NNWS	total
<b>Inside weapons, military purpose, or considered excess</b>										
Pu	47.5	100	3.2	5	4	0.31	0.005	0.51	-	160
HEU	635	470	15	24	20	Small	0.69	?	-	1165
<b>Declared excess</b>										
Pu	52.5	34	4.4	0	0	0	0	0	-	91
HEU	174.3	500	0	0	0	0	0	0	-	674
<b>Under IAEA safeguards</b>										
Pu	2	0	0.1	0	0	0	0	0	-	2.1
HEU	10	0	0	0	0	0	0	0	-	10
<b>Already disposed of</b>										
Pu	0	0								0
HEU	0	96								96
<b>Civilian (owned)</b>										
Pu separated	4-5	30.3	59.8	40.3	0	0.7			59.4	195
HEU*	5 - 10		~ 9 under IAEA safeguards, country figures not published							16 - 22

Major source: ISIS- Website [www.isis-online.org](http://www.isis-online.org)  
 \* Albright/ Berkhout/Walker 1996

Additional materials:  
 Naval fuel, figures unknown (hundreds of tons)  
 Pu in spent fuel: 1.275 t

- Annette Schaper: Weapons usable fissile material, Ottawa, January 10-11, 2002



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## **Why should universal safeguards be a goal?**

- In NNWS, international safeguards have triggered high standards of MPC&A.
- They create transparency and thereby confidence.
- Safeguards serve nonproliferation not only at the receiving but also at the supplying end.
- How can India, Pakistan, or Israel be motivated to accept safeguards if the NWS don't?
- Complaints because of discrimination in NNWS will stop.
- International verification is on the agenda anyway: trilateral initiative, FMCT, further reductions, future arms control.
- They will prepare the grounds for the verification of a nuclear weapon-free world.

## **How to raise the probability for early suspicions?**

### **Activities in former NWS and in NNWS**

- Commitment for transparency (production histories, voluntary declarations ...)
  - Full exploitation of all technical and other possibilities for verification (including NTM and "other information")
  - Culture that motivates individuals to comply and to resist non-compliance (democracy, free press ...)
  - Possibility of enforcing clarification
  - International trust, unexaggerated evaluation of verification results
- Annette Schaper: Weapons usable fissile material  
Ottawa, January 10-11, 2002

## Properties of weapons usable fissile material

Category	Quant.	Type	Control properties	Safeguards	Owner	Problems
Inside weapons, military purpose, naval fuel, or considered excess	By far the largest		<ul style="list-style-type: none"> <li>• multiplicity of forms</li> <li>• many un-known locations</li> </ul>	no safe-guards	a few countries	<b>great challenge:</b> <ul style="list-style-type: none"> <li>• inventories must be taken</li> <li>• facilities adapted to MPC&amp;A,</li> <li>• safeguards,</li> <li>• specific technical problems</li> </ul>
Declared excess			<ul style="list-style-type: none"> <li>• inventory inherently complex</li> <li>• uncomplete production records</li> </ul>			
Already disposed of	smaller quantities	Most is HEU, weapon grade	<ul style="list-style-type: none"> <li>• small number of forms,</li> </ul>			
Under IAEA safeguards			<ul style="list-style-type: none"> <li>• well known locations</li> <li>• technically unproblematic</li> </ul>			
Civilian (owned)			<ul style="list-style-type: none"> <li>• high standards of MPC&amp;A</li> </ul>			

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## **Excess weapon materials under IAEA safeguards?**

- **Statement issued at the G8 summit in Moscow 1996:**

"We pledge our support for efforts to ensure that all sensitive nuclear material (separated plutonium and highly enriched uranium) designated as not intended for use for meeting defence requirements is safely stored, protected and placed under IAEA safeguards as soon as is practicable to do so."

- **Guidelines for the Management of Plutonium 1997:**

"These guidelines apply to the management of all plutonium in all peaceful nuclear activities, and to other plutonium after it has been designated by the Government concerned as no longer required for defence purposes."

- **NWS at the NPT Review Conference in May 2000:**

"We are committed to placing as soon as practicable fissile materials designated by each of us as no longer required for defence purposes under the International Atomic Energy Agency (IAEA) or other relevant international verification."

- **EU Council at the NPT Review Conference:**

"...calling on nuclear weapon States, as agreed at the Moscow G7/P8 Summit on Nuclear Safety on 19 and 20 April 1996 to place fissile material designated as no longer required for defence purposes under appropriate international safeguards and physical protection."

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## Increasing the security of fissile materials

Category	existing, nonexisting (and partly existing) voluntary measures	internationally binding commitments
<p><b>Military:</b></p> <p>Inside weapons, military purpose, naval fuel, considered excess, declared excess, already disposed of, under IAEA safeguards</p>	<ul style="list-style-type: none"> <li>• halt production: NWS have stopped Ind, Pak, Isr ongoing</li> <li>• create transparency: publish inventories &amp; future policy plans US, UK published Pu inventories</li> <li>• dispose of materials: HEU disposition started Pu disposition attempt failed so far</li> <li>• verify disposition and non-military use: negotiations on trilateral initiative</li> <li>• improve MPC&amp;A: CTR intensify international efforts</li> <li>• convert naval reactors</li> </ul>	<ul style="list-style-type: none"> <li>• Fissile Material Cutoff Treaty</li> <li>• International Fissile Materials Register with the UN</li> <li>• International Nuclear Weapons Register with the UN</li> <li>• U.S.-Russian agreement on the disposition of excess weapons Pu implementation pending financing</li> <li>• Internationally agreed standards for MPC&amp;A</li> <li>• Convention on the Physical Protection of Nuclear Material (only international transports)</li> <li>• Internationally agreed standards for export controls</li> </ul>
<p><b>Civilian</b></p>	<ul style="list-style-type: none"> <li>• phase out Pu use, diminish stocks of existing separated Pu</li> <li>• stop HEU production and civilian use</li> </ul>	<ul style="list-style-type: none"> <li>• NPT</li> <li>• INFCIRC/153</li> <li>• Additional Protocol (I/540)</li> <li>• Guidelines of Pu management (I/549)</li> <li>• Euratom Treaty</li> </ul>

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## Nuclear Disarmament and the International Control of Delivery Systems

Jürgen Scheffran\*

While many countries have agreed to eliminate biological and chemical weapons in the Biological Weapons Convention (BWC) and the Chemical Weapons Convention (CWC), and also pledged in the Non-Proliferation Treaty (NPT) to forgo or eliminate nuclear weapons, there is still no multinational treaty restricting the development and use of delivery systems. Although the NPT preamble emphasizes “the elimination from national arsenals of nuclear weapons and the means of their delivery pursuant to a Treaty on general and complete disarmament under strict and effective international control,” the NPT does not further specify how this ultimate goal could be achieved for delivery systems.

The proliferation of delivery systems is one of the critically important issues related to the overall nuclear non-proliferation agenda. Delivery systems are an important part of weapons of mass destruction (WMD), in particular, nuclear weapons. Appropriate means of delivery are required to transport a nuclear weapon from its storage or deployment area to its target in a “militarily useful” way. Sophisticated delivery systems are costly and difficult to produce, and in many cases are the most visible part of a nuclear weapon. Therefore, the control of nuclear-capable delivery systems would be an important step toward making nuclear weapons useless and reduce the threat of their use. This is especially true for ballistic missiles, which represent effective and powerful means to deploy nuclear weapons.

The new world situation has rendered the huge missile arsenals of the Cold War increasingly irrelevant and improved the conditions for effective missile controls. To reduce the missile threat and prevent destabilizing military reactions to missile proliferation such as ballistic missile defense, adequate control measures must be found. To transform the current situation into the long-term vision, not only the goal needs to be analyzed and defined, but also the current situation and the path connecting both. The agenda for moving towards a NFWF includes measures to control nuclear-capable delivery systems.

Restricting the means for delivery of WMD is essential to reduce the threat posed by such weapons. Effective control is complicated by the fact that a variety of delivery systems could potentially be used. This includes rather sophisticated delivery systems like ballistic missiles, airplanes, cruise missiles, drones, and artillery, as well as a wide range of “low-technology” delivery systems – such as civilian cars, aircraft, ships or even suitcases – which can transport nuclear or other payloads. While control in the first category could effectively restrict the military value of WMD, control in the second category would have only a minor effect compared to the enormous efforts necessary. Therefore, it is reasonable to focus control on delivery systems which are explicitly designed for their military purpose and to deal with the residual risk of low-tech means of delivery by other measures.

In the first category of specially designed delivery systems, experts emphasize the priority for control of the various delivery systems differently. Most attention has been focused so far on ballistic missiles, but for some observers the military effectiveness of ballistic missiles has been exaggerated compared to aircraft. According to a 1991 study of the Center for International Security and Arms Control, “modern aircraft are, indeed, very capable and cost-effective alternatives for ground-missions.” Compared to ballistic missiles, combat aircraft with equivalent capabilities are widely distributed across the globe. There are only a few hundred ballistic missiles with ranges beyond 300 km in the hands of developing countries, compared with many thousand military aircraft beyond this range. A growing number of countries have indigenous design and production capabilities, and a range of first-rate aircraft are for sale in the international marketplace.

Although the proliferation of land-attack cruise missiles is still at a very early stage, cruise missiles potentially pose a proliferation threat comparable to that of ballistic missiles and attack aircraft, and are deserving of more non-proliferation efforts. Cruise missiles could be easier to build than advanced attack aircraft or ballistic

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missiles, do not require highly trained pilots nor do they place pilots at risk, could be less vulnerable than airplanes to preemptive or suppressive attacks, and are potentially very inexpensive compared to both ballistic missiles and attack aircraft. Using Global Positioning Satellite (GPS) guidance information, cruise missiles are potentially highly accurate (roughly 50 meters) and thus could be more destructive as conventional weapons – against valuable targets such as the World Trade Center or nuclear power plants – than inaccurate ballistic missiles with some WMD capability.

Compared to other nuclear capable delivery platforms, submarines can operate covertly, so that it is very difficult to monitor their location continuously. Due to their stealth, long range (more than 10,000 miles), and ability to operate submerged for extended periods, submarines are potentially able to launch strategic or tactical nuclear weapons from close to the territory of an adversary. During the Cold War, nuclear weapons were widely deployed on nuclear powered submarines. Although non-nuclear weapon states and “threshold” states do not possess such nuclear-powered submarines, it is possible that modern conventional-powered submarines could play a decisive role in future military conflicts.

In light of the variety of potential delivery systems for WMD, the present control regime is insufficient. The dominant approaches are export control by the major suppliers of delivery systems and bilateral arms control and disarmament of the former superpowers (INF Treaty, START Treaties). The current approach to curbing missile proliferation is the Missile Technology Control Regime (MTCR), which was initiated in 1987 with seven members. MTCR membership has grown to 32 countries. Although the MTCR has been successful in creating an international norm against missile exports and has delayed some missile programs, more significant accomplishments are impeded by problems and shortcomings.

Because of these major deficiencies, supply-side controls need to be complemented or replaced by more cooperative, demand-side solutions that go beyond the MTCR. The most effective strategy against proliferation is to create an international norm against WMD by convincing all states, without exception, to forgo the option of having WMD and related delivery systems. Appropriate measures include not only barriers such as export controls but global and regional disarmament, arms control and conflict resolution measures, security incentives as well as international economic and technology cooperation in exchange for giving up WMD.

Regional approaches for arms control could include such CBMs as launch notification and exchanges of information, including establishment of data centers; conversion programs; common seminars on military forces and strategy; regional flight test bans; a freeze on research and development of missile technologies for military purposes. The importance of regional approaches to disarmament and confidence-building was demonstrated in South America (Argentina and Brazil).

Since the different types of delivery systems are closely interrelated, it is insufficient to restrict control only to one means of delivery. As has been outlined in the 1995 INESAP Study “Beyond the NPT,”<sup>15</sup> an integrated approach is necessary that goes beyond the present regime. According to this study, a number of possible measures for limiting systems that could be used for nuclear delivery, could complement and facilitate the elimination of nuclear weapons:

1. The ballistic missile threat would be removed most effectively by the elimination of ballistic missiles, as has been suggested in 1992 by the Federation of American Scientists with the Zero Ballistic Missile (ZBM) regime. A Flight Test Ban (FTB) for ballistic missiles would be an initial step in stopping the development of new missile types. An international control body could be set up to verify that space technology is not used for the development and production of ballistic missiles.
2. Cruise missile non-proliferation efforts, such as the MTCR, should be continued and, if possible, expanded. However, it may be necessary to adopt arms control approaches that deal with the similarities

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<sup>15</sup> *Beyond the NPT – A Nuclear Weapon Free World*, Report of the INESAP Study Group, New York/Darmstadt, April 1995.

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between attack aircraft and cruise missiles, and between their underlying technology bases. Verification is difficult but not an insurmountable problem, as the INF Treaty proved.

3. To prevent military aircraft proliferation, states could include limits on the numbers and capabilities of military aircraft in their regional arms control regimes. A global ban on new types of combat aircraft would prevent both vertical and horizontal proliferation in a non-discriminatory way but due to the heavy involvement of such aircraft in conventional warfare all over the world such an attempt is currently unrealistic.
4. To address the possibility that nuclear weapons could be deployed much more widely on submarines, a first step would be the creation of an international control regime, similar to the MTCR, focusing on technologies critical for advanced submarines. Joint naval task groups operated by the UN could monitor, and if necessary, control the operation of diesel submarines during crises.

Diplomatic initiatives are required to reduce the role of delivery systems in critical regions (Northeast Asia, South Asia, Middle East) and to develop an international norm against them some of them.

#### **Building an International Norm Against Ballistic Missiles**

The most immediate candidate for control of delivery systems are ballistic missiles, which are perceived as especially threatening and provoke the development of ballistic missile defense systems. As the dangers of an offense-defence missile race become imminent, the need for an international initiative to control ballistic missiles becomes more urgent and leads to a number of potentially significant initiatives:

- In recent years, the MTCR member states committed themselves to “responsible missile behaviour” and agreed on a Draft International Code of Conduct Against Ballistic Missile Proliferation, that would improve openness about development and testing, including voluntary commitments.
- A related initiative is the Russian proposal for a Global Control System for the non-proliferation of missiles and missile technology. Launched in 1999 and further explored at expert level meetings in Moscow in March 2000 and February this year, the proposal acknowledges the security concerns raised by missile programmes and the need for security assurances. A Global Monitoring System would increase transparency with regard to missile launches and reduce the risk of miscalculation or misunderstanding.
- A breakthrough in transparency arrangements was achieved with the establishment of the Joint Data Exchange Centre in Moscow, staffed by military personnel from the US and Russia. Signed on December 16, 2000, the US-Russian Memorandum of Understanding on Notification of Missile Launches provides for pre- and post-launch notification of all ballistic missile tests and space launches, as well as notification of failed satellite launches. Other countries can join the agreement. After Bush took office, the fate of the agreement is in jeopardy.
- In 2000, Iran introduced a UN resolution on missiles which emphasized the “need for a comprehensive approach towards missiles, in a balanced and non-discriminatory manner, as a contribution to international peace and security.” It requests the Secretary-General, with the assistance of a panel of governmental experts, to prepare in 2002 a report on missiles in all its aspects.

#### **Verification**

A crucial aspect in the international control and disarmament of delivery systems is verification. To exemplify the possibilities and problems, the case of verifying ballistic missile disarmament is used.

National or international technical means of verification could focus on observable rocket characteristics (number, size, range, payload, deployment mode, launch preparations, flight trajectory), which provide indications of rocket type and performance. Much of the missile-program infrastructure – such as production facilities, test ranges, tracking and communication facilities, missile containers and missile-carrying vehicles - is highly visible. The biggest complication might be the dual-use of ballistic missiles and Space Launch

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Vehicles (SLVs). Differentiating between both rocket types is difficult, since much of the technology is easily convertible. However, some functional differences and operational characteristics could be used to improve distinction, such as differences in the basing mode, the testing procedures, the payload, flight trajectory, guidance systems and re-entry.

A variety of technical and non-technical means of verification exist to monitor ballistic missiles and their elimination. Remote sensing in the visible, infra-red or radar spectra, based on satellites, aircraft or on the ground, allows observation of missiles and the related launch and test facilities. Some of the verification tasks can be performed by commercial satellites, which are becoming increasingly cheap and efficient. Reconnaissance overflights (under the Open Skies regime) provide an alternative to satellite monitoring for many countries and can even supply superior information. During testing and training, a rocket communicates with its operators by sending and receiving telemetry signals which can be intercepted by receivers on ground stations, vehicles and satellites. Non-encrypted telemetry provides the necessary information on missile characteristics.

To ensure adequate verification of ballistic missile elimination regimes, technical means of verification need to be accompanied by inspections. As the experiences of the UN Special Commission (UNSCOM) inspections in Iraq have shown, a regime of unimpeded fast access to suspect sites is required to detect evidence of non-compliance. Verification problems are much easier to solve when states cooperate and are willing to exchange information. Systematic inspections of all ballistic-missile-related sites can provide basic information on an initial balance. Random short-notice inspections of declared sites should be augmented by a system of challenge inspections to undeclared sites. Pre-launch inspections would ensure that no undesired payload is used.

To determine the basic payload type – in particular, to detect re-entry vehicles at the front of a rocket - without disclosing proprietary information, non-intrusive devices and techniques can be applied, such as scanning and radiographic devices. Ground-based equipment for different regions of the radiation spectrum could be mutually complementary: nuclear radiation detection could search for alpha, beta and gamma decay, indicating nuclear materials. Neutron detection would exhibit information about the types of materials used, in particular whether they include explosives. X-ray equipment could provide basic design information while preventing violation of commercial interests. In case of suspicion, more precise x-ray detection, computer tomography or – in exceptional cases – the opening of the payload in the presence of inspectors could remove uncertainties about non-compliance.

Under a comprehensive space-launch notification agreement and missile flight test ban, any non-controlled space launch would be prohibited, and the detection of any rockets outside of agreed launch pads would indicate a violation. To limit the risk of undetected activities, it would be particularly important to implement measures that prevent the transformation of space launch technology for ballistic missiles. A safeguards system for space launchers could place some of the “most critical” items under supervision by an international organization. International cooperation in civilian space programmes would also be important for containing the use of space technology for missile development.

Citizens and non-governmental organizations can play an important role in promoting, implementing and verifying missile control and disarmament. Societal verification is essential to increase the risk of detection for those who secretly build a missile capability. In order to increase public awareness, a greater public discourse on the missile problem and its resolution is required. By building a network of information exchange and debate, experts, civil society and officials could be jointly engaged in this process. Activities could include meetings and conferences involving scientists and technicians, as well as protests at, and attempts to conduct citizen inspections of, critical facilities.

**Jürgen Scheffran**  
**International Network of Engineers and Scientists Against Proliferation**



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## 5. Legal and Structural Aspects of Nuclear Disarmament: Compliance, Implementation, and Societal Verification

### Questions

- What are the essential elements of a legal regime to enforce state compliance with an obligation of non-possession of nuclear weapons?
- What types of peaceful collective measures would be effective for this purpose?
- What are the essential elements of national implementation?
- How do these correspond to a legal regime that provides for effective and fair criminal prosecution of individual violators of basic norms of non-possession of nuclear weapons?
- What will be the role of societal verification?
- Should individuals be required to report violations of the disarmament regime?
- What are the essential elements of a legal regime that protects individual whistleblowers at both the national and international levels?
- What protections could a state offer citizens reporting on suspected violations by employers?
- Should there be transnational protection arrangements for individuals who report violations by states?
- What expertise and skills base must be developed to enable the implementation of a universal disarmament regime?
- What existing or new areas of research must be developed or expanded?

### Comments

- The model NWC envisions a security regime based on incentives for compliance, good faith, and institutionalizing the norm of non-possession of nuclear weapons. It suggests assistance to those states that want to move away from the use of nuclear energy, sanctions for non-compliance, and measures to seek clarification and settle disputes.
- It has been suggested elsewhere that the Security Council could agree not to use the veto with respect to weapons of mass destruction. Some argue this would require Security Council reform, including wider representation and no veto.
- Universal jurisdiction for individual violations of NWC and “prosecute or extradite” provisions should also be considered.
- In the negotiations for the International Criminal Court proposals to prohibit the use of WMD explicitly and classify their use as a war crime were rejected. Nuclear weapons could still be considered prohibited under general prohibitions even though there is no express prohibition. If the NWC were to prohibit the development of and possession of nuclear weapons – possessors could be prosecuted nationally even if only users could be prosecuted under the ICC treaty.
- The compliance process is a graduated process with an international verification system to engage states in implementation. In the CWC there are mechanisms for the evaluation of compliance but under the model NWC it is not clear whether states or the executive council carry primary responsibility for ongoing evaluation efforts.
- Sanctions are a key method for enforcement. To induce compliance, nationals of a delinquent state party could be expelled from the secretariat, and the right to call for a challenge inspection or to vote

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could be withdrawn, for example. Sanctions should target the individual members of the ruling elite rather than the whole state.

- Societal verification and civil monitoring are very important to enhance trust. There are civilian monitoring and verification aspects to the CTBT.
- The model NWC suggests protecting whistleblowers. In the US protections have been moderately effective – returning whistleblowers to the job and awarding them damages. It is feasible to make this protection under the NWC part of national law.
- With respect to societal verification, a main concern is confidentiality or protection of persons working in the nuclear weapons complex, if they are required to report violations. One way around this is to have a box in which all employees could leave pertinent information without disclosing their identity.
- Nuclear weapons development is a social process and part of a social system. We need to make nuclear weapons development illegal and societal reporting legal. Today whistleblowers are punished and we can only support them through international protest. Instead it should be a duty of citizens to report violations.
- We need to dispel the notion that nuclear weapons are needed to address breakout. Having nuclear weapons in the first place reinforces the idea that they are valuable.
- With respect to citizens who might be “disappeared” it would be necessary to pressure states through protests, publicity, and creation of international awareness. The model NWC gives a lot of protection to whistleblowers, but there would be the problem of states with no independent judiciary.
- Societal verification could work in totalitarian regimes, but people run higher risks. If you give rights to individuals, you also need to educate the whole society (schools, scientists) regarding arms control, non-proliferation, disarmament, and verification.
- A problem with societal verification is that it increases the openness of the nuclear complex. This could contribute to proliferation of information with respect to nuclear weapons if it is not properly protected.
- Many of the requirements and conditions of nuclear disarmament can only ultimately be resolved by self-policing and societal verification. Progress on these will give governments the confidence to move towards a nuclear weapon free world.
- There is a role for NGOs with technical and other expertise to develop verification criteria and technology which governments would find hard to ignore.
- Compliance can be considered along a ladder of graduated measures:
  1. International Verification System
  2. Circulation of Inspection Reports
  3. Process of Clarification
  4. Evaluation of Compliance
  5. Requests for Rectification
  6. Measures to Redress, Including Sanctions
  7. Referral to the UN
  8. Economic Incentives and Disincentives

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## Legal Aspects of a Nuclear Weapons Convention

John Burroughs and Andrea Pistocchi\*

At the outset of the nuclear age, what might be called a vertical model of a regime of non-possession of nuclear weapons was popular. The emphasis was on coercion and on international control of nuclear materials. The underlying framework was that of world government. Fifty years later, while retaining vertical elements, the model Nuclear Weapons Convention (NWC) places more emphasis on horizontal elements.

Horizontal elements include a process of development and entrenchment of a norm of non-possession within national societies and governments. This would go hand in hand with the cultivation of greater respect than now exists for the role of international law and institutions in building global security. Related to this, there is an assumption that states' conduct typically (not always) is guided by good faith and commitment to international cooperation. There is also some reliance on voluntarism and incentives. Notably, states can choose to agree to an optional protocol to the model NWC prohibiting the possession of nuclear reactors. In so doing, they would be obligated to provide assistance to states moving away from dependence on nuclear energy. The idea is to promote decreased use of nuclear technology which provides a foundation for weapons programs.

The model NWC also contains elements of coercion and vertical control, by providing for sanctions for non-compliance to be imposed by the Conference of States Parties or, in serious and urgent cases, the UN General Assembly and Security Council. The Security Council would have the authority under the UN Charter to direct use of force against non-complying states in situations posing a threat to the peace. Given that the permanent members of the Security Council are now also the five NPT-declared nuclear weapon states, increasing the legitimacy of the Security Council through wider representation and/or a restricted veto would be a highly appropriate, perhaps necessary, complement to the creation and sustaining of a nuclear weapon free world. For the Security Council to be able to act effectively with respect to non-permanent members violating the NWC, it will need to be seen as a voice and instrument of the entire international community. This means that it must be more representative, and also that it be able, at least in principle, to act vis a vis the permanent members if necessary.

In its early phases, however, the NWC would likely also be based on two power-related factors. First, for most states, their compliance in part would be based on the expectation that the most powerful states, especially the former nuclear weapon states, simply would not allow them to acquire nuclear weapons. This indeed is already the situation under the NPT, and the dynamic would be boosted in a nuclear-weapon-free world because the most powerful states would have a much greater interest in preventing other states from acquiring nuclear weapons.

Second, for the most powerful states, their compliance would be based in good part, not on sanctions or use of force applicable to non-compliance or incentives for compliance provided by the NWC regime, but rather on their assessment that their security interests are better served by a world in which no state has nuclear weapons. Further, the option of renuclearization in response to another state's renuclearization would remain in the background. Over the longer term, as the norm of non-possession becomes thoroughly entrenched and NWC and other international institutions strengthen, these power-related factors would recede in significance.

The preference embodied in the model NWC for a framework of states cooperating through international institutions rather than a framework of world government is found in a wide range of present-day international initiatives. Thus the Organization for the Prohibition of Chemical Weapons monitors states' implementation of

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\*These comments are based on a presentation by John Burroughs to the Ottawa Roundtable on Legal and Technical Aspects of Complete Nuclear Disarmament, January 10-11, 2002, as well as research by Andrea Pistocchi. John Burroughs is the executive director of the Lawyers' Committee on Nuclear Policy, New York, (US affiliate of the International Association of Lawyers Against Nuclear Arms), and Andrea Pistocchi is an intern with the UN Office of Physicians for Social Responsibility and the International Physicians for the Prevention of Nuclear War.

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their obligation of non-possession under the Chemical Weapons Convention, but does not own or control dangerous chemicals. An outstanding example of sophisticated integration of national and international measures is the newly established International Criminal Court (ICC). Under the principle of complementarity, the ICC prosecutes alleged perpetrators of genocide, crimes against humanity, or war crimes only when a national legal system has proved unable or unwilling to do so.

#### **Peaceful collective measures**

In an effective compliance regime, peaceful collective measures can include “carrots” (incentives or rewards for participation and compliance) and “sticks” (disincentives or sanctions for non-compliance). Regarding incentives, as already mentioned an optional protocol to the model NWC promotes discontinuance of reliance on nuclear technology and assistance with development of non-nuclear energy sources. The model NWC can be improved, discussion at the Ottawa Roundtable indicated, by development of other kinds of incentives.

Regarding sanctions, it is often overlooked that simple condemnation, by the Conference of States Parties, the General Assembly, or the Security Council, can be powerful because it sets in motion negative political and economic consequence resulting naturally from the diminution of a state's reputation. In addition to condemnation, the model NWC provides that the Conference of States Parties can impose sanctions, and identifies suspension of assistance with non-military nuclear activities as one such measure. Other sanctions related directly to the NWC regime could include, for example, suspension of the right of participation in the Conference of States Parties or (where applicable) the Executive Council.

The Conference likely could also lawfully call for states to impose economic sanctions, *e.g.* commodity embargoes, or diplomatic sanctions, *e.g.* closure of embassies. Sanctions can also be called for by the General Assembly, or mandated by the Security Council. Sanctions can range from relatively limited measures, like restrictions on flights in and out of a country or arms embargoes, to far-reaching ones that may dramatically impact a country's economy and society, like embargoes on key commodities. Increasingly it is understood that sanctions can be targeted at a country's leadership or elite, for instance by freezing or seizure of individuals' foreign bank accounts, or restricting flights, a measure which mostly affects the elite.

#### **National implementation and fair criminal prosecution**

The model NWC requires States to adopt national legislation implementing the obligations of the Convention. This includes making legislative provision for the prosecution of individual violators of the Convention, and for non-nationals, extradition to the state of nationality. If crimes relating specifically to nuclear weapons are included in the ICC Statute, accused persons could also be surrendered to the ICC for prosecution. However, there are no such specific provisions in the ICC Statute at present, and if later included on the present ICC model, they would concern only use and attempted use of nuclear weapons, not their research, development, or possession.

It is worth considering whether a treaty regime can be constructed under which states are required to prosecute or extradite persons suspected of participating in the research, development, possession, threat or use of nuclear, chemical and biological weapons, and perhaps other weapons like landmines or space-based ground-strike weapons that inflict mass or indiscriminate destruction. Proposals have already been made for a biological weapons regime along these lines. Extradition could be to other states which have a basis for prosecution, or to the ICC or other international tribunal if such crimes were built into their statutes.

#### **Societal verification and whistleblowers**

An enormous amount of information, especially but not only in the United States, has found its way into the public realm regarding nuclear arsenals, due to the dedicated work of researchers, the willingness of some government officials and scientists to take risks, and governmental openness policies. In the United States whistleblowers have found some protection, including payment of damages and the opportunity to return to their jobs, when reporting on health, safety and environmental concerns relating to nuclear activities. This is in large part to the efforts of non-governmental watchdog groups. Nonetheless, it remains the case that disclosure of information regarding nuclear weapons is risky because it may be found to violate laws protecting secret or

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confidential information Those working in military sectors, however, are generally bound by secrecy laws and there are severe penalties provided for violations. In the United States, for example, nuclear weapon scientists are bound by these codes until their death.

The model NWC creates a different paradigm, shifting the balance between individuals and their governments. This is because the drafters judge that whistleblowing – reporting violations of the Convention’s obligations – at the heart of "societal verification" of compliance with disarmament requirements, and societal verification in turn is essential to the success of disarmament. The model NWC requires those with relevant information to report violations, and therefore also expressly provide legal protection for whistleblowers, guaranteed at both the national and international levels. It protects those who supply information to the Disarmament Agency from prosecution, and provides that it is an unlawful employment practice to discriminate against persons have supplied information concerning violations of the Convention or have otherwise opposed such violations. It also provides whistleblowers the status of refugees, so that other states parties would be required to provide them asylum. These are innovative intrusions of an international agency into a national legal system, but they are believed necessary due to the centrality of societal verification to ensuring compliance.

In implementing these or similar provisions in context of an unfolding process of nuclear disarmament, a balance must be struck between secrecy and transparency. The balance must allow the disclosure of information necessary for disarmament to appropriate officials without publicly revealing information that might assist terrorists or hostile states, such as the precise location of nuclear weapons or materials or design information. However, it also true that as disarmament proceeds, the need to handle sensitive information carefully would diminish; when the point of abolition is reached, the possession of warheads or unsafeguarded nuclear materials would be unlawful. How information regarding bomb design would be handled in the latter stages of disarmament remains to be worked out. One can argue that such information must remain secret; one can also argue that to the extent feasible, it should be destroyed (*e.g.*, elaborate computer models), and therefore its illegitimate retention should be reported.

**John Burroughs**  
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**Physicians for Social Responsibility**  
**International Physicians for the Prevention of Nuclear War**

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## 6. The Future of Disarmament, Arms Control and Non-Proliferation Regimes

### **The Traditional WMD Arms Control and Non-Proliferation Architecture**

- Strategic Arms Reductions Treaty (START I)
- Intermediate Nuclear Forces Treaty
- Nuclear Non-Proliferation Treaty and 1995 Principles & Objectives
- Limited Test Ban Treaty
- Outer Space Treaty
- Threshold Test Ban Treaty
- Antarctic Treaty (demilitarizing the continent)
- Treaty of Tlatelolco (prohibition of nuclear weapons in Latin America)
- Geneva Protocol (prohibiting first use of BCW in war)
- Chemical Weapons Convention
- Biological Weapons Convention

#### **Abandoned Treaties (Past and Proposed)**

- Anti-Ballistic Missile Treaty and protocols
- START II & START III

#### **In Immediate Jeopardy**

- Comprehensive Test Ban Treaty
- Compliance protocol to the BWC
- U.S.- DPRK Agreed Framework

#### **Unfinished Elements**

- Strategic Offensive Reductions Treaty
- Fissile Materials Production Cut-Off Treaty
- South Pacific & African Nuclear Free Zone Treaties
- Measures to remove n-weapons from hair-trigger
- Strengthened NPT Safeguards (93+2)
- Physical Protection of Nuclear Materials Convention
- Missile Technology Control Regime (and Code of Conduct)

- Daryl Kimball, Ottawa, January 10-11, 2002

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## **Future Challenges to Multilateral Arms Control and Non-Proliferation**

**Daryl Kimball\***

### **Introduction**

As President George W. Bush and congressional leaders have correctly suggested, the response to the devastating attacks on New York and the Pentagon requires unprecedented international cooperation to prevent future outbreaks of terrorism and the threats posed by the spread and possible use of weapons of mass destruction. Defense Secretary Donald Rumsfeld has acknowledged the importance of “seeing that...weapons of vastly greater power...are not used by the kinds of people that attacked the United States.” Nevertheless, the Bush administration has so far failed to present an effective and comprehensive approach to these new threats, nor an adequate set of policies to deal with existing ones.

The first line of defense is, and must continue to be, preventing the spread of these dangerous weapons and related technologies. The current framework of global arms control treaties and agreements, which has been painstakingly constructed over the last four decades, was designed to make the acquisition and delivery of these weapons technically challenging and universally unacceptable. This framework must not only be preserved, but also strengthened and expanded. Doing so will require sustained and coordinated international effort, as well as U.S. leadership.

Unfortunately, arms control, non-proliferation and disarmament strategies are under assault. Since taking office, President George W. Bush and his top foreign policy advisors, along with resolute foes of arms control in Congress and outside government, have launched an all-out attack on the bilateral and multilateral framework of nuclear, biological and conventional arms control agreements. This framework has been supported by American leaders for decades and has succeeded in reducing military tensions, the risks posed by weapons of mass destruction, and the risk of nuclear war.

Over the past year, the Bush administration has defied much of the Congress, the U.S. public, America’s allies, and its erstwhile adversaries by dismissing and discarding key arms control and non-proliferation treaty commitments and strategies, including: the Anti-Ballistic Missile Treaty; the Strategic Arms Reduction Treaty process; the Comprehensive Test Ban Treaty; enforcement of the Biological Weapons Convention; restrictions on the trade of small arms; and restrictions on land-mines.

### **Bush’s “New Strategic Framework”**

- Military consultations with allies and friends – including counter-terrorism – buttressed by economic incentives
- Enhanced non-proliferation and counter-proliferation in areas of concern
- Cooperation with allies and friends on active missile defense and missile technology
- Unilateral nuclear force reductions
- Measures to support confidence and transparency

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Daryl Kimball prepared these comments and the accompanying text boxes for the Ottawa Roundtable on Legal and Technical Aspects of Complete Nuclear Disarmament, January 10-11, 2002.

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The immediate future for arms control and international security is bleak. Renewed and coordinated international leadership is needed to repair and strengthen the regime.

### 1. The New Anti-Arms Control Ideology

Underlying the Bush administration's declared distaste for arms control is a belief that the United States is best able to guarantee U.S. security through unilateral actions, U.S. military strength, and, when required, joining with like-minded governments in select coalitions of the willing for specific causes. These options, in the Bush administration's view, are much more preferable than working cooperatively with other countries through bilateral and multilateral agreements that impose restraints on or hamper U.S. freedom of action or military strength.

Administration officials believe that U.S. security can be enhanced by adopting a "new framework" for U.S.-Russian relations and for addressing weapons of mass destruction threat that would replace formal arms control agreements with informal or political understandings. Administration officials have provided the following outline for the new framework, but few details:

- Military consultations with allies and friends – including counter-terrorism – buttressed by economic incentives
- Cooperation on active missile defense and missile technology controls
- Substantial unilateral nuclear force reductions
- Enhanced non-proliferation and counter-proliferation in areas of concern
- Measures to support confidence and transparency

The initial focus of this approach is being directed at Russia with respect to the decade-long impasse on strategic nuclear weapons and missile defenses.

U.S. officials, led by Secretary of State Rumsfeld, the State Department's Assistant Secretary for Arms Control and International Security John Bolton, NSC Advisor Condoleezza Rice, and from time to time President Bush, have offered a number of reasons for the pursuit of this approach.

a) **"Arms control is from a different time"**: Condoleezza Rice, the president's national security adviser, argues, "The arms control treaties of the 1970s and 1980s came out of a peculiar, abnormal relationship between the United States and Russia... [Today] Russia is not a strategic adversary of the United States. We are not enemies. So the process can look different."

I would point out that the bulk of the traditional arms control ideas have come out of the Cold War era, they address a problem – weapons of mass destruction – that has not automatically vanished with the Cold War and they still have an important role to play in controlling and reducing the post-Cold War dangers posed by these weapons.

b) **"Arms control is not for friends"**: Secretary of Defense Donald Rumsfeld explains, "You negotiate a treaty to try to control hostility between two parties.... We don't have negotiations like that for treaties to not be hostile with Mexico or Canada or France or England."

I would suggest that Russia and China, while not our enemies, are states with which we have had a history of adversarial relations. Both are wary of U.S. military power and the existence of thousands of nuclear weapons creates the need for predictability, verifiability, transparency, accountability, and irreversibility. Furthermore, under these conditions, military planners continue to act based on worst case assessments of capabilities and not intentions.

c) **"Arms control is not for enemies"**: the administration has argued that many arms control and non-proliferation agreements are really aimed at "rogue" states that are, by definition, outside the bounds of the international community and that those nations will not abide by the compliance and verification mechanisms of arms control agreements such as the Comprehensive Nuclear Test Ban Treaty and the Chemical Weapons



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Convention. The United States and our allies are law-abiding nations and thus, most arms control arrangements only work against us and do not limit capabilities of others.

**d) “Formal Arms Control Is Tedious and Time Consuming”:** Bush argues that changes to our forces should not require years and years of detailed arms control negotiations. He cites the 1991 United States invitation to the Soviet Union to join it in removing tactical nuclear weapons from the arsenal. Huge reductions were achieved in a matter of months, making the world much safer, more quickly.

However, it is important to point out that the lack of progress on strategic reduction has not been the result of the treaties, but the political differences between the U.S. and Russia over the parameters of missile defenses and the pace of offensive reductions pending a resolution of the missile defense issue.

**e) “Treaties Limit Flexibility”:** The Bush administration further maintains that negotiated reductions are no longer needed because in the coming decades Russia will rapidly decrease its number of strategic offensive weapons for its own strategic and financial reasons. Current projections estimate that the Russian deployed strategic arsenal will consist of fewer than 1,100 warheads by 2010. U.S. officials have even signaled that they would not object to Russia maintaining multiple warheads on its land-based intercontinental missiles as assurance that the Russian force could overwhelm any U.S. defensive systems.

In keeping with these themes, the Nuclear Posture Review (NPR), which is to be delivered to Capitol Hill in a classified form this week will likely endorse the reduction of “operationally-deployed” U.S. strategic nuclear forces to 2,200 or below. But the NPR will likely also require that the “reduced” warheads remain as part of a “reserve” stockpile to hedge against a rapid Russian or Chinese buildup and require that reserve nuclear weapons can be quickly redeployed on the launchers and platforms affected by the “reductions.” As a consequence, the available U.S. nuclear force will be as large as it is today, it will not necessarily be subject to verification, it will include a significant number of tactical nuclear weapons, and it will remain in a quick-launch mode, capable of first-strike or quick-response to a real or perceived attack.

This approach, say some key Bush administration officials such as Steve Hadley and Robert Joseph at the NSC, will allow the U.S. to adjust its nuclear forces upward, should the need arise, without accusations of breaking treaties. Moreover, this flexibility to go up as well as down should deter others, particularly China, from challenging U.S. dominance or seeking strategic parity.

**f) The Result is “à la carte-ism:”** According to Bush’s “new strategic framework,” cumbersome treaties, like the Anti-Ballistic Missile Treaty would be discarded and only vital treaties, such as the nuclear Non-Proliferation Treaty (NPT), would remain intact. Voluntary, supplier agreements, such as the Missile Technology Control Regime, the Australia Group, and country specific trade restrictions on sensitive dual use technologies become the backbone of the administration’s effort to control proliferation among states of concern.

## **2. A Summary of the Attack on Arms Control**

Using the White House and Pentagon podiums, the Bush administration has sought – and to some degree is succeeding – to change the terms of the media and public debate from how arms control can better U.S. security to how arms control weakens America’s ability to protect itself. Rather than seeing arms control as a mechanism to enhance or preserve U.S. security by stemming weapons proliferation and capping and reducing global arms holdings, the Bush administration charges that arms control imperils U.S. security because it has been unsuccessful in preventing other countries from pursuing and acquiring weapons of mass destruction while giving the United States a false sense of security and, in the case of the 1972 Anti-Ballistic Missile (ABM) Treaty, kept the United States from building needed defenses.

### **a) Missile Defense and the ABM Treaty**

Until the tragic September 11 terrorist attack, the Bush administration’s top foreign policy objective was to get rid of the ABM Treaty to enable the United States to research, test, and deploy without any constraints a strategic missile defense system. Though the war on terrorism is now the top priority, Bush did not forget about his administration’s previous ranking objective and announced December 13 that the United States

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would withdraw from the treaty in six months. The move marked the first U.S. withdrawal from an arms control agreement and threatens to unravel the entire structure of arms control built up over the past 40 years. Prior to the U.S. announcement, Russia warned that a unilateral U.S. withdrawal from the ABM Treaty could lead to a Russian withdrawal from up to 30 other agreements, including ones capping Russian nuclear and conventional force levels.

While the likely U.S. withdrawal from the ABM Treaty will not produce immediate and dire consequences, it is clear that it will create new risks and will not hasten the development or deployment of effective national missile defenses, which are years if not decades away. Hours after Bush's repudiation of the ABM Treaty, there was yet another test failure of a key missile defense system component and the next day the Navy announced it was canceling one of its sea-based missile defense systems due to cost and technical problems. Testing of this system was part of the reason offered for needing to withdraw from the ABM Treaty.

Nevertheless, because military planners focus on worst-case scenarios, U.S. strategic missile defense development and deployment, possibly even including space-based elements, will likely inhibit Russia's willingness to implement deeper reductions of Cold War nuclear stockpiles and encourage China to accelerate its strategic nuclear weapons modernization program from two-dozen to over two-hundred nuclear-armed, long-range missiles to help them overcome any missile defense. China and Russia might also be less cooperative in preventing others from acquiring weapons of mass destruction or even possibly assist such efforts actively, believing that the spread of such capabilities would be the only possible way of containing perceived U.S. hegemonic ambitions.

#### **b) Agreements on Strategic Nuclear Reductions**

Voiding the ABM Treaty has not been the sole testament of the Bush administration's opposition to arms control. While pledging in November to reduce the U.S. nuclear arsenal to 1,700 to 2,200 deployed strategic warheads over ten years, Bush said he preferred to do so outside of a verifiable treaty arrangement. Russia has said it wants to reduce to 1,500 warheads but through a bilateral, verifiable treaty. Without a legally-binding treaty to verify the reduction and elimination of the bombs and their means of delivery, such reductions, even if fully implemented, are potentially reversible.

At this time, it appears, however, that Russian insistence that mutual U.S. and Russian strategic reductions be made transparent and verifiable by using provisions from earlier arms control treaties may prevail and result in some type of formal agreement. But it remains unclear whether the actual level of the reductions will be codified, and whether it would allow either side to store warheads that could be quickly redeployed. Without being codified, arms reductions lose their predictability, lessening the stability and security that can be afforded by enabling a country to know more about their potential adversary's capabilities. Lacking such information, countries may erroneously make worst-case assumptions about another countries' capabilities or intentions that could trigger an unnecessary, unwanted, and costly arms race. Moreover, without a legal obligation to pursue future cuts, a Bush successor could simply choose to ignore the pledge or, instead, buildup the U.S. arsenal. The same option, obviously, would be available to Russia as well.

#### **c) Controlling Loose Nukes in Russia**

In the wake of the September 11 attacks and the news that al Qaeda and other terrorist groups are seeking nuclear weapons, little has been done to address the most urgent nuclear proliferation threat: the possible theft, sale, or diversion of the tons of nuclear material and the thousands of unaccounted nuclear weapons in Russia and the states of the former Soviet Union. Despite proclaiming his strong support for U.S. programs to safeguard and destroy Russian weapons of mass destruction and fissile materials during his presidential campaign, Bush initially proposed a reduction in funding for such activities and Congress is reluctant to increase funding and mandate an improvement in coordination of the U.S. government's multi-agency efforts in this arena. In late-December, President Bush announced that an internal administration review of threat reduction programs had been completed and that he would propose increases in funding in some programs for fiscal 2003.

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#### **d) Regional Proliferation Hot Spots**

The administration has also stalled on solving one of the thorniest nuclear and missile proliferation cases: North Korea. The Bush team has thus far spurned an opportunity left over from the Clinton administration to negotiate an agreement with North Korea to give up its long-range ballistic missile program. In doing so, the administration undercut South Korea's efforts to seek better relations with its northern counterpart and put off indefinitely the possibility of holding U.S. talks with North Korea to stop its development and export of ballistic missiles and related technology. The Bush Administration and North Korea also need to work together to continue timely implementation of the 1994 Agreed Framework.

In its fight against terrorism, the Bush administration rushed to embrace India and Pakistan, waiving sanctions on U.S. military and economic assistance put in place after the two South Asian rivals conducted May 1998 tit-for-tat nuclear tests. This apparent acceptance of the two countries' nuclear weapons program constituted a swift reversal of U.S. policy over the past three years, which essentially called for India and Pakistan to rollback their programs and give up their weapons. The move could eventually undermine the U.S. position as a leader in non-proliferation efforts, particularly if some states – such as those in the Middle East concerned about Israel's nuclear weapons – perceive the U.S. commitment to non-proliferation as only a matter of convenience or reflective of a country's relationship with Washington.

#### **e) Biological Weapons Convention**

Washington also upset U.S. allies earlier this year when it voiced its opposition to a draft proposal designed to make cheating more difficult under a treaty banning biological weapons. The move was motivated in part by the administration's interest in preventing international oversight of U.S. bio-defense programs, which, ironically, are now believed to be the source of the anthrax sent to through the mail to Congressional members and news organizations. The U.S. offered some useful, but difficult to implement voluntary measures to restrict access to dangerous pathogens. Subsequently, the United States shocked the international community November 7 by insisting that the process used to negotiate global restrictions on germ weapons and accompanying inspections be abandoned, causing an international conference to end in disarray.

Although improvements to our public health and emergency preparedness systems can help mitigate the effects of future bio-terrorist attacks, prevention is the best cure. Without a better international compliance mechanism to detect and deter state-sponsored biological weapons programs, these weapons of mass destruction will likely become a greater threat in the future. It will be necessary to reverse the United States' current position not to enter into any kind of international negotiation that might lead to a legally-binding treaty on BW compliance and enforcement.

#### **f) Nuclear Testing and the CTBT**

Shortly after the 1999 Senate vote on the CTBT, Secretary of State Albright made it clear that “the United States will continue to act in accordance with its obligations as a signatory [of the CTBT] under international law ...” and that it “...will seek reconsideration of the treaty at a later date when conditions are better suited for ratification.”

Since taking office, senior Bush administration officials have said that they will not ask the Senate to reconsider approval of the CTBT, but they urge all states to maintain their existing testing moratoria. At present, the treaty remains on the Senate calendar. The CTBT cannot win Senate approval for ratification without presidential support, but the State Department has determined that the president cannot unilaterally withdraw the treaty from the Senate's consideration. The CTBT is trapped in U.S. political limbo.

However, the current Bush policy will likely take a turn for the worse without additional pressure from the international community and CTBT supporters in Congress.

Last year the Bush administration submitted the Clinton administration's original request for \$20m for CTBTO activities for FY 2002 but announced in August that it would not fund CTBTO activities related to preparations for on-site inspections. This was a concession to DoD opponents of the CTBT who argued that the on-site

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inspections are useless and will only come into play with CTBT entry into force. Opponents of the CTBT at the DoD argue that the U.S. does not need the IMS to meet its nuclear test monitoring and verification requirements and can get by with bilateral agreements to complete the Atomic Energy Detection System (AEDS). As Gen. Shalikashvili's 2001 report on the CTBT states, completing the enhanced AEDS network depends on completion of the IMS, which will provide access and coverage of some key areas more easily and cheaply than without. Congress approved the full \$20m for FY 2002.

In addition, Senate hardliners like Jesse Helms have urged President Bush to repudiate the U.S. signature to the CTBT. In early 2001, Undersecretary of State John Bolton sought to find ways by which President Bush could remove the CTBT from the Senate's calendar. In November 2001, the DoD and NSC successfully persuaded the President not to send a representative to the November meeting on CTBT entry into force at the United Nations.

In the coming days and weeks, we should expect that opponents of the CTBT in the administration will again try to limit, cut or eliminate U.S. funding for the CTBT. We should also expect that administration officials opposed to the CTBT will try to further weaken U.S. test ban policy, perhaps even trying to repudiate the U.S. signature to the CTBT. This could be accomplished by notifying the depositary for the CTBT (the UN Secretary General) by means of a letter from Bush stating that the US has no intention to ratify the treaty.

#### **g) The Nuclear Non-Proliferation Treaty**

The CTBT, which has the support of all U.S. allies as well as Russia, is one of the key disarmament commitments made by the United States and the other declared nuclear weapon states which helped secure the indefinite extension of the nuclear Non-Proliferation Treaty in 1995. But, in keeping with what the State Department's director of policy and planning Richard Haas has called "à la carte" multilateralism, the administration supports only those NPT provisions that constrain the capabilities of others, while it chooses to ignore U.S. non-proliferation and disarmament commitments outlined in Article VI of that Treaty and in last year's NPT Review Conference Final Conference Document.

To work, this treaty, like so many others, must continue to serve the interests of all treaty partners, not just a few. In addition, the administration's ad hoc approach and neglect for certain approaches leaves enormous gaps in what is essentially the United States' and the international community's first line of defense against weapons of mass destruction. U.S. unilateral rejection of arms control and disarmament strategies would also set a dangerous precedent that could, unfortunately, lead other countries to seek security by going-it-alone and building weapon systems rather than joining agreements with others to forgo or limit arms buildups.

### **3. Restoring Support for Arms Control**

Alone, each of the challenges and setbacks constitutes a setback to arms control. Taken together, the Bush administration's first-year activities threaten to undo more than 40 years of past accomplishments and significantly lessen the likelihood of future successes in controlling or reducing the threats posed by the development and spread of nuclear, biological, and chemical weapons, and destabilizing accumulations of conventional arms, including small arms and light weapons.

The Bush administration has painted arms control as a failed and outdated policy of a bygone era and treaties as simply pieces of paper or historical relics that have no tangible worth. Such an assessment rejects the notion that arm control, non-proliferation and disarmament measures can and have reduced the risk of war and, if that fails, to limit the destructiveness of war. Arms control aids countries in their search for security by ending arms races that have no finish lines. These are not transitory objectives, but ones that remain as real today as they were during the height of the Cold War.

The challenges ahead are numerous and complex. I offer the following preliminary suggestions:

a) The first goal of supporters of arms control, non-proliferation and disarmament is to limit the damage to the existing regime over the near term.

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b) A second goal must be to better articulate the ongoing value and role of arms control/disarmament measures in building international security and not take for granted that the value is understood and shared by others. For instance, the fundamental success of the NPT – that today, no more than eight countries are believed to currently possess such destructive weapons when thirty years ago it many predicted there would be dozens – is a fact that is too often overlooked.

c) Rally Western and non-aligned support around a comprehensive approach to WMD that emphasizes preventative measures and the reinforcement of effective arms control strategies as an alternative to the Bush administration’s anti-arms control, unilateralist “new strategic framework.” The New Agenda Coalition framework and the 2000 NPT Review Conference list of disarmament objectives are a useful starting point. Key components should be:

- negotiated and codified strategic nuclear reductions, which provide irreversibility, verifiability, predictability, and transparency, as unilateral reductions are pursued;
- Encouraging support for action to rapidly “de-alert” forces scheduled for withdrawal from operational deployment. ACA staff will work with Congressional supporters to encourage this approach;
- Extension of reduction process to include reserve strategic warheads and tactical nuclear weapons;
- Limiting future deployment of missile defense, particularly space-based weapons, so as to minimize the possible destabilization of relations between major military powers;
- Maintaining full U.S. financial support for the activities of the Comprehensive Test Ban Treaty Organization (CTBTO) and its efforts to put in place nuclear test monitoring, verification and on-site inspection tools;
- Preventing Bush administration repudiation of U.S. signature of CTBT or the resumption of nuclear testing by any state;
- Renewing international negotiations to improve compliance with the Biological Weapons Convention and tracking bio-terror and bio-defense developments. Continued implementation of the U.S./North Korean Agreed Framework to eliminate the North Korean nuclear weapons program and initiation of talks on an agreement banning North Korean ballistic missile tests and exports;
- Renewal of international efforts through the United Nations Monitoring, Verification and Inspection Commission (UNMOVIC) to assure that Iraq does not resume its programs to produce nuclear or other weapons of mass destruction;
- Maintenance of support for nuclear Non-Proliferation Treaty (NPT) regime and prevention of a roll back of commitments made by states parties at the 2000 Review Conference;
- Maintaining support for and a bilateral dialogue on Indian and Pakistani agreements not to conduct future nuclear tests and not to deploy nuclear weapons;
- Implementation of improved IAEA safeguards and export control procedures.

**Daryl Kimball**  
**Arms Control Association**

### **Strengthening the Existing Arms Control Framework**

- Seek a treaty agreement on verifiable irreversible reductions of strategic warheads – deployed and tactical
- De-alert maximum number of deployed strategic weapons
- Prevent missile defense deployment in areas where it will lead to an arms race, and prevent weaponization of space
- Encourage talks to freeze of North Korea’s Missile Program; Fulfill the 1994 Agreed Framework
- Avoid U.S. repudiation of CTBT
- Re-Affirm the Importance of the NPT and U.S. Article VI Commitments
- Renew talks on strengthening BWC verification and compliance

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## Nuclear Confidence Building Measures in South Asia

**Jaya Tiwari\***

Until this point, we tried to step back from the current political environment and envision legal and technical tools and measures that could help foster and implement a global nuclear disarmament regime. In this presentation, I would like first to go over the current political environment in a region with a very short nuclear fuse, South Asia, to highlight why nuclear disarmament is so critical for the sake of billions of people.

Second, I will examine the state of existing bilateral nuclear confidence building and safeguard measures between India and Pakistan and multilateral agreements to which they belong. While limited in their scope, these measures and agreements have played a useful role in creating a platform for cooperation, transparency, and dialog related to nuclear issues in the region. Furthermore, they could potentially be useful mechanisms for moving toward regional nuclear disarmament.

Let us look at current tensions between India and Pakistan. The two countries have a long history of animosity. They have fought three wars, in 1947, 1965, and 1972, and engaged in an undeclared but serious military conflict in 1999 in the Kargil region. They continue to clash over the disputed territory of Kashmir. (I don't think I need to detail the roots or the explore causes of the conflict for this audience). Following the terrorist attacks in India – on October 1<sup>st</sup> at the Jammu and Kashmir State Legislative building and on December 13<sup>th</sup> at the Indian Parliament building in New Delhi – already tense political relations between India and Pakistan took a turn for the worse. The attacks were carried out by Jaish-e-Mohammad and Lashkar-e-Toiba, extremist groups active in Kashmir with support from Pakistan.

In the weeks following the December 13 attack, the largest mobilization to date of Indian and Pakistani troops along the Line of Control (LOC) has taken place. Current reports indicate that there are nearly one million troops from the two sides along the LOC. While India and Pakistan have fought wars before and tension on the LOC is nothing new, the present conflict has the potential to quickly escalate to a full-scale war reaching a nuclear level.

More than ever, there is a feeling in India of “enough is enough” with respect to Pakistani support for militant groups active in Kashmir. The ruling BJP government in India is under intense domestic pressure to take action against Pakistan for the December 13<sup>th</sup> attack. India has demanded that Pakistani President Pervez Musharraf cut off support for Kashmiri militant groups based in Pakistan and extradite to India all those responsible for plotting the October 1<sup>st</sup> and December 13<sup>th</sup> attacks. The Indian leadership also appears ready to exploit President's Bush's rhetoric of a “global war against terrorism.” With President Bush having broadly and universally defined the war on terrorism, the BJP Indian government is betting that Mr. Bush will find it hard to back track and denounce Indian action against the same Islamic extremist groups that the United States is fighting against in Afghanistan. India appears quite confident that, should the country seek to solve the current conflict militarily, the international community in general and the United States in particular will not be in a position to vocally oppose Indian action.

India seems so confident, self-righteous, and undeterred – even by Pakistan's nuclear weapons capability – that just a few days ago the Indian Defense Minister, George Fernandes, announced that “India can take a first strike from Pakistan and survive, but Pakistan will be completely destroyed.” Even more worrisome is a statement made by the Indian Army chief yesterday. While I don't have the full details, the Army chief announced that India is ready to go to war with Pakistan and the use of nuclear weapons in response to a first strike from Pakistan could not be ruled out.

India's tough stand and positioning of troops along the LOC has put President Pervez Musharraf in a difficult spot. In the aftermath of the September 11 attacks, the Pakistani President abandoned his support for the Taliban regime and, despite strong domestic opposition, backed the U.S. military action in Afghanistan. President Musharraf's decision to support the United States in the war against the Al-Qaeda network and

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\*These comments were prepared for the Ottawa Roundtable on Legal and Technical Aspects of Complete Nuclear Disarmament, January 10-11, 2002.

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Taliban regime has considerably angered religious groups, as evidenced by frequent and continuing protests in Pakistan.

If, under pressure from India, President Musharraf abandons support for separatist group efforts in Kashmir (which all Pakistani governments have declared as the “struggle for Kashmiri independence”) and is perceived as weak and bullied by India, maintaining domestic support for his regime could prove difficult. To maintain the appearance of not backing down under Indian pressure, even if only for domestic reasons, President Musharraf has to keep up with the counter rhetoric and troop mobilization from the Pakistani side. Another India-Pakistan war breaking out under these circumstances doesn't appear that far-fetched. A full-scale conventional war between India and Pakistan now more than ever has the potential, whether intentional or accidental, of turning into a nuclear conflict. The consequences of the use of nuclear weapons in South Asia, home to some 1.5 billion people, will be truly horrific.

So how can we move away from the current situation, where Indian and Pakistani troops are clashing along the LOC with bombs and missiles in each other's face, to a nuclear weapon free South Asia? Here are some thoughts:

- Even the most optimistic of us will have to face up to the fact that achieving such a goal in South Asia will take a long time. Slow and incremental progress toward the goal of nuclear disarmament is probably the most likely outcome in South Asia.
- Reaching such a goal will also require incremental and sustained efforts on local, regional, and global levels. Policies and steps taken by the five nuclear weapon states (NWS), the United States in particular, will greatly impact the situation in the region.
- Toward this end, incremental progress can be achieved by enhancing the information exchange required by existing confidence building and nuclear safeguard measures between India and Pakistan.
- Increased transparency in the nuclear field could lead to lasting and irreversible nuclear threat reduction agreements between India and Pakistan, increase the prospects of future agreements, and serve as an element of increased stability in times of crises.

#### **Leveraging Existing Confidence Building and Nuclear Safeguard Measures: A few examples**

##### **1. The Bilateral Agreement on the Prohibition of Attack Against Nuclear Installations and Facilities**

Under this agreement, India and Pakistan have agreed to not attack, directly or indirectly, nuclear installations or facilities in either country. This is a unique bilateral agreement that no other hostile countries have yet concluded. The scope of the Indian-Pakistan No-Attack Agreement is even broader than the Geneva Convention's prohibition against attacking nuclear electrical generating stations. Indian and Pakistani agreement prohibits attacks against "nuclear power and research reactors, fuel fabrication, uranium enrichment, isotope separation and reprocessing facilities as well as all other installations with fresh or irradiated nuclear fuel and materials in any form and establishments storing significant quantities of radioactive materials."

As a part of this agreement, India and Pakistan exchange a list of the latitude and longitude of their nuclear installations and facilities each year on January 1<sup>st</sup>. Even in the midst of one of the tensest times, the two countries conducted their annual exchange at the beginning of 2002. Such information exchange between the two countries provides an excellent framework for transparency. With this exchange, each country implicitly accepts that the other side could and does gather satellite imagery of the sites included in the list. In its current state, the bilateral nuclear data exchange is limited in nature but could be useful for creating more stable and more transparent nuclear relations between the two nations.

##### **2. The Lahore Memorandum of Understanding**

On February 21, 1999, in Lahore, Pakistan, Indian and Pakistani Foreign Secretaries signed a Memorandum of Understanding pledging to prevent accidental or unauthorized use of nuclear weapons and take steps for the creation of communication mechanisms to enable early notification of a nuclear accident to the other party. Implementing the provisions of this agreement in good faith would be an excellent step to build trust and promote transparency.

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### **3. IAEA Safeguards Agreements**

Both India and Pakistan have agreed to site or material-specific safeguard measures designed to prevent the diversion of nuclear material from peaceful to weapons-oriented uses. There are a number of voluntary steps that the two countries could take that would not only strengthen international monitoring but also facilitate bilateral cooperation on nuclear issues. A simple first step, for example, could involve releasing data each party supplies to the IAEA for review by the other.

#### **Possible Additional Steps in South Asia**

##### **1. No Deployment**

The most encouraging news for those seeking the establishment of a nuclear weapon free South Asia is that, despite the political rhetoric, there is little evidence that India and Pakistan are pursuing full-scale deployment in the near future. Numerous technological and financial constraints facing India prevent it from deploying fully operational and survivable nuclear weapon systems at an accelerated pace. Given that Pakistani officials have stated that they will not be the first to openly deploy nuclear weapons, but will only do so in response to such action from India, sustained pressure and active efforts from the international community can help halt the pace of nuclear developments in the region.

If the international community is to succeed in capping South Asian nuclear capabilities below the deployment threshold, it will have to change India and Pakistan's cost-benefit calculations regarding weaponization and deployment decisions. In no uncertain terms, it should be made clear that overt weaponization and deployment by either India or Pakistan will result in stringent and sustained fiscal, military and technology transfer sanctions.

##### **2. Limiting the Areas of Deployment of Nuclear Weapons**

In the event that India and Pakistan move ahead with deployment decisions, steps could be taken to limit the scope of the deployment. Since 1975, Pakistan has proposed the idea of a South Asian Nuclear Weapons Free Zone (SANWFZ), which has not been accepted by India (though there are a number of UNGA resolutions on this). India has, however, supported the concept of the Indian Ocean as a Zone of Peace (IOZP). Such a zone is proposed to restrict nuclear weapons in the Indian Ocean. Combining some aspects of each of these proposals, a stabilizing measure for India and Pakistan to consider could involve, first, pledging to restrict nuclear weapons deployment from the western and northern Indian Ocean and their coastal areas. This first phase would be a compromise of the SANWFZ and the IOZP ideas. It would also limit Indian plans to deploy nuclear-tipped missiles on submarines, restricting such deployment to the oceans on India's eastern seaboard. As a second phase of restricting areas of nuclear weapons deployment, India and Pakistan could make a similar pledge for the Kashmir region. Such agreements would still leave open a wide swath of territory for basing nuclear weapons. However, the threat of the use of nuclear weapons in a tactical battlefield scenario in Kashmir could be minimized through the pledges suggested here.

#### **The Role of Non-State Actors in Nuclear Weapon Free South Asia**

The non-state actors can also play an important part in changing the course of the Indian and Pakistani nuclear weapon programs by educating the public of the dangers associated with production, possession, and use of these tremendously expensive and destructive weapons. There are some examples of steps already being taken in this direction. The Convention for Nuclear Disarmament and Peace, held in New Delhi in November 2001, brought together a large group of participants from all walks of life under one banner – no nuclear weapons in South Asia! The NGO communities in India and Pakistan must do a better job in educating the public and encouraging it to demand accountability and explanations for continuing to spend huge sums of money on nuclear weapon programs in countries where a large portion of the population still does not have access to very basic human need items.

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