BEYOND MISSILE DEFENSE

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October 2002

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Acknowledgements:
The authors thank John Burroughs, Jackie Cabasso,
Hal Feiveson, Randy Rydell and Frank von Hippel for useful comments

This is an updated version of Briefing Paper #10 submitted by the International Network of Engineers and Scientists Against Proliferation (INESAP) to the 2002 Non-Proliferation Treaty Preparatory Meeting

Edited and Designed by
GRACE
The Global Resource Action Center for the Environment
for the Abolition 2000 Missile Ban Working Group
www.abolition2000.org

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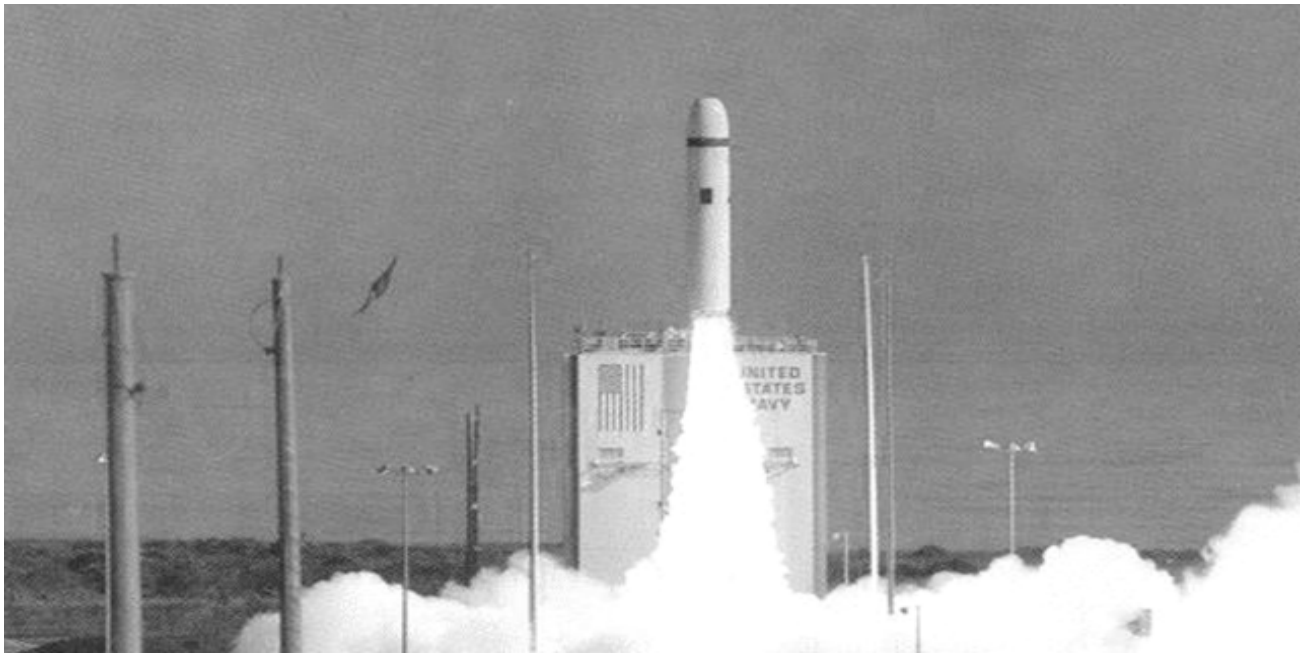

PREFACE

On 15 April 1999, UN Secretary-General Kofi Annan issued a statement drawing the world's attention to the lack of binding multilateral norms concerning missiles. Although the Preamble of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) includes the goal of eliminating delivery vehicles for nuclear weapons, the world has been lamentably slow in fulfilling this promise. This applies not just to missiles per se, but also to their development, production, stockpiling, export, and proliferation — as well as to missile defenses.

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So when, on 20 November 2000, the General Assembly adopted a resolution on Missiles, the world community took notice. The resolution asked the Secretary-General to prepare a report with the assistance of a panel of governmental experts on the subject of missiles in all its aspects. In July 2002, the Secretary-General transmitted the report to the General Assembly, an act that itself marked a step forward in the norm-building process, since it was somewhat extraordinary that a group of governmental experts from diverse countries could reach a consensus on such a sensitive subject.[1]

While very thin on recommendations, the report concluded that — missiles are posing "serious concerns" for international peace and security; these issues cannot be effectively addressed without due regard to their regional and global dimensions; "there exists at present no universally accepted norms or instruments" dealing with missiles; many approaches to the subject are being undertaken both within and outside the United Nations; and that many more such international efforts will be needed.

The present study represents one such effort from civil society to respond to this challenge. Written by an American lawyer and three physicists from India, Pakistan, and Germany – all of whom have combined scholarship with public interest advocacy — the study presents strong arguments for moving beyond existing policy and research paradigms towards an alternative approach that seeks to advance the global missile agenda into the new, fertile ground of disarmament. Over a half century after Herman Kahn proposed "thinking about the unthinkable," missile disarmament is now finally emerging as a subject that merits both serious thought and energetic actions.

The report offers for discussion and debate the elements of a "Ballistic Missile Framework Agreement" intended to serve as a basis for structuring future work in this field. Readers seeking panaceas, quick fixes, miracle cures, and silver bullets are advised to go elsewhere, for this is a serious study, while remaining accessible to a general audience. This audience is where, ultimately, the political will must be found to bring the various elements of this proposal to fruition.

Achieving an international ban on ballistic missiles – or ultimately all delivery vehicles for weapons of mass destruction – will surely not be easy. It will require imaginative new verification techniques, improved monitoring capabilities, binding legal obligations and means to enforce them, increased transparency, and financial and political support both inside and outside of government. It will also require new laws, new policies, and new institutions – both national and international – to implement them.

The study contributes to these goals more by offering an architectural blueprint of the requirements of a working missile disarmament regime, than by offering any handbook of the political tactics needed to create such regime. It does not answer all the possible questions on this challenging subject, but it does break new ground and will succeed in stimulating what is arguably most needed in the early stages of building new global norms – sustained thought and informed discourse.

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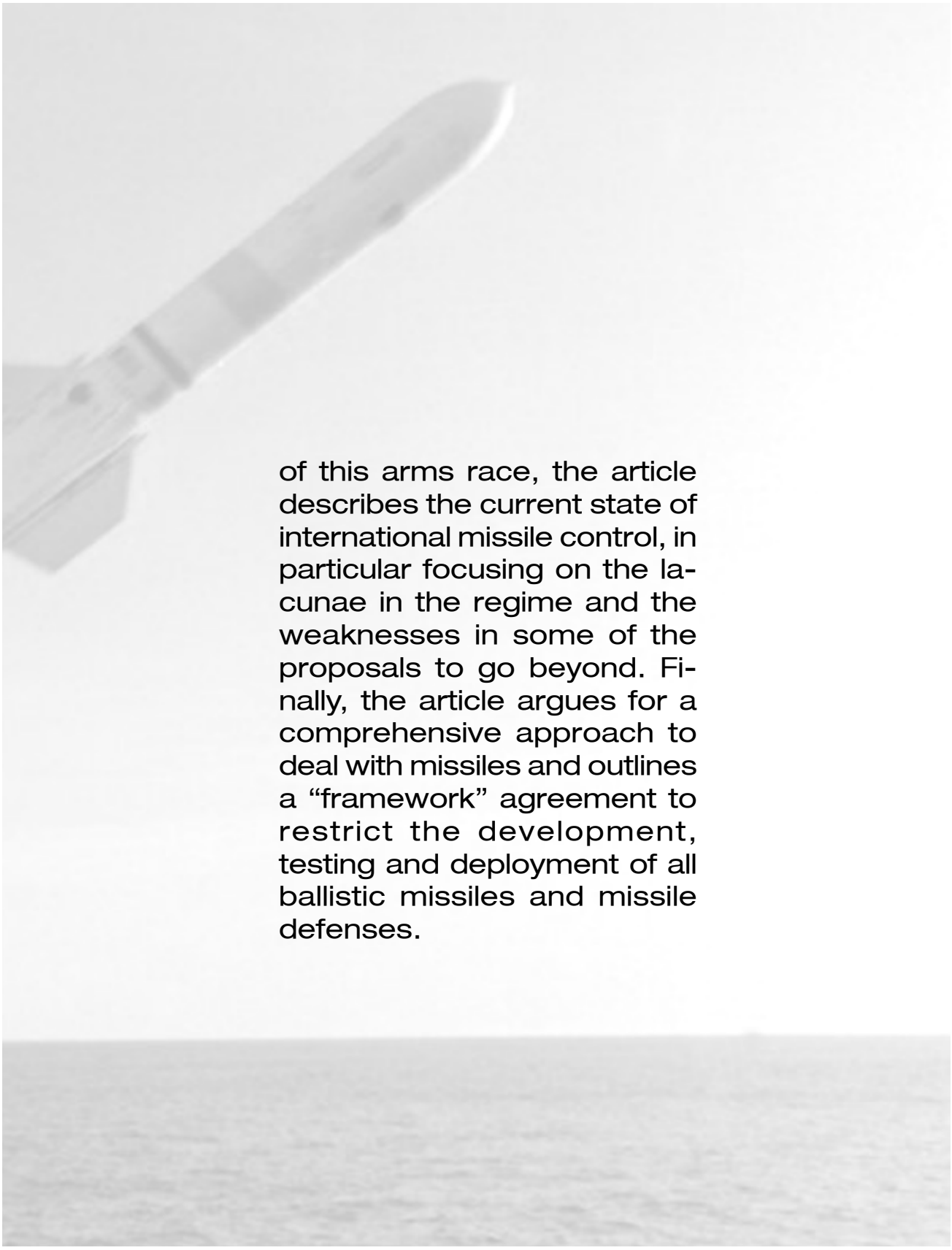
2 October 2002

Abstract

An asymmetric arms race has developed with, on the one hand, the United States' pursuit of more accurate conventional weapons, a space-based military capability, national and several theater missile defense systems, and, on the other, the acquisition of ballistic missiles and increased emphasis on nuclear weapons by a number of other states. After a short description of the complex dynamics



of this arms race, the article describes the current state of international missile control, in particular focusing on the lacunae in the regime and the weaknesses in some of the proposals to go beyond. Finally, the article argues for a comprehensive approach to deal with missiles and outlines a "framework" agreement to restrict the development, testing and deployment of all ballistic missiles and missile defenses.

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INTRODUCTION

Over the past few years, with the Cold War long over, a new kind of arms race has started to become apparent. Unlike earlier efforts of the United States and the Soviet Union to match and exceed each other in the development and deployment of nuclear weapons, ballistic missiles, and conventional weapons, the new arms race is more global, and asymmetric in both the kind of states involved and the kinds of weapons.

The United States is developing an array of new weapons systems for the maintenance of its global military dominance; the tip of the iceberg is the national ballistic missile defense (BMD) system being prepared under the rubric of protecting the continental United States from missile attack by third world states. There is also a diverse array of attendant theatre missile defense (TMD) systems to protect US military expeditionary forces around the world. The US is also developing increasingly accurate, stealthy, and longer-range conventional armaments, including a variety of missile systems, with improved ability to destroy hard targets like missile silos and buried command and control facilities.

At the same time, seeking to emulate US and Soviet strategic thinking and practice over the past fifty years that nuclear weapons and ballistic missiles can induce deterrence, a number of states are developing such systems, most notably, India, Pakistan, and North Korea. Prior to these states is Israel, which has the most sophisticated nuclear weapons and missile program outside the five nuclear weapons states, but is closely tied to the US and protected from any international pressures in this regard. Iraq tried to develop both nuclear weapons and ballistic missiles, but the Gulf War and its aftermath have largely destroyed this capability. Other states tried and succeeded to varying degrees (e.g. South Africa, Brazil, Argentina, South Korea, Taiwan, and Sweden) but have ceased at least for now.

Since the development of both intercontinental-range ballistic missiles (ICBMs) and ballistic missile defenses of any kind is a complex and

slow task, there is still time for political initiatives to prevent a costly arms race between offensive and defensive missiles, reduce concerns about US ambitions in the post-Cold War world, and limit the escalation of regional arms races and the scope of future wars.[2] We propose here that one direct way forward is to negotiate a truly comprehensive regime strictly controlling and eliminating ballistic missiles. This would place limits on all states with missile programs and not just be another ABM treaty or nonproliferation measure to limit the development or spread of ballistic missiles. States with advanced, long-range missile programs like the USA would have to stop further development of ballistic missiles and begin reducing them as part of a treaty bound process of eliminating the threat they pose to the rest of the world. In exchange, all other states would agree not to develop or acquire ballistic missiles or join in the reduction process.

Anti-missile systems that involve the development and use of ballistic missiles as interceptors would be forbidden as well.[3] Limits on the development of anti-missile systems are important because finding a commitment to going down to zero ballistic missiles while some states were building up anti-missile systems would be difficult. Missile disarmament in the context of the buildup of anti-missile systems could also lead to arms race instability and crisis instability endangering the whole disarmament process.[4]

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Unlike existing arms control treaties, which often takes years to negotiate (it took over forty years after it was proposed for the CTBT to be completed, and it has not yet entered into force) we suggest a possible new approach that could contribute to building an international norm against ballistic missiles.

We outline here the case for a Ballistic Missile Framework Agreement consisting of:[5]

- **an immediate test ban on ballistic missiles and missiles intended for use in anti-ballistic missile systems, and a commitment to the complete elimination of these weapons;**
- **a formal negotiating machinery for realizing commitments on missile control and disarmament through a series of phased, interlinked, overlapping stages, each involving ballistic missile reductions and limits on ranges;**
- **a pledge not to test and deploy space weapons as a first step to an internationally agreed space weapons ban and the de-militarisation of space;**
- **the creation of an international monitoring and inspection system to prevent the development, testing and deployment of ballistic missiles and space weapons;**
- **a regular public review, reporting, and implementation assessment procedure involving all the parties to the agreement.**

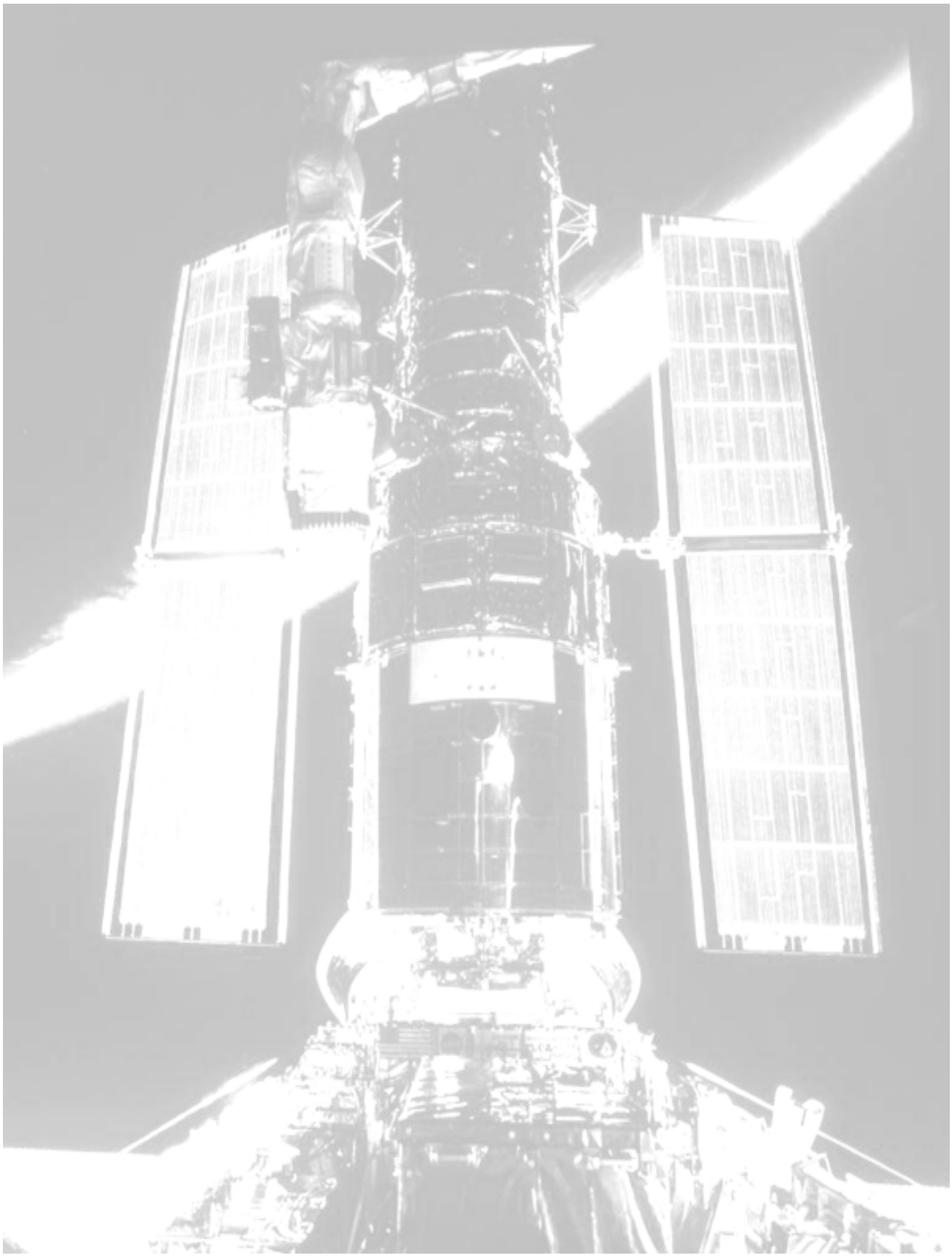
The essential precondition at this stage would be agreement on the goals and agreement on a negotiating process to move towards them. As Mian pointed out,[6] commitment to such an initiative already exists in the Nuclear Non-Proliferation Treaty (NPT); the preamble to the NPT emphasizes its goal as "the 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" (emphasis added). We suggest here a few simple initial steps that could form part of the framework structure and help create the momentum for the disarmament process.

Ballistic missiles are, of course, not the only means of long-range military attack. Therefore, to go ahead with a comprehensive disarmament program for ballistic missiles, it is necessary to deal with other means of projecting military power around the world using platforms such as bombers and aircraft carriers, as well as ships, aircraft and submarines armed with long range missiles. As the regime is slowly put in place, there would have to be a parallel regime controlling all force projection capabilities, including cruise missiles, the extra-territorial deployment of long-range bombers, and patrolling of international waters by aircraft carriers, and cruise missile armed ships and submarines.

While the number of such systems may seem quite large, it must be remembered that these hi-tech systems are manufactured primarily in only a few countries. We realize that in these countries, any efforts to ban the sale or deployment of these are likely to be opposed by the military-industrial complex. Overcoming such resistance shall require public mobilization and a widespread social movement willing to challenge the national security narrative that underpins the investment of massive amounts of resources to building such weapons, and to posit a more humane vision conducive to genuine human security.

While recognizing the interlinked nature of ballistic missile disarmament and other wide-ranging disarmament measures, for the purposes of this paper we limit our focus to ballistic missiles. Though we harbor no illusions about the likelihood of even a comprehensive disarmament regime for ballistic missiles at the current moment, we nevertheless feel that arms control efforts should think and plan for the long term. Even debating such a proposal would have some benefits. Sustained discussion of a comprehensive ballistic missile control regime could provide a cross-cutting look at a variety of arms control problems, from ballistic missile defense and the nuclear offense/defense knot, to the proliferation of weapons of mass destruction, emerging regional arms races, and the dangers posed by a potential arms race in space. Such a debate might provide a renewed sense of the growing dangers posed by interrelated high technology arms races, and hence greater urgency to find solutions before we enter irrevocably into another round of great power arms competition.

Sustained discussion of a comprehensive ballistic missile control regime could provide a cross-cutting look at a variety of arms control problems



The State of International Missile Control

Efforts to deal with the US National Missile Defense program have largely emphasized the need to maintain the ABM treaty and to limit anti-missile systems. In December 1999, the UN General Assembly adopted a resolution on *Preservation and Compliance with the Treaty On the Limitation of Anti-Ballistic Missile Systems*. Although there were 68 abstentions, only four states voted against the resolution: US, Israel, Micronesia, and Albania (UN 2000). Despite this widespread international pressure, the Bush Administration has made it quite clear that it intends to continue with NMD deployment, announcing in December 2001 its intention to withdraw from the ABM Treaty.[7]

Responding to the larger and longer term challenge posed by US military plans involving space capabilities, several states, especially China and to a lesser extent Russia, have sought an international agreement on *Preventing an Arms Race in Outer Space* (PAROS), through negotiations at the Conference on Disarmament (CD) in Geneva.[8] Though isolated in opposition to such negotiations, the United States and Israel have succeeded in preventing PAROS talks.[9] **This has, in large part, prevented the CD from agreeing even on a negotiating agenda for the past two years.**

In trying to address the acquisition of ballistic missiles by newer states, the mainstream arms control community has focused on a narrow, nonproliferation approach aimed at buttressing the Missile Technology Control Regime (MTCR). The MTCR was initiated in 1987 with seven members and has grown to 33 member states; members agree not to help non-members build or acquire ballistic missiles with ranges greater 300 km and payloads greater than 500 kg.[10] It has had little effect in creating and sustaining an international norm against missile exports because its design fundamentally limits its effectiveness; at best it could be said to have delayed some missile programs.[11] This is because:

1. The MTCR does not address the ballistic missile arsenals and programs of member states, i.e., the nuclear weapon states and their allies.

2. Numerous shorter-range missiles are already deployed in developing countries.

3. Although they can slow-down the military technology flow, supply-side controls are incapable of stopping the spread of missile technology in the long run.

4. The MTCR has no specific verification and enforcement mechanisms.

5. Export controls over dual-use goods can be in conflict with international technology cooperation and commercial interests in civilian spaceflights;[12] these may generate incentives to circumvent the control regime.

A few states have made preliminary proposals within the limits of the MTCR. At the recent MTCR meetings the United States, Britain, and France offered steps to reinforce MTCR export controls by an increased dialogue with non-MTCR parties, prelaunch notification for missile and space launches, and international standards in the missile field. At the October 2000 MTCR Plenary Meeting in Helsinki, Finland, member states envisaged an outreach to non-members and agreed on a *Draft International Code of Conduct Against Ballistic Missile Proliferation*, including a set of principles, commitments, confidence building measures and incentives, that could increase openness about development and testing, including voluntary commitments.[13] Universalization of the draft Code through a transparent and inclu-

sive negotiating process open to all states on an equal basis is envisaged. France has offered to hold the first negotiating session in 2002.[14]

Other states are now considering options for a stronger missile nonproliferation regime specifically as an alternative to missile defense. At the June 1999 G-8 summit in Germany, the former Russian President Boris Yeltsin proposed a Global Control System for the Non-Proliferation of Missiles and Missile Technology (GCS). In his April 25 statement at the NPT 2000 Conference, the Russian Foreign Minister Igor Ivanov urged consideration of a Russian proposal for a global missile confidence-building and nonproliferation regime.[15]

A goal of the proposed GCS is to increase transparency and reduce the risk of miscalculation or misunderstanding. Nations would be required to provide notification of missile or space-launch vehicle (SLV) test-launches. To discourage proliferation, the GCS would offer incentives to members of the regime that forswore the use of missiles to deliver weapons of mass destruction; including security assurances against the use of missile systems, assistance from the UN Security Council if such weapons were used, and assistance in the peaceful uses of space for members that gave up missiles as weapons.

It seems unlikely that major developing countries would accept another regime in which the five nuclear weapon states are left as the only missile powers.

Despite the offered incentives, the GCS proposal is merely a nonproliferation regime, comparable in some respects with the NPT but without its Article VI obligation to disarm. It seems unlikely that major developing countries would accept another regime in which the five nuclear weapon states are left as the only missile powers. If, on the other hand, all of the states currently with missiles or planning such a capability in the near future were allowed to keep their missile arsenals, then the value of the regime would be severely limited; even negotiations on the regime may well serve to incite future missile developments plans in other states.

A breakthrough in transparency arrangements was achieved on December 16, 2000 with the establishment of the Joint Data Exchange Centre (JDEC) in Moscow, staffed by military personnel from the US and Russia.[16] 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.

In Canada, experts from several countries met in March 2000 and February 2001 to examine options and alternatives to respond to US missile defense.[17] The first meeting discussed multilateral approaches to more effective ballistic missile control, international monitoring, and early warning. Participants emphasized the need to implement risk-reduction and confidence-building measures, such as de-alerting, improved ballistic missile early warning and launch notification. Monitoring and surveillance of missile and space-related activities and the exchange of technical data were identified as the keys to an effective missile-control verification system. The second meeting recommended modernizing international space law to deal with the dangers of space weapons and warfare, expanding the JDEC, and making GCS co-operation multilateral.

On November 20, 2000 the 55th session of the UN General Assembly adopted by 97 votes to 0 with 65 abstentions a resolution on missiles (A/C.1/55/L.1/Rev.1) introduced by Iran. The resolution emphasizes 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 a report on missiles in all its aspects.

Moving Towards a Global Missile Ban

The asymmetric multipolar arms race that is developing, between US efforts at global military dominance and the efforts of other states to keep from being left behind is profoundly dangerous.[18] Present efforts at managing the threat of ballistic missiles, from the US and other states, are compartmentalized and do not address interconnections and feedback. Further, the gap between these efforts and new developments in military technology for anti-ballistic missile systems is large and growing, and largely misses out on what may be required to constrain the US. The absence of multilateral norms for missiles/missile defense has even elicited concern from the Secretary General of the United Nations.[19]

There have been earlier proposals to limit ballistic missiles that were far-reaching. A former director of the US Arms Control and Disarmament Agency proposed that the US-Soviet Intermediate-range Nuclear Forces Treaty (INF) to ban all missiles with ranges from 500 to 5500 km be globalized.[20] Such a ban was proposed again by Canada to the members of the MTCR in 1995.[21] This would of course leave the nuclear weapons states with their long-range missiles.

Another suggestion is a Zero Ballistic Missiles agreement (ZBM) prohibiting the testing, production, and deployment of ballistic missiles, which picks up on a proposal made by US President Ronald Reagan to Mikhail Gorbachev at the famous Reykjavik summit in 1986.[22] Reagan called for a 50% reduction within five years and the total elimination of US and Soviet missile stockpiles within ten years.[23] Unfortunately, Reagan's parallel insistence on his 'star wars' space based anti-missile system prevented any further effort in this direction.

A more detailed scheme was proposed by the Federation of American Scientists in their "Zero Ballistic Missile" regime, which aimed at the complete elimination of offensive ballistic missiles, combined with unilateral declarations as well as regional and global multilateral agreements.[24] The ZBM proposal suggested a four-stage scheme leading towards ballistic missile elimination:

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Stage I: The US and Russia agree to make substantial and accelerated cuts in the number of deployed missiles beyond START II; ballistic missile-free zones are negotiated in certain regions.

Stage II: An international Missile Conference would be held to discuss critical issues and negotiate the implementation of regional ballistic missile-free zones and reductions announced in Stage I.

Stage III: The ZBM regime would be designed; an International Agency for Ballistic Missile Disarmament (IABMD) would be created to supervise the ZBM process and to provide technical and diplomatic assistance to states.

Stage IV: All states would move on varying schedules to zero ballistic missile capability within an agreed period of years.

Such proposals did not command much official attention, in part because they were considered

too ambitious and going too far all at once. It has been felt unlikely that "the five declared nuclear weapon states would agree to forego all their ballistic missiles in a single action, eliminating their nuclear deterrent in its current form".[25] At the same time, without a comprehensive scheme aimed at eliminating missiles and similar systems, there is unlikely to be global agreement on containing the problem. To get around this bind, we suggest that what seems to be required to control and eliminate ballistic missiles is a formal arrangement that will:

1. Recognize the problem of ballistic missiles and comparable delivery systems and express appropriate concern,

2. Commit to eliminate these weapons as soon as practicably possible,

3. Identify the fundamental political and scientific issues involved in meeting such a goal, and

4. Provide a mechanism to tackle these issues in a systematic step by step manner through a scheduled negotiating process.

These requirements are very similar to the kinds of structures found in recent international conventions dealing with environmental problems such as the Vienna Convention on protection of the Ozone layer and the UN Framework Convention on Climate Change. These international agreements dealt with chemicals that constituted a grave and urgent danger to society, were largely produced in a minority of states, were of great significance to them, but were a global hazard and required international agreement to deal with them. These conventions set up a standing negotiating process, a Conference of Parties, which was mandated to find means to meet the goals of the agreement.

As in these conventions, a ballistic missile framework agreement would set up a formal negotiating process for dealing with ballistic missiles, anti-missile systems, and analogous weapons systems, with a clear goal of eliminating them. The agreement would result in a series of phased stages, each being a step towards the ultimate goal. As a reflection of the seriousness of the issue, agreement would be needed at the outset on a moratorium on the further development, testing and deployment of ballistic missiles and anti-missile systems. Such a "missile threat freeze" would be like earlier nuclear test ban moratoria that created time and a climate conductive for negotiations.

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The flight test ban and launch control regime elements of a moratorium on ballistic missile development could help prevent future arms races, and development of long-range conventional weapons operating from or through space. Although not a substitute for a more comprehensive Outer Space Treaty, which would unambiguously prohibit the emplacement of weapons and weapons delivery platforms in space, a launch control regime that included inspections would help reveal efforts by any nation to place weapons in space. A ban on test flights of ballistic missiles could also have an immediate positive impact on the most volatile areas of emerging international arms competition, especially in South Asia, the Middle East and Northeast Asia.[26]

Given current political circum-

stances, an international monitoring and inspection system will be necessary to build trust in the missile control and disarmament regime.[27] Various technical and non-technical means of verification exist to focus on observable rocket characteristics that provide indications of rocket type and performance.[28] The efficiency of verification depends on the stage in the missile life-cycle that is to be controlled. For example, the flight test ban should be relatively easy to verify.

Though somewhat harder, activities other than flight tests undertaken as part of the development of ballistic missiles may also be amenable to various inspection schemes, especially in light of the experience gained in monitoring the INF and START agreements. Much of the missile infrastructure – such as production facilities, test ranges, tracking and communication facilities, missile containers and missile-carrying vehicles – is highly visible. However such technical means for remote sensing need to be accompanied by inspections; these could draw on the experiences of the UN Special Commission (UNSCOM) inspections in Iraq.

Because of their dual-use, it is difficult but not impossible to differentiate between ballistic missiles and space-launched vehicles. 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. To determine the basic payload type – in particular, to detect re-entry vehicles at the front of a rocket – without disclosing proprietory information, non-intrusive devices and techniques can be applied, such as scanning and radiographic devices.

Adequate verification capability would be further enhanced if the leading missile powers spend even a small fraction of their military budgets in developing verification technologies and building the necessary infrastructure.

Adequate verification capability would be further enhanced if the leading missile powers spend even a small fraction of their military budgets in developing verification technologies and building the necessary infrastructure. It is worth emphasizing that the goal is to ensure adequate – not perfect – verification. The potential risks of breakout under such a regime should be compared to a world with multiple arms races with much higher levels of insecurity.

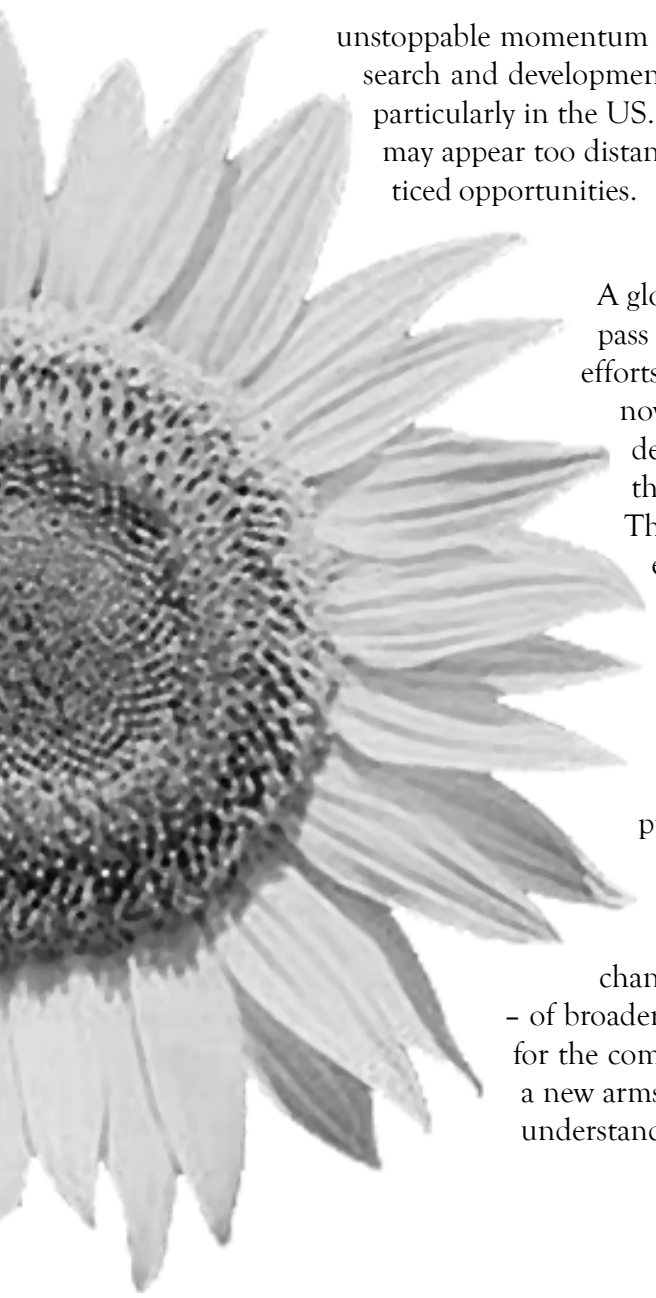
We expect claims that any limits on ballistic missile development by states with extensive missile arsenals will make them unable to defend their national interests adequately. Any useful discussion of an argument of this kind requires these states to articulate precisely what "national interests" require increasingly sophisticated long range, accurate ballistic missile systems. In particular, it would require an answer to how a missile flight test ban would impair adequate "deterrence."[29] The power projection roles of these weapons and the interests they serve would thus come to the surface in public debate, rather than the more typical situation of these states hiding behind the generalities of deterrence.

Conclusion

Our main interest in revisiting the idea of a treaty banning ballistic missiles is to give it wider currency and provide a positive alternative to those who refer to the threat of ballistic missile proliferation to support the development of BMD systems. We suggest that a comprehensive ballistic missile control regime would address both the multiple threats and technologies claimed as necessary either to deter them or to provide direct defenses. Even the initial steps towards a truly comprehensive ballistic missile control regime, such as a missile flight test ban, would help halt or slow a range of arms races and proliferation dynamics either in progress or likely to commence in the near future. By doing so, it also would help disentangle the growing problem of multiple arms races that feed on each other.

An agreement to eliminate ballistic missiles would delegitimize missiles as symbols of military, technical, economic, and political prestige, appropriately described as "trappings of power".[30] It would enhance global security and stability by increasing decision-making time and removing the threat of accidental ballistic missile launch. When compared to the MTCR, it would be more conducive to cooperation and pursuit of legitimate civilian space efforts. Because it aims at the elimination of a complete class of weapons in a non-discriminatory fashion, it would have a certain political appeal.

The effort to achieve a global missile control regime provides a kind of positive mirror image of the endless quest for military supremacy through technology. The militaries of powerful states attempt to do long-range planning, in part because the development cycle for complex weapons systems commonly takes a decade or more. Arms control advocates too must think long-term – the time to cut off these emerging arms races is now, before weapons systems have developed



unstoppable momentum and constituencies in respective military services, military research and development laboratories, military contractors, and parliaments, most particularly in the US. By beginning today to think systematically about concepts that may appear too distant a prospect to take seriously, we may discover previously unnoticed opportunities.

A global missile control regime and the types of steps it should encompass provides a common focus both for discussion and for organizing efforts for disparate elements of the world's peace movements. These now include the growing movement against US space weapons deployment, as well as the emerging peace movements in regions threatened by dangerous new arms races, particularly South Asia. There is also a broader movement against economically unjust and ecologically unsustainable globalization, which is beginning to make the link for a new generation of activists between military "power projection" and the interests it serves.

Even if achieving a ballistic missile control regime is unlikely in the immediate future, discussion of such a regime would, by providing a different perspective on technology development, the dynamics of arms racing, verification issues, and the reasons claimed for constant upgrades to military forces, help break the current deadlock in nuclear arms reduction efforts. The chances for progress will be improved if the attention – and pressure – of broader civil society can be brought to bear, perhaps through a campaign for the comprehensive flight-test ban as the first step away from the abyss of a new arms race, which would be effective, simple for a wider public to understand, and relatively easy to verify.

ENDNOTES

1. A/57/229, 23 July 2002.

2 The need for such an alternative to deterrence and missile defense has been emphasized by Jayanta Dhanapala. Speech, "Eliminating Nuclear Arsenals: The NPT Pledge and What It Means" (Talk at All Party Group on Global Security and Non-Proliferation, House of Commons, London, England, 3 July 2000).

3 The development of certain other types of ballistic missile defenses—for example, those employing lasers from or space—would be limited indirectly by the launch inspection and control elements of the regime proposed here; see further discussion below and in a separate paper under preparation.

4 On the stability issues concerning missile defense see (Scheffran, 1989) and (Scheffran, 2001a).

5 This idea is based on a suggestion for the Fissile Material Cutoff (Mian 2000a). Some of the elements for ballistic missiles have been outlined in (Scheffran 2001b). The framework approach was first developed for environmental treaties such as the Climate Change Convention.

6 Mian, 2000b.

7 Mufson & Milbank, 2001.

8 Rissanen, 2001; DD 2000

9 Despite an initial effort in 1957 to get agreement on the exclusive use of outer space for peaceful purposes, the United States consistently has maintained that "peaceful" uses of outer space means only non-aggressive uses and that military uses of space, including placement of weapons in space, is permissible unless specifically forbidden by treaty. Article IV of the 1967 Outer Space Treaty prohibits the placing in orbit or on "celestial bodies" 'nuclear weapons or any other kind of weapons of mass destruction.' For an overview of the development of law relevant to the weaponization of space see (Menon 1989).

10 Current MTCR members are Argentina, Australia, Austria, Belgium, Brazil, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, the republic of Korea, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Russia, South Africa, Spain, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and the United States. See for example (DD 2001).

11 See (Scheffran & Karp 1992). Nolan (1989) argues that the 'controls on missile exports, however desirable, represent efforts to assert great power prerogatives in a world in which the foundations for such prerogative are eroding quickly.'

12 One forecast of the worldwide satellite launch market for 2000-2009 estimates the value of satellites at over $126 billion and the cost of launch services at over $49 billion. See (Teal 1999).

13 MTCR, 2000.

14 DD, 2001.

15 Rice, 2000.

16 ACT, 2000.

17 CCFPD, 2000; LCSG!, 2001.

18 It is often assumed that the main motivation for the nuclear and missile programs of states are regional threats and thus they do not have anything to do with the P-5 arsenals. But the P-5, especially the United States, have a global military presence and thus are a *de facto* 'regional' threat to all countries. The premise that equitable disarmament is unnecessary for nonproliferation has been termed 'the grandest illusion of the nuclear age' (Perkovich 1999, 464).

19 UN, 2001.

20 Adelman, 1991.

21 IDR, 1995.

22 Frye, 1992; Frye 1996; Sherman 1987.

23 For analyses of the proposal see the special issue of *International Security* 12, no. 1, (Summer 1987) and (Schultz 1993).

24 Lumpe 1993; Holton, Lumpe & Stone, 1993.

25 Dean, 1998.

26 For an analysis of the applicability of such a regime to the case of South Asia, see (Mian & Ramana, 1999).

27 We explore this in greater detail in a separate forthcoming paper.

28 See further (Scheffran 1995), (Scheffran 1997) and (Scheffran 1993).

29 A loss of confidence in the reliability of a military system does not translate into a gain in confidence that the system *will* fail. Thus, the perceived deterring ability is not lost. This issue has been extensively discussed

30 Nolan, 1991.

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Appendix 1

Country	Name	Missile Characteristics	Range (km)	Payload (kg)
India	Agni	ballistic missile	1500-2500	1000
India	Sagarika naval	ballistic/cruise missile	300	500 (?)
Pakistan	Shaheen-I	ballistic missile	750	1000
Pakistan	Shaheen-II	ballistic missile	2300(?)	1000
Pakistan	Ghauri II	ballistic missile	1500-2300	500
Israel	Jericho I	ballistic missile	500	1000
Israel	Jericho II	ballistic missile	1500	1000
Israel	?	submarine launched missile	1500	?
Iran	Shahab III	ballistic missile	1300	750
North Korea	No Dong I	ballistic missile	1000	1000
North Korea[1]	No Dong II	ballistic missile	1500	1000
North Korea	Taepo Dong	ballistic missile	2000	1000
Taiwan	Sky Horse	Ballistic missile	950	500

1 North Korea has pledged that it would not flight-test the Nodong II (Perlez 2000) and (Wagner 2001).

This could imply that it has terminated the program or is planning to do so.

BEYOND MISSILE DEFENSE

October 2002