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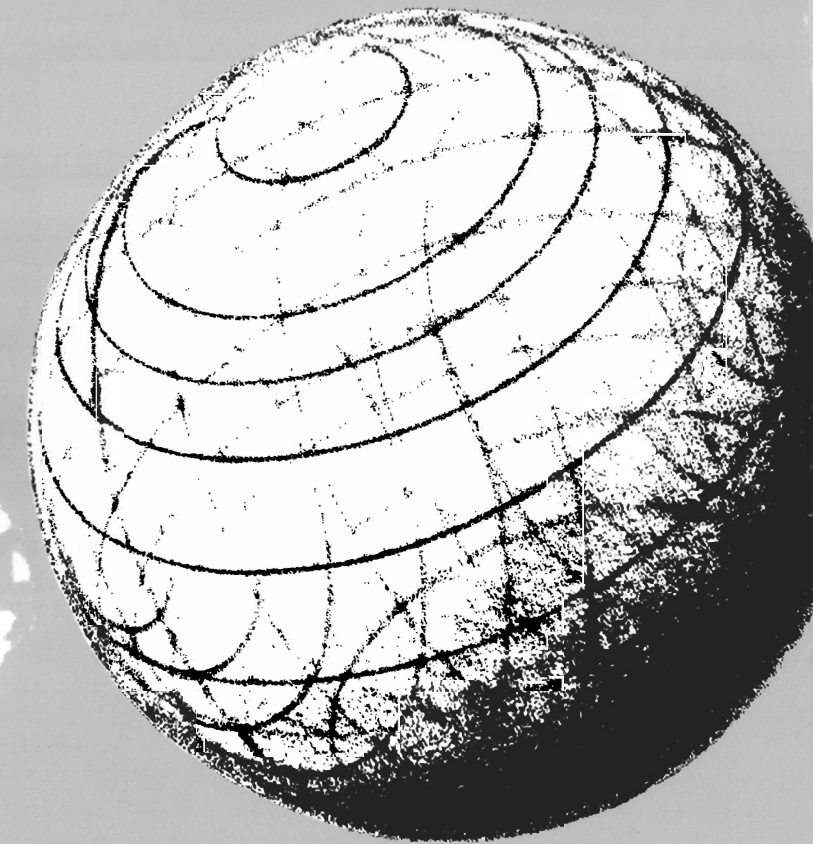
University of California  
Institute on Global Conflict  
and Cooperation  
University of California, San Diego

IGCC Research Paper No. **2**

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## **ARMS CONTROL: PROBLEMS AND PROSPECTS**

**Michael D. Intriligator  
Dagobert L. Brito**



University of California  
Institute on Global Conflict  
and Cooperation

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**Michael D. Intriligator  
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*The present paper builds upon these past papers, each of which treats a specific issue related to arms control. For references to the general literature in each area see the cited articles.*

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## ARMS CONTROL: PROBLEMS AND PROSPECTS

The basic question of arms control is simply whether it still has a role to play. Different people have provided different answers to this question, with some being enthusiastic supporters of arms control and others being skeptical or even hostile to arms control. The answer we give here is that arms control, broadly conceived, does indeed have a role to play, but that it requires both substantive and procedural rethinking entailing both a new agenda and a new procedure. This paper builds upon our past work to develop such a new agenda and a new procedure for arms control.

### ARMS CONTROL: GENERAL ASPECTS

Since it means different things to different people, a definition of arms control is necessary. *Arms control* will be taken here to refer to changes in the numbers and qualities of weapons, their configurations, and other changes that affect their use or effectiveness. It is not the same as disarmament, which refers only to reductions in or elimination of weapons. In fact, in certain instances, arms *increases* can be interpreted as arms control if such increases promote the goals of arms control. Nor is arms control the same as bilaterally negotiated weapons reductions, which is but one of several alternative approaches to arms control.

The traditional goals of arms control were formulated in the early 1960s by Thomas Schelling and others. The first and foremost of these goals, that of strategic stability, is to reduce the chance of war, especially nuclear war. The second goal is to reduce or limit damage in case war does break out, while the third is to reduce the cost of armaments.

In addition to these traditional goals, however, there are other aims which may be advanced through arms control. One of these, for instance, is to promote strategic and military objectives, while another is to promote international political objectives. A third is to promote domestic politics or to alter the domestic political climate. A fourth is to alter adversary perceptions. Finally, arms control initiatives have effects on alliances, so another goal is that of strengthening one's own alliance and/or weakening the enemy alliance.

Of these various goals, certainly reducing the chance of war, especially nuclear war, must remain the primary goal, and this will be the assumed goal in what follows. Thus in the term "arms control," the "arms" will be taken to refer to weapon numbers, qualities, configurations, etc., while the "control" will be taken to refer to control over their potential *use*, not simply their numbers or types.

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There are several approaches to arms control. While the approach most frequently emphasized is arms control based on bilateral negotiations on limitations or reductions of weapons and leading to treaties with verification provisions, this is but one of three broad approaches to arms control, namely the unilateral, bilateral, and multilateral approaches. The unilateral (or independent) approach involves initiatives taken on the part of a single country, with or without the expectation of reciprocity. Recalling that arms control refers to actions taken to stabilize the nuclear balance and that arms control is not restricted to weapons reductions, examples of unilateral arms control initiatives include the building and hardening of missile silos and the development and deployment of submarine-launched missiles, which, together with earlier bomber deployments, led to the creation of the triad of weapons that exists in both the United States and the Soviet Union and also the United Kingdom, France, and China. These unilateral initiatives are arms control initiatives in that they change the types and configurations of weapons and have a clear effect on the chances of war. In fact, they are probably among the most important arms control initiatives taken in the entire postwar period in reducing the chance of war via the system of mutual deterrence. Another type of unilateral initiative which refers to potential changes in weapons qualities is restraint in the development or deployment of new weapons systems. For example, for a long time the United States did not develop antisatellite weapons even though it had the capabilities to do so. Another example is President Nixon's unilateral decision not to produce biological weapons. These various unilateral arms control initiatives are often ignored, although they are extremely important. In fact, they are arguably the most important arms control steps ever taken in the nuclear period since they, together with weapons deployments, have jointly created the stability of mutual deterrence.

Bilateral initiatives form the second general approach to arms control. Such initiatives can be achieved through formal treaties, through mutual understandings, or through parallel unilateral action, i.e., unilateral actions taken simultaneously or consecutively by both sides. Examples include the limited test ban, which, in fact, progressed from parallel unilateral action to a mutual understanding to, ultimately, a formal (multilateral) treaty. The SALT I, SALT II, and START negotiations form another example of bilateral arms control, which has led both to formal treaties, such as the 1972 ABM Treaty, and to mutual understandings, such as the agreement to abide by the restrictions of SALT II even though it is not a ratified treaty.

Multilateral initiatives form a third general approach to arms control. As in the bilateral case, multilateral initiatives can be achieved through formal treaties, mutual understandings, or parallel unilateral action. Examples include the multiparty treaty prohibiting atmospheric testing and the

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would potentially lead to greater global stability without compromising national security policies.

This new procedure for arms control, in the form of a new five-nuclear-power forum, when coupled with the new agenda for arms control, could play an important role in achieving significant arms control results. The new forum, unlike present arrangements, would include all (overt) nuclear nations. Furthermore, by treating several agenda items in one forum rather than in separate fora it would allow for bargaining to reach mutually satisfactory agreements or understandings.

## CONCLUSION

Many people have become dissatisfied with arms control in recent years. Some have sought alternative solutions to the problem of nuclear weapons and the potential for nuclear war via utopian political solutions such as complete disarmament, world government, nuclear freeze, etc. Others have sought alternative solutions via utopian technical solutions such as a complete defensive shield to render nuclear weapons "impotent and obsolete." There are, however, no easy alternatives, whether political or technical, or at least none in the near future. Arms control remains the best approach for dealing with the problem, but it has to be modified in both substance and procedure to make it a more effective instrument. In terms of substance, a new arms control agenda would move away from the traditional emphasis on weapons reductions or limitations to focus more directly on the basic instabilities themselves, specifically in the form of inadvertent nuclear war, the possible erosion of deterrence, and potentially destabilizing proliferation. In terms of procedure, a new arms control forum involving all five nuclear nations would supplement or even eventually replace some of the present fragmented bilateral and multilateral fora as the principal forum for addressing the basic instabilities in the global system. This new agenda and new forum could revive the arms control process and make it an effective instrument in achieving global stability.

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on arms control. The five are parties to certain multi-nation fora, but they cannot negotiate effectively there in the presence of the various other nations.

It is certainly true that this new forum would be unwieldy, prone to political arguments and disputes, and much more complicated in its management and functioning than the traditional two-party forum. For example, four of the five are potential adversaries of the Soviet Union. Nevertheless, there are precedents for successful multiparty fora, not only in the area of arms control (e.g., the Stockholm CDE Conference), but also in dealing with other global issues, such as economic and environmental issues. Even more important, it is essential that all relevant parties be represented. Excluding the smaller nuclear powers, especially China and France, creates problems and tensions which are themselves potential sources of instability, e.g., the unwillingness of China and France to participate actively in the nonproliferation regime.

While such a new five-nuclear-power forum has, in fact, been proposed before, e.g., by former Canadian Prime Minister Pierre Trudeau and by Soviet General Secretary Mikhail Gorbachev, these earlier proposals have not included a new agenda for this new forum. Rather, they involved the traditional agenda items. The new forum should, however, also have a new agenda which is directed to current and potential future areas of global strategic instability. Indeed, one reason for the lack of emergence of such a forum is the concentration on traditional agenda items, such as weapons cuts or limitations, which is an important reason for the lack of participation of China and France in arms control negotiations and agreements which they have been invited to join. Some of the agenda items for the new forum would involve the multilateral arms control initiatives presented earlier, which would result in gains to all parties. One agenda item might be communications, involving, for example, an agreement on an expanded hotline connecting all five nuclear powers or any subset of these nations, and an agreement not to threaten the command, control, and communication systems of any of the parties. Another agenda item might be accidents and nuclear threats, involving, for example, agreements or understandings established ahead of the time of a crisis on procedures to be followed in such situations. A third agenda item might be strategic defenses, involving, for example, agreements on the extent of allowable strategic defenses, building on the ABM Treaty but modifying it both to include the other three nuclear nations and to allow for limited cooperative defensive deployments. A fourth agenda item might be nonproliferation, involving, for example, agreements on nuclear exports, transfers of nuclear technology, etc. Other agenda items would deal with other potential global risks, such as those due to other weapons of mass destruction, e.g., chemical and biological weapons. All of these agenda items

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three-party (US-USSR-UK) negotiations on a comprehensive test ban treaty. Another example is the Nonproliferation Treaty (NPT), which involves over 130 countries. In addition to the NPT, there are other multilateral initiatives that support the nonproliferation regime, such as the London Suppliers' agreement and the Zangger Committee. These multilateral approaches to nonproliferation are sometimes treated separately from arms control, but they are certainly consistent with the definition of arms control advanced here and thus should be treated as arms control initiatives. By the same token, unilateral initiatives to prevent nuclear proliferation, such as requirements for full-scope safeguards or for return to the supplying country of spent nuclear fuel rods, should also be regarded as arms control initiatives. They all are consistent with the broad operational definition of arms control as actions affecting arms that can reduce the chance of war.

Just as there are several alternative *approaches* to arms control, depending on the number of participants, there are several alternative *methods* of arms control, referring to the instruments by which arms control is achieved. The most frequently discussed method is probably reductions or limitations in the numbers of weapons, a method that long precedes the nuclear age. For example, the nine treaties stemming from the 1921-22 Washington Disarmament Conference used precisely this method to limit arms in the hope of preventing war. In the nuclear era, this method forms the basis of the SALT and START approaches to arms control. This is certainly not the only method of arms control, however. Another, which also long precedes the nuclear era, is that of agreements or decisions not to deploy certain weapons. In the nuclear era, an example of this is the ABM Treaty, which obligated the two superpowers not to deploy antiballistic missile systems beyond certain agreed-upon numbers and types of locations. Another example is the unilateral decision not to deploy an ASAT weapons system. A third example is the NPT, which obligated the nuclear non-weapons states not to develop or to deploy such weapons. A third method of arms control involves changes in types, bases, or configurations of weapons, that is, how weapons are deployed for use. Examples include the hardening of ICBM silos and the development of submarine-launched missiles. Another example is the development of missiles with MIRVed warheads (and also the possibility of deMIRVing missiles). A fourth method of arms control is that of limitations on testing. Examples include various test moratoria, the limited test ban, the partial test ban, and the threshold test ban, involving unilateral, multilateral, and bilateral approaches. A fifth method of arms control is that of nuclear-free zones. Unlike the method that involves decisions or agreements not to deploy, which pertains to countries, the method of nuclear-free zones involves decisions or agreements not to introduce nuclear weapons in certain designated areas. Examples include



the agreements not to introduce nuclear weapons in Antarctica, in Austria, on the seabed, and in space.

The alternative approaches and methods can be combined into a matrix of cross-classifications, as laid out in the table below. This table indicates some of the many possibilities of arms control. All of the cross-classifications are possible, and most can be illustrated by historical examples. Unfortunately, many people still treat arms control only in terms of the bilateral approach—limitations/reductions in weapons cross-classification, as in the SALT/START agreements and understandings. Such a narrow interpretation for arms control accounts, in part, for some of the growing skepticism about or even hostility to arms control. The argument against arms control is that since arms control purportedly refers to U.S.-Soviet negotiations on numbers of weapons and since purportedly these negotiations have not accomplished much, arms control does not work. This reasoning, however, is flawed, and the conclusion is false. Arms control involves many possible approaches, as illustrated in the table, not just bilateral negotiations. Furthermore, the bilateral negotiations themselves have had important effects. Not only would the world probably have been considerably more dangerous than it currently is if there had not been the SALT and ABM agreements; there is value in negotiating even without an agreement. (Recall that the final “T” in both “SALT” and “START” refers to “Talks,” not “Treaties.”) Thus the conclusion of this flawed line of reasoning, that arms control doesn’t work, is false, since it stems from two false premises.

ALTERNATIVE APPROACHES/METHODS OF ARMS CONTROL

Methods	Approaches		
	Unilateral	Bilateral	Multilateral
Limitations in numbers	Elimination of obsolete weapons	SALT I, II, START	MBFR
Agreements/decisions not to deploy	Restraint on ASAT	ABM Treaty	NPT
Changes in types, bases, or configurations	Hardened silos Sub deployments	New system restrictions in SALT II	
Limits on testing	Unilateral moratoria	Threshold Test Ban	CTB
Nuclear free zones			Seabed Space

weapons from falling into the hands of irresponsible leaders but also with preventing irresponsible decisions or a loss of control in current nuclear states. Bilateral agenda items would include further agreements on nonproliferation and agreements in advance as to how to deal with irresponsible leaders or decisions. These initiatives would be strengthened by unilateral nonproliferation measures, including stricter safeguards on spent fuel rods, and perhaps more important, by multilateral agreements that would extend the nonproliferation regime to cover the potential transfers of fissile material, nuclear facilities, nuclear technology, etc., from so-called “second-tier suppliers,” such as Argentina, Brazil, and India. These states were presumed, when the nonproliferation regime was established, to be nuclear importer states, but they and other states now have the capabilities to become nuclear exporter states. This recent change calls for further multilateral initiatives to strengthen the nonproliferation regime.

Pursuing all three categories of agenda items—immediate, to reduce the chances of accidental war; short-term, to prevent the erosion of mutual deterrence; and long-term, to control destabilizing proliferation—using all three different approaches—unilateral, bilateral U.S.-Soviet, and multilateral—would represent a significant and reinforcing set of initiatives that would treat the instabilities present or looming in the international system. Elements of this new agenda should also be pursued by a new multilateral arms control forum.

A NEW PROCEDURE FOR ARMS CONTROL

Bilateral fora for arms control have represented an important, but by no means the only, approach to arms control. Confining the negotiations to the superpowers could be defended in the past both on the grounds that at least one of the other nuclear powers, the U.K., was represented implicitly through its close association with the U.S. and on the grounds that all three smaller nuclear powers—the U.K., France, and China—had relatively insignificant stockpiles of nuclear weapons. The former argument, however, does not apply to France and China, while the latter argument, while true in the past, is only partly true today and will be less and less true in the future. The U.K. and France, and perhaps China as well, are planning substantial increases in not only their weapons stockpiles but also in their delivery capabilities. Under these circumstances it is essential that the U.K., France, and China participate with the U.S. and the Soviet Union in arms control negotiations—in a new five-nuclear-nations forum. No such forum currently exists. While these five are the permanent members of the UN Security Council this is not the appropriate setting for serious negotiations

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communication at all times and would provide protection for all nuclear power C<sup>3</sup>I systems. Multilateral agreements would also build on bilateral agreements on how to deal with potential accidents or nuclear threats and on not developing launch-on-warning systems.

The next group of agenda items are short-term items, referring to potential instabilities over the next five to ten years, especially the possible erosion of mutual deterrence. They involve actions to prevent such an erosion of mutual deterrence, since mutual deterrence constitutes the primary basis of current stability against a premeditated nuclear war. Of particular importance are actions to avoid a possible decapitation strike, a possible breakthrough in antisubmarine warfare, or the deployment of antisatellite systems. Bilateral agenda items would include agreements on antisubmarine warfare, antisatellite systems, and antiballistic missiles. On strategic defenses, as in the SDI program, while a complete defensive shield might undermine mutual deterrence and hence could contribute to strategic instability, a limited strategic defense system would be valuable for defending retaliatory capability, protecting the national command authority and C<sup>3</sup>I and providing some degree of protection against accidents, third-party actions, etc. Such a limited strategic defense system could be built unilaterally, but it would be preferable to develop and to deploy it on a bilateral basis, through U.S.-Soviet cooperation, given the mutuality of interests of both nations in achieving these goals. Thus strategic defenses would be part of the bilateral agenda with the goal neither that of developing a complete defensive shield nor that of no strategic defenses at all but rather with the goal of cooperative development of a system of active and passive defenses in order to protect both nations from accidents, loss of command authority, deliberate or accidental strikes by smaller nuclear powers, etc.

These bilateral agenda items would be supplemented, as in the previous group, by reinforcing unilateral initiatives and multilateral agreements. Unilateral initiatives would include actions to replace current vulnerable, fixed-site land-based missiles by less vulnerable mobile and concealable missiles, such as long-range cruise missiles. The fact that these missiles are not verifiable should not interfere with their deployment. Indeed, if they are not verifiable it means that they can be concealed, as in the case of submarines, and hence could survive a first strike, thus reinforcing mutual deterrence by being available for a retaliatory strike. Multilateral agreements would build on the bilateral agenda to cover antisubmarine warfare, antisatellite weapons, and limited strategic defensive systems.

Finally, the last group of agenda items are long-term items, referring to potential instabilities over the next ten years and beyond, specifically the possible advent of destabilizing nuclear proliferation. Arms control initiatives in this area would be concerned not only with preventing nuclear

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## THE NUCLEAR ARMS RACE AND ARMS CONTROL

The *nuclear arms race* refers to the interactive acquisition of weapons between the nuclear powers, especially the superpowers, involving both numbers and qualities of weapons. There are important interrelationships between the arms race and arms control, involving political factors, economic factors, technology and technological change, and perceptions. In fact, the arms race and arms control are, to a large extent, two sides of the same coin. The result of the combined effects of the superpower arms race and a variety of arms control initiatives, unilateral, bilateral, and multilateral, is that the current situation is one of great stability against a premeditated attack by either superpower against the other. This strategic stability, i.e., stability against a premeditated attack, stems from the current situation of mutual deterrence, in which each superpower has the ability to retaliate in a devastating second strike against a first strike of the other.

While there is strategic stability against a premeditated attack, the arms race itself exhibits instability, with misperceptions on both sides leading to both weapons procurements and weapons improvements. In fact, the instability of the arms race, ironically, reinforces the stability against the outbreak of war by enhancing deterrence. By adding to the capability of both superpowers to launch a second-strike counterattack, increasing numbers of weapons has enhanced deterrence against a premeditated strike.

As a result of the arms race, there are enormous stockpiles of nuclear weapons on both sides. These stockpiles are, however, fundamental to stability against war outbreak via mutual deterrence. While some have argued that the stockpiles can be cut considerably without losing the stability of mutual deterrence, there is, in fact, considerable value in having not only a variety of types of weapons, as in the triad of three independent systems, but also a large stockpile of each type of weapon, as both serve as a hedge against potentially destabilizing technological breakthroughs that could occur on either side. For example, the variety of weapons types and large numbers of weapons of each type offset the effects of substantial increases in accuracy, which are potentially destabilizing; which have, in fact, occurred in recent years; and which have put at risk all fixed-site land-based missiles. The presence of other types of weapons, particularly mobile and concealable weapons, such as submarine-launched missiles, however, has ensured a continuation of mutual deterrence. Large weapons stockpiles and a variety of weapons types provide important and reinforcing contributions to strategic stability via mutual deterrence.

The concept of stability is important in this context, but has often been misinterpreted. The current situation is one of an unstable arms race, with no stopping point as each side builds additional weapons or creates

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additional weapons capabilities. At the same time, however, and partly as a result of this quantitative and qualitative arms race, there is considerable stability against a premeditated attack due to fear of retaliation. An attack by either side would be suicidal and therefore irrational. (See below for irrational leaders.) There is thus an unusual juxtaposition of stability and instability, namely, instability of the arms race but stability against a premeditated attack.

Nuclear weapons, which are obviously the cause of the problem of the possibility of nuclear war, are, less obviously, also a contribution to the solution of this problem, via mutual deterrence. Their presence has fundamentally and irreversibly changed the global system. Since the knowledge of how to build nuclear weapons not only exists but cannot be destroyed, there is no way to eliminate nuclear weapons from the world. A completely disarmed world is, in fact, probably one of the most dangerous situations imaginable, since in such a situation even a small number of nuclear weapons could represent a substantial threat without the threatened nation having the capability to retaliate, i.e., without mutual deterrence. Indeed, the time when nuclear weapons are probably most likely to be used is in such a situation, with a very small stockpile on only one side, as in the U.S. atomic strikes against Japan. For this reason, nuclear disarmament, interpreted as reductions in nuclear weapons stocks down to zero or near-zero levels, is extremely dangerous in raising the probability of war and is therefore inconsistent with the paramount goal of arms control.

While the current situation between the superpowers is one of strategic stability based on mutual deterrence, there are other paths to nuclear war. Probably the greatest danger of nuclear war today stems from *inadvertent* rather than *advertent* war, in particular, via accident, loss of control, undependable field actions' escalation from a regional conflict, and the actions of third party nuclear powers. It is these inadvertent paths to nuclear war that must be treated as part of the new arms control agenda.

#### A NEW AGENDA FOR ARMS CONTROL

The strategic relationships between the United States and the Soviet Union have clearly changed over the postwar period. Furthermore, new nuclear powers have emerged, and technology has developed rapidly. Nonetheless, the bilateral arms control agenda is still basically the same as it has always been, stemming from the prenuclear period and even back into the nineteenth century and earlier, focusing on limitations on or reductions in the number of weapons. Such limitations or reductions are useful, particularly in improving the political climate, but may have only a limited role to

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play in the current situation. Small reductions can improve the overall political climate and possibly reduce tensions, but, from the arms control viewpoint of reducing the chance of nuclear war, they are largely meaningless. Conversely, large reductions could undermine the stability of mutual deterrence, which is, in fact, reinforced by relatively large numbers of weapons on both sides. Furthermore, there are much more positive ways for improving the political climate than weapons limitations or reductions, such as joint projects in support of economic development or environmental protection. Thus, the traditional bilateral arms control agenda of weapons limitations or reductions should be supplemented or even replaced by new agenda items.

These new bilateral agenda items should address the principal current areas of instability, and they should be supplemented by related unilateral and multilateral initiatives.

The most immediate new agenda items would deal with the most important potential instability currently, which is inadvertent nuclear war. They involve actions to reduce the chance of inadvertent war, especially due to accident-prone weapons or warning systems, to a loss of control by the national command authority, and to escalation from a regional conflict. While the probability of such an inadvertent nuclear war is undoubtedly small, it is still probably larger than the probability of a premeditated war. Furthermore, accidents can and do happen, particularly at complex and large-scale man-machine interfaces, such as the control of strategic nuclear weapons. Witness, for example, the accidents of Challenger and Chernobyl, two other complex large-scale man-machine interfaces. Of course, the chance of inadvertent nuclear war significantly increases in a time of crisis, but even without a crisis there is a chance of accident, as in the case of the Chernobyl accident.

Bilateral agenda items to deal with inadvertent nuclear war would include agreements in advance on how to deal with potential accidents or nuclear threats, e.g., by irrational leaders or terrorists; on not deploying launch-on-warning systems, which could significantly raise the probability of war based on various human or technical mishaps; and on a possible bilateral crisis-control center. These bilateral agenda items would be supplemented by reinforcing unilateral initiatives and multilateral agreements. Unilateral initiatives would include the elimination of weapons or warning systems that are vulnerable or accident-prone and improvements in C<sup>3</sup>I (command, control, communications, and intelligence) to ensure control and avoid false commands or communications. Multilateral agreements would extend communications in time of a potential crisis from the nuclear superpowers, via an expanded hotline, to all five nuclear powers, adding Britain, France, and China, so that any two, three, four, or all five can be in