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PROSPECTS FOR SPACE ARMS CONTROL

by J. F. Pilat

At the recent Wyoming Ministerial, U.S. Secretary of State Baker and Soviet Foreign Minister Shevardnadze signed a memorandum of understanding on a bilateral verification experiment and data exchange related to a prohibition on chemical weapons, an agreement on advance notification of certain strategic exercises, and an umbrella agreement on START trial verification and stability measures. Despite these substantive achievements in high priority areas for the United States and the Soviet Union, media attention on the ministerial focused on an offer by the Soviets that would allow a START agreement to be concluded without a resolution of U.S.-Soviet differences in the Defense and Space (D&S) talks. Of course, the Soviet offer did not "delink" START and D&S, because the Soviets continued to demand the right to withdraw from START if the United States deployed space-based defenses. A more substantial proposal on Defense and Space was the U.S. initiative inviting a group of Soviet experts to visit Los Alamos and the TRW Corporation's test facility in San Juan Capistrano to learn more about U.S. SDI research activities. The U.S. invitation was proposed in the context of the Predictability Measures Protocol to a Defense and Space Treaty, tabled by the United States, which calls for regular exchanges of data, briefings, visits to laboratories, and observations of tests designed to foster transparency and predictability.

There has been limited movement in the D&S talks--for example, the Soviet decision to dismantle the Krasnoyarsk radar meets a key objective of the United States in the talks, and the Soviets have accepted some of the concepts put forward in the Predictability Measures Protocol and are reportedly considering the invitation presented by Secretary Baker at Jackson Hole --but the United States and the Soviet Union have fundamental differences in this area. The U.S. approach to the Defense and Space talks is designed to enhance strategic stability and U.S. national security by facilitating a cooperative transition to a stable offense-defense balance if advanced defenses should prove technically feasible. The Soviet approach, it would appear, was initially designed to achieve a ban on all research, development, testing and deployment of "space strike weapons," an objective which is still being pursued through attempts to limit the U.S. Strategic Defense Initiative (SDI) program. These divergent U.S. and Soviet approaches suggest that the D&S talks, the only ongoing negotiations in the area of space arms control, are unlikely to produce a treaty in the foreseeable future.

Of course, as activities in the Conference on Disarmament (CD) and elsewhere demonstrate, there is considerable international interest in space arms control. There are existing agreements restricting or regulating certain activities in space and, especially in the last decade, we have seen a flurry of governmental or nongovernmental proposals for total or limited bans on all space weapons, on ASATs, and on nuclear and nuclear-driven space weapons, as well as proposed confidence-building measures of various types. Yet, other than confidence-building measures, which may be difficult in themselves, the probability of achieving additional agreements on space arms control in the foreseeable future appears low. Among the reasons are the following:

- civil and military operations are becoming less distinguishable, and civil-military dual-use assets are growing, with the prospect that space arms control could either adversely affect civilian space programs or that these activities could undermine an agreement;
- military space missions are widespread and recognized as essential to national security, and technological developments have made additional military space activities more attractive;
- a growing number of states are pursuing military space options, which complicates the arms control situation;
- the verification problems of space arms control are particularly daunting, and the potential military significance of non-compliance is high; and
- arms control activities are focusing on areas viewed to have a higher priority, and where agreement appears more reachable.

I shall consider each of these factors in turn, and conclude with an assessment of the prospects for further space arms control.

Civil-Military Ambiguities

Civil and military space activities are becoming less distinguishable, as civil space capabilities (e.g. SPOT) are increasingly capable of performing military missions, and more civil-military assets are deployed (e.g. GPS, STS). In this emerging environment, space arms control could unacceptably limit the operations of civil or civil-military space assets. On the other hand, if such operational limitations were not imposed by an agreement, and civil activities were left wholly unconstrained, the operational capabilities of civil space assets

could pose military risks -- perhaps unacceptable risks over time. In the future, civil assets may have the capability to be used as military support systems in conflict or as weapons (e.g. maneuverable satellites as ASATs), or perhaps to test fundamental components of weapon systems (e.g., navigation) that might reduce or eliminate the need for the space testing of a weapon system.

Military Space Prospects

Space has long been a medium of critical military activities, including reconnaissance and surveillance, navigation, communications, meteorology and geodesy. While political and technological factors had for decades limited interest in the use of space for the deployment and operation of weapons, technological developments have increased the attractiveness of such options. There is little interest in trying to eliminate current military missions, many of which are widely recognized to be essential for strategic stability (command and control, early warning) and arms control (verification). However, existing military space capabilities could play a critical role in terrestrial conflict. And, military space capabilities which are under development or in research stages, if they prove technically feasible and are deployed, could potentially have a decisive impact in warfare. The issue is not only developing and deploying such capabilities, but of deterring or engaging the capabilities of an adversary, including so-called residual capabilities. Arms control can in principle reduce the military threat, but it is a very imperfect instrument for doing so, as some considerations about ASAT controls indicate.

As has been widely recognized, one cannot readily distinguish between "benign" and "threatening," "stabilizing" or "destabilizing," space capabilities. The same assets that can be used to verify arms control agreements could also be used for targeting the forces of an adversary or possibly as a means of attacking those forces. Accordingly, as an example, it is widely understood that one cannot, through a negotiated limitation or an elimination of ASATs, protect benign satellites without creating also a sanctuary for threatening or destabilizing satellites.

In another vein, because the United States is probably more dependent upon its military space capabilities than the Soviet Union, especially in the area of communications and intelligence, assuring their survivability through unilateral or negotiated measures is recognized as paramount. The vulnerability of existing U.S. systems, an argument of the

proponents of ASAT bans, will be addressed within budgetary constraints by increasing survivability and redundancy, irrespective of arms control prospects. Even proponents of ASAT limitations understand that survivability initiatives are "inevitable" and "desirable." However, improving maneuverability could in principle create an ASAT capability, and active defenses (DSAT) could also have offensive roles. Thus, survivability, if achieved by such means, could undermine at least some of the additional protections proffered by arms control enthusiasts by creating weapon-capabilities. These problems will exist whatever military options or arms control proposals are presented. As a consequence of such problems, which extend beyond ASATs to other military space activities, unless one is to forego the use of space for military activities altogether, it is not clear that a space arms control regime could be forged which is fully consistent with national security.

Proliferation of Military-Space Capabilities

There is a proliferation of military space programs, with programs to develop military space launch capabilities, observation satellites, and the like, being undertaken in a large number of states. While the threat is currently limited, and efforts by the Western economic powers to control exports to missile programs have been initiated, i.e., the Missile Technology Control Regime (MTCR), capabilities are likely to grow over time. And, over time, these capabilities will have to be taken into account when any space arms control initiative is considered. In the nuclear arena, nuclear non-proliferation has long been viewed as a sine qua non, a necessary albeit not sufficient condition, for nuclear arms control. The more nuclear weapons spread, the less likely are deep cuts, a la START II, in nuclear arms. The proliferation of military space capabilities will have the same relation to space arms control.

The Challenge of Verification

The verification of any space arms control accord would be an unprecedented challenge. We have, of course, entered into negotiations in areas where verification is difficult, and may ultimately prove impracticable--chemical weapons, conventional forces, and strategic nuclear arms. In the space arms control arena, we do not always know the range of weapons that might be deployed in space or used against space objects; we do not know if they have unique, observable characteristics or what those characteristics may be; and we do not know

if we will have practicable means to detect and monitor them. While some of these problems may arise in other arms control negotiations (e.g., new chemical agents), the military significance of non-compliance with a space arms control agreement could be a potentially greater threat to U.S. and Western security. Moreover, as indicated, existing or desired space capabilities, both civil and military, because they can play a role in crisis or conflict, may undermine an accord.

Verification requirements would depend, of course, on the precise terms of an agreement, but they could include:

- traditional NTM, with enhanced sensing capabilities;
- open telemetry on all space objects, including civil and military support satellites;
- pre-inspection of payloads for all space launches;
- mandatory identification and interrogation of all orbiting space objects;
- intrusive on-site inspection for dedicated R&D, testing (including nuclear-weapon test sites), production and decommissioning facilities;
- challenge inspections for suspected R&D, testing, deployments, etc.; and
- CBMs to facilitate verification.

The level of intrusiveness required for a verifiable regime would be unprecedented, perhaps unacceptably so. In the new arms control environment, these requirements are not wholly implausible, as they would have been only a few years ago, but they may not be practicable. They could be seen as threatening national sovereignty, and they would conflict with current military missions in space. However, even if they proved acceptable on political and military grounds, they are extraordinarily difficult to implement.

Problems involved in detecting tests of space weapons are quite distinct from problems of detecting and monitoring deployment of these weapons, but both are difficult endeavors. Testing of a space system almost always results in one or more active physical or chemical signals emanating from that system. For many weapon systems in research or under development, we do not know these signals, or characteristic signatures. If known, they can in principle be detected, perhaps with passive detector systems; but in many cases, these signals may not persist and can only be observed if one knows where to look. On the other hand, deployment of space systems may involve the stationing of systems that could be made to appear as communications or other types of satellites, and that, while deployed at their post

but not in use, may emit no signals at all or only essentially unobservable signals. A nuclear explosive, a laser, or a beam weapon may have little or no intrinsic radiation or emanations; the power supplies servicing directed energy weapons may provide little detectable activity until they are called on to provide a usable weapon capability. As a consequence of these and other considerations, detection of actual deployment of space weapons is correspondingly more difficult than the already difficult task of detecting testing.

Detecting and monitoring deployment may in principle be accomplished by active techniques for querying space objects. Stimulating emissions and radiation from questionable objects via active pulsing and interrogation is one possibility, as is the use of radiographic techniques for imaging the interior of vehicles and systems. Further, chemically-powered space systems might be usefully examined for capability and mission if chemical "sniffers" can be brought close enough to them. However, proposals for using close-in space detection technologies, which have yet to be proven, would conflict with the desire of military planners to keep potential threats physically far removed from valued space assets. The pre-inspection of payloads could possibly minimize this problem, but such a measure has its own problems and could be "spoofed." Thus the advantage of increased confidence in verification that such detection systems could in principle provide must be weighed against the principle of providing sanctuaries around space systems such as have been advocated on both military security and confidence-building grounds. There is also a serious danger of damaging systems under observation, as well as the possibility that they may be designed to self-destruct if queried in this fashion. Moreover, some active interrogation technologies are promising, using low power, as discriminators in the critical mid-course of the layered strategic defenses put forward in some SDI architectures and, at higher powers, as weapons themselves. Distinguishing between verification satellites and space-based strategic defense or other weapon platforms might pose peculiar and perplexing problems. In addition to these problems, active interrogation techniques raise serious questions about national sovereignty, which neither side may yet be willing to resolve in favor of active measures.

Arms Control Priorities

A final factor in considering the prospects for space arms control is the current arms control agenda, which reveals higher priorities--the implementation of the INF agreement, the

high priority talks on conventional Forces in Europe (CFE), and the Chemical Weapon Convention and START negotiations. Efforts to conclude and implement agreements in these areas will have implications for any attempts to consider, negotiate, conclude, and implement any agreements in the area of space weaponry. Of course a START agreement would result in pressures for some agreement on SDI, such as an additional commitment to the ABM Treaty. However this matter is resolved, high-level attention may not be available for more ambitious proposals for or negotiations on space arms control. And, while current negotiations and agreements may provide verification precedents necessary if a space accord is to be reached, implementing the INF Treaty and any other agreements that might be reached will require and "tax" assets that would be necessary to implement any space agreements. The prospects of an arms control "overload," and their implications for space arms control, should not be minimized.

Conclusions

In conclusion, there are existing agreements regulating certain space activities and interest in building on them. Modest adjustments to the current space regime are possible, and I would expect interest to focus increasingly on the ABM Treaty and its interpretation, limited ASAT bans or testing restrictions, and CBMs. Rapid movement in these areas does not now appear probable. Fundamental differences in the D&S talks may preclude any bilateral agreements and multinational fora do not seem to offer better prospects. This situation may change as a consequence of a START agreement, but a major accord, bilateral or multilateral, on space weapons or ASATs appears even more remote, given military and political interests as well as technological problems. The military and political environment could change, given the dramatic events we are witnessing in the world, but decisive change is unlikely in the near-term. Prudence would dictate that in the interim we address the technological challenges of space arms control, in order to be prepared if perceived opportunities in the strategic environment become reality.