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The Soviets and SDI

One of the most significant developments in the nuclear age was the President's call to the nation in March 1983 to build a strategic defense system to protect the United States and its allies. This visionary concept and the President's determination to bring it to reality initially was greeted with widespread skepticism and a good deal of head shaking over his presumed naivete. And yet, as the nation's scientists and engineers have been mobilized, the technologies examined, and successful tests carried out a growing number of scientific and political leaders have come not only to accept the validity of the concept but the wisdom of implementing it. While skeptics and critics continue to voice their doubts, there is one person in the world who believes nearly as strongly as Ronald Reagan that SDI will work and that America can build it if it decides to do so -- and that person is Mikhail Gorbachev.

It seemed appropriate to me to speak today in this center of high technology development not of our own SDI with which some of you are more familiar than I am but rather the Soviet approach to strategic defense and their own pursuit of SDI type technologies. I think you will be surprised by the breadth and

depth of the Soviet program and the long term commitment they have made to strategic defense, including advanced technologies. It is ironic that the US effort to achieve strategic defense is the focus of world attention, as if the Soviet program had never existed. Indeed, I hope that when I conclude the principal question remaining in your mind will be why we have waited so long to create a defense for our country -- to prevent nuclear weapons from reaching their targets.

Until March 1983, the United States developed its strategic military programs within the strategic reality that the existence of huge nuclear arsenals and the vulnerability of both sides to those weapons would lead each side to calculate that a nuclear attack would be suicidal -- that even if one side preempted, the other side would have enough weapons remaining to destroy the still-vulnerable initiator of the conflict. This is the concept we have known as mutual assured destruction. Even though this has not been our official policy, it has been the reality.

There are two problems with this concept. First, the Soviets never accepted it. The Soviets believe that nuclear war could occur and, in light of that fact, they have designed their military programs to try to enable the Soviet Union to survive and to prevail. This includes the development over many years, and continuing until today, of a massive national strategic air defense against bombers and cruise missiles, a

ballistic missile defense of Moscow and a vigorous R&D program, as well as large scale measures for leadership protection, civil defense, and protection of vital elements of the national economy. It speaks volumes that in a relationship in which for twenty or more years strategic stability presumably has been based on mutual vulnerability, the Soviet Union has been working to eliminate its own vulnerability and consolidate a unilateral strategic advantage.

Second, the offensive balance has not been maintained. To take just one example, the Soviets have continued to improve their heavy ICBM force in order to be able to take out all of the US ICBM force, other nuclear force installations, and the few hardened leadership facilities we have. Their heavy ICBM force is designed in order for the Soviets to strike first, and effectively, despite their propaganda claim that they would not use nuclear weapons first. The Soviet concept, an initial strike by their heavy ICBMs, is the essential lead element of their strategic defenses, for it reduces the nuclear threat with which the rest of their defenses have to contend.

It is the Soviet program for strategic defense that I want to address today. Only by understanding the scope of this Soviet effort, our own vulnerability, and the destabilizing effect of this imbalance -- recognized for years by our own military as a serious flaw -- can one fully understand the significance of the President's initiative.

The Soviets have devoted considerable resources to strategic defense. Over the last two decades, the Soviet Union has spent roughly as much on the defense as it has on its massive offensive forces. While estimates of Soviet spending on their military programs are based on an arcane and in absolute terms not particularly reliable science, there is some value in it for comparative purposes. For example, it is our judgment that over the past ten years the Soviet Union has spent nearly a \$150 billion on strategic defense, or almost 15 times what the United States has spent.

And what have they bought for their money? They have the world's only operational ballistic missile defense system, installed around Moscow. Six years ago they began to upgrade and expand that system -- actually, to replace it with a completely new system -- to the limits allowed by the 1972 ABM Treaty. When completed the modernized Moscow ABM system will be a two-layer defense composed of silo-based long-range modified Galosh interceptors; silo-based, high-acceleration Gazelle interceptors designed to engage targets within the atmosphere; associated engagement and guidance radars; and a new large radar at Pushkino designed to control ABM engagements. The silo-based launchers may be reloadable. The new system will have the 100 ABM launchers permitted by the Treaty and could be fully operational in 1988. The Soviet system for detection and tracking of ballistic missile attacks

consists of three layers -- a launch detection satellite network, two over-the-horizon radars directed at US ICBM fields, and two networks of large ballistic missile detection and tracking radars.

The current layer of ballistic missile detection radars consists of eleven large ballistic missile early warning radars at locations on the periphery of the USSR. These radars can distinguish the size of an attack, confirm the warning from the satellite network and the over-the-horizon radar systems, and provide target tracking data. The Soviets are now constructing a network of nine new large phased array radars -- three new ones have been detected this year -- that can track more ballistic missiles with greater accuracy than the existing network. Most of these duplicate or supplement the coverage of the earlier network but with greatly enhanced capability. The radar under construction near Krasnoyarsk in Siberia, however, closes the final gap in the Soviet early warning radar coverage against ballistic missile attacks. Together the nine new large phased array radars cover almost all approaches to the Soviet Union; the Soviets will undoubtedly build one or two more such radars to complete this coverage. (It is the Krasnoyarsk radar, by the way, that violates the 1972 ABM Treaty. It is not located within 150 kilometer radius of the national capital as required of ABM radars, nor is it located on the periphery of the Soviet Union or pointed outward, as required by the Treaty for early warning radars. That is why

the Soviets made the preposterous claim that it was a space tracking radar.)

The growing network of new large phased array ballistic missile detection and tracking radars of which Krasnoyarsk is a part, is of particular concern when linked with other Soviet ABM efforts. Such radars take years to construct and the existence of a network of highly capable radars might allow the Soviet Union to move rather quickly to construct a nationwide ABM defense based on these radars, if it chooses to do so. The Soviets also are developing components of a new ABM system which are apparently designed to allow them to construct individual ABM sites in a matter of months rather than the years that are required for the silo-based ABM systems going into Moscow. Soviet activities in this regard potentially violate the ABM Treaty's prohibition on the development of a mobile land-based ABM system or components. We estimate that by using these components the Soviets could undertake rapidly paced ABM deployments to strengthen the defenses of Moscow and defend key targets in the Western USSR and east of the Urals by the early 1990s. In addition to these developments, the SA-X-12 surface to air missile system, to be deployed in the Soviet ground forces at any time, can engage conventional aircraft, cruise missiles and tactical ballistic missiles. It could also have capabilities to intercept some types of US strategic ballistic missile re-entry vehicles. Its technical capabilities bring to the forefront the problem that improving

technology is blurring the distinction between air defense and ABM systems. This problem will be further complicated as newer, more complex air defense missile systems are developed.

We are very concerned that the Soviets continuing development efforts give them the potential for widespread ABM deployments. The Soviets have the major components for an ABM system that could be used for widespread ABM deployments well in excess of ABM Treaty limits. The components include radars, an above ground launcher, and the high acceleration missile that will be deployed around Moscow. The potential exists for the production lines associated with the upgrade of the Moscow ABM system to be used to support widespread deployment. Taken together, all of the Soviet Union's ABM and ABM related activities are more significant and more ominous than any one considered individually. Cumulatively, they suggest that the USSR may be preparing an ABM defense of its national territory. Such a defense, while not as comprehensive an approach as our own SDI efforts, could provide an important degree of protection and would fit well into the Soviet scheme for strategic defense -- this is the only missing element in their defenses.

Although the United States dismantled most of its defenses against Soviet bombers in the 1960s, the Soviet Union has continued to invest enormous resources in a wide array of strategic air defense weapon systems. Currently the Soviets

have nearly 12,000 surface to air missile launchers at over 1200 sites; 10,000 air defense radars and more than 1200 interceptor aircraft dedicated to strategic defense. An additional 2800 interceptors assigned to Soviet air forces could also be employed in strategic defense missions. The newest Soviet air defense interceptor aircraft, the MIG-31/FOXHOUND, has a lookdown, shootdown and multiple target engagement capability. More than 85 FOXHOUNDS are now operationally deployed. In contrast, the US has approximately 300 interceptor aircraft based in the US, dedicated to strategic defense, 118 strategic air defense warning radars and no operational strategic surface to air missile launchers.

Finally, the Soviets also have a wide range of passive defenses to ensure wartime survivability and continuity of Soviet nuclear forces, leadership, military command and control units, war-related industrial production and services, the essential work force, and as much of the population as possible.

The USSR has hardened its ICBM silos, launch facilities and key command and control centers to an unprecedented degree. Much of today's US retaliatory force would be ineffective against those hardened targets. Soviet leaders and managers at all levels of the government and Party are provided hardened alternate command posts located well away from the urban centers, in addition to many deep bunkers and blast shelters in Soviet cities. This comprehensive and redundant system

provides hardened alternate facilities for more than 175,000 key Party and government personnel. Elaborate plans also have been made for the full mobilization of the national economy in support of a war effort. Reserves of vital materials are maintained, many in hardened underground structures. Redundant industrial facilities are in active production. Industrial and other economic facilities have been equipped with blast shelters for the work force and detailed procedures have been developed for the relocation of selected plants and equipment.

As if all these developments were not worrisome enough, since the late 1960s the Soviet Union also has been pursuing advanced technologies for strategic defense -- technologies which the US is intending to explore in its strategic defense initiative program. The Soviets expect that military applications of directed energy technologies hold promise of overcoming weaknesses in their conventional air and missile defenses. The Soviets have been working as long as the United States in laser, particle beam, kinetic energy and microwave technologies applicable to strategic weapons. Let me briefly discuss their activities in each of these.

The Soviet laser weapons program began in the 1960s. Many Soviet organizations both civilian and military are involved. The Soviet laser weapon effort is guided and supported by some of the best scientists and engineers in the Soviet Union. Yevgeniy Velikhov, the rising vice president of the Soviet

Academy of Sciences, made his early mark in directed energy related weapons research. (He is, by the way, the same Velikhov who was one of 200 Soviet signatories of a full page ad in the New York Times which stated that SDI would not work. He, and some of the others, made their mark by demonstrating the value of these technologies.)

The level of effort that the Soviets have applied to their laser weapons program is great. While it is difficult for us to measure the size of this program precisely, we estimate roughly \$1 billion per year for the laser effort. It is clear, based on the observed scale and scope of the Soviet effort, that their program is considerably larger than that of the United States. For example, the Soviets have built over a half a dozen major R&D facilities and test ranges and have an estimated 10,000 scientists and engineers associated with the development of lasers for weapons.

The Soviets have conducted research in the three types of gas lasers that the US considers promising for weapons applications: a gas dynamic laser, the electric discharge laser, and the chemical laser. Soviet achievements are impressive. The Soviets have not only followed suit with the US in their work on these three kinds of lasers, they have continued to work on certain types of lasers which the US abandoned. The Soviets have been working on other types of lasers that the US has not seriously considered for weapons

application until very recently. They also are investigating excimer, free electron and x-ray lasers and have been developing argon ion lasers for over a decade. The Soviets appear generally capable of supplying the prime power, energy storage and auxiliary components needed for most laser and other directed energy weapons. They have developed a rocket-driven magnetohydrodynamic generator which produces over 15 megawatts of electrical power -- a device that has no counterpart in the West. The Soviets may also have the capability to develop the optical systems necessary for laser weapons to track and attack their target.

The USSR has now progressed, in some cases, beyond technology research. It already has ground-based lasers that could be used to interfere with US satellites and could have prototype space-based anti-satellite laser weapons by the early 1990s. We expect the Soviets to test the feasibility of ground-based lasers for defense against ballistic missiles by the late 1980s and could begin testing components for a large scale deployment system in the 1990s.

The remaining difficulties in fielding an operational system will require still more development time. An operational ground-based laser for defense against ballistic missiles probably could not be deployed until after the year 2000. If technology developments prove successful, the Soviets may deploy operational space-based anti-satellite lasers in the

1990s and might be able to deploy space-based laser systems for defense against ballistic missiles after the year 2000.

Soviet research and development of those technologies that could support a particle beam weapon also have been impressive. Work on ion sources has been spectacular. We estimate that we may be able to test a prototype particle beam weapon intended to disrupt the electronics of satellites in the 1990s. A weapon designed to destroy satellites could follow later. A weapon capable of physically destroying missile boosters or warheads probably would require additional years of research and development.

The USSR also has conducted research in the use of strong radiofrequency signals that have the potential to interfere with or destroy critical electronic components of ballistic missile warheads. The Soviets could test a ground-based radiofrequency weapon capable of damaging satellites in the 1990s. Soviet capabilities to develop micro-wave weapons or radiofrequency weapons are on a par if not superior to those of the US.

The Soviets also have a variety of research programs underway in the area of kinetic energy weapons using the high speed collision of a small mass with the target as the kill mechanism. Long range, space-based kinetic energy systems for defense against ballistic missiles probably could not be

developed until the mid-1990s or even later. The USSR could, however, could deploy in the near term a short-range space-based system useful for satellite or space station defense or for close-in attack by a maneuvering satellite.

Perhaps the biggest obstacle to Soviet success in these advanced defenses against ballistic missiles are remote sensor and computer technologies -- currently more highly developed in the West than in the USSR. The Soviets are devoting considerable resources to improving their abilities and expertise in these technologies. An important part of that effort involves increasing exploitation of open and clandestine access to Western technology. For example, the Soviets have long been engaged in well funded effort to purchase US high technology computers, test and calibration equipment, and sensors illegally through third parties.

The Soviets have had a near monopoly on strategic defenses for many years. Their primary motivation for engaging initially in the strategic arms limitation talks with the United States in 1969 was to kill the US anti-ballistic missile program. Indeed, for many months in the early stages of SALT, the Soviets refused even to discuss limits on offensive strategic systems.

The Soviet effort we see today to kill SDI is of a piece with the effort nearly twenty years ago to kill ABM. The

Soviets simply do not want the United States to be able to defend itself against strategic nuclear weapons. Limited though the current Soviet anti-ballistic missile system is, the Soviets are laying the foundation that will give them the option of a relatively rapidly deployable nationwide ABM system -- a system that despite deficiencies would give the Soviets a significant unilateral advantage both politically and in time of war. Through an intensive worldwide propaganda campaign, the USSR hopes that it can dissuade the United States from pursuing the SDI research program and thereby preserve the Soviet monopoly in defense against ballistic missiles. Indeed, the same Soviet covert action structure that was used against the enhanced radiation weapon in the late 1970s and the deployment of intermediate nuclear forces to Europe in the early 80s is now being used against SDI.

The Soviets wish that the President's March 23rd announcement had never been made and that they could pursue their own solitary development of an anti-ballistic missile defense and research on advanced strategic defense without competition from the United States. The advent of SDI, however, faces the Soviets with the mobilization of an American effort to build a strategic missile defense in the United States and they are moving heaven and earth to convince or pressure the United States to drop it. They believe we can develop a highly effective strategic defense, in part because they are doing large elements of such a program themselves.

In the Soviet view, a US decision at this point to give up on defense and to rely solely on offensive weapons for deterrence not only would preserve their monopoly in strategic defense, but would be a key indicator of a loss of US will to compete militarily. Moreover, failure to proceed with an American strategic defense would hand the Soviets a unilateral military advantage of historic consequence -- with awesomely negative implications for strategic stability and peace.