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AMERICA NEEDS A NEW SPACE LAUNCH VEHICLE

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In January, the U.S. Department of Defense held a futuristic war game session in Colorado Springs and concluded that America's weaknesses in space could invite attack. That same month, the bipartisan, congressionally mandated Commission to Assess United States National Security Space Management and Organization, chaired by now-Secretary of Defense Donald Rumsfeld, warned that America faces the possibility of a "Space Pearl Harbor" attack because it cannot protect its interests in space. Such a warning demands action.

The United States operates over 300 active satellites, nearly half the total number in space; 60 percent are commercially operated, 20 percent are military, and the remaining 20 percent are government-civilian. As this dependence on satellites grows, hostile nations will find it increasingly attractive to target them in order to disrupt U.S. daily life and military operations.

America's space assets gave it an unparalleled advantage during the Persian Gulf War, and many nations are working to gain similar capabilities. While Russia has been in space longer than America, both Iran and North Korea are developing space programs, and other nations like India and China are pursuing well-established programs.

As more nations gain access to space, monitoring that access and guaranteeing that it will be used peacefully become more difficult. Commercial launches by Russia, China, Ukraine, and international efforts account for almost 30 percent of launches worldwide. A growing number of nations and companies are offering space services—everything from launching satellites to giving other

nations, groups, or individuals access to their existing satellites or satellite reconnaissance. During the Gulf War, the French company SPOT Imaging agreed not to give Iraq access to its satellite imagery. In the future, nations may not be so easily compelled by U.S. interests. The Secretary of Defense, who has only begun to define the Administration's space policy, must ensure that the new policy guarantees reliable, cost-effective, and assured access to space.

Space Access and National Security. America's commercial, civil, and military reliance on space inevitably will draw attacks from hostile powers that see its undefended capability as an Achilles heel, as Chinese military writings make clear.

Adversaries will target America's military satellites to destroy critical infrastructure, and civilian systems to disrupt American life. Exploding a nuclear warhead in space would obliterate satellites

nearby and release enough radiation to destroy other satellites in low-Earth orbit within months. Hostile nations that have ballistic missiles could explode warheads filled with pellets, sand, or shrapnel within 100 meters of a satellite, destroying it on impact. Currently, over 20 nations possess or

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are developing ground-based lasers capable of disrupting satellite signals. Reportedly, a British satellite was thrown out of orbit by invading computer hackers (the British government denies this account).

Much as air dominance has been vital in warfare since World War II, space control or even space dominance may prove decisive in future wars. Whether the United States needs to protect its assets in space, deny access to others, or repair or replace vital components of its space networks, it must rapidly deploy the satellites and tools necessary to do so.

One of the first steps in ensuring U.S. pre-eminence in space is to develop low-cost and reliable means of putting satellites into orbit. The most promising way to achieve this is to develop a reusable launch vehicle with civil, military, and commercial uses.

America's Declining Launch Infrastructure.

Both America's expendable rocket boosters and its existing reusable launch vehicle, the Space Shuttle, are wholly inadequate to support a modern space program. The National Aeronautics and Space Administration (NASA) traditionally spends 10 times more to upgrade the Shuttle than to develop new vehicles, which severely inhibits its ability to develop launch alternatives. America's launch infrastructure is:

- **Too costly.** NASA advertised the Space Shuttle in the 1970s as an inexpensive way to access space, but it costs NASA approximately \$10,000 to put one pound of payload into orbit. NASA predicted that routine manned space flights would cost \$10 million to \$20 million per launch, but each launch today costs around \$500 million. It costs the Pentagon approximately \$72 million per launch to put a payload into space on a traditional expendable rocket booster.
- **Based on unreliable technology.** On June 2, a booster failure caused the destruction of the X-43A, NASA's revolutionary unmanned aircraft. In July 2000, a booster rocket failure caused a national missile defense test to be aborted before the new technology could be

tested. Such problems add to the failures encountered in conventional satellite launches.

- **Poor turnaround time.** NASA expected to launch the Shuttle from either coast up to 50 times per year, with only two weeks between missions. Today, the Shuttle can be launched only from Florida, and it takes at least four months to prepare for each mission. The program is lucky to complete eight launches a year.

In the past five years, Washington has cut two programs that promised low-cost, reliable, and rapid space access. The X-33 program had nearly completed its prototype when it was cancelled this year due to lack of funds. The prototype would have taken off like a rocket and landed like a plane. Unlike the Shuttle, it would not have required additional tanks or boosters for each launch and would have relied on newer, more efficient engine technology. The Delta Clipper Experimental (DC-X/A), which first flew in 1993, is a one-third size model of a large single-stage-to-orbit launch vehicle that launches and lands vertically, like a rocket. It flew 12 times, including twice within 26 hours, before it was cancelled after being damaged in a flight test.

During the early 1990s, these programs were driven by projected increases in the demand for launch services. However, when that demand dried up, so did funding, despite national security implications.

Next Steps. The United States must be prepared to support its space-based infrastructure should it come under attack. Many adversaries would be deterred from taking hostile action against U.S. space-based assets if they knew their attempts would be futile. The Administration should renew America's innovative space launch vehicle projects as soon as possible. The first step should be to include adequate funding in the President's upcoming amendment to the FY 2002 Department of Defense budget for a reinvigorated X-33 program under the Air Force and a new program based on the Delta Clipper Experimental project.

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