The Non-Line-of-Sight Cannon was put on show on the National Mall in Washington in 2008. *Photographer: Chip Somodevilla/Getty Images*

Politics | The Big Take

Russia's War on Ukraine, China's Rise Expose US Military Failings

Cost overruns and a culture of risk aversion underscore the problems at the Pentagon.

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It was envisioned as the centerpiece of a $200 billion program revolutionizing how the US Army would fight. Now it's languishing in storage in Virginia, a 25-ton symbol of the malaise that lies at the nexus of the Pentagon and the defense industry.

The Non-Line-of-Sight Cannon (NLOS-C), a self-propelled 155mm howitzer on tank tracks, was integral to Army plans to develop the kind of high-tech system that would help offset the numerical advantages of a peer like China or Russia in a future conflict.

It was part of an ambitious concept to replace combat units with a family of ground and air vehicles, both manned and robotic, all networked wirelessly.

Only it was too ambitious: the so-called Future Combat Systems program was plagued by technology issues, slips in schedule and ballooning costs. By the time the NLOS-C was put on show on the National Mall in Washington in 2008 as part of the Army's charm offensive on Capitol Hill, doubts were already beginning to form.

"We were under such pressure to finish the assembly and integration on time, we were putting parts together that had never been assembled before," recalls Mark Signorelli, who worked for contractors United Defense and later BAE Systems, which developed the NLOS-C.

In 2009, after spending $20 billion in eight years with little to show for it, the Pentagon canceled Future Combat Systems – run by Boeing Co. and SAIC – to avert what then-Defense Secretary Robert Gates termed a "costly disaster."

THE COLLAPSE OF WHAT WAS THE LARGEST AND MOST AMBITIOUS ACQUISITION PROGRAM IN ARMY history illustrates how the defense industrial base that has underpinned US military primacy for decades is misfiring. Munitions shortages, failed audits and surveillance gaps exposed by the Chinese balloon ultimately shot down off South Carolina suggest that America's military-industrial complex may no longer be fit for purpose.

Recovering a high-altitude balloon on Feb. 5 off the coast of Myrtle Beach, South Carolina. *Photographer: Petty Officer 1st Class Tyler Thompson/U.S. Navy/Getty Images*

As Russia's invasion of Ukraine enters a second year, and China relations plumb new depths over flashpoints from Taiwan to semiconductors, that reality raises serious questions about US readiness to fight a war.

"We have a defense industrial base that's built to achieve first-level deterrence by virtue of the world class platforms we have deployed," said Roy Kamphausen, a former China strategist for the chairman of the joint chiefs of staff and now president of the National Bureau of Asian Research. "But there are serious questions about how we would sustain ourselves in a high-intensity conventional conflict of more than a few weeks in duration."

After decades of consolidation, the industry suffers from a paucity of competition and lacks the kind of "surge capacity" needed to wage major industrial wars. Cost overruns are routine. And a culture of risk aversion rules from the Pentagon to the boardrooms of defense industry giants.

One upshot: the scrapping of Future Combat Systems means that more than a decade later the US Army has yet to develop a replacement for its Cold War-era armored vehicles – the Abrams tank and the Bradley Fighting Vehicle.

Or take hypersonic missiles, a field in which the US once held a strong technological lead as far back as the 1960s. The Defense Advanced Research Projects Agency (DARPA) began a program to design hypersonic weapons in the early 2000s, only to halt it following a series of early failed tests.

Spin forward to summer 2021, when China conducted two hypersonic weapons tests, including the launch into space of an orbiting weapon capable of carrying a nuclear payload, alarming military planners in Washington. The fast, low-flying and highly maneuverable weapons represent a potential threat to the homeland, since they could be used to send nuclear warheads over the South Pole and around US anti-missile systems.

Yet the tests also spoke to a deeper concern that the US may have chronically underestimated China's ability to deliver innovative technologies to its military.

The moment encapsulated a failure of the Defense Department to transition critical technologies in R&D to production, with the result that "in the interim, Russia and China caught up," said Michèle Flournoy, a former Undersecretary of Defense for Policy. "Now we are playing catch up."

Last summer brought another wake-up call. As Washington sent Ukraine Javelin anti-tank missiles and Stinger surface-to-air missiles, along with howitzers and ammunition, it began to deplete its own stockpiles, demonstrating its own lack of resilience.

A US soldier with a Javelin anti-tank weapon during a joint military exercise in Syria's northeastern Hasakah province in September. *Photographer: Delil Souleiman/AFP/Getty Images*

A third shock as regards US ability to counter China is only now dawning, according to Flournoy, a potential future contender for Secretary of Defense: the presence of Chinese-made components throughout defense supply chains that create "unacceptable dependencies if not vulnerabilities."

"Most prime contractors can't even tell you how much Chinese content is in their systems, ranging from semiconductors to displays to nuts and bolts," she said.

The Defense Department acknowledged that the defense industrial base faces many of the same supply-chain challenges as other sectors. "Lead times from ordering a component to delivery drive production timelines," said spokesman Jeff Jurgensen. "To offset long lead times, the Department is making sustained investments to expand production capacity and stockpile critical weapons and materials."

THE DEFENSE INDUSTRY'S PROBLEMS HAVE CRYSTALLIZED INTO A MATTER OF URGENCY OVER THE LAST 18 months, but they date back decades.

In the wake of the Soviet Union's fall, US politicians hoped to cash in on the "peace dividend," the promise of economic benefits from reduced defense spending. Then-Deputy Secretary of Defense William Perry laid out what this would mean for the industry at a dinner now known as the "last supper," in which he told executives to consolidate or face extinction.

Consolidate they did. The defense sector has moved from more than 70 aerospace and defense "prime contractors" that worked directly with the government in 1980 to just 5 by the early 2000s, the same number as today: Lockheed Martin Corp., Raytheon Technologies Corp., General Dynamics Corp., Northrop Grumman Corp., and Boeing.

"Not too many years ago, we had five times as many contractors and there was more competition and there was more creativity," said Representative Ken Calvert, the California Republican at the helm of the House's defense spending panel. "As these larger guys kept buying the smaller guys coming up with the ideas, and then encapsulate them and restructure, it's taken a lot of the innovation out."

Even some major projects end up with just one bidder. In 2019, Boeing declined to compete for a Pentagon program to develop and procure a next-generation intercontinental ballistic missile because it viewed the tender as heavily skewed in Northrop Grumman's favor, leaving Northrop as the sole bidder for the nearly $85 billion project.

The dearth of contractors and rigid requirements from their single customer, the Pentagon, helps contribute to the cost overruns that have become synonymous with the industry. One prominent example is the Navy's Littoral Combat Ship. What Navy leaders had touted as a 55-vessel fleet costing $220 million per ship has dwindled to 35 costing on average $478 million apiece.

An F-35 A Lightning II fighter on the tarmac at Emmen Air Base, Switzerland, in March. *Photographer: Fabrice Coffrin/AFP/Getty Images*

That's nothing compared with the F-35. The F-35 Joint Strike Fighter – the world's most expensive weapons program – is projected to cost $1.7 trillion over its 66-year lifetime, roughly equivalent to the nominal GDP of Russia. Despite its eyewatering price tag, the jet is still plagued by deficient software.

These overruns are baked into the system. Like many defense projects, the F-35 is intricately bound up with US domestic politics. Nearly every state has economic ties to the project, with 29 states counting on it for $100 million or more in economic activity. The F-35 directly and indirectly creates about 250,000 jobs in 45 states and Puerto Rico, according to Lockheed Martin.

THE TORTURED PROCESS OF DEFENSE ACQUISITION HAS SQUEEZED CREATIVITY FROM THE SYSTEM AND made it difficult to deliver innovation. A 2021 Hudson Institute study argued that the time it takes for the Defense Department to go from identifying a need to awarding a contract has increased from about one year in 1950 to seven years today. For innovative systems, such as the F-35, it can take another 21 years to become operational.

China, by contrast, is able to deliver capabilities far more quickly. In a July 2021 address, Maj. Gen. Cameron Holt, then deputy assistant secretary of the Air Force for Acquisition, estimated that China is procuring munitions and other high-end weapons systems "five-to-six-times" faster than the US.

At the nub of the problem is the Pentagon's planning, programming, budgeting and execution process, known as PPBE. It controls the resources that make weapons programs happen, but such is its reputation that Congress created a commission to overhaul the process. It's due to report this year.

"The Pentagon is such a huge bureaucracy and the budgeting process and acquisition processes are really long, very slow, very cumbersome and very linear," said Stacie Pettyjohn with the Center for a New American Security. "You're not really rewarded for taking risks."

The Pentagon's largess is so sprawling that, through military bases and contracts, it touches all 535 members of US Congress – money that translates into jobs and revenue for companies that are major campaign donors.

Then there are Pentagon regulations, which over time have helped shape the way defense companies work. The result is traditional defense contractors are adept at maneuvering the onerous regulations process required to do business with the Pentagon, whereas startup firms are not.

SpaceX's Falcon 9 rocket with the Dragon spacecraft atop takes off at NASA's Kennedy Space Center, Florida, in October. *Photographer: Kevin Dietsch/Getty Images*

Elon Musk had to sue the government to allow SpaceX to compete for the Pentagon's national security space launches. The US government at the time was pouring money into United Launch Alliance – a joint venture between Boeing and Lockheed Martin – that had to use Russian-made rocket engines to propel Pentagon satellites into space after the government decided neither Lockheed nor Boeing were up to the task of being a launch provider.

Musk won. By the time he sued, SpaceX had flown its Falcon 9 rocket and was already entrenched with NASA. And United Launch Alliance is now partnered with Jeff Bezos's Blue Origin to develop a fully reusable, American-made engine.

"They have a motto: Fail To Succeed," said Calvert, who's known Musk for 20 years. "In other words, they're not afraid of failure, because they learn from those failures and then they move on to the next thing."

THE SYSTEM EVEN STRUGGLES TO MAKE ENOUGH OF PLATFORMS AND TECHNOLOGIES THE US ALREADY has, as illustrated by the lack of capacity to make enough munitions to replace those sent to aid Kyiv.

The number of Javelins transferred between February and August last year represented seven years of production at 2022 rates, a study by the Center for Strategic and International Studies in Washington found. The number of Stingers equaled the total built for all foreign customers over the last two decades.

The shortfalls stem from reforms introduced in the 1990s, when the Pentagon encouraged defense contractors to embrace the "just-in-time" revolution in manufacturing. The new system was imperfect, but it wasn't necessarily inefficient for the challenges of the day. Its shortcomings are becoming glaringly evident now.

The Pentagon treats the defense industrial base like "a hardware store that has many other customers," said Eric Fanning, a former Army Secretary who now is the president of the Aerospace Industries Association. Whereas in fact there is just one, meaning that there is no sense for munitions companies to maintain capacity that exceeds demand.

These same constraints on US industrial production exposed by supplying Ukraine would apply in any potential war against China – whose economy is some 10 times larger than Russia's. Recent war games conducted by CSIS found that the US could run out of long-range, precision-guided munitions in less than a week in a conflict over Taiwan.

At the same time as it pursued a manufacturing revolution, the industry embraced globalized supply chains in search of low costs and high efficiency with little regard to geopolitical risk.

A February 2022 Pentagon report highlighted supply-chain vulnerabilities in areas including hypersonics, directed energy weapons, and microelectronics. The Titanium Metals Corporation (TIMET), for example, is the last remaining US producer of titanium sponge, necessary for the manufacture of military engines and airframes to armor for America's main battle tank.

In September 2022, the Pentagon halted deliveries of the F-35 after finding an alloy used in magnets for pumps made by Honeywell International Inc. was made in China. Deliveries resumed after the company found an "alternative US source" for the alloy.

All of these factors have implications for America's ability to deter China.

The US government is reevaluating its processes for designing, manufacturing, delivering and sustaining equipment, said the Defense Department's Jurgensen. "These actions will allow us to deliver modernized capabilities to the warfighter at the speed and scale required for the high-end fight - providing a deterrent value all their own."

The Pentagon in November. *Photographer: Alex Wong/Getty Images*

There are reasons to avoid panic. The US still spends more on its military than anyone else and possesses technology that China and others are clamoring to copy. China also has its own problems, with chronic corruption and an inability to catch up on foundational technologies like semiconductors and jet engines.

There's a new sense of urgency in the Pentagon after recent shocks. Even the canceled Future Combat Systems program had its merits, argues Signorelli, formerly of BAE Systems.

"I can point to vehicles today that are using technology that we developed on FCS," he said.

For John Ferrari, a retired Army major general who served as director of program analysis and evaluation, the issue is that the relationship between industry and its Pentagon patron is so complex and multifaceted that it's difficult to know where reforms should begin.

"Every single person knows that what we're doing is crazy," said Ferrari. "But everybody is helpless to change it."