

Game changer competition

Reuben Steff discusses the emerging technological arms competition and a possible New Zealand response.

A new arms competition is underway between the United States, Russia and China, with implications for every state concerned with international peace and security, including New Zealand. Unlike the Cold War arms race that chiefly sought numerical superiority, the current competition is characterised by a race to develop new 'game changing' technologies, with the United States out in the lead across a range of platforms. Indeed, we are on the cusp of seeing the deployment of weapons systems that until recently have only been imagined in science fiction.

Since antiquity, military developments in one country have generated responses in others. Today is no different as Russia and China pursue systems to offset US advances. Despite the fact that the strategic consequences of this competition are unknown, there is little debate taking place outside of national security circles. To shine some light on this subject, this article firstly sets the stage for the competition taking place. It then considers some of the potentially 'game changing' technologies that are being developed by the United States, Russia and China, looks at how US missile defence is generating a response and outlines the nuclear modernisation efforts of these countries. Concluding comments make the case that New Zealand should positively contribute to efforts to restrain this competition and enhance international security.

While the United States maintained a clear military lead over its rivals throughout the 1990s and into the early 2000s, the picture became cloudier from the early 2000s as the Russian and Chinese economies grew rapidly, which translated into new military capabilities. This, in turn, has called into question the balance of power in neighbouring regions that they judge critical to their national security, leading them to assert their geopolitical interests in recent years. For Russia this had led to a struggle with the United States and NATO for influence over former Soviet territories (and parts of the Middle East); for China it is a confrontation over the East and South China seas, and nearby naval trade routes through which an increasing amount of global trade transits.

This confrontation has been intensified by the fact that America's advantage in conventional weapons technology is being challenged. Two high profile examples include China's pursuit of 'carrier killer' ballistic missiles (the DF-21) designed to push US

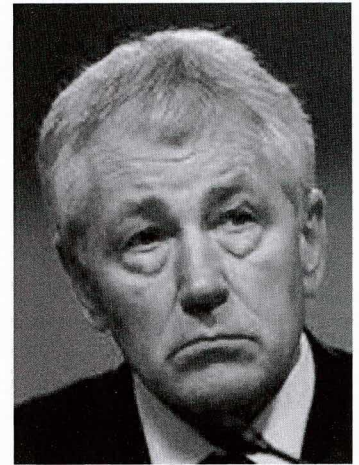
power away from the Chinese coast and Russia's cruise missile strikes from the Mediterranean into Syria that took many commentators by surprise. Speaking in November 2014, then US Secretary of Defense Chuck Hagel articulated America's concerns when he stated that

countries like Russia and China have been heavily investing in military modernization programs to blunt our military's technological edge, fielding advanced aircraft, submarines, and both longer range and more accurate missiles. They're also developing new anti-ship and air-to-air missiles, counter-space, cyber, electronic warfare, undersea, and air attack capabilities.¹

Furthermore, in a February 2016 speech current US Secretary of Defense Ashton Carter made it plain that after a decade of fighting insurgencies, the United States is returning its attention to waging a great power competition against Russia and China. While noting that 'we do not desire conflict of any kind with either', Carter explained that 'Russia and China are our most stressing competitors' as 'they have developed and are continuing to advance military systems that seek to threaten our advantages in specific areas'. Thus 'DOD [Department of Defense] has elevated their importance in our defence planning and budgeting'.² The next section outlines some of the key systems the United States is developing to try stay ahead of its great power competitors.

Restoring superiority

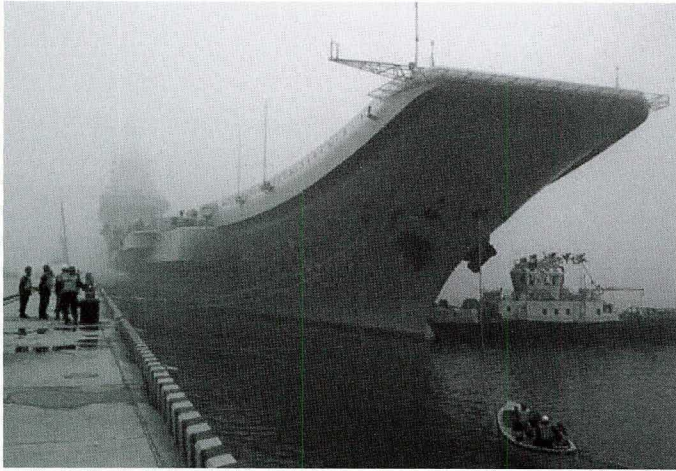
While stealth technology and precision strike capabilities have given America an ability to project power deep into the territories of adversaries since the 1980s, the proliferation of Russia's sophisticated air defence systems in recent years to China, Iran, North Korea, Syria and Venezuela, as well as Russia's and China's development of fifth generation fighter jets, has called the future of US air dominance into question. The deployment of new hypersonic missiles could renew America's advantage. In August 2014 the United States tested an advanced hypersonic missile as part of its Prompt Global Strike programme. Able to travel at five times the speed of sound (Mach 5), these missiles are much harder to detect in flight than traditional ballistic missiles and could allow the United States to threaten dispersed and well-defended nuclear weapons programmes deep inside enemy territory.



Chuck Hagel

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An increasingly complex arms competition is underway between the United States, Russia and China. While the United States is in the lead across a range of current and emerging systems, it can no longer take its position for granted, and there is an urgent need for greater attention to be paid to this competition as the strategic consequences are unknown. Furthermore, an opportunity exists for countries like New Zealand to seize the initiative and play a role in advancing arms control programmes that promote collective reassurance and will enhance international security.



China is developing a blue water navy

A recent report states that their speed will enable ‘US commanders the ability to penetrate an opponent’s decision making process, and as a result, rapidly put an adversary on the defensive’.³ It goes on to note that hypersonic missiles promise to ‘revolutionize military affairs in the same fashion that stealth did a generation ago and the turbojet engine did a generation before’ and the United States ‘cannot afford to lose this emerging competition. . . .

There are few effective defences to this capability’.⁴ The United States hopes to deploy its first medium-range system in the 2020s. Russia and China are not allowing themselves to fall behind and are designing and testing their own missiles, and investing in facilities to develop the supporting infrastructure. Tests are the clearest sign of intentions, with China conducting three tests of its Wu-14 hypersonic strike vehicle in 2014 and another in northern China in April 2016. Russia and India are planning tests for 2017.⁵

Another futuristic technology the United States is investing in is directed energy. The US Navy tested prototypes between 2009–12 and installed a test system on the USS *Ponce* in the Persian Gulf for operational tests in 2014. These ‘lasers’ could counter potential targets such as small boats, incoming rockets, artillery shells, mortars, unmanned aerial vehicles, manned aircraft, cruise missiles and anti-ship ballistic missiles (such as the DF-41). When deployed they could lead to profound shifts in US naval tactics, ship design, and procurement plans comparable to the advent of shipboard missiles in the 1950s.⁶ While directed energy faces limitations (such as having to maintain ‘line of sight’ with their targets and being susceptible to disruption by atmospheric conditions), their advantages are considerable, including a low marginal cost per shot relative to launching costly missiles; a deep magazine

Chinese DF-21 ‘carrier killer’ ballistic missiles



The WU-14 hypersonic missile being tested by China will be able to carry warheads at speeds allegedly of up to 12,000 kilometres per hour (Mach 10)

that could be fired as long as ships generate electricity; the ability to engage targets virtually instantaneously and intercept missiles designed to ‘dodge’ missile defence interceptors. The US Navy reportedly anticipates moving to a shipboard laser programme of record in 2018 and achieving an initial operational capability in FY2020 or FY2021.⁷

Railgun hopes

The United States also has high hopes for its electromagnetic railgun. Likened by some to a ‘battlefield meteorite’, it uses electromagnetic rails (rather than gunpowder or explosives) to accelerate hardened projectiles to astounding velocities that could destroy enemy ships and terrorist training camps, and intercept missiles inexpensively and in larger numbers than current missile defence systems.⁸ With conventional guns, bullets lose acceleration after firing, whereas railgun projectiles gain speed as they travel the length of their 10.6-metre barrel, exiting at 7200 kilometres per hour.⁹ It will also allow massive capacities. Discussing their potential utility, US Deputy Secretary of Defense Robert Work has stated

I can’t conceive of a future where we would replicate Cold War forces in Europe. . . . But I could conceive of a set of railguns that would be inexpensive but would have enormous deterrent value. They would have value against airplanes, missiles, tanks, almost anything.¹⁰

The US Navy intends to test a railgun at sea in 2016 or 2017 and anticipates fielding systems in ten years.¹¹

The Congressional Research Service explains that the successful deployment of any one of the above technologies would be regarded as a ‘game changer’; if two or three of them are deployed, then it may be considered as a ‘revolution’ in warfare.¹² Unsurprisingly, then, and although there is less information available in the public domain, multiple sources note that both Russia and China are also pursuing their own hypersonic missile, directed energy and railgun programmes in an attempt to keep up with US efforts.

The strategic consequences of this competition are unknown. Consider hypersonic missiles which could dramatically decrease the decision-time open to actors during future crises. This, in turn, could increase pressure to pre-empt the other sides’ hypersonic forces since the best defence will be to destroy weapons prior to launch (increasing war planners’ emphasis on taking offensive action). Similarly, they cannot be divorced from the highest stage of escalation — nuclear warfare. Therefore, how conventional and nuclear deterrence are managed will change as well, especially as hypersonic missiles could be equipped with nuclear warheads. Although the United States has said it only seeks a conventional

capability, military planners in other countries plan for worst-case scenarios and will assume the United States would not rule out deploying nuclear hypersonic missiles.

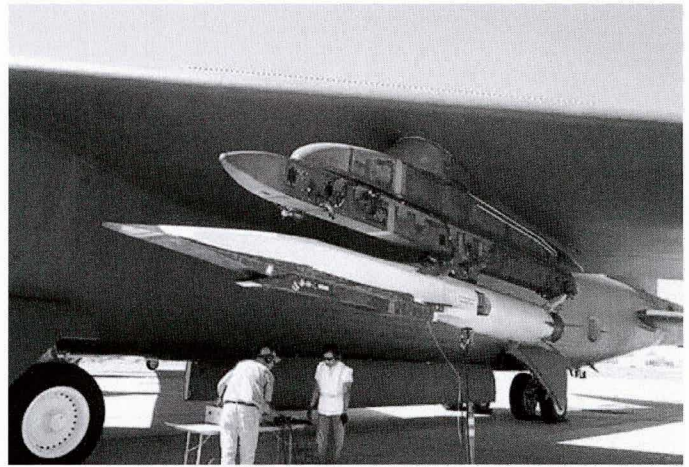
Missile defence

Another driver of competition is America's on-going development and deployment of ballistic missile defence systems. A bit of historical background is required: during the Cold War, the superpowers agreed to stabilise the nuclear arms race after both secured 'second strike' capabilities (the ability to suffer a surprise nuclear first strike and retaliate with sizeable nuclear weapons against the attacker). This led to the codification of mutually assured destruction (MAD) with the signing of the Anti-Ballistic Missile Treaty in 1972 that outlawed the development/deployment of national ballistic missile defence systems capable of defending against the others' intercontinental ballistic missiles (ICBM) — their *strategic* nuclear forces. Investments into *tactical* theatre missile defences were allowed to continue. The ABM Treaty came to be seen as the cornerstone of 'strategic stability'.

However, in 2001 the George W. Bush administration unilaterally abrogated the ABM Treaty, emphasising the unreliability of deterrence by retaliation against 'rogue states' and China. This took place alongside debates over whether the United States was seeking to achieve *nuclear primacy* — a strategic capability that would allow it to destroy foreign nuclear arsenals in a pre-emptive first-strike (and thus escape MAD).¹³ In theory, national ballistic missile defence would complement this. The United States began deployment of a ground-based mid-course defence system in Alaska and California in 2004, while investments and deployment into proven theatre missile defence continued (Patriot-3, THAAD and Aegis SM-3). While Barack Obama cancelled a planned 'third site' of the ground-based mid-course defence system slated for Poland and the Czech Republic, he has, if anything, expanded and deepened US commitment to the overall programme by pursuing a European phased adaptive approach (that is progressively rolling out systems across Europe) and sold a range of ballistic missile defence systems to allies spread across the Middle East and North-east Asia. Eventually, it is envisaged that these regional systems will work in concert with one another.

Great suspicion

Russia and China view these systems with great suspicion, believing they could undermine their nuclear deterrents and are a geopolitical mechanism for the United States to reinforce its alliance systems around their borders. In response, Russia and China are taking steps to counter the US ballistic missile defence system.¹⁴ Their efforts have involved fielding new strategic nuclear and conventional weapons equipped with BMD countermeasures, and making alterations to nuclear doctrine. In 2010 Russia deployed the Topol-M (SS-27) ICBM, which contains a manoeuvrable re-entry vehicle to evade US ballistic missile defence systems in flight. A submarine-launched version (the Bulava) was deployed into service in June 2012. Russia will also deploy a 'super heavy' ICBM ('Sarmat') in 2016 and plans a total of fourteen tests of new missiles and warheads this year.¹⁵ China is deploying a road-mobile DF-31A ICBM, and developing the DF-41, which could be modified to include multiple independent re-entry vehicles to allow it to hold up to ten missiles. The DF-41 was successfully tested for a seventh time this year and could be deployed by the end of 2016. China is also rolling out a ballistic missile submarine



A Boeing X-51 WaveRider missile, which can reach speeds above Mach 5

force and shows indications of gradually changing its 'no first use' nuclear doctrine and moving from a minimum to a medium deterrent posture.

China also tested ballistic missile defence interceptors three times in 2010 and could be on the cusp of making a decision to deploy its own limited strategic ballistic missile defence system. China's interest in BMD technology has waxed and waned since the early 1960s, seemingly keyed to the rising and falling of America's interest in BMD programmes, suggesting an action-reaction dynamic is playing out. Some ballistic missile defence interceptors also have an anti-satellite function. China demonstrated this when it destroyed a satellite in 2007 with a 'kinetic kill' interceptor similar to America's SM-3 missile. This test became the largest contributor to the estimated 500,000 pieces of debris floating in space that pose an indiscriminate threat to space-based systems. China, which was widely condemned for this action, has conducted three tests since that time. The United States followed China's test in 2008 by destroying a malfunctioning satellite with an SM-3 interceptor, albeit without releasing destructive debris. As one Chinese People's Liberation Army official noted, interceptor technology 'is useful for both missile defence and space applications, but space is more important'.¹⁶ This is because the United States, as the dominant global military power, relies on space-based assets more than its competitors (US satellites number 549, China has 142, Russia 131, Japan 55 and the United Kingdom 39), while satellites are intrinsically hard to defend. Thus, America's position in space is potentially vulnerable to others' anti-satellite technologies and is another element of the contemporary arms competition. Russia has this technology and India is interested in it, and no doubt other nations will shortly follow suit as space becomes an increasingly contested and important domain.

Nuclear modernisation

Early in its first term, the Obama administration tried to re-energise nuclear arms control and the wider non-proliferation agenda by signing New START with Russia (that committed both states to limit themselves to no more than 1550 deployed warheads), stated its intention to ratify the Comprehensive Nuclear Test-Ban Treaty and reiterated US commitment to pursuing total nuclear disarmament. But it has become increasingly apparent that the global non-proliferation agenda is making little ground. In fact, all the world's nuclear powers are engaged in efforts to modernise their nuclear arsenals and some, such as India, Pakistan, China and North Korea, are gradually expanding their arsenals.

The Arms Control Association reports that the United States is set to spend \$350 billion between FY 2015 and FY 2024 on nuclear modernisation. Independent estimates put the cost of nuclear modernisation over the next 30 years as high as \$1 trillion. The US arsenal is spread across ICBMs, submarine-launched ballistic missiles and strategic bombers, all of which are being replaced or rebuilt. The 'nuclear weapons complex' of supporting laboratories, factories and testing sites where weapons are designed, developed and built will also be renewed. As such, the Arms Control Association notes that 'The planned U.S. investment in nuclear forces is unrivalled by any other nuclear power.'¹⁷ Furthermore, despite advice that US security could be maintained while reducing strategic forces by a third below New START levels, spending levels are aligned to sustaining the current nuclear force for the foreseeable future.

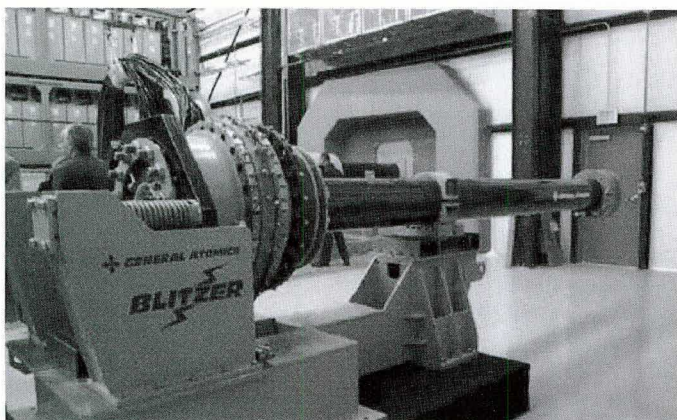
Obama has not been helped by his congressional opponents, who contend that cuts would threaten US national security and have prevented moves to ratify the Comprehensive Nuclear Test-Ban Treaty, and Russian officials who declare that future arms control agreements will require placing limits on US ballistic missile defence systems. The Obama administration has rejected the latter, and threatened to walk away during the New START negotiations when Russia tried to bring them onto the table. Worryingly, during a recent trip to Washington DC one government insider told me that he sees little likelihood of a major arms control treaty in the next ten years, noting that the demographics of the Senate and Congress will have to change first.

Russian response

Russia is also modernising its nuclear programme, developing three new land-based missiles, modernising its ballistic missile carrying submarines, upgrading its air force, developing a new nuclear-capable cruise missile and a new tactical bomber and deploying its Iskander short-range mobile tactical nuclear missile. As noted, Russia points to US efforts in ballistic missile defence and hypersonic missile technology as a rationale for its own programme. Other indications of Russia's intentions were revealed when it skipped the 2016 Nuclear Security Summit and tested cruise missiles that violate the Intermediate Nuclear Forces Treaty. China, which has long-restrained itself in this area but has been the least transparent, maintaining only about 250 warheads and approximately 50 capable of hitting the United States, is slowly but surely expanding and modernising its nuclear forces to make them more survivable and enhance its retaliatory capacity.

During the Cold War, specialists in the United States believed that there was an autonomous dynamic to the Cold War arms

A US Navy railgun



race — a technological imperative or determinism that applied to the development of military technology. The United States had to avoid being overtaken by the Soviets. This led the Americans to pursue a Doctrine of Comparative Technological Advantage that has been institutionalised today.¹⁸ For example, in 2012 then Deputy Defense Secretary Ashton Carter revealed the creation of the Strategic Capabilities Office. The director of the of-



Ashton Carter

ice, Will Roper, articulated the rationale, stating that the United States felt that they were 'correctly [realising] that going back into great-power competition [with Russia and China] is going to require bringing back a lot of capabilities that had gone dormant in the department'.¹⁹ The role of the office is to re-imagine existing military systems and give them new missions and field new technologies as quickly as possible. Indeed, the US investment in research and development is immense, totalling US\$71.4 billion in 2017 (a figure that roughly equals Russia's total 2015 military budget).²⁰

The Strategic Capabilities Office is one element of America's new Third Offset Strategy, designed to offset adversaries' strengths by creating advanced leap-ahead technologies. While these efforts are understandable in a world where America's position is being contested, James Acton has noted that some of these systems, such as hypersonic missiles, appear to lack a clear mission or articulation of how they fit into US strategy.²¹ It is entirely possible that in some cases technology drives US strategy rather than the other way around, even as they generate responses elsewhere that may undermine the potential security benefits that accrue from deploying the systems in the first place.

Key driver

The above paragraph raises a question — what is actually driving this competition? Is it a real threat posed from outside or are internal domestic and industrial forces the prime drivers? Or both? In recent discussions between myself and researchers in Washington DC-based think tanks, it became evident that while domestic drivers do play a role, in the current geopolitical environment characterised by intensifying confrontation each side does believe a real external threat exists, and thus an active competition is leading them to take into account others' respective weapons programmes and respond with their own. This is a dangerous situation and makes the need to decipher and restrain this arms competition all the more urgent.

The Cold War arms race of massive deployed nuclear forces has been replaced by a less obvious and more complex competition, where qualitative advancements are key. The United States is clearly leading this race and will continue to pursue these technologies. For our part, New Zealand has been a beacon of progress when it comes to promoting global disarmament efforts in international bodies. Now is the time for it to recalibrate its efforts by identifying those emerging weapon systems that could be most destabilising in the future, and consider how they might be

restrained and where 'quick wins' could be achieved to generate momentum for arms control processes (for example by promoting a hypersonic missile test ban or anti-satellite weapon test ban to prevent indiscriminate orbital debris). This could provide New Zealand with considerable diplomatic cachet. Relatedly, New Zealand should encourage efforts to look at the role these systems are playing in undermining great power relations and the affects they will have on international security in the years to come.

NOTES

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