



# ARCTIC SECURITY BRIEFING PAPERS

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## Cruise Missiles: When defence is not an option

*Cruise missiles recently made the front pages when President Vladimir Putin marshalled impressive audiovisuals to hype Russian strides in developing new and sinister military technologies. Cruise missiles were included but concerns regarding them didn't just arrive with his speech. They have figured prominently, for just one example, in the current Canadian and American intention to replace the Arctic-based North Warning System.<sup>1</sup> Cruise missiles pose a two-fold challenge: the unavoidable reality that there is no credible defence against long-range nuclear-armed cruise missiles; and, the related and equally inescapable reality that the only way to manage them in the long term is through internationally negotiated control agreements. The latter challenge is obviously made all the more daunting by a current political climate that is less than conducive to anything quite that rational.*

### The threat

Cruise missiles first made their mark in World War II, and they are still spawning new bouts of anxiety. They are still essentially pilotless, air breathing, flying bombs, but the V-1 buzz bombs of the German Luftwaffe have given way to variants that can carry nuclear weapons, fly largely undetectable<sup>2</sup> for thousands of kilometers, and then strike within feet of the intended target. They can be launched virtually from anywhere – from land, surface ships, submarines, or aircraft. And now military planners are pursuing models intended to reach supersonic and hypersonic speeds. Mr. Putin has promised a nuclear-powered, indefinite range version capable of outmanoeuvring any US defences,<sup>3</sup> while President Donald Trump has also proposed a new nuclear-armed cruise missile to support a nuclear posture that is shifting toward more “flexible” nuclear options.<sup>4</sup>

Russia's Arctic exercises around the Kola Peninsula and the Barents Sea last fall featured multiple cruise missile firings from surface ships, submarines, and land launchers.<sup>5</sup> The American Coast Guard is reportedly mulling plans to include cruise missile launchers on a proposed fleet of three heavy icebreakers.<sup>6</sup>

And cruise missiles also figure into American charges that Russia is in violation of the Intermediate-Range Nuclear Forces (INF) Treaty, a bilateral US-USSR treaty which entered into force in 1988 and banned all land-based missiles, including ground-launched cruise missiles, with a range between 500 and 5,500 kms. A 2014 report by the Obama Administration concluded that Russia was in violation of its obligations under the INF,<sup>7</sup> and the 2018 Nuclear Posture Review charges that Russia is engaged in the “production, possession, and flight testing of a ground-launched cruise missile” within the

prohibited range.<sup>8</sup> Russia in turn makes the credible claim that the US launcher system for the NATO ballistic missile defence system, deployed in Romania, and soon in Poland, also has the capacity to launch cruise missiles banned by the INF Treaty.<sup>9</sup> These claims and counter-claims put the Treaty in jeopardy, and, as the Brookings Institution's Steven Pifer argues, if the INF differences are not resolved and the Treaty preserved, the prospects for renewal of the New Start Treaty in 2021 become increasingly bleak.<sup>10</sup>

Basic cruise missile technology (complicated guidance systems and necessarily small propulsion plants) is also spreading - although, for now, relatively few states have deployed them. According to the 2017 report of the Pentagon's Defense Intelligence Ballistic Missile Analysis Committee, the US, Russia, China, and Iran have the capacity to deploy long-range cruise missiles. These same countries, plus France, Germany, Sweden, Spain, South Korea, India, Israel, Pakistan, Taiwan, the United Arab Emirates, and the UK all have the capacity to launch short-range (roughly up to 400 kms) versions.<sup>11</sup>

### **Homeland defence is not an option**

In the 2016 North American Vigilant Shield exercise, involving Canadian and American forces through NORAD, participating US National Guard forces operated out of Canadian Forces Base North Bay and reportedly used Boeing Avenger surface-to-air missiles intended to shoot down cruise missiles at short range.<sup>12</sup> But that is not evidence of any effective homeland defence against cruise missiles.

Long-range cruise missiles do pose a serious threat, meaning they are one more threat against which there is no credible defence. The only feasible defence against cruise missiles is point defence – that is, specific locations can be identified for protection through the installation of concentrated air-defence systems. In localized battlefield operations, damage limitation efforts against conventionally-armed cruise missiles are feasible. Nationally, there can be selective points chosen for defence, and currently the US has chosen to deploy such systems around Washington, D.C.<sup>13</sup>

Some propose that key ports be added to the list of protected points – but the protection of ports is not just a matter of localized air defence systems. Defence also depends heavily on intelligence and detection technologies to identify which of the millions of containers that enter North American ports each year might have warheads or other explosives, or even cruise missiles,<sup>14</sup> on board.

None of that constitutes continental defence, and in the case of nuclear armed cruise missiles, damage limitation efforts have little meaning when failure to intercept even one attacker would mean devastating catastrophe. Given that cruise missiles, launched off-shore from aircraft, ships, or submarines, could come from just about anywhere, and given that their target destinations could also be just about anywhere, continent-wide defence is impossible. Even if approaches to Canadian and North American coasts along the full length of the continent could be effectively monitored, there simply is no possibility of deploying interceptor aircraft or anti-aircraft systems broadly enough to mount a credible defence.

Recognition that broad defence against cruise missiles is in fact not possible has led some analysts to assert (or fantasize about) the possibility of mounting a defence that focuses on the “archer” rather than the “arrow.” In this scenario, the arrows are obviously the cruise missiles and the archers are the platforms from which they would be launched – e.g. an adversary's ships, submarines, or

strategic bombers. There being no credible defence against arrows after they've been launched (besides potentially coming from just about anywhere, cruise missiles are small, employ stealth technologies, and fly at very low altitudes, making reliable detection impractical), the thought is that their launch platform (the archers) could be destroyed before any cruise missile arrows were launched.<sup>15</sup>

In other words, the proposed solution is pre-emptive attack, but pre-emption as a defence posture amounts to a dangerously destabilizing conflict escalation strategy. The more an adversary understands that its opponent is betting on pre-emption, the more it is itself incentivised to launch even earlier surprise attacks. In the midst of any deep political crisis, the last thing antagonist states should want is a strategy that has both sides concluding that there is advantage to be gained from the early resort to military attacks – even a nuclear attack.

Comprehensive homeland defence against cruise missiles is simply not possible, and it will not be made more feasible by a new North Warning System that improves cruise missile detection capabilities. Improved domain awareness is always important; however, it doesn't translate into improved interception, and this is not the first time contemporary defence planners have faced a daunting and intractably threatening weapon system it can detect and track, but for which it has no defence. Indeed, that defines the nuclear age. There is no protection from nuclear attack – the only defence is the promise to meet apocalyptic destruction with more of the same in return. Defence is not possible, and for the most part, and wisely so, isn't even attempted – a wisdom that was for a time enshrined in the ABM Treaty, the US-Russia agreement, abrogated by the George W. Bush Administration, to limit missile defence to selected point-defence sites and put severe limits on efforts to even try to develop defensive capabilities against ICBMs.

Despite long and costly efforts, meaningful defence against strategic range nuclear ballistic missiles remains a fantasy. The point, in the cruise missile context, is that, though improved surveillance and early warning are important in their own right, they will not solve the cruise missile problem.

### **The arms control imperative**

Given the current climate in Washington, it is no longer surprising, though it is still decidedly short-sighted, that cruise missile fears have to date generated little official exploration of more realistic and less dangerous ways to confront a very real threat.

The strategic-range threat (strategic air- or sea-based launchers combined with long-range nuclear-armed cruise missiles), like the nuclear threat generally, is in the first instance “managed,” not through defence, but by the threat of catastrophic counter-attack. There will be no escaping the MAD (mutually assured destruction) dynamic of the nuclear age as long as the madness of nuclear weapons endures. But keeping nuclear attack disincentives in place itself requires diplomacy (a truth one fervently hopes the Trump Administration will discover before it's too late). That includes not only the need for deft crisis diplomacy, it requires perpetual care to avoid descending into the horrific circumstances of nuclear-use incentives, in which any nuclear state might come to conclude that initiating nuclear use could be to its advantage. Diplomacy is also and especially essential to building a grand global coalition/movement to politically challenge the nuclear powers and to impose serious political costs on their continued nuclear intransigence (which is what makes the

failure of states like Canada to support that disarmament movement when it produced the Treaty on the Prohibition of Nuclear Weapons such an abandonment of responsibility). And arms control diplomacy and negotiations are obviously essential for working out the details of mutual and verifiable restraints or prohibitions on the weapons themselves – including cruise missiles.

Cruise missiles are only marginally subject to effective arms control. As already noted, there is the prohibition of mid-range, land-launched cruise missiles through the Intermediate-Range Nuclear Forces Treaty (INF Treaty). The central contemporary strategic arms control agreement, the New START Treaty of 2010, also imposes indirect limits on nuclear-armed cruise missiles inasmuch as it restricts the US and Russia each to a maximum of 1,550 deployed nuclear warheads on a maximum of 800 delivery vehicles (of which only 700 can be deployed at any one time). Cruise missiles are not counted as delivery vehicles in this formulation; instead, they are counted as warheads carried by aircraft, and one notable feature of the Treaty is that it counts each strategic bomber as carrying only one nuclear warhead, even though one bomber might carry as many as 20 nuclear-armed air-launched cruise missiles. Nuclear-armed cruise missiles have not been deployed at sea since 1991 as a result of the Presidential Nuclear Initiatives undertaken by US President George H.W. Bush and Soviet President Mikhail Gorbachev. President Putin has however made a point of declaring that Russian sea-launched cruise missiles used in Syria could carry nuclear warheads.<sup>16</sup>

Controlling nuclear-armed cruise missiles remains a major challenge, and it is clear that any successor treaty to New START will have to finally deal with cruise missiles as delivery vehicles subject to legally binding limits.

The Missile Technology Control Regime (MTCR) represents a political commitment among the 35 participating states (which include Canada, the US, and Russia, with China not formally in the group but having declared it will not help other countries acquire missiles capable of delivering nuclear weapons)<sup>17</sup> to impose limits on the spread of missile technologies, including cruise missiles. The original focus of the MTCR was to curtail the spread of missiles designed to deliver weapons of mass destruction, without impeding space programs. There is thus a commitment not to transfer to another state any unmanned delivery systems (including cruise missiles) that can carry a payload of 500 kilograms more than 300 kms or deliver any type of weapon of mass destruction.<sup>18</sup> This is a politically agreed arrangement, rather than a legally binding treaty, and critics charge that in large measure it is a matter of the missile “have” states trying keep the “have not” states from joining their exclusive club. The MTCR is nevertheless an important non-proliferation measure, but one that will not be sustained without its maturation into a legal obligation that applies equally to all states.

Former US Defense Secretary William Perry, now an effective and committed disarmament advocate, has led opposition to a US Air Force proposal for a new nuclear-armed cruise missile, the Long Range Stand Off Weapon (referred to as the LRSO). Even some supporters of nuclear “modernization” question the need for the LRSO, arguing that the US already has nuclear-armed cruise missiles and bomber aircraft that are sufficiently stealthy to frustrate Russian or other air defence systems – in other words, they regard the LRSO as expensively redundant. Others advocate developing it with the possibility of trading it away, for example, in exchange for full Russian compliance with and continuation in the INF Treaty.<sup>19</sup> Arms control advocates offer two main arguments against the LRSO and nuclear-armed cruise missiles generally: first, they are dual use and can deliver either nuclear or conventional warheads – an ambiguity that could lead to mistaken

escalation to full-out nuclear exchanges in response to a mis-identified conventional attack; second, cruise missiles are designed to deliver lower-yield nuclear warheads, lowering the use threshold – because there cannot be any realistic expectation that a low-yield nuclear attack would not escalate to high-yield nuclear attacks.<sup>20</sup> As the NATO Secretary-General told the Wall Street Journal in 2016, “No one should think it is possible to use nuclear weapons in a limited way as part of a conventional conflict.”<sup>21</sup>

To date, only Russia, the US, and France are in declared possession of nuclear-armed cruise missiles,<sup>22</sup> although the US insists that China has nuclear-capable cruise missiles.<sup>23</sup> The limited employment of nuclear armed cruise missiles offers an unusual opportunity to halt their expansion and work toward their elimination, as the respected Dutch international affairs institute, Clingendael, argues:

“Eliminating nuclear-armed cruise missiles — multilaterally, bilaterally, or unilaterally — may seem a relatively small step to reducing the risks of intentional and inadvertent nuclear weapons use in the world, but it is an achievable step with immediate and obvious benefits. It would not only decrease the risks of use, miscalculations, and nuclear escalation, but would also show willingness to work on serious steps towards nuclear disarmament. This is especially important today, when many non-nuclear weapon states increasingly criticize the nuclear weapon states for not fulfilling their nuclear disarmament commitments made in the Non-Proliferation Treaty of 1968, which may be damaging the fundamentals of the international nuclear arms control system. From this perspective, pivoting away from nuclear-armed cruise missiles is not only a concrete risk-reduction measure, it is also a symbolic step contributing to the strength of global nuclear arms control systems.”<sup>24</sup>

Arms control advocates have also made the eminently sensible proposal that the US, Russia, and China get together to ban further testing of hypersonic weapons (some variants envisioned as air-breathing missiles, like cruise missiles) before they can become operational. They argue there is only one military role for such systems, and that is to launch surprise first strikes against an adversary’s key strategic assets – in other words, they would embody a highly destabilizing strategy of pre-emption that would generate escalating incentives to use nuclear weapons before they could be destroyed in a surprise attack. As the Bulletin of the Atomic Scientists has put it, banning these weapons before they are fully developed “stands out as an easy and highly significant opportunity to resist an onslaught of destabilizing weapons technology.”<sup>25</sup>

These are all arms control imperatives of significant importance and urgency. The most immediate urgency is the need to ensure the survival of the INF and New Start Treaties. Both impose some limits on cruise missiles, particularly nuclear-armed cruise missiles. But that is only a start – intensified arms control diplomacy, despite the current realities in Washington and Moscow, remains the most promising response to the cruise missile threat. That threat is real, but it can be mitigated – not by devising fanciful defences but by pursuing serious arms control.

## Notes

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<sup>1</sup> Andrea Charron and James Ferguson, "Beyond NORAD and Modernization to North American Defence Evolution," Canadian Global Affairs Institute, May 2017. [www.cgai.ca](http://www.cgai.ca)

<sup>2</sup> Taking advantage of stealth technologies, staying below radar lines of site, following circuitous routes to a target, maneuvering around radars air defence installations.

<sup>3</sup> Andrew Roth, "Putin threatens US arms race with new missiles declaration," The Guardian, 01 March 2018. <https://www.theguardian.com>

<sup>4</sup> Hans M. Kristensen, "The Nuclear Posture Review and the US nuclear arsenal," Bulletin of the Atomic Scientists, 02 February 2018. <https://thebulletin.org>

<sup>5</sup> "Russia's Northern Fleet Cruise Missile Exercise Ended in Arctic," Naval Force News – Russia, 27 September 2017. <http://cqcounter.com>  
Thomas Nilsen, "Cruise missiles crisscross the Barents," The Independent Barents Observer, 21 September 2017. Radio Canada International. <http://www.rcinet.ca/eye-on-the-arctic>

<sup>6</sup> Sydney J. Freedberg Jr, "New Icebreaker Will Have Space, Power For Weapons: Coast Guard," Breaking Defense, 10 January 2018. <https://breakingdefense.com/2018/01/new-icebreaker-will-have-space-power-for-weapons-coast-guard/>

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Carlo Muñoz, "How the Coast Guard is prepping cruise missile on icebreakers as another Cold War heats up," The Washington Times, 17 January 2018. <https://www.washingtontimes.com>

<sup>7</sup> Amy F. Woolf, "The New START Treaty: Central Limits and Key Provisions," US Congressional Research Service Report, 05 February 2018.

<sup>8</sup> US Department of Defense, Nuclear Posture Review 2018.

<sup>9</sup> Steve Pifer, Arms and the Men, Blog, 16 January 2018. <https://www.brookings.edu/blog/order-from-chaos/2018/01/16/arms-and-the-men/>

<sup>10</sup> Steve Pifer, Arms and the Men, Blog, 16 January 2018. <https://www.brookings.edu/blog/order-from-chaos/2018/01/16/arms-and-the-men/>

<sup>11</sup> "Ballistic and Cruise Missile Threat, 2017," Defense Intelligence Ballistic Missile Analysis Committee, Department of Defense, 2017. <https://missilethreat.csis.org/dod-releases-report-worldwide-missile-threats/>

<sup>12</sup> Murray Brewster, "Cruise missile threat biggest priority in upcoming NORAD makeover," CBC News, 26 July 2017. <http://www.cbc.ca>

<sup>13</sup> Lt. Gen. Dan Leaf (ret.), "Comprehensive missile defense for the homeland," Defense News, 13 December 2017. <https://www.defensenews.com>

<sup>14</sup> Russia has reportedly developed a launch system that can fire up to four cruise missiles from a standard shipping container. Jeffery Lewis, "Sokov on Russian Cruise Missiles," 25 August 2015, ArmsControlWonk. <https://www.armscontrolwonk.com/archive/207801/sokov-on-russian-cruise-missiles/>

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<sup>15</sup> Andrea Charron and James Fergusson, "NORAD and the Evolution of North American Defence," Inside Policy, Macdonald-Laurier Institute, 24 May 2017. <https://www.macdonaldlaurier.ca/norad-and-the-evolution-of-north-american-defence-andrea-charron-and-james-fergusson-for-inside-policy/>

<sup>16</sup> Richard Woolgar-James, "How the new nuclear-armed cruise missile might aid disarmament," 27 June 2016, *Bulletin of the Atomic Scientists*. <https://thebulletin.org>

<sup>17</sup> "The Missile Technology Control Regime at a Glance," Fact Sheet, Arms Control Association. <https://www.armscontrol.org>

<sup>18</sup> The Nuclear Threat Initiative, backgrounder. <http://www.nti.org>

"The Missile Technology Control Regime at a Glance," Fact Sheet, Arms Control Association. <https://www.armscontrol.org>

<sup>19</sup> Aaron Mehta, "Will the US trade its new sub-launched cruise missile for Russian arms treaty compliance?" DefenseNews, 06 February 2018. <https://www.defensenews.com>

<sup>20</sup> Richard Woolgar-James, "How the new nuclear-armed cruise missile might aid disarmament," 27 June 2016, *Bulletin of the Atomic Scientists*. <https://thebulletin.org>

<sup>21</sup> As quoted in: "Revive Arms Control and Start With Nuclear Armed Cruise Missiles, Clingendael: The Netherlands Institute of International Relations," 09 June 2016. <https://www.clingendael.org>

<sup>22</sup> "Revive Arms Control and Start With Nuclear Armed Cruise Missiles, Clingendael: The Netherlands Institute of International Relations," 09 June 2016. <https://www.clingendael.org>

<sup>23</sup> Hans M. Kristensen & Robert S. Norris, "Chinese nuclear forces, 2016, Nuclear Notebook, 13 Jun 2016, *Bulletin of the Atomic Scientists*. <https://thebulletin.org/2016/july/chinese-nuclear-forces-20169627>

<sup>24</sup> "Revive Arms Control and Start With Nuclear Armed Cruise Missiles, Clingendael: The Netherlands Institute of International Relations," 09 June 2016. <https://www.clingendael.org>

<sup>25</sup> As quoted in: Patrick Tucker, "The Problem with the Pentagon's Hypersonic Missile," DefenseOne, 14 April 2016. <http://www.defenseone.com>