



ARCTIC SECURITY BRIEFING PAPERS

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Replacing the North Warning System: Strategic competition or Arctic confidence building?

Canada and the United States have begun planning a replacement for the North Warning System, the network of air defence radars across the top of the continent. Jointly funded and operated through NORAD, though located primarily in Canada, the system's renewal comes in the context of a persistent Cold War revivalism that presages a preoccupation with national defence and geostrategic competition. But another feature of the current context is broad recognition that the changing physical environment and increasing access to and activity in the Arctic drive a priority need for enhanced domain awareness within the region to support public safety, law enforcement, and sovereignty protection, while also serving national defence and strategic stability.

Replacing the North American Arctic's North Warning System (NWS) will be an extended and expensive process, with construction unlikely to be completed before the mid-2030s. The chain of Arctic radar stations monitors air approaches to the northern mainland territories of Canada and the US. It came on line in the early 1990s as a replacement for the Cold War inspired Distant Early Warning (DEW) Line of northern radars built in the mid 1950s when the Soviet Bomber threat loomed large. The DEW Line never had, and the NWS does not now have, any capacity to monitor hostile aircraft over extended distances; the idea was and is to draw a line in the snow to serve as a tripwire signalling an attack from the north and heading south.

In those early Cold War years Canada shared US concerns about the bomber threat (the Canadian Arctic being the route by which the Soviet aircraft would head to the US heartland), but a major factor in building the DEW Line was the recognition that the Americans required it and would not, and could hardly be expected to, tolerate a blind spot in the Canadian north that would deny them early warning of an attack en route to the lower American mainland – in other words, if Canada would not cooperate in building a line of radars, the US would find its own ways of monitoring Canadian territory for signs of Soviet attack, with major implications for Canadian sovereignty.

Canada understood that in order to avoid that kind of American "help" it would have to support and be part of a credible system to monitor Canadian territory on behalf of both countries (hence, the frequently noted "defence-against-help" reality for Canadian defence policy). It's a condition that also applied when the NWS was built, and it still applies. Canada shares a continent with the Americans and is simply obliged to make a credible contribution to its defence – and the American definition of credible is the one that counts.

Soon after the DEW Line was built in the 1950s, the Soviet bomber threat was much degraded, with attention turning to the post-Sputnik Soviet missile threat. By the mid-1980s the old Soviet bomber threat was certainly not a central concern in the minds of North American defence planners, but the Soviet Union did continue to maintain a substantial strategic bomber capability that regularly, even if infrequently, patrolled within range of North America. Added to that, cruise missiles capable of being fired from those bombers were emerging. Thus, by the early 1990s, the DEW line was replaced with the NWS radars, supplemented by American Airborne Warning and Control System (AWACS) aircraft that were permitted to operate in Canada, and long-range radars on the Pacific and Atlantic coasts.¹

That was more than two decades ago, and now the Government's June 2017 Defence policy document describes the NWS as approaching "the end of its life expectancy from a technological and functional perspective," and reports that bilateral efforts are already underway to develop a successor early warning system.²

The cost is unknown, but given that the cost of the NWS ran into the billions, its replacement promises to cost many billions more.³ The replacement timeline will extend over at least two decades: research and analysis into options to be completed by 2020; the chosen system to be approved in 2021; from that is to follow a request for proposals from industry to be completed by 2023; with the final contract to be awarded in 2024 (the Canadian procurement record might suggest that is an optimistic timeline). Delivery or installation of the system is expected to take at least a decade, with completion anticipated for the mid-2030s or beyond.⁴ The plan is for a "system of systems" designed to integrate radars, maritime sensors, satellites, drones, and other technologies.

The All Domain Situational Awareness Science and Technology Program managed by Defence Research and Development Canada (DRDC) includes plans to spend \$133 million over five years on research and analysis in support of enhancements to monitoring the air and maritime (surface and subsurface) approaches to Canada, with a particular emphasis on the Arctic. The effort will include international cooperation with the Five Eyes states (Canada, Australia, New Zealand, United Kingdom, US),⁵ with a focus on four areas:

- Strategic surveillance of airborne traffic and aerospace warning;
- Awareness of maritime traffic in Canadian approaches and Arctic littoral regions;
- Awareness of sub-surface activity approaching or in Canada's North; and
- Analysis of sensor mixes and information integration and sharing for all domain awareness to enable detection of modern threats beyond the threshold of the current systems.⁶

The impetus for NWS replacement

The need to overhaul Arctic monitoring and surveillance systems responds to both public safety and national defence imperatives. Climate change, as is now routinely noted, means continued expansion of activity in the region, and that in turn requires a constantly improving ability to maintain credible awareness of events and conditions, especially in the air and maritime domains. Domain awareness is obviously essential (though not sufficient) for mounting the full range of effective and timely emergency response, search and rescue, disaster relief, and defence operations. With increased access to and activity within the Canadian Arctic and the entire pan-Arctic region, the

capabilities and intentions of both state and non-state actors warrant increased attention.⁷ And taking advantage of evolving surveillance technologies is an important part of that process.

The current NWS consists of 11 long-range and 36 short-range radar sites forming a line across Alaska, the Yukon, Northwest Territories, Nunavut, and Labrador (with three of those sites located in Alaska).⁸ Overall, the coverage area is a swath about 5,000 kms long and just over 300 kms wide. Those radars track all air traffic within their coverage area and send data via satellite to the Canadian Air Defence Sector at the 22 Wing Base at North Bay, Ontario. Coastal air defence radars on the Atlantic and Pacific coasts also transmit data to North Bay, part of the bilateral NORAD aerospace command. Unauthorized military traffic along or through the NWS corridor is rare, and the coastal radars further south have drawn NORAD into a significant drug interdiction role – identifying unauthorized aircraft and assisting law enforcement agencies in tracking suspected contraband runners.

The NWS, like its DEW Line predecessor, is also a Cold War installation, and its primary strategic role has been to pay attention to long-range Russian military aircraft (primarily bombers capable of carrying nuclear weapons). Interceptions are rare because Russian military flights near Canadian airspace are only occasional, not regular, and because much of the NWS is far from international airspace. Roughly, from Tuktoyaktuk to the eastern shore of Baffin Island above Cumberland Sound, the NWS runs through some 3,000 kms of Canadian territory, where Russian military aircraft never venture. The western end of the line, along the Alaskan, Yukon, and the western Northwest Territories coast in the region of the Beaufort Sea, does run adjacent to international airspace where the Russians do show up from time to time. The eastern end of the NWS runs from the lower east coast of Baffin Island and south along the Labrador coast – also adjacent to international airspace where Russian aircraft can show up. For most of its length, the NWS does not run along Canada's most northerly frontier. It doesn't cover the outer perimeter of the Arctic Archipelago, or as Joe Clark described the northern coastal border of the Arctic Archipelago, "the seaward facing coasts of the Arctic islands."⁹ As a Cold War installation, the focus of the NWS was not to monitor Canada's territorial frontier, it was to provide the American strategic deterrent early warning of attack – and that required only that the warning radars be well away from the American heartland, and that meant anywhere in the far north would work.

Currently, of course, Russian peacetime patrols and training flights might venture undetected near the "seaward facing coasts of the Arctic islands," but they never come anywhere near the Tuktoyaktuk-to-Baffin Island radars of the North Warning System. If the Russian bombers ever crossed the NWS in that mid-Canada section, they would be very deep within Canadian territory. In other words, much of the NWS is not a frontier system and cannot now monitor and track airborne entries into Canadian airspace around the archipelago.

While Russian bombers still conduct (occasional) flights on the periphery of North America, the larger concern is the growing inventory of cruise missiles capable of reaching targets in North America from ships and aircraft in international territory near North American shores. Such air breathing missiles have been in the Russian arsenal for a long time, and they are becoming increasingly available to other potential users. Increasingly, states and even non-state groups could develop the capacity to launch, from ships in international waters, cruise missiles capable of reaching well into North American territory. The current NWS does not have a reliable capacity to

detect approaching cruise missiles, whether launched from aircraft or ships in international airspace or waters, largely because they are low flying and approach underneath its radar range, and they employ evasion tactics and technologies. As US NORAD Commander Admiral William Gortney told the US Senate Armed Services Committee in 2015,¹⁰ the international north is viewed as an emerging operating area from which not only the Russians, but other states, “rogue regimes, myriad terrorist organizations, individual violent extremists, and transnational organized crime” groups are likely to be looking for weaknesses to exploit.

The North Warning System also cannot contribute to the detection ballistic missile launches or to tracking their flight, so American military planners would like to see its replacement become a multi-purpose Arctic sensor system capable of tracking not only aircraft, but also ships and ballistic missiles. Research into “continental surveillance radars” is being pursued through Defence Research and Development Canada.¹¹

If the NWS replacement is to have a capacity to detect aircraft, including cruise missiles, much farther out from North American shores, and have some capacity for ballistic missile detection, experts insist the new northern surveillance/warning system will require a mix of ground, air, space and sea-based sensors, and will need locations both further north than the present NWS and further south down the Pacific and Atlantic coast lines.¹²

Domain awareness to assure Canadians and neighbours

The importance of comprehensive and timely domain awareness in the Arctic can hardly be overstated – not because of mounting external threats, but because of mounting internal responsibilities. Increased activity in the Arctic will drive greater attention to law enforcement and to ensuring compliance with navigation rules and environmental regulations. Increased risk of disaster will drive the need for timely emergency response and expanded search and rescue capacity. And the constant requirement for any sovereign state to be fully aware of and to regulate all entries into its coastal zones, territorial waters, airspace, and land territory certainly drives a requirement for increasingly sophisticated domain awareness technologies and operations.

Higher or lower levels of threat do not really translate into higher or lower requirements for domain awareness. At lower threat levels, domain awareness is still essential for providing credible assurances to Canadians that those threat levels remain low and that there are no activities or circumstances in or near Canadian territory that could change that, and to give neighbors credible assurances that there are no activities and no presence within Canadian jurisdictions that could pose a threat to neighbors. Current threat assessments and analyses of geopolitical realities continue to conclude that state-based military threats are not present or likely to develop in the Arctic. Obviously, such threat assessments depend on physical surveillance and detection systems, but also on intelligence and geopolitical analyses.

The point of constant and effective monitoring and surveillance is to aid the rule of law, support public safety, and advance national security, and it is also to support informed threat assessment. The commitment of resources to domain awareness is necessarily ongoing, while the commitment of resources to law enforcement, public safety, and national security necessarily change in response to changing threat assessments.

That is not to ignore the growing insistence among some analysts that threat levels are in fact dramatically changing, that we are back in a Cold War, and that Russia and China must now be regarded with the same wariness that was accorded them during the Cold War. There is no doubt that the world changed in the wake of Russia's actions towards Georgia and Ukraine, but attempts to make those European-centred concerns the basis for military planning in the Arctic ignores some pretty fundamental realities – namely, that a deeply rooted inclination to cooperate and deflate tensions still pervades the Arctic. Through the recent agreement to collectively control fishing in the Central Arctic Ocean, commitments to cross border assistance in search and rescue and oil spill prevention and mitigation, operational cooperation among the region's Coast Guards, and of course the extensive work of the Arctic Council, the Arctic has shown itself capable of resisting the tensions and divisions that now plague Europe.

It is a truth that Cold War revivalists have had trouble hearing. They have urgent warnings to flag, and while those warrant attention, they are not the basis for prudent security planning. The key to understanding public safety and national security vulnerabilities in the Arctic, and thus to security planning, is timely and reliable domain awareness. A North Warning System replacement that focuses on deepening real-time awareness throughout the Canadian and North American Arctic, rather than on frontier trip wires, will not only serve public safety and national security, it can model the kind of transparency that can contribute to region-wide domain awareness and, as a result, build confidence and cooperative security throughout the entire region.

Notes

¹ Philippe Lagassé, "Northern Command and the Evolution of Canada-US Defence Relations," Canadian Military Journal, Spring 2003.

² Department of National Defence, *Strong, Secure, Engaged: Canada's Defence Policy, 2017*.

³ Lee Berthiaume, "Radar upgrades raise questions about ultimate costs of Liberals' defence review plan," Canadian Press, 30 August 2017. <http://www.cbc.ca>

⁴ "North Warning System Replacement," DND, <http://www.forces.gc.ca/en/business-defence-acquisition-guide-2015/aerospace-systems-960.page>

⁵ Department of National Defence, "DRDC prepares the future of the North," The Maple Leaf, last modified, 25 November 2016. <https://ml-fd.caf-fac.ca>

⁶ Department of National Defence, "Government of Canada Announces Contract Awards for All Domain Situational Awareness Science and Technology Program, New Release, 20 October 2017. https://www.canada.ca/en/department-national-defence/news/2017/10/le_gouvernement_ducanadaannoncelescontratsattribuesdanslecadredu.html

⁷ Department of National Defence, "All Domain Situational Awareness S&T Program," Defence Research and Development Canada, last updated 26 October 2017, accessed 06 February 2018. <http://www.drddc.gc.ca/en/partnerships-partenariats/all-domain-situational-awareness-connaissance-situation-domaines.page>

⁸ Department of National Defence, North Warning System Background, 2012. <http://www.forces.gc.ca/en/news/article.page?doc=north-warning-system/hgq87x9w>

⁹ Peter Pigott, *From Far and Wide: A Complete History of Canada's Arctic Sovereignty*, Dundurn: Toronto, 2011.

¹⁰ US, Canada eye North Warming upgrade: NORAD," Nunatsiaq News, 08 April 2015. <http://www.nunatsiaqonline.ca>

¹¹ David Pugliese, "Canada examining contributions to US missile defence in the Arctic," *Ottawa Citizen*, 17 September 2017. <http://ottawacitizen.com>

¹² Andrea Charron and James Fergusson, "NORAD and the Evolution of North American Defence," Inside Policy, The Macdonald-Laurier Institute, 24 May 2017. <https://www.macdonaldlaurier.ca>

Andrea Charron and James Fergusson, "Beyond NORAD and Modernization to North American Defence Evolution," Canadian Global Affairs Institute, May 2017. <http://www.cgai.ca>