CANADIAN GLOBAL AFFAIRS INSTITUTE
INSTITUT CANADIEN DES AFFAIRES MONDIALES

Modernizing North American Defence

by Peter Rayls, Ramesh Balakrishnan and Daniel Chrobak

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CONFERENCE REPORT

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Keynote Address – The Strategic Outlook and Threats to North America

Commodore Jamie Clarke – Deputy Director, Strategy, NORAD/NORTHCOM

Given its unique and vital place within the U.S.-Canadian bilateral relationship, NORAD is the key vehicle for both nations to cope with an increasingly complex and dangerous world due to adversaries leveraging multiple domains to create new threats to North America. NORAD continues to use its interpretation of the strategic and operational threats to North American to justify its need to modernize its capability to detect, deter, and defeat threats. As has happened in the past (e.g., the growth of the inter-continental ballistic missile –ICBM– threat in the early 1960s and the re-emergence of Soviet air threats in the 1980s), NORAD is at a point where changes in the threat environment have created a need for NORAD to modernize its capabilities to defend North America.

- For several decades, NORAD's strategic outlook has continually been redefined, following the threats of the time. Today, threats operate across multiple domains and can strike North America both above and below the threshold of response. Great power politics have returned and operate once more in North America.

- A safe and secure North America includes the Arctic. Climate change and the opening of the Arctic have created new threats: Russia and China have become emboldened and escalated their search for influence in the Arctic (militarily and economically).

- And in terms of capabilities, North America is behind. The radar technology NORAD uses is now obsolete (North Warning System) and incapable of detecting Russian missiles. It is a significant issue, as "we cannot deter what we cannot defeat, and we cannot defeat what we cannot detect."

- NORAD needs three essential elements to succeed in its mission to protect the continent: 1) New and upgraded sensors or radars that operate across services and domain; 2) Improve command and control processes and capabilities, which includes implementation of the Joint All-Domain Command and Control System; 3) Develop and field advanced "defeat mechanisms" to maintain response capabilities (but those defeat capabilities remain very costly).

- Protecting North America is not merely about sovereignty. It is to "defend our entire way of life." It is important to get Canadians and Americans to believe that there is a real threat.

Q&A Session

Regarding the industrial relationship between the U.S. and Canada, and NORAD modernization: should Canada seek a single solution with the U.S., a joint venture between both nations' industries, or should Canada seek to "carve out a space" for itself?

Cmdre Clarke: All of the above. NORAD/NORTHCOM is working with industrial partners to identify solutions. Additionally, there is a need to try to prevent bilateral agreements from slowing things down.

What is the timeframe for NORAD Modernization?

Cmdre Clarke: At this time, it is unsure.

Canada and the United States have differing priorities/goals when it comes to North American defense and NORAD. Canada emphasizes domain awareness and sovereignty, while the U.S. emphasizes deterrence: Can situational awareness be the vehicle to see these two priorities come together?

Cmdre Clarke: Attention to sovereignty is born out of a touch of naivety. While maintaining U.S. second strike capability is necessary, it is not a comprehensive solution.

How will NORAD/NORTHCOM integrate its network of systems with the networks of other Combatant Commanders (CoComs)?

Cmdre Clarke: It is a work in progress, and one that sees a healthy dose of competitions between the CoComs based on their theater/mission-specific requirements.

Panel I – Enhancing Arctic Capability

Heather Conley – Senior Vice-President for Europe, Eurasia, and the Arctic, Center for Strategic and International Studies

Dr. Rob Huebert – Professor, University of Calgary, and Fellow, Canadian Global Affairs Institute

BGen Carla Harding – Director General Support, Canadian Joint Operations Command

Stephanie Pezard – Senior Political Scientist, RAND Corporation

Moderator: LGen (ret'd) Michael Day – Fellow, Canadian Global Affairs Institute

Panel members collectively emphasized a need for Canadians and Americans to become much more aware of the current and potential future risks to North American security in the Arctic region. The current competition with Russia and China amounts to a new Cold War marked by grey zone threats. Competing great powers are investing time and effort across multiple domains in the Arctic. Canada and the United States may be behind in dedicating the capabilities required to address these threats. China's and Russia's diverging intents, to which the U.S. and Canada need to respond, complicate security calculations in the Arctic, demand more careful strategic planning. As such, protecting the Arctic demands the U.S. and Canada balance differing security needs created by different powers with different goals.

Heather Conley

- Recognizing the Arctic as a strategic arena, i.e., the "Arctic Awakening," is critical in an era of great powers competition. The U.S. is behind: it had its awakening only 12-18 months ago, while Russia had its own 12 years ago, and China 7 years ago. The U.S. Coast Guard and the 2nd Fleet have been the backbone of U.S. presence in the Arctic. However, their presence lacks a long-term strategic outlook, meaning Russia and China are ahead.

- Organizationally, the Arctic is a geographic seam between North American and European Atlantic. This begs the question: Does the U.S. need a unified command for better operational planning?

- CSIS's Arctic Strategic Study views China's Arctic interests in three areas: Economics, Energy, and Shipping. A military posture is required to protect these interests. Russia's conventional buildup in the Arctic has a global outlook.

- The lack of U.S. capabilities in the Arctic is due to limited funds: The U.S. has no deep-water ports in the Arctic, the U.S. Navy's uses its only heavy icebreaker ship in Antarctica, and there are no anti-submarine warfare capabilities in the Arctic

- What country is of strategic priority, Russia or China? Secretary of Defence Mike Esper talks about a "China First, Russia Second" military posture. But does this priority need to be flipped in the Arctic? Additionally, it is of strategic importance to view the Arctic as NATO's northern flank.

BGen Carla Harding

- What does "Canada's Arctic" mean? It represents 0.3% of Canada's population, but 40% of its land area and 70% of its coastline. It is a unique region that is not geographically homogenous.

- Military plans for the region need to consider location and seasons. It necessary to avoid viewing the North through a southern lens. Having conversations with local population about assumptions, strategies, and plans can help better preparation. Military forces

cannot rely on resources already in the region: They are already allocated; using them will seriously impact the local inhabitants

- Due to post-9/11 deployments to the Middle East and Africa, the Canadian military has lost the capabilities and skills to operate in the Arctic.

Stephanie Pezard

- The grey zone is an elusive space in the conflict spectrum. It can include operations of destabilization in both the political and social realms, and demonstrations of force in the information domain. Cyberattacks, attempts at influencing public opinion, fake news, and disinformation campaigns are examples of the latter. The grey zone also has an economic domain; trade sanctions belong to that space.

- Russian military exercises that demonstrate capabilities, which are becoming routine, belong to the grey zone space as well. They have offensive components, e.g., disruption to civilian communications, GPS systems. The multiplication of these exercises increases the possibility of accidents that could elevate situations, either intentionally or unintentionally.

- Chinese activities in the Arctic are currently focused mostly on scientific and mining activities. They include attempts to build infrastructure and presence. They might be innocuous, but they raise eyebrows.

- Three main concerns regarding China and Arctic security are military (i.e., intelligence operations and military presence to secure interests); legal (Chinese legal behaviour in the Arctic may mirror their legal claims in the South China Sea); and political (i.e., attempts to use economic means to create political wedges in the region). In terms of the economic side of China's challenge, it is in fact possible that China might positively respond to alternatives for investment.

Rob Huebert

- Analysis of regional security in the Arctic needs to consider the political nature of Arctic sovereignty.

- 2007/2008 marked the resumption of the Cold War. Russia announced the resumption of its military presence in the Arctic and is now making the region a critical theatre in its efforts to counter NATO expansion. Between 2007 and 2014, Russia has become a *de facto* Arctic hegemon. The current situation is paired with Russian efforts to field hypersonic missiles to counter U.S. anti-ballistic missile (ABM) capabilities.

- In terms of China's role and goals in the Arctic, China is not automatically in lockstep with Russia. Their interests will eventually diverge, and they will become competitors. There

has been a movement from bilateral competition (U.S.-Russia) towards trilateral competition (U.S.-Russia-China).

- The political nature of a potential conflict in the Arctic needs to be better understood, the U.S. and Canada need to revive their political and strategic processes. Political leaders on both sides of the border lack understanding over the situation.

- The new geopolitical environment requires a new Arctic security strategy: Canada and the U.S. need to respond to Russia's capability growth. Currently, Canada does not have an Arctic policy, and Secretary of State Mike Pompeo has recently called for freedom of navigation in the Northwest Passage, challenging Canada's claims to this territory.

Q&A Session

What is unique about the strategic environment in the Arctic?

H. Conley: It requires North America to leverage space and data capabilities to develop a comprehensive communications system and operational picture of the Arctic. Russia possesses advanced electronic warfare and GPS jamming capabilities, and China possesses capabilities through its Baidu GPS system. The U.S. needs to engage in more military exercises in the Arctic. The U.S. and Canada need an allied strategy for the Arctic that includes NATO to create a strategy that integrates the European and North American Arctic.

R. Huebert: The Arctic is a difficult and unique operating environment that is complicated by climate change, but it is central to the security of North America. Deterrence and Arctic war-fighting capability is integral, and new and renewed political cooperation on Arctic security is required at the highest levels.

S. Pezard: Strong basis for cooperation in the Arctic at the operational level and among strategic competitors is essential, and includes: improved early warning systems, procedures to prevent accidental escalation, cooperation and communication to handle incidents, prevention, and search & rescue.

BGen Harding: Canada needs to integrate the instruments of power across DIME (diplomacy, information, military, and economic) and apply this approach in the Arctic.

Should NATO be more involved in Arctic security?

H. Conley: There is currently no forum to discuss Arctic security. The Arctic Council does not have the mandate to discuss security issues. NATO should be a part of this; Denmark, Norway, and the U.K. have strong defence capabilities to contribute. There needs to be more transparency, a clear code of conduct, and confidence-building measures.

S. Pezard: Establishing a clear view about the goals for an Arctic security forum is necessary. The central question to answer is whether it will include Russia.

LGen (ret'd) Day: Conflict in the Arctic needs to be conceived differently; North America is behind in tackling Arctic security challenges and needs to take concrete measures.

Panel II: Defending North America Against Missiles

Ian Williams – Deputy Director, Missile Defence Project, Center for Strategic and International Studies

Dr. James Fergusson – Professor, University of Manitoba, and Fellow, Canadian Global Affairs Institute

David Crist – Ballistic Missile Defence Systems Architect, Lockheed Martin

Brant Dayley – Director, Customer Capability Assessments and Analysis, Raytheon International

Moderator: Sarah Goldfeder – Principal, Earnscliffe Strategy Group, and Fellow, Canadian Global Affairs Institute

Panel members focused on the changing nature of the threat to North America from missiles and the need for Canada and the United States to work together to upgrade their capabilities in order to defeat these threats. These capabilities must be interoperable, able to counter multiple threats, and have the ability to evolve. The improvement in technology and capabilities would need to work in tandem with improvements to NORAD operations and Canada's willingness to actively participate in BMD. Additionally, there is a clear sign that industry and militaries are working together to develop the necessary capabilities despite playing catch up in the area of BMD.

Brant Dayley

- U.S. BMD is a layered system that uses ground-based and regional missile defence that allows for deterrence and hedging against uncertainty and countering hypersonic glide vehicles. Ground-Based Midcourse Defence provides foundational capabilities, a "network of networks" function.

- The U.S.'s adversaries took advantage of its emphasis on counterintelligence (COIN) for two decades to improve their ballistic missile capabilities. Now, the challenges include the need to build "over the horizon" capabilities and multi-function across domain systems.

David Crist

- The Aegis ship-based BMD system completed 50 years of development in 2019. The Aegis system is comprehensive and includes radars, sensors, systems engineering, command and control, and integration with ground-based systems. An air defence platform evolved

into an integrated air defense & ABM system; the first SM-2 interceptor missile test was conducted in January 2002.

- Aegis is now evolving to include a new architecture, new sensors, modeling, simulation, and testing modules, with an emphasis on the continued need for data fusion. The fielding of hypersonic missiles would be a "game changer," even as the intercontinental ballistic missile (ICBM) threat remains. It is important to create solutions that are not geo-specific

- Aegis Ashore radars in Romania and Poland are a major component in the European Phased Adaptive Approach, and Aegis fire control is foundational for any future Canadian ships that may be retrofitted for BMD.

How do we integrate all of this? We know that industry is talking amongst itself.

James Ferguson

- Homeland defence should be the first defence priority for both the U.S. and Canada, and it demands that the outdated North Warning System gets updated and that NORAD goes through modernization.

- But NORAD modernization is unfortunately not on the radar in Canada; it is currently not funded under the Canadian defence spending plan. Canada needs to reprioritize to address this vital gap.

- NORAD modernization needs to address the 360° threat to all of North America. Warning systems need to cope with cruise and hypersonic missile systems. On that matter, Canada's defence policy, *Strong, Secure, Engaged,* is outdated. The Department of National Defence should focus on defence at home.

- NORAD remains a Cold War structure that makes clear distinctions between air defence, space, and ballistic missiles. It now needs a comprehensive and integrated system that treats "aerospace" as a reality, not just a concept.

- NORAD modernization is a strategic and political problem. More coordination between Global Affairs Canada (GAC) and the Department of National Defence (DND) is needed. The defence establishment needs to stop viewing NORAD through the lens of Canadian sovereignty; and the Permanent Joint Board on Defence needs to be overhauled in order to increase efficiency in bilateral coordination.

Ian Williams

- The air defence threats to North America are more complex than ever before: ballistic missiles; cruise missiles; 5th generation fighters; electronic warfare; unmanned aerial vehicle (UAV); non-state actor attacks; contested spaces; and data loss due to cyber-

attacks are only but a few of them. U.S. no longer holds a monopoly on precision-guided munitions, and now there are threats from ballistic missiles that have terminal maneuverability.

- The missile defence architecture of the future should encompass the capability to address a full spectrum of emerging threats from Russia and China, as well as other adversaries. Iran's use of precision-guided munitions in the last year demonstrates the current threats. These new capabilities have lowered the bar for conflict, altered escalation dynamics and the possible threshold for the use of nuclear weapons.

- Climate change has opened a viable and usable transit point for Russia, which exploits this opening by building capabilities and testing hypersonic missiles.

- The main danger is that missile defence platforms turn into "single points of failure." Priority should be put on the defence and resilience of the systems.

Brant Dayley

- Industry now works with Combatant Commanders, which generates a large set of requirements. It understands the need for interoperable systems, and knows how to deal with the issues of information overload and data management. A campaign plan is required to help guide industry and requirements

David Crist

- The approach to take should be that of "pacing the threat," i.e., having systems adapt as the threats evolve. And industry can teach the defence establishment on this matter, as it is continually learning from testing. Additionally, simulations and attention to interoperability can generate savings.

Canada tends to be reactive to U.S. actions and changes in strategy. Does this slowness leave Canada behind?

James Ferguson

- Events may outpace Canada. To prevent this from happening, procurement process in Canada needs to be overhauled, and Canada needs to commit 40% of its defence spending to modernization.

- U.S.-Canada defence industrial technology collaboration has been on track. Canadian startups and businesses are trusted suppliers to their U.S. partners, and it appears the closeness of this collaboration will continue.

Ian Williams

- Missile defence systems need integration and testing to counter advanced threats. Canada needs to be more proactive, adopt more cost-effective systems (including battle management), and think about accomplishing integration to increase interoperability across systems. Developing a joint kill chain where technologies such as AI and machine learning can be leveraged to better engage in anomaly detection and locate kill objects.

- The unpredictable and diverse nature of threats requires a missile defence that is designed to be flexible and adaptable. In face of the questions for the need for a standalone, $2B radar in Hawaii to counter North Korean missile threats, using space-based sensors for all of North America might be the best option.

Armchair Discussion – Modernizing American Homeland Defence

Richard Fontaine – CEO, Center for a New American Security

Moderator: Colin Robertson – Vice-President and Fellow, Canadian Global Affairs Institute

This discussion gave consideration to the impact of President Donald Trump on North American defence, and the potential for lasting impacts in a post-Trump world. Informed by 80-year history of bilateral defence cooperation, Richard Fontaine contrasted the changes wrought by Trump with the inertia of North American defence. He emphasized the implications of the re-emergence of great powers conflict, while seeking to differentiate the current conflict from the Cold War. He also mentioned the ongoing debate about the role that Huawei should have in the development of 5G networks, which served as a useful vehicle to discuss potential paths forward for Canada (i.e., should Canada take the risks that the U.K. is taking with regards to Huawei?).

How do we assess the big threat? How does North American defence fit within a bigger picture?

- There is a consensus that great power competition has re-emerged, particularly with Russia and China, even as the threats associated with the Global War on Terror remain. The military dimension is just one vector in this competition, technology and innovation, diplomacy, information and communication are also part of it. The U.K.'s decision to allow Huawei to control a portion of their 5G network is an example of the technology aspect of it.

- These multifaceted threats and challenges that face the U.S., Canada, and allies made harder by how "illiberal powers" position themselves in the world. Differing visions between liberal and illiberal powers are what creates geopolitical tensions. But currently, the situation lacks the ideological consistencies of the competition between communism and democracy found in the Cold War. The new paradigm is one of open systems versus

closed systems, and the current economic interdependencies (that were not present during the Cold War) complexify the picture, as it prevents a clear alignment process.

Where do you see the alliance system and the U.S. go, considering the influence of President Trump?

- The U.S. foreign policy establishment views allies as the U.S.'s greatest asset against Russia and China. On the other hand, Russia and China appear quite lonesome. The U.S. has NATO and five treaty allies in the Pacific. Those allies have fought the U.S.'s wars, while not pushing the U.S. to fight theirs. The U.S. should tend to these alliances because the broader competition is also a competition for allies; and to have more powerful liberal democracies on one's side is a good thing.

- President Trump has a diametrically opposed instinct on this, as he thinks allies have been taking advantage of the U.S, by free riding and spending too little on defence. But this specific impulse is not exclusive to Trump; American officials have shared the opinion that allies need to spend more. Nonetheless, President Trump's position on the matter has been the starkest.

- People like to point to George Washington's warning against "entangling alliances," but the world has fundamentally changed since. The system of alliance will be tested at some point, especially if there is another a situation like Libya that arises. It will be harder for some allies to engage, because public opinion has become reluctant to engage in U.S.-led operations

Will the U.S. remain as the backbone of intervention?

- It depends on what operations and where. The French run their own counter-terrorism mission in the Sahel, and part of U.S. support for that is refueling capabilities and intelligence, surveillance, and reconnaissance (ISR). The French are worried that the U.S.'s refocus to the Pacific will divert those support capabilities and make the U.S. strategically blind.

- In Washington, there's now the question of whether intervention is the U.S. to undertake. But the U.S. leaving these things to locals or allies on their own almost never works. If the U.S. pulled out of Syria, Afghanistan and Iraq, how long would U.S. allies stay there?

- Some of this questioning is not unique to Donald Trump. There is a broader sense that the U.S. has over-invested in lives and resources on wars: all Democratic candidates – like Trump – promise to end these "forever wars." Plus, polling data shows that the majority of U.S. citizens say Afghanistan and Iraq were not worth fighting.

- But the U.S. fears the costs of withdrawal will be greater than the costs of staying. It was a real concern of President Obama's and remains an issue for President Trump. Currently, there are more troops in the Middle East than at the beginning of the Trump administration.

Would this change post-Trump?

- The politics of issues regarding China, the desire to end forever wars, trade, immigration, are now part of the new normal in American politics (whether Republican or Democrat). Whoever the next president is, they will have to deal with these political issues. For example, the U.S. tends to go on protectionist waves. Now, President Trump tends to be favourable to tariffs – it might change in the future.

CNAS has a project underway – America competes – where does Canada fit in this competition?

- The project explores the areas in which the U.S. needs to compete on the global stage, and U.S. competitiveness directly includes Canada. Homeland defence is one key to the U.S. becoming stronger in a new age of great power competition. Competitors' new capabilities increase their ability to strike North America. If NORTHCOM and NORAD cannot defend the homeland then U.S. Strategic Command (STRATCOM) needs to disperse its weapons in a crisis or conflict.

- But is goes beyond the continent; the interruption of data affects deployed capabilities that are outside the homeland. The security of North America influences security in other parts of the world.

- The technological component to great power competition is important: China would like to see a technological domain develop that has fundamentally illiberal values built into its architecture – surveillance, censorship. Allies should form a united front of liberal, democratic nations and coordinate their technological policy.

Given the close defence relationship between the U.S. and Canada through of NORAD, can Canada adopt a similar stance on Huawei as the British?

- The U.K. says the core can be protected from the periphery, where Huawei will operate. The U.S., New Zealand, and Australia reject this idea on technical grounds, also informed by China's legal framework. Will Huawei share information with the Chinese government? Chinese technology companies have to comply with government's demands for information.

- Huawei building out 5G in any of our countries is not a good idea. Right now, the U.S. reconsider its outright ban to Huawei and adopt a "scalpel approach," focused on stopping Huawei 5G as opposed to destroying Chinese competitors.

What would be your advice to the Canadian government? Is homeland defence the top priority?

- The number one objective of the U.S. national defence strategy is defence of the homeland, i.e., protecting the population and the territory in order to ensure the safety of operations abroad. But discussing what the public perceived threats is important, as it influence resource allocations.
- It is not clear how much people believe that Russia and China are direct threats to Canada. Political will arises depending on how acutely Canadians feel the threat. A question then becomes central: Is there a view of Canada as a stand-alone target or simply a collateral target due to its proximity and alliance with the U.S.?
- Russia and China do not make the list of top threats to the American public, either. Rather, it is terrorism, global warming, cyber threats (identity theft), Iran and North Korea, and immigration that make the top of the list.

Armchair Discussion – Keeping Canada Strong at Home and Secure in North America

Jody Thomas – Deputy Minister, Department of National Defence

Moderator: Dr. David Perry – Vice-President and Senior Analyst, Canadian Global Affairs Institute

In this conversation, Deputy Minister Thomas reflected on the relationships between Canada's national military strategy, its bilateral relationship with the United States, and its needs invest in the modernization of NORAD while fulfilling its procurement promises made as part of *Strong, Secure, Engaged*. In a world increasingly complex and dangerous, Canada seeks to chart a course forward in a fiscally sound and efficient manner. By leveraging the steady state of the bilateral military relationship and attempting to overhaul Canada's military procurement culture and organization, Thomas seeks to reinforce the strength and security of Canada for the decades ahead.

Reflecting on Strong, Secure, Engaged*, especially "strong" and "secure," how much does the strategy hold true today?*

- *Strong, Secure, Engaged*, as a concept, holds. It holds true for how the Canadian Armed Forces and the Department of National Defence should structure its operations. It did not predict things that would happen (e.g. the U.S. strike that killed Iranian General Qassem Soleimani, Iran's counterstrike on the U.S. in Iraq, and the downing of flight PS752). But it did address concerns that the world was changing, and that Canada's defence establishment had to respond to it.

What are some key issues for North American defence?

- NORAD modernization was a missing piece of *Strong, Secure, Engaged*, which the mandate letter of the Minister of National Defence now includes. There are two drivers for advancing the modernization of NORAD: the rise of great power competition, with actors who do not believe in the rules-based international order gaining power; and climate change, with wars being fought over resources, increased deployment of Canadian troops domestically and internationally; and the melting of the ice in the Arctic.

What is the way forward in terms of working with the United States' defence and national security establishment, with regards to the current American administration?

- The military bilateral relationship is "administration agnostic;" it persists because it has to. Senior leaders from both nations have developed relationships that transcend administrations and governments. These relationships are bolstered by the systems already in place – the relationship with NORAD is not a relationship that needs to be built, it just is. Based on current threats, there is no choice, both sides need the relationship.

Is there a framework to NORAD modernization that demands a "one and done" activity? Or does the Department of National Defence intend on adopting an iterative activity?

- DND is hoping to move away from a "one and done" mentality, whether it concerns major procurement projects or smaller ones. Canada cannot afford to miss a generation of technology, as it has in the past. DND needs to establish a cyclical approach to procurement and infrastructure maintenance/improvement; developing a constant and "evergreen" mentality with regard to procurement is a necessity.

- The U.S. and Canada have to bring the North Warning System to 2020 technological standards and start planning for its next iteration. To do so, the military need to leverage

existing civilian technology in order to meet its needs, in the same way that military technology has previously been leveraged to civilian needs. The IDEAS and MINDS programs serve that purpose.

- DND has to determine how it will approach funding large investments, both short and long term. The modernization of NORAD will require new funds, funds that are not tied to *Strong, Secure, Engaged*.

What is the timeline on moving forward with NORAD Modernization?

- There is currently not a clear timeline – the advancement of North American defence will be iterative and progressive. Rather, Canada looks to do small improvements: improve search and rescue, for example. The Department of National Defence is also looking at engaging in public consultation with the local population before starting large projects.

How are threat perceptions developed to inform mandate letter?

- Mandate letters go through constant, iterative process that looks at change in the world to identify threat perceptions – informed by work with international organization, allies, and other government agencies. The threat perceptions outlined in the mandate letter is a valuable tool to explain why we do things.

What is Defence Procurement Canada going to look like?

- DND is currently studying options, based on lessons learned from allies.

Panel III: Modernizing Continental Intelligence, Surveillance and Reconnaissance (ISR)

Charity Weeden – Vice-President, Global Space Policy, Astroscale U.S. Inc., and Fellow, Canadian Global Affairs Institute

BGen Colin Keiver – Director Air Force Development, Royal Canadian Air Force

Patrick Thauberger – Business Development (Airborne Systems), General Dynamics Mission Systems – Canada

LCdr Michael Bielby – Continental Control & Surveillance, Canadian Joint Operation Command

Moderator LGen (ret'd) Mike Day – Fellow, Canadian Global Affairs Institute

The panel discussed the ongoing need to update and improve the ISR networks that provide domain awareness, especially as it relates to NORAD modernization. There were parallel streams of discussion throughout the panel that often intersected. These include the need for space based ISR; the conflict between "information technology" and "information management," especially as it might pertain to organizations and processes; and how to manage data in order to provide decisionmakers with the relevant, accurate information on time. Swimming below the surface of this discussion was the political question of paying for ISR modernization and its potential roles in a whole of government setting.

LGen (Ret'd) Mike Day

- Canada fell behind as great power competition arose and the geostrategic setting changed. There has been a realization that there is an immediate need to act.

- One of the challenges in defending North America is knowing where the threats are and monitoring them, which requires a wide range of capabilities. The return of great power competition requires even more information and data. Thinking about modernizing NORAD involves thinking more broadly about modernizing equipment and institutions and bringing in additional components, which introduce the challenge of security ownership, control, and distribution of that information.

LCdr Michael Bielby

- Canada currently leverages existing and emerging space based ISR capabilities, and is developing technologies with allies in order to advance domain awareness. Continental ISR and modernization needs to be viewed from a global lens.

- Because of the return of great power conflict and the emergence of state-on-state, grey zone conflicts, the CAF needs to revisit how it operates at every level. Adopting a more holistic, whole-of-government approach is necessary. The Government of Canada's procurement practices cannot keep pace with technology and should not try to; procurement projects are usually out-of-date by the time they are fully operational. The Canadian tradition of updating capabilities in a piecemeal fashion needs to end.

- Canada needs to significantly expand ISR capabilities, such as system of systems for multi-domain awareness, a combination of persistent active and passive sensors. Purchasing space based ISR capabilities/hardware/technology is the way to go, and Canada could increase its use of contractors because of their industrial/technological agility.

Charity Weeden

- Space infrastructure is more important than ever for North American defence. Space based ISR modernization can increase area coverage widely, including for the Arctic. Spectral diversity in space based ISR capabilities is possible and beneficial.

- There are three challenges to overcome in order to fully exploit space based ISR for continental defence: 1) Technology, process, and capabilities need to be developed to cope with the ever-increasing amounts of raw data being collected. 2) There is a need for dedicated, space based ISR sharing policy to ensure is access to quality information. 3) The space domain is large, and it is dangerous (3 Cs: congested, contested, competitive); active and passive threats currently coexist, and the active satellite population will double, thanks to Space X.

BGen Colin Keiver

- ISR is three words: intelligence, surveillance, reconnaissance. Having well-integrated ISR structures is critical; if one capability lacks, the whole system crumbles. Within ISR is the question of effective, timely, and well-informed decision making at all levels. Building ISR capabilities are necessary to present strong enough deterrent power and to pursue de-escalation in an effective manner.

- NORAD already has space based capabilities that are working for NORAD and other allies. For example, it has helped Australia with multispectral imagery for their bush fire crisis. Perception also matters when it comes to information: what can be perceived as a threat to some can be an opportunity to others. Hence, the proper analysis of information is critical.

- ISR not only serves the purposes of the defence establishment; space based assets can help northern communities by providing social welfare capabilities to remote areas. The capabilities for North American defence can bring forward security and prosperity among populations. Multiuser space based capabilities allow for cost-sharing, making this overwhelmingly extensive set of systems affordable.

Patrick Thauberger

- From an industry perspective, ISR is about getting the right information to the decision makers at the right time. To adequately inform decision-making, the accuracy of the information matters more than its origin and the amount of analysis put it in.

- Currently, it is possible to leverage various ISR sources: commercial, classified, open source, military intelligence. All can be fused into a product tailored to the individual when they need it. The real challenge lies in the difficulty of fully conceptualizing (and pricing) a service such as ISR. As such, modern ISR capabilities for the Government of Canada should be viewed as a client/service provider relationship, which requires trust and openness, as it involves a significant amount of risk-sharing

ISR is constituted of three, interwoven capabilities; if one is lacking, the system collapses. Another challenge is that of data stream: there is an overwhelming amount of data to be

analysed, but maybe this data is not enough, maybe it does not contain the needed information. As such then, what are the next steps to improve ISR capabilities and ensure the proper flow of information across domains?

BGen Colin Keiver

- The concern is that of an information management (IM) nature: in face of a multi-origin, constant data flow, the question is what the objectives are and what type of information is needed. Being selective is a requirement – mapping out not just process of data collection, but also the result needed, is critical.

Charity Weeden

- Domain awareness has lots of interactions to balance (Cyber, air, space, maritime, etc.) and incorporates a lot of multi-level requirement (technological, political, analytical). Conceptualizing a framework, a plan, and a policy piece to ISR becomes a necessity.

Patrick Thauberger

- In ISR, language matters: the term "data collection" is often used and it has become the focus of ISR activities. Unfortunately, the question of analysis has been pushed aside – it needs to come back to the forefront. There are now opportunities to leverage AI and machine learning to have more targeted and specific images.

LCdr Michael Bielby

- The issue is not scarcity of data: there is too much data; and the price to properly manage and analyse it is too high. As such, the governance piece is essential: adopting a whole-of-government approach is necessary to share the cost across actors, with a coordinator at the top to generate an integrated data requirement

BGen Colin Keiver

- The whole of government approach is essential, as now ISR is no longer about regional stability in face of geopolitical challenges, but also the prosperity and the security (in all meanings of the terms) of the continent and its population

How do we take the first step toward a whole of government approach to make this work?

Patrick Thauberger

- The Arctic Working Group could serve as a model, as it has brought together different departments from the different Arctic governments.

Charity Weeden

- Space based ISR bring significant value-added to efforts of leveraging information that can help solve both defence and humanitarian problems.

What role can industry play in this to help produce solutions?

BGen Colin Keiver

- Industry and the government need to create a narrative that goes beyond the current hard defence focus. Industry can help create opportunities for all Canadians.

Patrick Thauberger

- Conferences that bring together government and industry present opportunities and arenas for better shared understanding and collaborative problem-solving; an agency such as Defence Procurement Canada can help improve industry/ government connectivity and encourage collaboration though a single point of contact.

LCdr Michael Bielby

- Partnerships between federal departments and industry focused on problem-solving instead of filling specific technical requirements can move the collaboration forward. For ISR, the issue at hands pertains to analytics. But potential tools exist.

Charity Weeden

- Industry is good at timely, accurate information. But what does it mean to have data that can inform decision-making in meaningful ways? Timely, accurate, and unambiguous information is at the heart of the paradigm.

What is the one thing that can help jumpstart the building of ISR capabilities?

LCdr Bielby: A unified, whole of government objective.

BGen Keiver: The process has already started.

Charity Weeden: Protecting space-based assets is essential.

Patrick Thauberger: Governments need to look at options for outsourcing.

Panel IV: The Maritime Dimension to North American Defence

Capt (N) Doug Campbell – Director Naval Major Crown Projects, Royal Canadian Navy

John Sanford – National Maritime Intelligence – Integration Office

Neil O'Rourke – Assistant Commissioner for the Arctic, Canadian Coast Guard

RAdm Steve Waddell – Vice-Commander, U.S. 2nd Fleet

Moderator: Dr. David Perry – Vice-President and Fellow, Canadian Global Affairs Institute

It is clear to experts that the maritime domain is in a period of flux. Maritime organizations are currently in the midst of fielding new fleets, structures, and capabilities to meet new requirements and counter new threats. The changing world order is forcing a reflection on how to modify new and existing equipment and technologies to meet emerging challenges, as well on how to meet potential needs for additional capabilities. Part of this process includes thinking about the processes, organizations, and culture needed to face those new challenges. This demand for reflection and introspection parallels to the process of adaptation the RCAF and USAF had to go through in the 1950s and 1960s when facing the rise of a Soviet nuclear threat, best embodied by the creation of NORAD in 1957.

What is your perspective on the role of marine domain in the defence of North America?

John Sanford

- "Awareness" is probably not the best word to use to describe the needed knowledge of maritime threats to North America: one can be "aware" of a threat without fully comprehending it. "Effective understanding" is a better term to use

- Maritime domain awareness requires a whole-of nation-approach, rather than a mere whole-of-government approach. The use of the maritime domain for drug trafficking, for example, demonstrates the multitude of potential threat to the security of the homeland and the need for a holistic approach.

RAdm Steve Waddell

- Canadian presence and participation in U.S. Navy (USN) activities in Norfolk, Virginia and throughout the USN's Atlantic operations is not new. However, it has been a while since there has been a senior Royal Canadian Navy (RCN) officer in Norfolk.

- The USN re-established the 2nd Fleet in 2018 in order to counter the Russian threat in the North Atlantic. The 2nd Fleet is a small, expeditionary unit that provides naval support to both NORTHCOM and EUCOM. Its focus is on the North, about which the USN has a zeal to learn from its Canadian partners.

Neil O'Rourke

- The term "security" has taken on new meanings. In addition to "traditional" threats, there are now emerging threats in the economic and environment realm. In order to better counter these, the capability of sharing intelligence with other maritime partners is critical.

- The Canadian Coast Guard provides the civilian support fleet to the Government of Canada, e.g. the Royal Canadian Mounted Police or the Canadian Border Service Agency. As such, it contributes to North American defence thanks to its Northern systems of radars and intelligence capabilities that it then shares with other departments, including the Royal Canadian Navy.

- The Canadian Coast Guard also contributes to continental defence thanks to a wide range of relationships and partnerships. These arenas of cooperation allow for "backdoor diplomacy." Some of these partnerships are international, e.g., the Arctic Coast Guard Forum, others are local: with the Inuit communities in the Arctic.

- The multiplication of maritime activities in the Arctic present a risk: increases in commercial shipping, scientific activity, cruise ships, adventure tourism can become significant threats in the future.

Capt (N) Doug Campbell

- Canada's ongoing procurement projects contribute to the building of capabilities for continental defence. The Canadian Surface Combatant Project is to replace the Halifax and Iroquois classes of ships, with the new vessels having extensive data gathering capabilities. Arctic and Offshore Patrol Ships will add additional Northern surface capabilities to the RCN.

- Naval Major Crown Projects (like other DND agencies) is in the midst of updating its ship procurement process to make it more evolutionary, iterative, and less revolutionary.

Neil O'Rourke

- The Canadian Coast Guard is enhancing its fleet with an emphasis on Northern and icebreaking capabilities. Canada purchased 3 Viking Class icebreakers to sustain the life of existing icebreakers and ensure that the Canadian Coast Guard can keep seven icebreakers on the water during icebreaking season.

- In May 2019, there has been an announcement that the Canadian Coast Guard will procure 16 multipurpose vessels that will have light icebreaking capabilities. These ships will add efficiency and decrease overall maintenance costs. They will be designed to add capacity and operational flexibility and allow better cooperation with the RCN.

Can you speak to bilateral cooperation and relationships with Canada's allies with an eye towards NORAD/NORTHCOM?

RAdm Steve Waddell

- There is a shift in language, from an emphasis on "interoperability" to "integration."
- The 2nd Fleet is unique in the USN because of international officers, like RAdm Waddell, who are exchange officers with functions and portfolios, not simply liaison officers.
- The 2nd Fleet reverses the early 2000s disappearance of NATO's footprint in the Northern Atlantic, and signals a return to the idea of the Atlantic as a theatre of operations. The Atlantic is again becoming a contested environment. The 2nd Fleet helps to fill the gap in the seam that currently exists due to the geographic boundaries between NORTHCOM and EUCOM, by supporting both commands retain situational awareness of the Atlantic.

Capt (N) Doug Campbell

- Interoperability is still important and a part of the requirements of the RCN's new vessels, and ongoing procurement projects will enable bilateral cooperation. The new vessels will utilize a lot of U.S. technological equipment.
- As new ships come online, the RCN will learn from those ships and make adjustments to follow-on ships as needed.

John Sanford

- Grey zone activities constitute manipulating the law in order to fulfill an objective. For example, illegal fishing in Canadian and American waters may be covert operations to collect intelligence for their nations.
- It is critical to improve the process and policies that allow intelligence, military, and law enforcement to cooperate, to give key information needed to make a decision, and to dedicate the assets necessary to execute that mission.

Neil O'Rourke

- Unfortunately, the Canadian Coast Guard has little capability to board or seize threat vessels due to the legal boundaries of their mission. But they can provide support to those that can board or seize.

Q & A Session

Looking into the future, how can new vessels improve North American defence?

J. Sanford: It is necessary to improve ISR capabilities, especially in the air and subsurface areas.

Capt (N) Campbell: The capabilities of vessels have the ability to change over time and vessels can often complete requirements not envisioned at the time of procurement

N. O'Rourke: The Canadian Coast Guard is thinking about the future; but it is not there yet with a comprehensive requirements list.

RAdm Waddell: Instead of thinking of a single platform for a single capability, interoperability to gain synergy from partnerships should be the focus. There is a need to influence and change the existing culture on previous uses of capabilities to emphasize a need for flexibility and ingenuity.

Panel V: The Future of NORAD and Continental Defence

Dr. Michael Dawson – former Political Advisor to the Commander of NORAD/NORTHCOM

BGen Richard Heitkamp – Deputy Director, Politico-Military Affairs (Western Hemisphere), U.S. Army JS J5

Stephen Fuhr – former Chair, House of Commons Standing Committee on National Defence

Moderator: Sarah Goldfeder – Principal, Earnscliffe Strategy Group, and Fellow, Canadian Global Affairs Institute

The panel's discussion focused on the tug and pull between the need for NORAD modernization, based on the renewal of great powers conflict, and the fiscal realities of attempting to support an unfunded program. Dedicating additional defence dollars to NORAD will be a tough sell for Canadian, as they do not view the threats to North America in the same way as defence experts and are more focused on funding domestic programs. Complicating this mix are external pressures from the U.S., either directly through calls for increased spending or indirectly through Canadian desires to acquire political capital with its bilateral partner. This is a tug of war that Canada has long struggled with and will probably continue to struggle with for the foreseeable future.

What does a modern NORAD mean for Canada?

Michael Dawson

- The geostrategic situation is changing, now rife with increasingly aggressive rejectionist states that invest heavily in advancing military technology. The Russians have enacted a new use of force doctrine, different from the tradition of deterrence, that of escalating to de-escalate. The first use of low yield/tactical nuclear weapons might be acceptable to Russia.

- NORAD is dependent on fragile, obsolete systems that could lead to mistakes. Canada needs to retire a number of old verities and be on board with NORAD modernization. Modernizing the institution is to ensure that NORAD can do its primary mission. Canada also needs to join the American BMD program.

- The bilateral relationship is largely based on the economy and trade, but there's more to it. The history of NORAD shows that the defence relationship is just as important. Canada cannot view the defence budget as a piggy bank from which to take money. Defence is not just a national affair; it is a bilateral affair. And Washington will not favourably view backsliding on continental defence, even if the reasons are legitimate.

- Canadian participation in defence buys Canada political capital in other areas. Canada and the U.S. might fight about soft wood lumber, but when it comes to the defence of the continent – they are on same page and working together.

Our tight ties in defence have also been leveraged to help us in tough times in other domains.

BGen Richard Heitkamp

- Technology has changed, which means the threats have change. The Russian doctrine is now more aggressive. It is not far-fetched to think a pre-emptive attack might occur. Canada could be the target for a Russian attack. What about a nuclear attack on Canada meant as an escalation move to get the U.S. to deescalate?

- The U.S. understands Canada's political reality and does not expect revolutionary changes in defence spending. The NORAD "brand" is different than in the U.S. Few people understand that NORAD exists and its importance to North America. Canada should strive to find dual uses for investment in NORAD to help sell the dollars spent to the Canadian public.

- Modernizing the North Warning System is essential. It was in the Minister of National Defence's recent mandate letter. It will bolster the "strong" and "secure" elements of *Strong, Secured, Engaged*. It will increase domain awareness. A reform of procurement processes could create opportunities and save defence dollars.

- The Five-Eyes is a good relationship, but not all Five Eyes partners are created equal. New Zealand and Australia are surpassing Canadian ISR capabilities. The U.S. shares more information with Canada than anyone else within Five Eyes. It could change drastically if Huawei gets a role in Canadian 5G development.

Stephen Fuhr

- There is a healthy understanding that Canada needs to invest in NORAD modernization. But it is not in the budget, and Canada needs to find the money, which will be hard to do.

Canada is spending $180B on infrastructure and $150B on its armed forces over the next 20 years. Fiscal constraints are a concern and lead to the question: What can Canada do in the meantime that is not going to make it worse?

- The future of continental defence can take two paths: Maritime control may migrate into the NORAD mission or Canada is going to be unable to distance itself from BMD. And the current acquisition and fiscal constraints will make Canada's move towards BMD difficult.

- Canada needs to make smart choices now. Its procurement process is problematic: while the technology cycle is shrinking, the procurement cycle is increasing. If Canada gets it wrong now, capabilities may be limited later.

There has been a lot of discussion of Canada's capacity to participate in in NORAD. What might the range of options look like?

BGen Richard Heitkamp

- Canada should take many small steps. It is going to be difficult just to start, especially since this minority government might only last 2 years.

- Canada can pursue increases in domain awareness, especially maritime awareness thanks to undersea sensors, robotics, and unmanned sensors.

Michael Dawson

- Canada should buy refueling tanker aircraft. They are always in short supply. There could be a high political payoff from the U.S. if Canada signed up for 4 or 5 tankers. Canada does not need to do anything revolutionary, just make a decision.

Stephen Fuhr

- Governments are risk averse, but the situation cannot be met with paralysis by analysis. If you have a reason to get something, go and get it.

Is Canadian complacency stalling the government in making decisions because they have to explain them to the population?

Stephen Fuhr

- Canada leans on the U.S. too much. The country needs to look at the west coast.

Dr. Michael Dawson

- The Canadian government has not spoken honestly to the Canadian public about these issues for a long time. Canada is essentially a military protectorate of the U.S. Academics try to educate students, but the media presents either factually incorrect material or feeds into this idea that the continent is not under threat
- Canada is not a pacifist nation; Canada stepped up in NATO and NORAD in the 1950s and 1960s. Canada should return to those days.

How do you get political leadership onboard to get a solution you are happy with?

BGen Richard Heitkamp

- The homeland is no longer a sanctuary, but even some leaders in the Pentagon are not convinced or they believe that focusing on the "away game" will prevent from having to fight the "home game."

Stephen Fuhr

- Canadians want a lot: New infrastructure, pharma care, university tuition… Can they be convinced that they want national defence, too?

The memory of 9/11 is fading, so how do we sell necessity to defend homeland?

Stephen Fuhr

- Access to information (and everything that is happening around the world) may make it easier. People are now more aware of the challenges. If it did happen here, citizens would want their government and military to be prepared and handle the situation.

Michael Dawson

- Canada needs to think in terms of its various diasporas: 1/7 of Canada can trace back their lineage to Eastern Europe. Canadian support for NATO works for these Canadians, while there tends to be much more skepticism for a small deployment like the one in Mali.

About the Authors

Peter Rayls *is a PhD candidate in Canadian military History at Queen's University. He is currently working on a dissertation that examines how personal relationships between Canadian and American air force officers influence the creation and early operations of NORAD. He received his B.S. in military history from the U.S. Military Academy and his M.A. in history from Ohio State University. Peter served for thirteen years in the U.S. Army in a number of positions around the world and is also a graduate of the U.S. Army's Command and General Staff College.*

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