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## NORAD: REMAINING RELEVANT

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### EXECUTIVE SUMMARY

Most Canadians probably understand that NORAD — the North American Aerospace Defense Command — is an operational military alliance between the U.S. and Canada that has been protecting the two countries from aerial attack and invasion since the Cold War. What few of them likely realize is that NORAD is just as much about protecting Canada from the United States. Given the massive imbalance in military power between the two countries, and the determination by the U.S. to defend its own soil at all costs, NORAD provides Canada with a means to have some control over its own territorial defence, neutralizing the threat that the U.S. will impose its own defence on Canada. Throughout its 60-year existence, NORAD has been Canada's "defence against help."

But that defence isn't guaranteed. As NORAD evolves, Canada's commitment to it must evolve, too. If there comes a point at which the United States believes that the alliance is no longer sufficiently securing its northern frontier, it may forge its own path and impose its own defence plans for Canada, on Canada. There are already areas where the relationship may be starting to strain.

One key policy inflection point occurred after 9/11 when Canada declined to participate in the U.S. missile-defence program. This has led to an awkward situation where Canadian officers and troops participate in missile-warning activities within NORAD's structure, but cannot participate in missile-defence

activities outside NORAD's structure. So far, adept commanders have been able to manage this cumbersome state of affairs, but there is no guarantee that will last.

The state of modern military technology has meant the mission of NORAD has had to largely shift away from defending against aerial bombers to defending against cruise missile threats. There is also the risk of terrorist attacks that do not respect borders. Those, combined with the rapid missile-program advance of a belligerent North Korea, the rise of China's military ambitions and the determination of Russia to remain a formidable threat, all effect Canada's place in NORAD, particularly in light of its northern geography.

Whether the Canadian government likes it or not, NORAD must adapt to a renewed emphasis on early warning and attack assessments. To date, Canada has, somewhat inexplicably, continued to refuse to participate with the U.S. in continental missile defence. It has also dithered at length over the procurement of badly needed new fighter jets that are key to enhancing North American security under NORAD. As the North Warning System (NWS) approaches obsolescence, a decision on its replacement must soon be made by the two governments

The U.S. is watching Canada's commitment closely. The alliance will not survive merely on the nostalgia for its Cold War record. Canada will be expected to do its part for NORAD in the current context, or the U.S. will do whatever it takes to ensure its own defence, regardless of Canada's sovereignty. There may soon come a moment where Canada has no choice but to step up on continental missile defence and equipping its forces. Otherwise it may risk the end of an alliance that has not only protected North America, but has defended Canada against U.S. help.

## **ABSTRACT**

The North American Aerospace Defense Command (NORAD) is now over 60 years old and remains one of the principal institutions in both Canada-U.S. defence relations and the bilateral relationship more generally. Through active participation with our more powerful neighbour in the defence of North America in NORAD, Canada achieves key strategic goals: "defence against help" (from the U.S.) and a voice in our own defence.

NORAD's missions have evolved with the changing geostrategic and technological contexts but remain centred around aerospace warning; aerospace control against air-breathing threats, including terrorist use of aviation; and most recently, maritime warning.

Two factors necessitate significant modernization of NORAD's capabilities. The first is the challenge posed by revisionist national policies in Russia, China and the so-called rogue states of North Korea and Iran. The second is the adoption in Russia and to a lesser extent in China of a new generation of precision weaponry, including long-range, stealthy cruise missiles and bombers, low-yield nuclear weapons and advanced conventional weapons. Russia, in particular, has articulated a doctrine of nuclear use, suggesting that nuclear weapons might be used to terminate armed conflicts (through escalation) that threaten the Russian homeland and neighbourhood. Both North Korea and Iran are developing long-range ballistic missiles and North Korea is now a nuclear power; while neither of these states is irrational, their behaviour could be unpredictable.

The ability to blunt coercive strikes directed against North America would be essential to allow time for diplomacy before retaliatory use of force might be politically necessary for a U.S. president. NORAD's existing warning systems and fighter-interceptors are reaching the end of their lives. Their replacement will pose significant policy questions, including choices of technologies, location of sensors, possible public-private partnerships and new or modernized airfields in the Far North of Canada, among others.

The Canadian government in its defence policy statement, Strong, Secure, Engaged, has placed a high priority on replacing the existing North Warning System and the RCAF fighter fleet. Given the bi-national nature of NORAD, Canadian follow-through on these commitments will be closely watched in Washington by those charged with homeland defence.

Key Words: NORAD, Russia, cruise missile, nuclear, Canadian defence policy

## 1. INTRODUCTION

The North American Aerospace Defense Command (NORAD) has been at the heart of the Canada-U.S. defence relationship since 1958. NORAD is unique among defence relationships and alliances for its bi-national structure in which the commander (traditionally a U.S. officer) and deputy commander (a Canadian) report to both governments. This bi-national structure is replicated throughout the command, with Canadian and American forces personnel working side-by-side and responding via a single chain of command to both capitals. NORAD thus operationalizes two profound Canadian national interests: "defence against help" from our larger, more powerful neighbour, and a voice in our own defence. These imperatives were obvious to Canadians from the early days of U.S. preparation for possible Japanese threats to the Pacific coast: "The country would lose independence from Americans if Canada did not take the initiative in developing acceptable means of bilateral cooperation...." (Douglas 1992, 32; Jockel 1987, 2) However constant these interests may be, their strategic context is evolving because of technological developments and different understandings of the utility of nuclear weapons, especially on the part of Russia. These changes pose new policy challenges for NORAD and for Canada in particular, since the U.S. will defend itself regardless. NORAD is at a point where the question of its future relevance will depend upon choices made in Canada.

## 2. ORIGINS: OVERVIEW OF THE POLITICAL AND HISTORICAL CONTEXT

NORAD's deepest roots date back to August 1938 and what is sometimes described, rather grandly, as the "Kingston Dispensation." Speaking at Queen's University, then president Franklin Roosevelt referred to his "good neighbour" policy in the Americas. This included seeing Canada as a true nation of the Americas while also accepting Canada's status as a member of the British Empire. In velvet words, the president stated that "the people of the United States will not stand idly by if domination of Canada is

threatened by any other empire.” (Nossal, Roussel and Paquin 2015, 28) After meditating on Roosevelt’s words (which were widely welcomed in Canada), then prime minister William Lyon Mackenzie King responded that “we too have our obligations, as a good, friendly neighbour, and one of these is to see that... our country is made immune to attack or possible invasion as we can reasonably be expected to make it and should the occasion ever arise, enemy forces should not be able to pursue their way, either by land, sea, or air to the United States across Canadian territory” (Nossal, Roussel and Paquin 2015, 28)

In August 1940, King visited Roosevelt in his private railway car in Ogdensburg, N.Y. The two leaders discussed the president’s conviction that the two nations had to co-operate to ensure the defence of the continent. King agreed (Eayrs 1965, 208). The Ogdensburg statement spelled out that understanding and established what would be the core institution of bilateral defence co-operation, the Permanent Joint Board on Defence (PJBD).

None of the three statements by the president and prime minister (Roosevelt at Queen’s University; King’s response; the joint statement at Ogdensburg) constituted an official treaty or agreement; however, their value as political statements from the highest level has endured.

In September 1945, Igor Gouzenko, a cipher clerk at the Soviet Union’s embassy in Ottawa, defected to Canada with evidence that Soviet espionage had penetrated the U.S. nuclear weapons program as well as Canadian and British defence efforts. Despite the shock felt in Washington and Ottawa, bilateral military co-operation continued with little sense of urgency. In February 1947, the two governments issued a Joint Statement on Defence Collaboration. It covered exchanges of personnel, standardization of equipment, joint military exercises and reciprocal use of military facilities. These rather banal activities were hedged around by King’s insistence that each partner remained free to determine the extent of future co-operation (Eayrs 1972, 348). Yet, only five years later, Canada and the U.S. would be deeply involved in planning extensive air defences, which would soon become a joint endeavour as foreseen by the PJBD. What had brought about such a sudden change?

Two events stunned the U.S. defence and intelligence establishments. First was the revelation at the May 1947 Moscow military parade that the Soviets had reverse engineered the American B-29 bomber, the aircraft that had delivered the two atomic bombs on Japan (Gordon 2009, 9-13). The second event, occurred on Aug. 29, 1949, when the Soviet Union detonated its first nuclear weapon, a successful test of a nearly exact copy of the “Fat Man” bomb tested in New Mexico and used against Nagasaki. Most assessments had concluded that a Soviet atomic bomb was not likely before 1951 or even 1953, but Soviet espionage at Los Alamos and elsewhere had delivered the secrets of the Manhattan Project, including the more advanced implosion weapon (Rhodes 1995, 187-198). The Cold War nuclear era had begun. The Soviet version of the B-29, the Tu-4 (NATO reporting name: Bull), could strike the entire U.S. on a “one-way” mission. U.S. intelligence (Joint Intelligence Committee [U.S.] 1948, as cited by Jockel 1987, 32) estimated that 1,000 such Soviet aircraft could be produced by 1949, along with

25 atomic bombs of 20 kilotons yield, and 200 bombs by 1954 (Joint Chiefs of Staff [U.S.] 1950, as cited by Jockel 1987, 35).

By 1950, both Canada and the U.S. were developing jet interceptors (the similar CF-100 and the F-89); planners, politicians and scientific advisors were debating the location of early warning radars; and soon, air force officers began to consider integrated command and control (Jockel 1987, 91-92). These issues were extensively discussed in the PJBD. NORAD actually began operations in 1957 as a purely military command exercising operational control of both nations' air defences, but the diplomats soon caught up with it and imposed an exchange of notes. Canada's then secretary of state for external affairs, Sidney Smith, insisted that "It is a matter of orderly practice for governments to record in diplomatic exchanges important decisions affecting their relations." (Jockel 1987, 108) The prime minister and U.S. State Department concurred. The NORAD Agreement thus dates from May 12, 1958.<sup>1</sup> Its early years were tumultuous, marked by American anger over Canadian hesitation in implementing its commitment to accept U.S. nuclear weapons for the CF-101 VooDoo and BOMARC Surface-to-Air Missile, which replaced the CF-100 and the stillborn CF-105 (Jockel 2007, 61). By 1965, NORAD was fully functioning as an essential component in U.S. deterrence strategy while offering a defence against surprise attack.

Today NORAD is located at Peterson Air Force Base in Colorado Springs, Colo., with the alternate command centre in nearby Cheyenne Mountain. Subordinate headquarters are located at bases in Alaska, Winnipeg and Florida, each staffed on a bi-national basis.

### **3. NORAD AND U.S. NORTHERN COMMAND TODAY**

Over the decades, NORAD's air defence missions have evolved from basic air defence of ports and defence industries, essential to sustain western Europe in the event that the Soviet army moved west, to protecting the U.S. deterrent against "precursor" attacks designed to limit a U.S. counterstrike, to preventing "decapitation" strikes against the U.S. command structure. Today NORAD missions are: aerospace warning, aerospace control and maritime warning. NORAD provides to the U.S. and Canadian national command authorities (the president and prime minister and their ministers of defence) unambiguous aerospace warning in the form of an Integrated Tactical Warning and Attack Assessment (ITW/AA). This integrates a variety of sensor information to the detection, validation and warning of attack against North America, whether by aircraft, ballistic or cruise missiles or space vehicles (NORAD 2019). This part of the NORAD mission constitutes an important element in maintaining strategic stability between the two large nuclear powers.

Aerospace control uses radars and fighters to detect, intercept and identify air-breathing threats (i.e., not ballistic missiles) to North America and, if necessary, engage them. These include cruise missiles, unauthorized or unidentified aircraft, drug-trafficking

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<sup>1</sup>

Canadian officers posted to Colorado Springs are often surprised to learn that their U.S. counterparts do not consider NORAD to be a "treaty." The difference stems from U.S. treaty practice, which requires a treaty to be ratified by the U.S. Senate. The U.S. implements the agreement as legally binding, as it does with all executive agreements.

aircraft and terrorists. The maritime-warning mission, established in 2006, requires a shared awareness and understanding of the activities conducted in U.S. and Canadian maritime approaches, maritime areas and internal waterways.

NORAD's present disposition reflects policy decisions taken by the two governments during the 1980s, chief among them the North American Air Defense Modernization (NAADM) plan agreed to in 1985. These policies were developed in large part to counter an emerging Soviet capability: long-range Air-Launched Cruise Missiles (ALCMs), particularly the missile identified as the AS-15 Kent, in NATO nomenclature. Very accurate and difficult to detect and track, the AS-15 was capable of striking key targets when launched at considerable range far from the target's defences, renewing concern of a "decapitation" strike against U.S. command and control and/or leadership (Jockel 2007, 123-134). Under the NAADM, key elements were the replacement of the 1950s DEW Line (Distant Early Warning Line) with the new radars of the North Warning System (NWS) and the construction of several Forward Operating Locations to allow the deployment of USAF and CAF fighters northwards to counter cruise missiles and their carrier aircraft.

A key policy inflection point was the Canadian decision after 9/11 not to adopt U.S. proposals for a completely integrated continental defence structure. This led the U.S. to establish Northern Command (NorthCom) in October 2002 for the defence of the U.S.<sup>2</sup> Like other U.S. geographic combatant commands, NorthCom conducts defence relations with allies, partners and other nations in the assigned region, in this case Canada and Mexico.<sup>3</sup> The four-star U.S. general who commands NorthCom is "double-hatted" as the commander of NORAD.

A second Canadian policy decision, and an unexpected one — to decline to participate in North American missile defence — also shaped NORAD's structure, as well as opening a rift between the two countries. After considerable discussion, it was agreed that Canadian military personnel could take part in missile-warning activities, which were placed under NORAD, but not in the active missile-defence role, which was placed under U.S. Northern Command (Fergusson 2010, 233-244). This anomaly, the division of a mission deemed vital by the U.S between NORAD and NorthCom, remains a troubling incongruity in Colorado Springs. U.S. commanders have managed to make the bifurcated NORAD/NorthCom missile-warning and defence mission work, but this remains a vulnerability that could become a serious policy issue in the event that a future commander (or commander-in-chief) considers the arrangement undesirable or unworkable.<sup>4</sup>

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<sup>2</sup> Under the 1986 Goldwater-Nichols Act, combatant commanders (COCOMs, who hold four-star rank) exercise combatant control over the forces assigned to them. The chain of command runs from the president through the secretary of defence to the COCOM.

<sup>3</sup> Mexico is quite familiar with NORAD through its deployment of military officers to NorthCom in Colorado Springs. However, the traditional Mexican foreign policy of non-alignment has meant that NORAD has always been and remains, irrelevant to Mexican security.

<sup>4</sup> The Americans have never quite understood Canada's reluctance, given our participation under NORAD in the 1960s in developing missile-defence concepts, or the Canadian government's unwillingness to take a decision which would have guaranteed NORAD's relevance far into the future.

A third set of policy decisions was forced upon NORAD as a result of its failure to intercept the civil airliners used as weapons on Sept. 11, 2001. In the post-Cold War calm, NORAD's fighter interceptors in the continental U.S. had been reduced in number and were positioned primarily to identify unidentified aircraft approaching the U.S. (Jockel 2007, 209).<sup>5</sup> They were therefore unable to intercept the airliners before they could strike their targets. (The National Commission on Terrorist Attacks Upon the United States 2004, 352) An immediate policy change, under the code name of Operation Noble Eagle, was to increase the number of alert aircraft and then to work out an effective geographic distribution so that every major U.S. city was within a prescribed distance of a fighter base.<sup>6</sup> With the tactical problems addressed, the much more complicated policy for intercepting suspicious aircraft had to be developed. Given the profound ethical consequences inherent in Operation Noble Eagle, a comprehensive legal and ethical framework was established under which detailed protocols for tactical action and decision-making were promulgated in both countries.<sup>7</sup>

#### **4. OVERVIEW OF EMERGING POTENTIAL THREATS**

The following discussion is focused upon the military capabilities of the so-called revisionist powers, as well as on what is known of their declared doctrine for using the new generation of precision-guided nuclear and conventional weapons. Weighing the political intent of adversaries requires a broader analytic context including the adversaries' foreign policy, leadership dynamics and their own perceptions of vulnerability and opportunity. NORAD, as an operational command, must focus mostly on the capabilities available to a potential adversary and the doctrine governing their use, while relying on a wide-aperture view of the adversary and the current geostrategic situation to provide indications and warnings of hostilities and intimidation actions.

#### **THE CHANGING UNDERSTANDING OF DETERRENCE**

Deterrence has always been more complex than the simplistic invocation of mutually assured destruction or the Gorbachev-Reagan declarations that a nuclear war cannot be won and must never be fought. As far back as the 1980s, advancements in precision guidance led some strategists to observe that a new generation of precision conventional weapons could effectively strike key targets hitherto included in nuclear-targeting plans. (Krepinevich 2019, 38) More recently, advances in very low yield nuclear weapons may have made them more useable. Defined escalation ladders have therefore been

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Map: "NORAD Fighter Status 11 September 01 0800 EDT." There were seven alert sites on the periphery of the continental U.S., one alert site in Alaska and two in Canada. Each had two fighters ready to scramble for a total of 20 NORAD fighters. Jockel cites NORAD as source, but the NORAD website appears no longer to host this map.

<sup>6</sup>

RCAF interceptors are based at CFB Cold Lake, Alta. and CFB Bagotville, Que.; aircraft are occasionally deployed to bases closer to Canadian cities and critical infrastructure. On a day-to-day basis, the geography of Canada's two fighter bases mean that most Canadian cities are protected by U.S. fighters, which under standard NORAD policies can operate in either country. Operational control of U.S fighters would be by the Canadian NORAD region.

<sup>7</sup>

U.S. and Canadian protocols for Operation Noble Eagle are classified and differ slightly, but officers of either country can implement them.

superseded by “cross-cutting conventional and strategic (nuclear) escalation paths,” which present new challenges to warning systems and defences (Krepinevich 2009, 78-80).

## **RUSSIA**

Beginning in the late 1960s, successful U.S.-U.S.S.R. arms-control negotiations clarified the mutual understanding of deterrence while placing limits and then reductions on the two superpowers’ massive arsenals. However, under Russian President Vladimir Putin, Russia has articulated a revisionist foreign policy heavily influenced by NATO’s expansion, its suppression of Serbia in the 1999 Balkan wars and its support for the anti-Russian “colour revolution” regime change in Ukraine. Russian doctrine thus draws upon its historical memories of invasion as well as its fear of America’s and its allies’ capability to destabilize Russia through precision conventional strikes on its strategic weapons, command-and-control nodes and leadership, and thus their ability to achieve a decisive advantage in any regional conflict in Russia’s neighbourhood (Steil 2018). In response, for the better part of a decade, Russian defence ministers and senior military officers have articulated a doctrine commonly described as “escalate to de-escalate.” While some academic observers and journalists have discounted the meaning of the expressed doctrine, most analysts — especially those linked to NATO states — do not (Zysk 2018, 4).

Implementation of the Russian doctrine would begin with warnings expressed through diplomatic channels, followed by public statements to the effect that Russia will react unless the status quo ante is restored. Movements of assets and exercises, visible to adversarial monitoring, would strengthen the warning. Intimidation tactics, such as close approaches to national borders or even overflights, might follow. At a certain point, a limited conventional strike might be employed, followed by a low-yield nuclear strike, probably on a target where few individuals would be killed. Should the desired effect not be achieved, at that point, Russia might choose to execute a limited nuclear strike with low-yield weapons against military targets, escalating to carefully selected key civilian economic and infrastructure targets. The latter option is sometimes described as “strategic operations to destroy critically important targets,” intended to arouse public opinion favouring a stand-down in the face of Russian determination. At every stage, intense public messaging plus cyber harassment would be employed (Zysk 2018, 7).

Whatever the finer points of deterrence/escalation theory may be, Russian military modernization has placed high priority on the necessary precision long-range conventional and nuclear weapons. In particular, Russia’s Long-Range Aviation (LRA) program, far from being a moribund Cold War relic, has received extensive modernizations of its two strategic bombers, the Tu-95MS (NATO reporting name Bear-H) and the Tu-160 (Blackjack); the Tu-160 has been placed back into production to replace the Bears. An entirely new strategic bomber is under development (SIPRI Yearbook 2018, 244). A major part of the modernization has been the deployment of a new ALCM, with two variants, the Kh-101 (conventional) and Kh-102 (nuclear). They have been allocated the NATO reporting name AS-23 Kodiak. The AS-23 is estimated to have 2,500- to 2,800-kilometre range, is capable of extremely precise targeting and is very difficult to detect and intercept (Zysk 2018, 8). The Russian navy’s most modern nuclear



attack submarines as well as its modern diesel-electric submarines are being equipped with the SS-N-30 Kalibr Land-Attack Cruise Missile (LACM), with a range of 2,500 kilometres (CSIS Missile Defense Project, 2018. "Missiles of Russia;" SIPRI, 249-250).<sup>8</sup>

The conflict in Syria has provided an occasion for the practical implementation of the doctrine. Syria, with its Russian naval base, has long been seen by Moscow as a strategically important ally, providing Russia with the ability to deploy a naval presence on the Mediterranean, among other strategic benefits, as noted by Andrew Parasiliti, director of the Center for Global Risk and Security at the RAND Corporation, cited by Ann Simmons in the Los Angeles Times on April 6, 2017. At various times, LRA Bears and Blackjacks, along with the LRA's medium bomber, Backfire-C, have launched volleys of the new ALCMs against ISIS and rebel targets. Russian submarines have also launched Kalibr LACMs. A reasonable conclusion for Moscow would be that the escalation doctrine has now been successfully implemented: U.S. President Donald Trump first took great care to avoid inadvertent U.S.-Russia clashes and has begun to reduce the U.S. presence in the Syrian theatre.<sup>9</sup>

For NORAD, the re-emergence of a potentially effective Russian threat has brought the command full circle. The LRA's operations in the Arctic, approaching U.S. and Canadian airspace (but not violating internationally agreed borders), appear to be realistic and systematic exercises of the LRA/AS-23 capacity to launch limited strikes against North America as foreseen in the escalation doctrine. NORAD's capacity to warn of and blunt limited strikes is deemed essential to provide the U.S. leadership with, for example, the opportunity to tailor a diplomatic response combined with minimal conventional retaliation, rather than an immediate nuclear strike, which, however small, could accelerate the dynamics of escalation. The new concepts of escalation and deterrence, combined with technological advances, place a renewed emphasis on early warning and attack assessment, missions at the heart of modern-day NORAD that now require new approaches.

## CHINA

For over a decade, China has been pursuing a massive transformation of its large but old-fashioned military to produce a technologically advanced, agile and professional force capable of projecting power beyond China's traditional sphere of influence. Part of this effort is the expansion and modernization of its strategic nuclear forces with a new generation of land-based ICBMs and ballistic-missile submarines. Following the example of the U.S. and Russia, China has begun a program for a long-range strategic bomber with conventional and nuclear precision-strike capabilities, possibly embodied in a new generation of ALCMs (SIPRI Yearbook 2018, 266). This capability could allow China to conduct both conventional and limited nuclear operations with a high degree of precision as a tool in crisis management and intimidation. As China develops its long-range

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<sup>8</sup>

Range estimates for Russian cruise missiles vary from source to source. The more conservative figures are cited.

<sup>9</sup>

A previous example, as perceived in Moscow, was NATO's decision not to intervene on Georgia's behalf in 2008 after Russia deployed nuclear capable Iskander ballistic missiles to the theatre.

precision-strike capabilities, it may alter its traditional policy of maintaining its nuclear forces at low alert levels to ensure responsiveness, but has given no indication that it would alter its declaratory policy of no first-use of nuclear weapons (SIPRI Yearbook 2018, 261).

## **THE “ROGUE NATION” THREATS**

North Korea and Iran pose lesser threats, but the former has attained nuclear weapons status and a basic (and as-yet not-fully-developed) ICBM capability in unknown but small numbers. Iran continues to progress in its regional ballistic-missile programs but has not yet perfected an ICBM. These two states amply demonstrate the kind of risks posed by proliferation. Perhaps of more concern is the proliferation of cruise missiles to countries of concern and/or non-state actors. Many of these are dual-capable and can be targeted with a high degree of accuracy; Michael Stott reported for Reuters in 2010 that Russia has offered for sale a “cruise missile — the SS-N-30, in a shipping container.” This concept could appeal to non-state actors such as Hezbollah, or countries seeking an asymmetrical counter to U.S. superiority. Other arms suppliers have offered similar systems.

Finally, there is the persistent threat of terrorism. Although recent attacks in various countries have been carried out by small numbers of attackers or individuals, the 9/11 model is still a concern, if for no other reasons than the shock effect of a mass-casualty attack and the inevitable economic losses that would follow.

## **5. POTENTIAL POLICY CHALLENGES FACING NORAD GOING FORWARD**

The Canadian government’s intentions regarding the defence of North America and its defence relationship with the U.S. and NORAD in particular are stated in its defence policy statement, Strong, Secure, Engaged, or SSE (SSE 2017). There is no change in the priority assigned to the defence of North America and NORAD from previous defence-policy documents, where those priorities ranked second only to the defence of Canada itself.

SSE does state that Canada will fulfill its NORAD obligations “with new capacity in some areas” and “modernize NORAD to meet existing challenges and evolving threats to North America, taking into account the full range of threats.” (SSE 2017, 90) Elsewhere, SSE states: “Canada will ensure it has the military capabilities required to meet its NORAD obligations, including sufficient mission-ready fighter aircraft, and enhance our capacity to provide continuous aerospace and maritime domain awareness and aerospace control.” (SSE 2017, 83) Of particular importance to Canada, this means the modernization or replacement of the North Warning System. SSE states:

“... while the current NWS is approaching the end of its life expectancy from a technological and functional perspective, unfortunately the range of potential threats to the continent, such as that posed by adversarial cruise missiles and ballistic missiles, has become more complex and increasingly difficult to detect. To this end, Canada and the United States have already launched bilateral

collaboration to seek an innovative technological solution to continental defence challenges including early warning. Studies are ongoing to determine how best to replace this important capability as part of the overall NORAD modernization.” (SSE 2017, 79)

New fighter aircraft for the NORAD mission and NWS modernization are included in the “new initiatives” listed in SSE, implying that funding will be available when appropriate.

If the larger policy context for NORAD is amply stated in SSE, a large number of subsidiary policies must be established to operationalize SSE’s intent. In particular, replacement of the surveillance capability will require decisions such as the negotiation of bi-national cost sharing. More fundamental will be the technological choice and location of new sensors. Although specifics are classified, references in documents such as the U.S. 2019 Missile Defense Review (2019, xvii) suggest that systems that could detect and track both air-breathing and non-air-breathing threats (i.e., ballistic missiles and hypersonic glide vehicles) are receiving consideration. Selection of such a system might pose a significant policy challenge, since the NWS provides the capability to detect only bombers and, to a limited extent, cruise missiles, not ballistic missiles. Canada participates in ballistic-missile warning, but in a role mainly focused on assigned personnel, not technical capabilities. Canada could conceivably have to accept a more active role in missile warning, which might be decried as a “slippery slope” to full participation in missile defence. Language in SSE referencing new capacity and the full range of threats echoes that in the 2019 Review and suggests that the replacement for the NWS might well have capabilities to allow it to contribute to missile warning. U.S. planners might see adoption of such dual-capable systems as essential to continuation of the missile-warning function under NORAD.

Russia’s deployment of the SS-N-30 Kalibr dual-capable sea-launched land-attack cruise missile poses another set of challenges. In limited strikes, the missile would be launched from one of Russia’s advanced submarines, placing a premium on NORAD’s ability to perform its maritime-warning mission in the first instance and then execute its aerospace-control mission, i.e., detecting and intercepting the SS-N-30. The implication is that a new set of sensors might be necessary along the coasts of North America. An alternative (or complementary) system would be additional Aegis radars in naval combatants, including on some of Canada’s planned surface combatants.<sup>10</sup> Procuring Aegis systems would be a significant policy decision that would materially add to NORAD’s warning capabilities as well as providing additional capability for NATO ballistic missile defence activities, in which Canada is a participant.

Another policy issue could potentially include the degree to which NWS replacement might become a venture between government and private industry. The relocation of NWS installations to more northern positions will require new and specific policies. Among the most important would be a stringent environmental regime for construction

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In the U.S. navy and Japanese Maritime Self-Defense Force, Aegis radars are part of a system including variants of the Standard surface-to-air missile, capable of defending against ballistic missiles up to the IRBM class. Adoption of Aegis radar does not automatically imply adoption of the Standard missile, as some navies have procured the radar alone. Aegis is the ancient Greek (from the Iliad) for a shield or protection.

and operation (given the unhappy experience of contaminated DEW Line sites) as well as opportunities for Indigenous Peoples' participation. Moving the NWS north will probably require the construction of at least one fighter forward operating location and several support airfields. With regard to new or expanded/developed airfields, policies regarding shared civilian use and use by other government agencies will need to be established. Finally, a decision on fighter procurement is unavoidable and it should be noted that no decision is, in a very real sense, a policy decision.

Experience shows that Canadian defence policy statements should be read as aspirational, subject to government's fiscal contingencies and electoral politics. Different policy outcomes from those implied in Strong, Secure, Engaged are not inconceivable. However, it must be noted that policy regarding NORAD is bi-national in nature and, as such, is closely watched by those elements of the U.S. Joint Chiefs of Staff and the Congress most concerned with homeland defence.

In the new era of state-to-state confrontation, especially in regards to Russia, Canada will be expected to do its part, or the U.S. (following on Roosevelt's formulation in 1938) will do whatever it takes to assure its own defence, regardless of Canadian sovereignty. Should Canada prove unable to decide on a fighter procurement, the U.S. could propose basing its own aircraft in Canada (as was the case in the 1950s and '60s in Newfoundland), with operational control vested exclusively in American officers. Similarly, hesitation over NWS replacement would lead the U.S. to seek a national solution, even if it is inferior to one using Canadian geography. In either of these cases, NORAD's survival could be problematic. A NORAD reduced to symbolism as a subordinate command would no longer place Canadians in a bi-national chain of command reaching to the highest levels and a unique entry into U.S. decision-making would be lost.

## **6. WILD CARDS**

In the unsettled conditions of 2019 and 2020, one or more "wild cards" could materially impact the policies outlined in SSE for improving the defence of North America against the possibility of an active campaign of intimidation by Russia. Intensified Cold War-type strategic challenges are emerging from Russia and China. One prominent feature of the Cold War was the negotiation of the scope of the competition between the U.S. and the U.S.S.R. In particular, the various strategic arms negotiations and the treaty-implementation processes not only reduced and stabilized the Soviet and U.S. nuclear arsenals, but the processes of treaty verification and regular consultations clarified "red lines" and allowed each side to gauge the other's strategic thought. Should the U.S.-Russia New START arms-control agreement not be extended in the aftermath of the abandonment of the Intermediate-Range Nuclear Forces Treaty, it is possible that a build-up of nuclear weapons on both sides could occur, with at best an imperfect understanding that nuclear use in non-strategic circumstances might occur. In such circumstances, there could be pressure on Canada to increase its defence commitments to NORAD, in terms of fighter interceptors or a multiplication of sensors on Canadian territory.

Another wild card would be the possibility of disruptive technologies altering military calculations and force planning. This seems not unlikely, given the emerging maturity of several advanced technologies, such as directed-energy weapons (lasers) after many years of development. Another disruptor would be practical anti-satellite weapons, whether deployed in space or launched from terrestrial bases, high-flying unmanned aerial vehicles (UAVs) or fighters. These could threaten the crucial infrared warning data that NORAD depends upon for ITW/AA. Equally important would be the implications of anti-satellite weapons for the rapid transmission of the data that knit together the entire NORAD/NorthCom enterprise. The U.S. and Canada might then have to develop less-vulnerable alternatives to satellites, such as infrared detectors and communications modules mounted on long-endurance, high-altitude UAVs.

Finally, U.S. defence policy has been more consistent during the current administration than presidential rhetoric might suggest. One constant has been President Trump's sharp criticism of NATO allies that do not adequately fund their share of the common defence. Thus far, Canada has been included in Trump's criticism of NATO allies' defence spending and it is not impossible that he may question the adequacy of Canada's contribution to NORAD's cost structure and deployed capabilities.

## 7. CONCLUSIONS

NORAD has now been in existence for over 60 years. Its longevity reflects its adaptability as missions have evolved from a more or less "conventional" defence against attacking bombers, which any Second World War commander of an air-defence campaign would recognize. In the thermonuclear/ICBM era, NORAD provided early warning and a hedge against a sudden decapitation strike, functions vital to strategic stability at the height of the Cold War. In the years after the Cold War, NORAD took on what appeared to be make-work missions, such as tracking drug runners, while failing to think as creatively as fiction author Tom Clancy, who imagined the use of a civilian airliner to attack the Capitol Building in Washington, D.C. (Clancy, 1994). Stung by a failure to prevent the 9/11 attacks, NORAD recovered quickly to deploy a new basing scheme as well as a detailed protocol for countering any further terrorist attacks using civilian aircraft.

Today, with a renewed air threat and a Russian destabilizing doctrine including the threat of nuclear use, NORAD has circled back to its original mission, the air defence of North America.

But there is more to NORAD's longevity than its capacity for adaptation. Other arrangements could have executed the same missions after the Cold War. Looked at through the lens of the three functional principles enunciated by former president Roosevelt and former prime minister Mackenzie King in 1938 and 1940 (joint defence of the continent; the U.S. will defend Canada if necessary; Canada has its responsibility to contribute to the defence of North America), NORAD is a near-perfect articulation of these principles.

From another angle, NORAD also operationalizes three important principles of Canadian strategy for managing its defence relations with the U.S. By accepting responsibility for the joint defence of the continent, Canada's fundamental requirement of "defence against help" is secured. By participating in a bi-national military command serving both governments, Canada achieves a voice in its own defence. By establishing a treaty-based institution, with predictable understandings and a structure for addressing changed circumstances, Canada's proven method of dealing with the larger neighbour to the south is extended to a key element of the defence relationship.

For these reasons, NORAD continues to serve the national interest.

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After his first posting in New Delhi, he specialised in Cold War issues at the Canadian Embassy, Moscow and in Ottawa in the Policy Planning and Defence Relations Divisions. In 1991-1996 at the Canadian Embassy, Washington DC he was responsible for Political-Military Affairs including Strategic Nuclear Issues, Arms Control, NATO issues and Canada-US Defence Relations.

On return to Ottawa, from 1996-2001, he was Deputy Director in the Northern Europe Division for the UK, Ireland, and Northern Ireland peace process and from 2001-2010 Senior Policy Advisor for Canada-US Relations including participation in the abortive bilateral discussions on ballistic missile defence.

From 2010 to 2014, he was Canadian Political Advisor to the Commander of NORAD and United States Northern Command at NORAD Headquarters in Colorado Springs.

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